

glacialis is represented¹). In the Oceanitidæ and Diomedeinæ this epithelium is softer; its character in other Petrels is but an exaggeration or reproduction of that existing in some other birds, particularly that occurring in such storks as *Xenorhynchus*.

The displacement of the pyloric orifice of the gizzard to the left necessitates a corresponding change in the commencing duodenum, so that this at first ascends in an upward curve towards the right before it returns to form the backwardly-directed loop, characteristic of Aves and Mammalia, round the pancreas (Pl. II. fig. 1, p.).

This peculiar upward curve of the commencing duodenum, the singularly small inverted stomach, and enormously deep proventriculus are all peculiar, so far as I am aware, to the group of Tubinares, though universal amongst them, and no other bird yet examined has, so far as I know, a similar disposition of these viscera.²

The intestinal cæca are entirely absent in all the Oceanitidæ, but are, with one exception, present, though of small size, in the Procellariidæ. They are always short and globular, and closely connected to the intestine, so as to appear as mere nipple-like projections from it. Plate II. fig. 3 represents those of *Majaqueus* slightly enlarged. They are usually situated quite close to the cloaca, the large intestine in nearly all the Tubinares being quite short; the length of the cæca themselves rarely exceeds .25 inch, except in the very largest species (*vide* table, p. 23). In five specimens (one a nestling) of *Cymochorea leucorrhœa* that I have examined, I find only a solitary cæcum, lateral in position, developed, owing apparently to the abortion of its fellow. As Mr. Swinhoe in his description of *Cymochorea monorhis*³ also records the cæcum as single, it is probable that the existence of such a single cæcum is a character of the genus *Cymochorea*. It is not unusual, I may observe, in a group of birds in which the cæca are of small size, and probably of no physiological importance, to find specimens or species with the normal number of cæca reduced by one. I may give as instances *Mergus albellus* (*cf.* Hunter, *Observ.*, vol. ii. p. 325; and Garrod, *Coll. Papers*, p. 220) amongst the Anseres, and *Plotus anhinga* (Garrod, *l.c.*, p. 345) amongst the Steganopodes, not to mention all the Ardeidæ amongst the Herodiones. In *Halocyptena*, in the only specimen yet examined, I could find no trace of any cæca at all, so that the tendency to their disappearance already observable in

¹ The figure of Carus and Otto (*Tabulæ Anat. Comp. Illustr.*, part 4, t. vi. figs. 15, 16) of the epithelium of the gizzard of *Fulmarus glacialis* does not at all faithfully represent what I have seen in two (quite fresh) specimens of that bird, nor have I ever in other Petrels seen epithelium of such a corneous and pavement-like nature as that figured by them. I have, therefore, had one of my specimens carefully drawn of the natural size. In this place it will be well to recall the still more highly developed gastric epithelium of some of the Fruit-pigeons (*Phænorhina goliath* and *Carpophaga latrans*) described by Verreaux and Des Murs, Viallanes and Garrod (*vide antea*, *Report on the Birds*, pp. 152-154).

² The description of these parts in the Little Auk (*Alca alle*) given by Professor Owen (*Anat. Vert.*, vol. ii. p. 163), and originally due to Home (*Lect. Comp. Anatomy*, i. pp. 283, 284, 1814) does not all apply to that bird (*cf.* the figure and description given by Macgillivray in Audubon's *Ornithological Biography*, iv. pp. 306-309), and probably refers to some member of the Tubinares.

³ *Ibis*, 1867, p. 387. I have examined the type of this species, which is now in Mr. Seebohm's collection, and find it to be a true *Cymochorea*.