STUDIES OF TASMANIAN CETACEA.

Part III.

Tursiops tursio.

Southern Form.

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Plates XXIII.-XXV.

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In foregoing papers we have dealt with (i.) *Orca gladiator*, *Pseudorca crassidens*, *Globicephalus melas*, and (ii.) *Ziphius cavirostris*. In the present instance we desire to place on record certain data relating to *Tursiops tursio*, and to show reasons why it should be included as an inhabitant of the Australian Zone. In a succeeding paper we hope to publish certain facts concerning *D. delphis*.

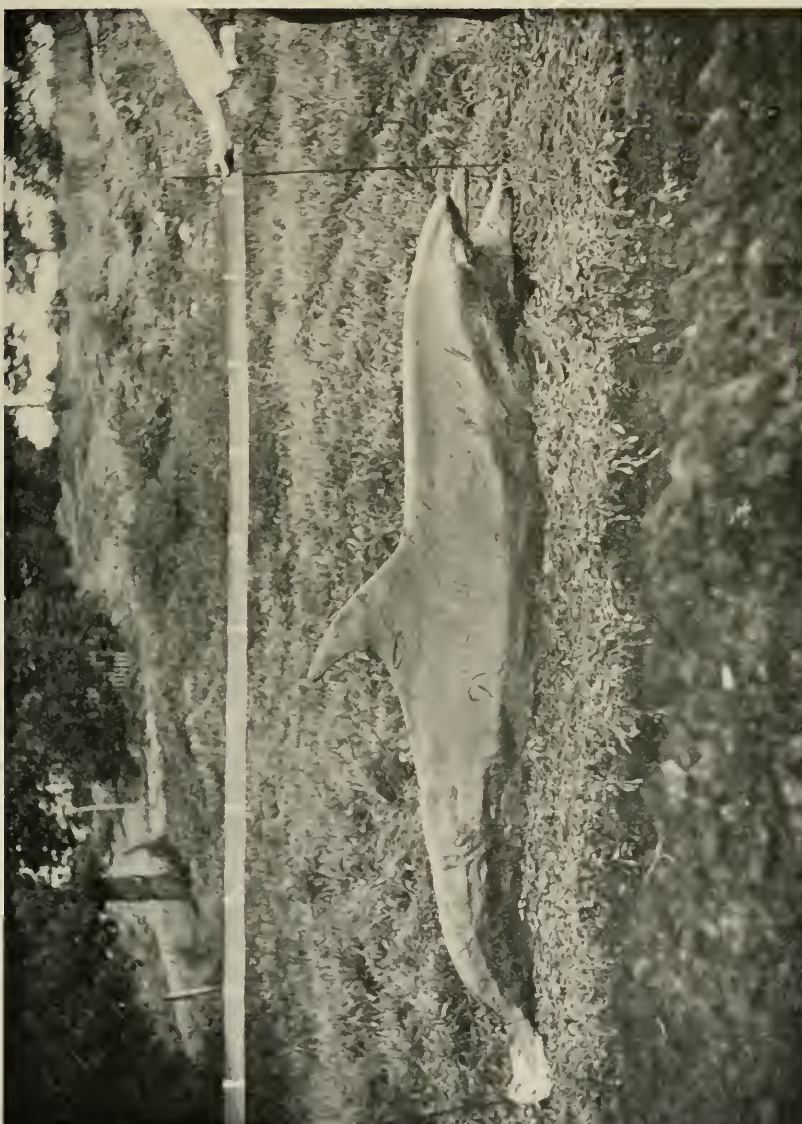
The genus *Tursiops* should not be confounded with that of *Tursio*, which latter genus, with very little readjustment, might well be relegated to mere specific rank, for it is closely involved with other genera—for example, *Prodelphinus*.

Gray used the designation *Tursio* in 1862, but, as it had been previously used by Wagler for another genus, Gray's designation lapsed, and *Tursiops* was substituted. *Tursio*, however, is still retained for its correct genus, which explains why care must be taken to differentiate between the two genera.

In all lists of Australian Cetacea the representative of the genus *Tursiops* inhabiting these seas is given as *T. catalania*, the species being founded by Gray in 1862. (1) As has been observed by several authorities (2) of the numerous species described of this genus, it is very difficult to satisfactorily differentiate them from the main form of *T. tursio*. In this connection we would again draw attention to the remarks made in our previous

(1) Gray; *Delphinus catalania*, Proc. Zoo. Soc. Lond., 1862, p. 144.
,, *Tursio catalania*, B.M. Cat. S. and W., 1866, p. 262.

