these animals also, because from its organization we may suppose that *Polyparium ambulans* likewise reproduces asexually, but, notwithstanding its considerable size, no sexual products are found in it.

From all this therefore I come to the conclusion that *Polyparium ambulans* is an astomatous individual animal, separated by external influences from a single-mouthed Actinia furnished with widely open degenerated tentacles, and add the further supposition that this animal has grown by paranomal development under shallow-water conditions of life into the band-like form, and as such may be capable of asexual reproduction, perhaps by fission.

This fabric of speculations may perhaps collapse as soon as the animal which has given occasion for it shall be more exactly known than at present by further investigations, in which, amongst other things, the terminal chambers of the body will have to be examined. My purpose is attained if by these pages the attention of naturalists is directed not only to the animal discovered by Korotneff, but also to the processes of what I have denominated paranomal development, which call for further investigation.

XXXIV.—*On a remarkable new Species of* Cladorhiza *obtained by H.M.S. 'Challenger.'* By Arthur Dendy, B.Sc., F.L.S., Assistant in the Zoological Department of the British Museum.

[Plate XV.]

In returning the collection of Hexactinellid Sponges dredged by H.M.S. 'Challenger' to the Natural-History Museum, after the completion of his examination of the group, Professor F. E. Schulze also returned a very remarkable little Monaxonid sponge, which had been accidentally sent to him with the others. As the specimen in question did not come into my possession until after the completion of the Report on the 'Challenger' Monaxonida by Mr. Ridley and myself, I have thought it desirable to give an account of it in this place. It is a new and very well-marked species of the genus *Cladorhiza*, M. Sars; and I propose for it the name *Cladorhiza pentacrinus*, owing to the resemblance which it bears to the Pentacrinoid larva of *Antedon*. The specimen was, unfortunately, received in the dry condition.

Cladorhiza pentacrinus, n. sp.

Sponge (Pl. XV. fig. 1) stipitate, consisting of a long, slender stem, terminating above in a subglobular body, which bears a circlet of short pinnæ or arms *, curving upwards and inwards over the top. The stem terminates below in a number of very slender, long, branching rootlets. Total length of the single specimen 24 millim. Length of body and pinnæ together 4 millim. Length of stem 11 millim. Diameter of body 2 millim. Surface of body and pinnæ hispid, owing to the projection of some of the megasclera. Colour white. Oscula and pores unknown.

Skeleton.—The skeleton is arranged much as usual in the genus *Cladorhiza*. The skeleton of the stem is formed of long, slender styli, arranged side by side longitudinally; in the head it breaks up into several radiating branches, one for each pinna. In the basal part of the head these branches are not very well defined, and the spicules composing them are rather loosely arranged. Although the pinnæ are curved the spicules forming their axes are straight, and hence it follows that the styli in any part are inclined at an angle to those lower down in the pinna (Pl. XV. fig. 2). The rootlets are formed by repeated dichotomous ramification of the stem. The styli are smaller in the head and pinnæ than in the stem, and they also become much smaller and slenderer in the rootlets as ramification proceeds, the extreme end of each rootlet being composed of a single long and very slender spicule (Pl. XV. figs. 3, 5). They are arranged throughout with their apices pointing upwards.

Spicules.—(*a*) Megasclera: These are the usual long, slender, fusiform styli (Pl. XV. figs. 4, 5); they are frequently blunted at the apices, and in full-grown examples they are narrowed at the base. They vary greatly in size, measuring when full-grown (in the uppermost part of the stem) about 1·5 by 0·02 millim. They are smaller in the head and arms and in the rootlets. The terminal spicules of the latter measure only about 0·0063 millim. in diameter, and they have faintly developed oval heads, forming the extreme points of the rootlets.

(*b*) Microsclera: These are of two kinds: (1) tridentate anisochelæ (Pl. XV. figs. 6, 7, 8), of the ordinary general Cladorhiza form, but with a well-marked specific character. The three teeth at the large end are of considerable size, and the shaft is curved and fimbriated as usual in the genus. The

* I am unable to give the exact number of the arms, but there are about ten or twelve. Judging from the allied *Crinorhiza* forms, I am inclined to attach no great importance to the exact number.

peculiarity consists in the form of the three teeth at the small end of the spicule. These are elongated, slender, curved, and fang-like; they are not flattened. They are attached by a rather narrow base to the tubercle and taper gradually to a sharp point at the apex, which is directed towards the large end of the spicule. Their form will be best understood from the illustrations. These spicules measure 0·038 millim. in length and 0·022 millim. across from apex to apex of the two lateral teeth; they are enormously abundant in the head and pinnæ, forming a dense incrustation upon the latter, especially upon their inner surfaces (Pl. XV. fig. 2). (2) Large sigmata (Pl. XV. figs. 9, 10), measuring 0·11 by 0·0042 millim.; also very abundant.

