condition of the palate, it is difficult to say in which of the two genera Dr Gray and other British naturalists subdivide the family Arcto-cephalina it should be placed. Two species of the genus Otaria from the Chincha Islands have now been described by Zoologists, one the Otaria Godeffroyi of Peters (*op. cit.* p. 266, Plate I.), the other the Otaria Ulloae, recorded by my friend Dr M'Bain in the preceding article. This young cranium, in addition to other points in which it differs from O. Godeffroyi, possesses bi-cuspidate crowns to the 1st and 2nd upper incisors, whilst in the latter the crowns are simple. From Dr M'Bain's specimen it differs in the almost entire absence of a constriction behind the post-orbital processes; in the greater relative breadth of the cranium than at the zygomata; in the more vertical form of the occiput; in the shortness of the face; and in the zygomata springing from the superior maxillæ opposite the 5th upper molars. Whether or not it is to be regarded as a new species cannot be at present decided. The consideration of this question must be deferred until the opportunity for a more extended comparison with other specimens is obtained.

Length of skull	5·2
Breadth at zygomata . .	3·5
Breadth of cranium . . .	3·6
Length of lower jaw . . .	3·6
Breadth at condyles . . .	2·9

FURTHER OBSERVATIONS ON THE STOMACH IN THE CETACEA. By Professor Turner.

Since the publication of my contribution to the anatomy of the Pilot Whale in this Journal, November 1867, I have made some additional observations on the Cetacean stomach.

Amongst the specimens recently purchased by the University of Edinburgh for the Anatomical Museum, from the collection of the late Professor Goodsir, is an inflated and dried

stomach, which, though unmarked, is obviously from its size that of an adult Cetacean, and presents the same type of arrangement of its compartments as I have already described in the young Globio-cephalus. The collection also contains a fœtus 13 inches long, which from the form of the head and body evidently belongs to the genus Globio-cephalus.

In the adult stomach the diameter of the lower end of the esophagus was 5 inches. The 1st compartment or paunch was 31 inches long, its greatest transverse circumference 42 inches. In the fœtus the length was only $\frac{8}{10}$ths of an inch. In the adult the length of the 2nd or globular compartment was 19 inches, its greatest circumference 38 inches. In the fœtus the same compartment measured $\frac{6}{10}$ths of an inch long, and its capacity about equalled that of the paunch. In the young pilot whale described in my former paper, the 2nd compartment was somewhat more capacious than the 1st; but in the adult stomach, as the above measurements show, the paunch greatly surpassed in its capacity the globular compartment. Hence in the Cetacea possessing this type of stomach the paunch undergoes a great increase of size when the animal acquires its food independent of the mother. In the adult stomach I was enabled to re-examine the relations of the esophagus to the openings into the 1st and 2nd compartments. The hand could be freely passed down the esophagus into the paunch, as well as into the orifice of the globular compartment, the opening into the former being about one-third larger than into the latter, which agrees with what I had previously seen in the adult Globio-cephalus shown me by Dr Murie. Separating the mouth of the 2nd compartment from the paunch was a strong fold of mucous membrane, projecting for 3 inches and terminating in a free crescentic border. This fold marks, I believe, the bottom of the esophagus and the upper orifice of the paunch, and the arrangement bears out the description I gave of my former specimen, that the 1st and 2nd compartments both open directly into the bottom of the esophagus. Since then M. P. Fischer[1] has described a similar arrangement in the stomach of Grampus griseus. A strong fold of mucous membrane extended

[1] *Annales des Sciences Naturelles*, VIII. p. 363, 1867.

round the greater part of the mouth of the 2nd compartment, and was in series with the mucous folds which projected into its cavity.

The 3rd compartment in the adult was 6½ inches long. Its greatest diameter at its middle was 3½ inches, that of each of its two orifices 1 inch. Its aperture of inlet was situated not at its upper end, but nearly 2 inches below, an arrangement, which, along with its median dilatation, strongly supports the view I have already advocated, that this is a true compartment of the stomach, and not a mere tubular passage. In the fœtal stomach the 3rd compartment is so small that it is with difficulty recognizable. The 4th compartment in the adult was 14 inches in circumference: in the fœtus about the size of a small pea. The 5th or sigmoid stomach was 18 inches long in the adult, and its greatest transverse circumference was 14 inches: in the fœtus its length was 1·1 inch. The dilatation immediately preceding the cylindrical duodenum was 12 inches long in the adult, and its greatest transverse circumference was 15 inches; a constriction externally, and a projecting fold of mucous membrane internally in series with the valvulæ conniventes, marked the commencement of the cylindrical gut.

The comparison of the adult stomach with the fœtal organ and that of the young animal previously described proves that in the Cetacea, as in the Ruminantia just before birth, the compartment which serves as the true digestive chamber is relatively larger than the pouch in the immature than in the mature condition. It would require a more extended examination of this organ in embryos of different ages to see if in the fœtal cetacean, as Mr Gedge showed in our last number, p. 323, Pl. VII. to be the case in the fœtal ruminant, the paunch ever possesses at any period of intra-uterine life a greater relative development.

In another fœtal Cetacean 15 inches long, with an elongated beak and apparently the young of a Delphinus, the stomach was arranged as in Globio-cephalus, and its compartments were of the same size as those in the fœtus just described. Thus in Globio-cephalus, Delphinus, and, as M. Fischer has recently shown, in Grampus the same type of stomach prevails.