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XXXVIII.—The hydroids of St. Andrews bay

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forms a curve with the concavity forward. The articular surface is divided into two parts by a ridge which runs obliquely from its inner posterior angle to about the middle of its anterior border. The outer portion is considerably the larger and is concave from side to side and convex from before backwards; the inner is convex in both directions.

It will be convenient to defer the comparison of the cranial structure of the Plesiosaeria with that of other reptiles until the skulls in some of the other genera have been described, especially since very considerable differences exist between the short-snouted Plesiosaers of the Lias and the later Pliosours. It may, however, be mentioned that these latter appear to approach the Triassic Nothosaurs more nearly in the structure of the palate than do the former.

EXPLANATION OF PLATE XIII.

Fig. 1. Dorsal surface of an imperfect skull of *Peloneustes philarchus*, (Seeley) (specimen 1).

Fig. 2. Ventral surface of ditto (specimen 4).

Fig. 3. Frontal region of ditto (part of specimen 2).

<i>f.</i> Frontal.	<i>p.f.</i> Prefrontal.
<i>ju.</i> Jugal.	<i>par.for.</i> Parietal foramen.
<i>la.</i> (?) Lachrymal.	<i>p.mx.</i> Premaxilla.
<i>mx.</i> Maxilla.	<i>post.pal.vac.</i> Posterior palatine vacuities.
<i>na.</i> Nasal (?).	<i>q.</i> Quadrate.
<i>o.</i> Ridge on pterygoid.	<i>sup.orb.</i> (?) Supraorbital.
<i>oc.c.</i> Occipital condyle.	<i>vo.</i> Vomer.
<i>pal.</i> Palatine.	
<i>p.o.</i> Postorbital.	

XXXVIII.—*The Hydroids of St. Andrews Bay.* By Rev. J. H. CRAWFORD, F.L.S., St. Andrews Marine Laboratory.

SINCE the first list of Hydroids was published in the *Ann. & Mag. Nat. Hist.* in 1874 (vol. xiii.) by Prof. M'Intosh * several additional species have been procured.

During the present season, again, a few forms have been added to the local Hydroids, which seem to show that the bay is probably richer than has been supposed. Many of the Athecata are known to attach themselves by preference to the red seaweeds and to *Zostera marina*. Unfortunately the west rocks, where *Delesseria sanguinea* grows most luxu-

* And also copied in 'Invertebrate Marine Fauna and Fishes of St. Andrews,' 1875.

riantly, are covered with young mussels, and the bed of *Zostera* on the far side of the Eden has not yet been examined.

ATHECATA.

Clava multicornis.—The commonest form. Found everywhere on stones between tide-marks.

Hydractinia echinata.—Colonies occur on various empty shells.

Coryne vaginata.—On *Delesseria sanguinea*.

Syncoryne decipiens.—From débris of fishing-nets.

Eudendrium ramosum.—From deep water.

— *capillare*.—On *Antennularia ramosa*.

Tubularia indivisa.—From deep water.

— *coronata*.—From deep water.

— *larynx*.—From deep water.

In addition to such positive results, the detached Medusa-buds occur with sufficient regularity to make it practically certain that the corresponding hydroids are present, and the distribution is often sufficiently local to indicate the position those should occupy. In March or beginning of April we look for *Lizzia (Rathkea) octopunctata*; in May *Hybocodon prolifer*; in June *Syncoryne eximia*, *Sarsii*, and *gravata*, *Stauridium productum*, *Perigonimus repens*, *Bougainvillia fruticosa*, *Ectopleura Dumortierii*; in July *Bougainvillia ramosa* and *Syncoryne pulchella*. *Euphysa aurata*, the most beautiful of our smaller hydroids, occurs in great numbers from the latter end of July till the beginning of September.

MEDUSÆ.

Lizzia octopunctata. April.

Hybocodon prolifer. May.

Syncoryne Sarsii. June.

— *eximia*. June.

— *gravata*. June.

Stauridium productum. June.

Perigonimus repens. June.

Bougainvillia fruticosa. June.

Ectopleura Dumortierii. June.

Bougainvillia ramosa. July.

Syncoryne pulchella. July.

Euphysa aurata. August.