(2) Among others by Beddard, Camb. Nat. Hist. Mammalia, p. 379.



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paper concerning the manner in which both genera and species of the Cetacean order have been created in the past. (3) These remarks apply with added force to the *Delphinidæ*, as pointed out in strong terms by Professor Flower, (4) when writing concerning Dr. Gray's tendency to multiply species.

Since Gray published his original description it has been usual to refer to the Australian form of *Tursiops* as *T. catalania*, and to eliminate *T. tursio* as an Australian species. We propose to show that *T. tursio* is to be found in the Australian Zone, and, further, that we have certain material which may relate to the species *catalania*. Our present opinion regarding this second species is mainly based on a study of the vertebræ, which differ in a remarkable manner from the typical *Tursio*. Unfortunately, Gray's original description of *catalania* is founded mainly on a rather vague description of the osteology of the skull. We hope to gather further material in the future regarding this presumably second species, and to place our observations on record. In the present instance we will confine our attentions to showing that there is in Australian seas a species which simulates very closely that of the European *T. tursio*. The distribution of this species is evidently cosmopolitan, but, in order to make a slight local distinction, we propose to refer to the species in the vernacular as "The Southern Form."

As Gray's original description is not readily available to many Australian students, it has been considered advisable to refer to portions of it in detail. Particularly so as it has an important bearing on the present paper. Gray stated (5) *inter alia*:—

"Mr. John Macgillivray has sent to Mr. Cuming, who "has transferred them to the British Museum collection, "two skulls of a species of Dolphin or Bottlenose which he "regards as probably new. These skulls were accompanied "by the following notes:—

"Delphinus, N.S. The larger of the two skulls be- "longed to an individual killed off Cape Melville (within "the Great Barrier Reefs), north-east coast of Australia, "September 5th, 1860. It was a female, 7½ feet in length. ". . . The smaller of the two skulls represents another of the "same species. It was considerably smaller than the "first one, being only 6¾ feet in length. . . The two skulls "differ in shape and size. No 1 is 17 inches long; the "beak to the notch is 10 inches, and the upper teeth-bone

(3) Pap. and Proc. Roy. Soc. Tas., 1919, p. 6.

(4) Flower, Proc. Zool. Soc. Lond., 1883, p. 466.

(5) P.Z.S., 1862, p. 143.

"8½ inches long; the front lower teeth are worn away and "truncated, like the teeth of the common *Delphinus* "*tursio*, which was described as *D. brunatus* by Montague. "There are twenty-seven teeth on each side in the upper, "and twenty-five teeth on each side in the lower jaw. No. "2 is seventeen inches long; the beak 9½, and the upper "tooth-bone 8 inches long. The teeth, twenty-four above "(perhaps one on each side is deficient, as the end of the "jaw is very tender), twenty-three or twenty-four below. "The front teeth are slightly truncated, but this skull "differs from No. 1, being rather more convex and rather "narrower, especially in the hinder part, from the middle "of its length."

Gray continues:—"I have compared these skulls with "those of the different species of Bottlenoses (*Tursio*) in the "British Museum; and they are perfectly distinct from any "of them. The species may be called *Delphinus catalania*. "It is smaller in size, and has a much smaller brain cavity "than *D. cymodice* (Gray, Zool. Erebus and Terror, t. 19) "and *D. metis* (Gray, Zool. Erebus and Terror, t. 18), and "the beak is not so tapering as in these species, and the "teeth are rather more numerous. It is equally distinct "from *Delphinus eurysome* (Gray, Zool. Erebus and Terror, "t. 17), believed to be from the North Sea. It is not easy "to point out the distinction of these species in words; but "there cannot be a doubt about them when they are com-"pared together."

In 1883 Professor Flower [6] devoted considerable attention to the genus under review, and made several observations regarding the sex characters of *T. tursio*. We desire to quote certain of Professor Flower's remarks, and also to place in italics the portions which agree with our own observations. In this manner will be seen the remarkable similarity which exists between the Tasmanian form and the species examined by Flower, who stated *inter alia*:—"*In the males the rostrum is larger and compara-*"*tively narrower. The intermaxillaries are mor prominent* "*and convex, especially in their posterior half; in this region* "*the external border of the maxillaries is almost parallel to the* "*corresponding portion of the intermaxillaries;* the crests of "the cranium are more elevated and less sloping laterally. "*The heads of the females are remarkable for the breadth of the* "*rostrum at its base and its middle point; the rostrum conse-*"*quently has a more triangular form; the intermaxillaries are* "*more flattened; the exterior border of the posterior portion of* "*the maxillaries is not parallel to the external border of the*

(6) Flower; P.Z.S., 1883.