Locality. Station 169, July 10, 1874, lat. 37° 34′ S., long. 179° 22′ E. North-east from New Zealand, 700 fathoms, blue mud; bottom temperature 40° Fahr.

This species is very remarkable (1) for its minute size, (2) for its peculiar external form, and (3) for the structure of the small end of the chelæ.

It is, with a single exception, the smallest sponge known to me; the exception is *Chondrocladia clavata*, Ridley and Dendy *, which belongs to a closely-allied genus, and is only slightly smaller than the present species, which it resembles somewhat in external form. In considering the size, however, the possibility must of course be borne in mind that the single specimen present may be not yet full-grown.

As regards external form, *Cladorhiza pentacrinus* is a very good example of the general rule that all deep-sea Monaxonida have a definite and symmetrical shape †. It makes some approach to the "*Crinorhiza*-form" found in other deep-sea species of the genus, but it differs from all species possessing that form in having the pinnæ short and curved inwardly. This peculiar curvature of the pinnæ suggests the possibility that they have the power, in life, of bending and unbending like the arms of a crinoid. They differ very markedly in appearance from the long, rigid, radiating pinnæ of typical *Crinorhiza*-forms (e. g. *Cladorhiza longipinna*, Ridley and Dendy ‡), the function of which processes is doubtless to support the sponge on the soft mud on which it lies. This function of support cannot be fulfilled by the pinnæ of *Cladorhiza pentacrinus*, because, in the first place, they are not disposed in a suitable manner, and, in the second place, it is almost certain that the body of the sponge is raised far above

* Report on the Monaxonida dredged by H.M.S. 'Challenger,' p. 100, pl. xx. figs. 1, 1*a*.

† *Cf.* Report on the 'Challenger' Monaxonida, p. 262.

‡ Ibid. p. 92, pl. xx. fig. 2.

the surface of the mud upon the long, slender stalk, the animal being anchored in the mud by means of the delicate rootlets. This view of the position of the body in life is confirmed by the fact that there is an egg-capsule of some mollusk attached to the stem just at the point where it branches into rootlets, and in order that this attachment might take place, the stem must have been entirely out of the mud. In presence of the facts now ascertained * with regard to the existence of contractile (muscular) tissue in the Porifera, there is no great improbability involved in the supposition that the arms or pinnæ of *Cladorhiza pentacrinus* may be endowed with some slight power of motion, although it is very difficult to see how any advantage to the sponge could arise from the possession of such a power. Unfortunately the condition of the specimen quite precludes any investigation as to the presence of contractile fibre-cells (*myocytes*, Sollas) in the arms. In a species of the allied genus *Esperella* (*E. Murrayi*), however, it has been shown by Ridley and Dendy † that there is a well-developed system of undoubtedly contractile fibrous tissue, whose function is to open and close the peculiar crack-like pore-areas, and thus to regulate the supply of water.

In the peculiarity of the chelæ the species stands quite apart from all others of the genus, in which, it will be remembered, the small end of the chela is usually very poorly developed.

The species is of further interest owing to the fact that no other Monaxonid sponges were obtained at the same station, which is hence totally unrepresented in the Report on the Monaxonida.