The Thecaphora are indicated in the following comparative list.

In Athecata, St. Andrews compares unfavourably with the other two stations, the proportion being 10 species against 16 for Heligoland, and 25 for Plymouth. In Thecaphora, on the other hand, St. Andrews has a decided advantage, numbering 53 species, against 35 for Heligoland and 36 for Plymouth. When Athecata and Thecaphora are placed together, St. Andrews still retains the lead, with 63 against 61 and 51. In Medusoids the numbers recorded are still more decidedly in favour of St. Andrews.

The Plymouth Hydroids and Medusæ are taken from the 'Journal of the Marine Biological Association' for November 1890 and 'Faunistic Notes at Plymouth during 1893-1894,' by Walter Garstang, M.A.; those of Heligoland from 'Beiträge zur Meeresfauna von Heligoland.—IV. Die Cœlenteraten Helgolands,' vorläufiger Bericht von Dr. Cl. Hartlaub, 1894.

ATHECATA.

	St. Andrews.	Plymouth.	Heligoland.
I. CLAVIDÆ.			
Clava multicornis	*	*	*
— squamata .....	..	..	*
— cornea .....	..	*
— leptostyla .....	..	*
Tubiclava cornucopiæ .....	..	*
II. HYDRACTINIIDÆ.			
Hydractinia echinata	*	*	*
III. PODOCORYNIDÆ.			
Podocoryne cornea	M	*	
IV. CORYNIDÆ.			
Coryne vaginata	*	*	
— Van Benedenii .....	..	..	*
— vermicularis .....	..	*
— pusilla .....	..	*
— fruticosa	M	*	
Syncoryne Sarsii	M	..	*
— eximia	M	*	* M

ATHECATA (continued).

	St. Andrews.	Plymouth.	Heligoland.
<i>Syncoryne pulchella</i>	M		
— <i>gravata</i>	M		
— <i>decipiens</i>	*		
V. STAUROIDIDÆ.			
<i>Stauridium productum</i>	M		
VI. MYRIOTHELIDÆ.			
<i>Myriothelia phrygia</i> . . . . .	..	*
VII. EUDENDRIIDÆ.			
<i>Eudendrium rameum</i>	*	*	*
— <i>ramosum</i>	*	*	*
— <i>capillare</i>	*	*	*
VIII. ATRACTYLIDÆ.			
<i>Garveia nutans</i> . . . . .	..	*
<i>Perigonimus repens</i>	M	*	*
— <i>vestitus</i> . . . . .	..	*
<i>Dicoryne conferta</i> . . . . .	..	..	*
<i>Bougainvillia ramosa</i>	M	*	*
— <i>fruticosa</i>	M		
IX. TUBULARIIDÆ.			
<i>Tubularia indivisa</i>	*	*	*
— <i>coronata</i>	*	..	*
— <i>larynx</i>	*	*	*
— <i>humilis</i> . . . . .	..	*
— <i>bellis</i> . . . . .	..	*
— <i>simplex</i> . . . . .	..	*
<i>Ectopleura Dumortierii</i>	M		M
<i>Corymorpha nutans</i>	M	*	* M

THECAPHORA.

	St. Andrews.	Plymouth.	Heligoland.
I. CAMPANULARIIDÆ.			
<i>Clytia Johnstoni</i>	* M	*	*
<i>Obelia geniculata</i>	* M	*	*
— <i>dichotoma</i>	*	*	*
— <i>longissima</i>	*	*	*
— <i>heligolandica</i> .....	..	..	*
— <i>Adelungi</i> .....	..	..	*
<i>Campanularia Hincksii</i>	*	*	*
— <i>volubilis</i>	*	*	*
— <i>verticillata</i>	*	*	*
— <i>flexuosa</i>	*	*	*
— <i>raridentata</i>	*	*	*
— <i>angulata</i>	*	*	*
<i>Thaumantias inconspicua</i>	M	M	M
<i>Lovenella clausa</i>	*	..	*
<i>Gonothyræa Loveni</i>	*	..	*
— <i>hyalina</i>	*	..	*
— <i>gracilis</i>	*	..	*
II. CAMPANULINIDÆ.			
<i>Campanulina acuminata</i>	M	*	*
— <i>repens</i>	*		
<i>Opercularella lacerta</i>	*		
III. LEPTOCYPHIDÆ.			
<i>Leptocyphus tenuis</i>	*		
<i>Calycella syringa</i>	*	*	*
IV. LAFOËIDÆ.			
<i>Lafœa pocillum</i>	*		
— <i>pygmæa</i>	*	..	*
— <i>dumosa</i>	*	*	*
— <i>fruticosa</i>	*	*	*
<i>Cuspidella humilis</i>	*		
— <i>costata</i> .....	..	*
<i>Filellum serpens</i>	*	..	*
V. COPPINIDÆ.			
<i>Coppinia arcta</i>	*	..	*