"*intermaxillaries, but has a rounded projection outwards. The*
"*cranium of the female is relatively a little broader than that*
"*of the male;* its height is the same in the two sexes. *The*
"*mandible is a little more elongated in the male.*"

Professor Flower summed up his remarks on the genus as follows:—

"1. *T. tursio*, including those that have been named "*Metis*, *Eurysome*, *Cymodice*, *Aduncus*, and *Gilli*, some "of which may be specifically distinct, but, if so, are very "closely allied, and still require definite elucidation of "their characters, the principal differences observed in "the skulls depending on the comparative breadth of the "rostrum, a character much influenced by sex. *T aduncus* "(*T. abusalam*, Gray) differs from the rest only in its "superior size."

"2. *T. catalania*, of smaller size than any of the "others, and with smaller and more numerous teeth. "There is truth in the remark with which Dr. Gray "concludes his original description."

One of the most recent reviews of this genus which we have had the opportunity to see is that by Dr. Beddard (7) in 1900. He points out *T. tursio* is the only satisfactory type of the genus, and gives as apparent synonyms *Delphinus truncatus*, Montagu; *D. metis*, Gray; *D. cymodice*, Id.; *D. eurynome*. He allows, with certain provisional remarks, *T. catalania*, Gray; *T. abusalam*, Ruppell; *T. gilli* and *T. parvimanus*.

As regards *T. catalania*, Dr. Beddard points out that the species is of small size, and the colour is the same as *T. tursio*, except that the sides are covered with blotches of darker colour. The beak is also relatively longer. The species is admitted both by Sir W. Flower and Mr. True.

We would like to draw attention to the fact that, although *T. catalania* was originally described from two specimens obtained from the north-east coast of Australia, successive writers have included it as the representative of genus for the whole Australian Zone, and have not included *T. tursio*. We have not had the opportunity of examining specimens from the type locality and other sections of the Australian coasts, but there can be no question concerning the occurrence of a Southern form of *T. tursio* in Tasmanian seas. As regards the second species, as stated elsewhere, we hope to gather further material.

The question of external colouration is worthy of mention, but we are of opinion that too much attention

(7) Beddard: A Book of Whales, p 273.

should not be paid to variability of colour as regards specific classification. The usually accepted definition as regards the external colour of *T. tursio* is that the upper surface is lead colour and the under surface white. Beddard, however, quotes [8] an instance mentioned by Van Beneden of specimens which were intense black, except for a white streak on the ventral surface. The two specimens with which this paper chiefly deals were of deep and polished black on the upper surfaces, and slate coloured on the under surfaces. The colour being the same in both sexes.

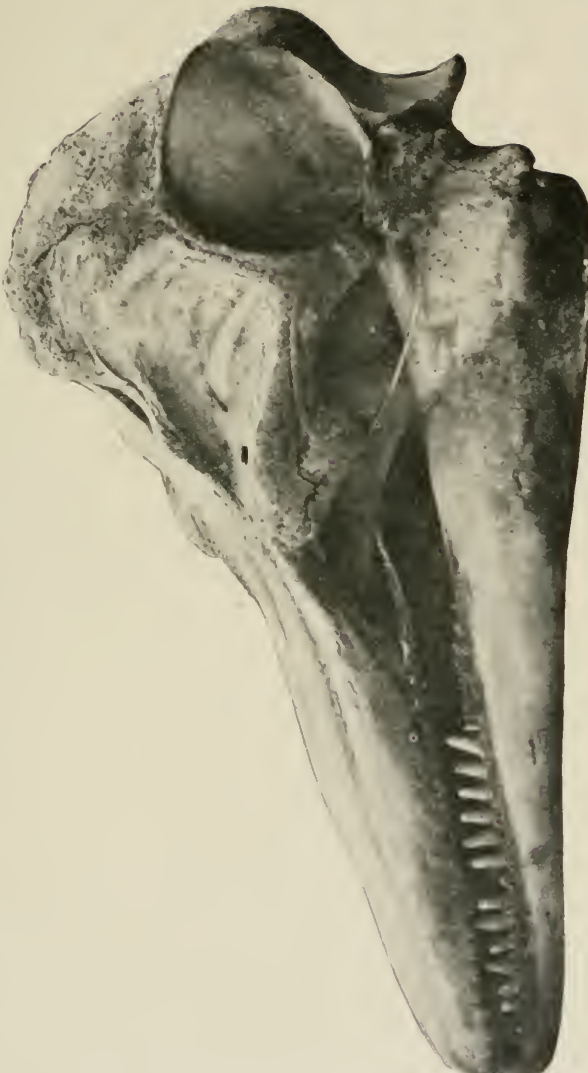
As regards the vertebral formula, our specimens showed C. 7; D. 13; L. 17; Ca. 28-65.

