

portion to the condyle; its plane coincides with that of the occiput, which is slightly inclined forward. The bones around the foramen are firmly coossified; but the supraoccipital has separated somewhat from the squamosals and parietals. Other sutures are more or less open. On each side of the condyle, and somewhat below its lower margin, there is a deep rounded cavity, perforated by a pneumatic foramen.

The cavity for the reception of the head of the quadrate is oval in outline; and its longer axis, if continued backward, would touch the outer margin of the occipital condyle. This cavity indicates that the quadrate had an undivided head. The brain-case was comparatively small; but the hemispheres were well developed; they were separated above by a sharp mesial crest of bone. A low ridge divided the hemispheres from the optic lobes, which were prominent.

The following measurements indicate the size of the specimen:—

	millim.
Width of skull across occiput (approximate)	24
Transverse diameter of occipital condyle	5
Vertical diameter	4
Width of foramen magnum	5
Height	6
Distance from occipital condyle to top of supra-occipital	11

In its main features the present specimen resembles the skull of the *Ratitæ* more than that of any existing birds. Other parts of the skeleton will doubtless show still stronger reptilian characters.

In the matrix attached to this skull a single tooth was found, which most resembles the teeth of birds, especially those of *Ichthyornis*. It is probable that *Laopteryx* possessed teeth and also biconcave vertebræ.

The specimen here described, and others apparently of the same species, were found in the Upper Jurassic of Wyoming Territory, in the horizon of the *Atlantosaurus*-beds.

Yale College, New Haven, March 18, 1881.

Regeneration of lost Parts in the Squid (Loligo Pealei).

By A. E. VERRILL.

I have observed in this species, as well as in *Ommastrephes illecebrosus*, numerous instances in which some of the suckers have been torn off and afterwards reproduced. In such examples new suckers of various sizes, from those that are very minute up to those that are but little smaller than the normal ones, can often be found scattered among the latter, on the same individual. It seems to me possible that some of the specimens having the suckers on the tentacular arms unusually small, may have reproduced all those suckers, or, still more likely, the entire arm.

I have seen specimens of this species, and also of *O. illecebrosus*,

which, after having lost the tip, or even the distal half of one or more of the sessile arms, have more or less completely reproduced the lost parts. In such cases the restored portion is often more slender and has smaller suckers than the normal arms; and where the old part joins the new there is often an abrupt change in size. Probably this difference would wholly disappear after a longer time.

An unquestionable and most remarkable example of the reproduction of several entire arms occurs in a small specimen taken off Newport, R. I., Aug. 1880. This has the mantle 70 millim. long, dorsal arms 22 millim., third pair of arms 30 millim. The three upper pairs of arms are perfectly normal; but both the tentacular and both the ventral arms have evidently been entirely lost and then reproduced from the very base. These four arms are now nearly perfect in form, but are scarcely half their normal size on the left side, and still smaller on the right side. The left tentacular arm is only 24 millim. long, and very slender, but it has the normal proportion of club, and the suckers, though well formed, are diminutive, and those of the two median rows are scarcely larger than the lateral ones and delicately denticulated. The right tentacular arm is less than half as long (12 millim.), being of about the same length as the restored ventral one of the same side; it is also very slender, and its suckers very minute and soft, in four equal rows. The right ventral arm is only 14 millim. long, the left one 15 millim. long; both are provided with very small but otherwise normal suckers.

In another specimen from Vineyard Sound, a female, with the mantle about 150 millim. long, one of the tentacular arms had lost its club; but the wound had healed, and a new club was in process of formation. This new club is represented by a small tapering acute process, starting out obliquely from the stump and having a sigmoid curvature; its inner surface is covered with very minute suckers. The other arms are normal.

It seems probable that some of the normal European species of *Loligo* that have been based on the smaller size of the tentacular arms or of the suckers are due to similar instances of regeneration of these parts.—*Amer. Journ. Sci.*, April 1881.

Note on Wardichthys cyclosoma, Traq. By THOMAS STOCK, Natural-History Department, Museum of Science and Art, Edinburgh*.

A small fish was described and figured by Dr. R. H. Traquair in the 'Annals' for April 1875, vol. xv. p. 262, pl. xvi. figs. 1-5, in a paper entitled "On some Fossil Fishes from the Neighbourhood of Edinburgh." The description was drawn up from a single specimen obtained by him from the Wardie Shales about fifteen years previously. A new genus was established for its reception under the name of *Wardichthys*, so called in honour of Mr. John Ward, F.G.S., of Longton, Staffordshire, a well-

* Read before the Edinburgh Geological Society, April 1881.



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