THECAPHORA (continued).

	St. Andrews.	Plymouth.	Heligoland.
VI. HALECIDÆ.			
Haloikema Lankesterii	*	
Halecium halecinum	*	*	*
— muricatum	*	..	*
— Beanii	*	*	*
— labrosum	*	..	*
— tenellum	*	..	*
VII. SERTULARIIDÆ.			
Sertularella polyzonias	*	*	*
— Gayi	
— rugosa	*	..	*
— tenella	*	..	
Diphrasia pinaster	*	
— rosacea	*	..	*
— tamarisca	*	..	
— attenuata	*		
— pinnata	*		
Sertularia pumila	*	*	*
— operculata	*		
— filicula	*		
— abietina	*	*	*
— argentea	*	*	*
— cupressina	*	*	*
Hydrallmania falcata	*	*	*
Thuiaria articulata	*	
— thuia	*		
VIII. PLUMULARIIDÆ.			
Antennularia antennina	*	*	
— ramosa	*	*	*
Aglaophenia tubulifera	*	
— pluma	*	
— myriophyllum	*	*	
Plumularia frutescens	*	*	
— Catharina	*	*	*
— setacea	*	*	*
— similis	*	*	*
— echinulata	*	*	
— pinnata	*	*	*

* indicates the presence of the Hydroid.

M " " Medusa.

* M " " both Hydroid and Medusa.

*Noticeable Features of Hydroids and the corresponding
Medusæ.*

1. Comparative abundance of Thecaphora and poverty of Athecata, possibly owing in part to insufficient search for the latter.

2. The appearance in considerable numbers of *Hybocodon* in May and *Euphysa* in August. *Steenstrupia* may yet be found if searched for at sufficient depths; I netted it in great numbers in Sullom Voc, Shetland, after a westerly gale had stirred up the bottom; the second day I obtained a few as the mass were settling down, and after that I got no more.

3. The singularly interesting and beautiful budding forms—*Hybocodon*, with its heavy group of buds round the tentacle-bulb; *Rathkea*, budding round the short thick manubrium within the subumbrella; and the graceful *Codonium gemmiferum* (August), with the buds spirally arranged round the long manubrium mainly outside the umbrella. That figured in Forbes's Monograph is a young form evidently recently detached. The adult resembles in the length of the manubrium and other details Haeckel's *Sarsia siphonophora*.

The very occasional appearance, often entire absence for the season, of *Siphonophora* perhaps merits incidental mention.

XXXIX.—*Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander C. F. Oldham, R.N.—Series II., No. 20. Report upon some Mollusca dredged in the Arabian Sea during the Season 1894-5.*
By EDGAR A. SMITH.

WITH the exception of the *Amussium andamanicum*, all the species quoted in this paper are from comparatively shallow water, and consequently have not that special interest which is attached to deep-water forms. It is proposed to give figures of the new species in a subsequent communication.

Pleurotoma marmorata, Lamarck.

Pleurotoma marmorata, Lamk., Reeve, Conch. Icon. fig. 21; Kiener, Icon. Coq. Viv. pl. vi. fig. 1; Weinkauff, Conch.-Cab. ed. 2, pl. iii. fig. 4; Tryon, Man. Conch. vol. vi. pl. ii. figs. 16, 16 a.
Jun.=*P. hastula*, Reeve, *op. cit.* fig. 139.

Hab. Red Sea, Indian Ocean to Polynesia; lat. 20° 37' 15"