INTRODUCTORY AND PHYLOGENETIC.

As Anthropotomists are apt to refer rather loosely to "vestiges of the cartilaginous cranium," we wish to make our position quite clear prior to introducing the several data that go to make up the present section of our paper. If we assume that the history of the cartilaginous skull has, in the main, been correctly read, we still have to face the fact that a cartilaginous tract, that by ostosis has taken its place in the bony skull, may revert to its former cartilaginous condition if the pressure of external evolutionary conditions so compels it. In an instance such as this is, it would be manifestly incorrect to call such a structure "a vestige of the cartilaginous cranium," since that summary method of dismissing the case would occlude all the interesting facts of its racial history. As it is, in this latter connection, that we have to deal with, part of a cartilaginous tract, in the Dolphin's skull, we desire to avoid any ambiguity—hence this statement.

Between the ossified pre-frontal bone (Ethmoid, of Flower, and others), the frontal, and in part the nasals, of a common Dolphin's skull there remains a strip of cartilage that may, or may not, ossify. It is a moiety of the ethmo-cartilage, but is not a relic of the cartilaginous skull, since, as far as our researches go, it relates to the ethmo-turbinals, which always ossify in part in intra-uterine life, and, *in toto*, at a very early period—certainly before the septal portion of the ethmoid, or, as we here term it, the coalesced pre-frontals. If no whale ever ossified this cartilaginous tract, and, therefore, never showed any ethmo-turbinals at all, we might assume this to be a pre-mammalian racial character, and push the ancestry of the whales back to an early date, and call

(8) Beddard: A Book of Whales, p. 275.



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this cartilage a chondro-cranial relic, or anything else of a like nature, but the Rorquals show well developed ethmo-turbinals, and other whales also in part develop the sense capsules. Accordingly we are really dealing with a suspension of ostosis, under pressure of racial evolutionary needs. Retaining this thought in the mental foreground, we set out to examine this cartilage in various Dolphins' skulls, with the following results.

1. We are impressed with the fact that the enormous variation of a Dolphin's skull in the nasal regions, must have first retarded the ostosis of a considerable area; next, the ossific processes acting upon the now changed, and modified area, accelerated ostosis in some parts, and retarded it in others. As an illustration of accelerated and extended ossific energy, we may cite the vomer in Dolphins' skulls. Its basic position insures an early ossification of all its parts, which is sufficiently complex, by the way, to rule out the term "azygous bone," since it not only extends enormously forwards, but posteriorly expands over the whole sphenoid element, and even reaches the basi-occipital. Looking to other vertebrates, we find that Tonkoff, in 1902, saw its paired origin indicated in the bird, although frequently overlooked. In the crocodile it practically has three centres, two giving rise to the palatine moieties, and a third to a central portion that is embraced by the pterygoids. Traces of this latter appear in Dolphins' skulls, while to crown all we get the additional extension backwards just cited. Sir W. Flower was always careful to point out that so-called "azygous bones" were only those whose compound origin was so remote as to be uneasy to trace, a fact our studies have served to recall.

3. As an instance of retarded ostosis, we may name the ethmo-nasal regions of Dolphins' skulls.

4. In very young Dolphins' skulls the whole of this area, including the pre-frontal, and nasal regions, retains the condition of a more or less semi-cartilaginous state, showing its recent evolutionary remoulding. The same skulls, however, will have the vastly extended vomer, completely, and perfectly ossified (including even its basi-sphenoidal plate).

5. The manner in which the bony elements at the vertex of Dolphins' skulls blend, and inter-blend, according to the various factors of genera, is extremely interesting, as note.

In *Delphinus*, the nasals early fuse with two lateral strips of the ethmoid cartilage, and so extend down the sides of the coalesced pre-frontals, that line the back of the nose. This is an ethmo-nasal ankylosis.