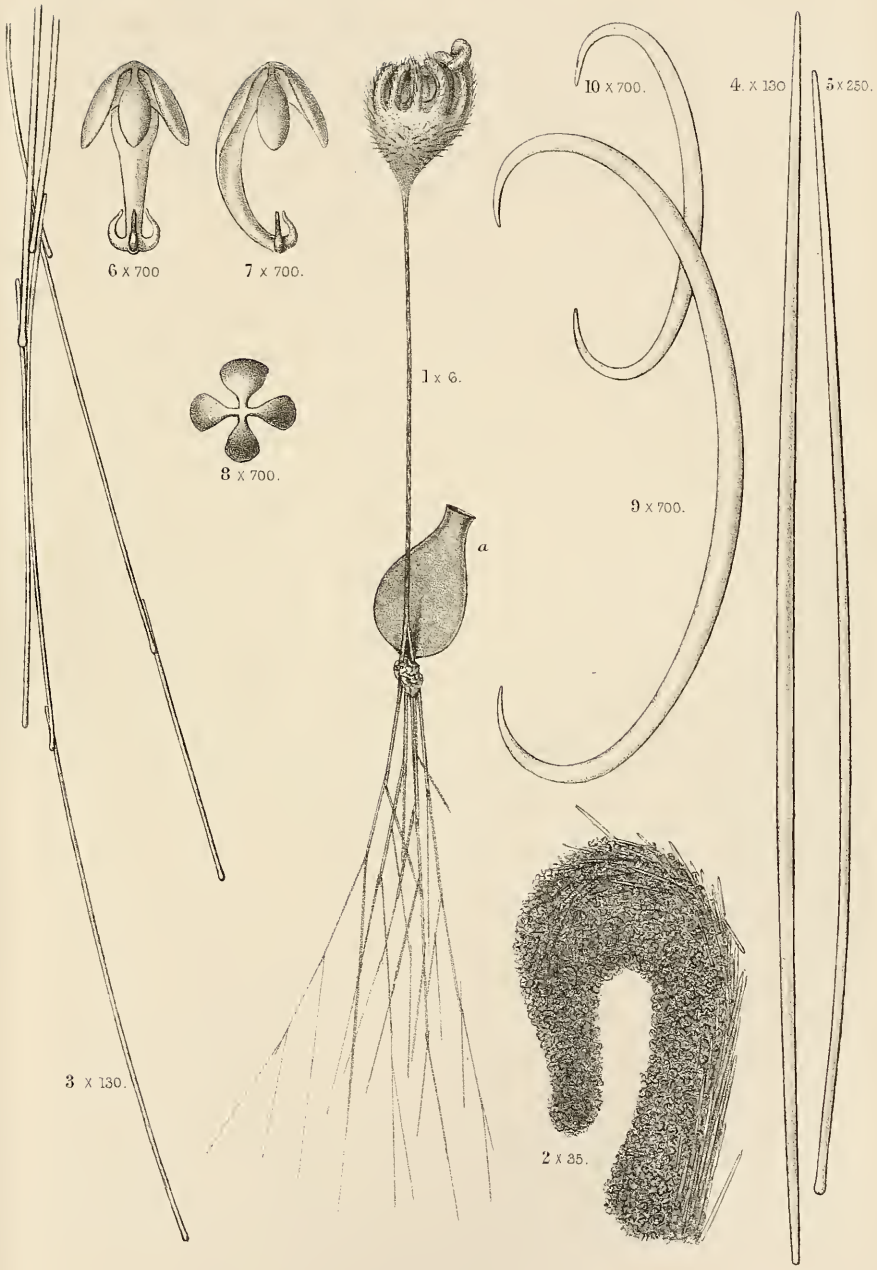
EXPLANATION OF PLATE XV.

Cladorhiza pentacrinus, n. sp.

Fig. 1. The entire sponge, ×6: *a*, the egg-capsule of some mollusk attached to the stem.
Fig. 2. The upper portion of one of the pinnæ, ×35, showing the arrangement of the spicules.
Fig. 3. Two terminal rootlets, × 130, showing the arrangement of the spicules.
Fig. 4. A large stylus from the upper part of the stem, ×130.
Fig. 5. The terminal stylus of a rootlet, ×250.
Fig. 6. A tridentate anisochela, front view, ×700.
Fig. 7. Ditto, side view, ×700.
Fig. 8. Ditto, end view, from the large end, ×700.
Fig. 9. A full-grown sigma, ×700.
Fig. 10. A smaller sigma, ×700.

* *Cf.* Sollas, article "Sponges" in 'Encyclopædia Britannica,' ed. ix. p. 419; and Ridley and Dendy, Report on the 'Challenger' Monaxonida, Introduction, chap. ii.

† Report on the 'Challenger' Monaxonida, pp. xxx, xxxix, 68, pls. xiii., xiv., xlviii.



A. T. Hollick del. et lith.

Mintern Bros. imp.

Cladorhiza pentacrinus.