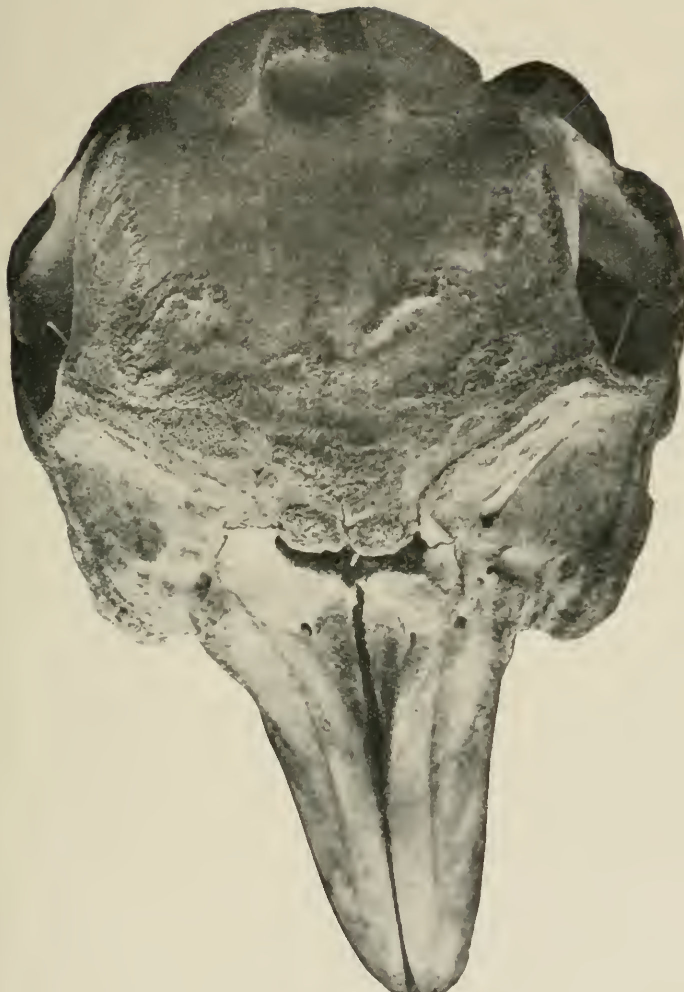
In some skulls these lateral ethmo, bony moieties, remain distinct, showing that they are not really parts of the nasals; this, however, is rare, and quite individual. The rest of this cartilage, that is the central portion, may remain as cartilage throughout, or ossify to both nasals, and pre-frontals. This latter is an ethmo-naso-pre-frontal ankylosis.

In *Tursiops*, the nasals early in life remain as two bosses at the vertex of the skull, and always show this basic character. Whatever may happen, later, will follow lines well marked off from those obtaining in the true Dolphins' skulls. We may cite the following, by way of illustration.

The ethmo-cartilage in skulls of *Tursiops*, is less compressed than in those of *Delphinus*, and in the centre it may ossify as two tongue-like strips, that appear above the upper end of the pre-frontals. These are very suggestive of the ethmo-turbinals, and accordingly we so name them. We have skulls that show this very well, indeed. The assumption here is, that the arrested ossific power is returning to earlier evolutionary states, much in the same way that Wormian ossicles appear in human skulls. Exactly how much, or how little, this strip of ethmo-cartilage will manifest definite ossific moieties, will depend upon various circumstances, one of which appears to be the effect of pressure. Still dealing with *Tursiops*, we may note that the vertex of a most carefully prepared skull will show the following bones, in addition to the maxillæ and frontals.

1. Two ossicles that represent the Interparietal and Pre-interparietal. (9)
2. The two true nasals, which combine with any, or all of the other moieties in that region of the skull, according to individual, and sex variations.
3. Two, Ethmo-turbinals.
4. Two, more or less plate-like lateral moieties that fuse with the pre-frontals, the frontals, and nasals, in various ways. These may fuse to extinction upon one side, and remain distinct upon the other.

(9) Pre-interparietal not always present.



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5. If they fuse, they may do so either most strongly to the frontal, or similarly to the pre-frontal. Again, the whole mass at the vertex may fuse to extinction, and the ethmo-turbinals remain as cartilage.

The latter state is nearest to the skull of *Ziphius cavirostris*, as represented in the Hobart Museum Osteological collection. By the usual methods adopted in cleaning Museum cetacean crania, either this region of a Dolphin's skull is left, immersed in muscle and cartilage, or else it is so mutilated in the attempt to remove such animal matter, that it is useless to a student. Our notes are made from skulls that took at least two years to prepare, every microscopic fragment of bony tissue being retained in position, and every microscopic fragment of animal matter having been removed by isolated maceration, thus avoiding a chance blow from other bones. In this way only is it possible to retain spongy bone, and to define the bounding lines of ostotic action. Beach worn specimens often help to elucidate a point, here and there better than imperfectly macerated ones, but it is sure to happen that the very piece most urgently needed has been ground away.

To correctly work out all these points it is essential to disarticulate a young *Tursiops* skull, and trace the respective elements into the cranial cavity, and unless the fronto-occipital sutures are carefully separated, some of the evidence will be lost.

Phylogenetically, all this means that the ancestor of the Dolphin group manifested well-developed ethmoidal sense capsules, the ossific processes relating to which were arrested. A cartilaginous remoulding took place, and later on a partial ossification of some parts, with a tendency to reproduce others, in a state similar to that of the Wormian ossicles of human crania. We close these notes as we began them, by saying these are not vestiges of the cartilaginous cranium.

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Southern Form.

The males of this genus closely approach the size attained by the females of the genus *Globicephalus*, and, although the maximum size has still to be recorded, it is certain that they reach eleven feet. The females, in our opinion, never exceed ten, the vast majority being a full foot shorter.

Tursiops furnishes a most useful text for an osteological study, as the genus—in point of size—is midway between the Orcas upon the upgrade, and the porpoises upon the down grade. The common Dolphin, which ranges in our seas up to eight feet in length, presents osteological characters worthy of a separate study, and, therefore, in this paper it is proposed to present a comparative study of the male and female *Tursiops*, rather than to contrast with *Globicephalus* or *Delphinus*, as would most commonly obtain.

MALE SKULL.

The occipital condyles are very heavy in appearance, and divergent upon their upper margins, so that the space between them and the magnum foramen—with which their upper ends terminate—is exactly two inches, while three-quarters of an inch below the foramen they have so contracted that the intervening space is only three-eighths of an inch. From this point, however, they again diverge in a rounded curve to their bases—a fourth of an inch lower down. The magnum foramen is buried away under the overlapping condyles, which latter form two hollow grooves along its margins, terminating above in two deeply marked pits. The foramen itself measures $1\frac{3}{4}$ x $1\frac{3}{4}$ inches, and is arched, rather than notched, upon its upper border in the individual skull here used for descriptive purposes. Some male skulls, however, available to us, show the notch most distinctly, while female skulls, apparently, have the magnum foramen transversely oval, and quite devoid of either notch or distinct arch. When large numbers of these skulls, of various ages, and both sexes, are available for direct comparison, it will most probably be shown that the following facts obtain:—

1. All young *Tursiops*' skulls have a transversely oval magnum foramen.

2. The majority—if not all—females retain this form throughout life.

3. Adolescent males show the inception of the upward enlargement of the foramen, in the immediate centre of the upper wall, and thus constitute "a notch."

4. Later in life, the edges of the notch become absorbed, as the needs of the medulla oblongata demand, and the "arched" upper edge of the foramen is the result.

Thus it will be noted that a transversely oval foramen—and, therefore, one of unequal measurement—is converted into one whose central measurements are equal in both directions.

If a line is drawn horizontally across the vertex of the skull, it will be found to be exactly five inches above the upper wall of the magnum foramen.

The par-occipital processes have thickened borders, are concave as they contribute moieties to the otocrane—they are notched for the passage of the nervus vagii. Mesiad—they are confluent with the basi-occipital, and basi-sphenoidal plates of the otocrane. A ridge marks the occipito-sphenoidal suture, but the spheno-sphenoidal suture is overlapped by the enormously extended vomer. The whole of the vertex of the skull is rough and granulated, even at times raised into bony callosities, and the sutures proper to this region stand out as ossified ridges. The line of the super-occipital—as viewed in profile—is that of an "ogee," hollow above the magnum foramen, and rounded higher up. A line vertical to the basis crani, and made to touch the occipital condyles, would stand away from the deepest part of the curve of the ogee, an inch and three-quarters.

The temporal fossæ are largely composed of the parietals, which are ridged above, and continued posteriorly as two wings that extend a quarter of an inch beyond the line of the super-occipital. These ridges slope backward and downward, finally losing themselves at the exoccipito-squamosal sutures, having upon all their faces, made open parabolic curves. In macerated skulls these curves are very symmetrical, but in old beach-worn specimens they always suffer much mutilation. The pre-maxillaries expand over the maxillaries at their upper ends, and form two hollow grooves. The maxillaries cover the whole of the frontals, except a wedge-shaped strip on either side of the skull, the bases of these wedges being turned towards the "blowers." In point of size, the frontal strip thus exposed does not exceed one and a half inches, but may vary considerably within this limit in individual skulls. When a line is drawn—mesiad—from the tip of the skull beak to the vertex, the upper edges of the maxillary wings subtend angles of 78 degrees to it Over the zygomatic arches, the maxillary wings are much thickened—in male skulls of this genus—as much so relatively as in *Globicephalus* and *Orca*, but female skulls show very little super-ossification in this region. As far as our knowledge goes, no female *Tursiops* skull ever shelves here, as obtains in *Delphinus*. It is simply a matter of less super-ossification, incidental to lower muscular power. The post-orbital processes of the frontals make such shallow curves, anteriorly, that it is best to regard them as lines, and, as such, they subtend angles of 60 degrees to the tops of the arches, formed by the united surfaces of the maxillo-frontal elements. On either side of the skull, the frontals are seen to protrude beyond the maxillaries in this region. The post-orbital processes approximate the zygomatic processes of the squamosals to within a quarter of an inch. As in all the *Delphinidæ* of the normal type, the malar bones have been disrupted, and are functionally superseded by the powerful bony arches, composed of the orbital moieties of the frontals, maxillaries, and incidentally the zygomatic processes of the squamosals. The malar bones are six inches long, measured in a straight line from their ant-orbital junctions, with the super-orbital plates of the maxillaries, to their terminations at the zygomatic processes of the squamosals.

In male skulls—such as those under review—the pre-maxillaries, when viewed in profile, give the following results. From the narial basin they arise with a well-marked curve to the middle of the beak, next depress to form a well marked hollow, elevate again, and, lastly, slowly shelve off to the tip. In female skulls, the beak is much more depressed, and unless one had noted these curves in the male skull they would hardly be looked for. Having once noted the well-marked profile of the male, the more easy curves of the female manifest themselves quite naturally, although so slightly marked.

The pterygoid bones are separated in male skulls by the very small space of one-sixteenth of an inch.

As in the skulls of *Globicephalus*, the pre-maxillary and vomer appear in the palate.

The broken and spongy alveoli (here and there absorbed) suggest the following dental formula:—

$$\frac{24 \;.\; 24}{20 \;.\; 22}$$

In a general way anything up to 25 teeth may be present, and even in old animals some of the posterior teeth never function, as we have evidence to show.

As we hold perfect skeletons of the two sexes of the Tursiops, we propose to give comparative measurements, this being, in our case, an exceptionally fine opportunity for such a method of presenting the facts, since both animals were obtained in the flesh. Both animals were fully matured. as their skeletons prove, the male was ten feet eight and a half inches, between vertical rods, and the female was exactly nine feet in length.

Having dissected these animals, and prepared their skeletons, we have every confidence in saying they represent normal sex types of the genus, and that the data may be relied upon accordingly.

COMPARATIVE SKULLS.

Character of Measurement.	Male Skull. in.		Female Skull. in.
From tip of beak to occipital condyles	21	...	19
Internal length of the brain cavity	$6\frac{3}{4}$	...	6
Maxillary notch to tip of the beak	11	...	11
Tip of beak to superior nares	14	...	14
Length of palate in a middle line	$12\frac{3}{4}$	...	$12\frac{3}{4}$
Tip of beak to end of alveolar margin	10	...	$9\frac{3}{4}$
Height of skull at vertex	$8\frac{3}{4}$	...	8
Breadth at squamosal processes	$11\frac{1}{2}$	...	10
Breadth of brain case at parietals	8	...	$7\frac{1}{2}$
Ditto of brain superorbital ridge	10	...	10
Ditto across beak at base	$5\frac{1}{2}$	...	5
Ditto across middle of beak	4	...	$3\frac{3}{4}$
Ditto of pre-maxilla	2	...	$1\frac{7}{8}$
Width of condyles	$4\frac{3}{4}$	...	$4\frac{1}{2}$
Height of foramen magnum	$1\frac{3}{4}$	...	$1\frac{3}{8}$
Width of foramen magnum	$1\frac{3}{4}$	...	$1\frac{1}{8}$
Length of ramii of lower jaws	$19\frac{1}{2}$	...	$16\frac{1}{4}$
Height of ramii at coronoid processes	$4\frac{1}{2}$	...	$3\frac{3}{4}$
Length of tooth line	$9\frac{1}{2}$	...	$9\frac{1}{2}$
Length of symphysis	$2\frac{1}{4}$	...	$2\frac{1}{2}$

A glance at this table will show the curious manner in which the male and female skulls simulate each other in the vast majority of their measurements, and yet sharply contrast in the length of the lower jaws. A single ramus can without fear be sexed so constant is this character; the ramii of adult males nearly reach 20 inches, and the females as nearly reach 17 inches. The notes already given as to the skulls and their profiles will serve to sex the crania.

Our data respecting the living animals supply the information that the lower jaws of the males protrude at least an inch and a half beyond the upper maxillæ. This accounts for fifty per cent. of the excess of ramal length, and explains the reason for the male and female crania being similar in most of their measurements, and yet showing so sharp a contrast in the matter of their mandibles. Our photo will make this partly evident, as the rod is sloped to touch both jaws. The following notes upon the skeletons of the adult sexes will aid the student in the determination of fragmentary elements and even single bones.

COMPARATIVE CERVICAL VERTEBRÆ.

Measurement Made.	Male. in.		Female. in.
Width across the processes of the axis	$6\frac{3}{4}$	...	$6\frac{1}{4}$
Total length of cervical series	$3\frac{1}{2}$	...	$3\frac{1}{4}$
Width across centrum of cervical No. 7	$2\frac{3}{4}$	...	2
Vertical measurement of same	$2\frac{5}{8}$	...	$1\frac{3}{4}$

DORSAL VERTEBRÆ.

Measurement Made.	Male. in.		Female. in.
Greatest height of dorsal No. 6 along angle subtended by the spine	$5\frac{3}{8}$	...	$5\frac{1}{8}$
Across diapophyses of same	$5\frac{1}{2}$	...	$4\frac{3}{8}$

LUMBAR VERTEBRÆ.

Measurement Made.	Male. in.		Female. in.
Total length of lumbars, 6, 7, 8, 9, 10, 11, 12, 13, 14	$15\frac{1}{8}$	...	$12\frac{1}{4}$
Greatest width across diapophyses	$12\frac{1}{8}$	...	$9\frac{1}{4}$
Greatest height of neural spine	$6\frac{7}{8}$	...	$5\frac{1}{4}$
Greatest length of body of vertebra	$1\frac{3}{4}$	...	$1\frac{1}{4}$

SCAPULÆ.

Measurement Made.	Male. in.		Female. in.
Greatest scapular height	$7\frac{1}{2}$	...	$6\frac{1}{2}$
Greatest scapular width	12	...	$8\frac{7}{8}$

ARM BONES.

Measurement Made.	Male. in.		Female. in.
Length of humerus	$3\frac{3}{4}$	...	$3\frac{1}{4}$
Length of radius	$4\frac{1}{4}$	...	$4\frac{1}{4}$
Length of ulna (including the olecranon process)	$3\frac{1}{2}$	...	$3\frac{1}{2}$
Width of radius and ulna (distal)	$3\frac{7}{8}$	...	$3\frac{1}{2}$

Vertebral formula. Cervicals 7, the first two fused to extinction in all skeletons handled by us. Dorsals 13. Lumbars 17. Candals 28. Total 65. Ribs 13 pairs, five of which reach the sternum, which latter is always in a single piece.

HISTORY.

The two whales chiefly noted in this paper, both came into the Tamar River (the male some years prior to the female), and were thus captured; both were in ill-health. The male had just escaped from some titanic battle, and was torn and mutilated. The female ascended the North Esk to Hobblers' Bridge, and died there, but the male still showed fight, and was killed in the Cataract Gorge, and afterwards exhibited in Brisbane-street.

Both were similar in external outlines, and also in colour. In the matter of the lower jaws, the mandibular symphysis protruded more in the male than in the female.

The upper parts of these Dolphins were deep black, richly polished, with slate-coloured tints below. We hold skulls and parts of skeletons from King Island, Flinders, and the North-West Coast of Tasmania, and there is some evidence in favour of admitting a second species of *Tursiops*, but for the present we regard *Tursiops tursio* as being alone certain. If a second species is shown to exist, we think a curious twisting of the neural spines of the lumbar vertebræ and the moderate length of some eight feet odd, will largely enter into its specific characters. Twice we have traced such items, but we are still awaiting the evidence obtainable from the dissection of a complete specimen.

In conclusion, we may just point out that as far as our evidence goes the *Tursiops* of Australian seas very closely simulates that of European waters, and, upon the whole, justifies the retention of a single classification for both parts of the globe. It might be wise, however, to retain for our Dolphins the additional distinctive title—"Southern Form"— as we suggested in the early part of our paper.