PROCEEDINGS

OF THE

ROYAL SOCIETY OF EDINBURGH.

VOL. XI. 1881–82. No. 110.

NINETY-NINTH SESSION.

GENERAL STATUTORY MEETING.

Monday, 28th November 1881.

PROF. MACLAGAN, Vice-President, in the Chair.

The following Council were elected :—

President.

THE RIGHT HON. LORD MONCREIFF.

Vice-Presidents.

DAVID MILNE HOME, LL.D.	Prof. H. C. FLEEMING JENKIN, F.R.S.
Sir C. WYVILLE THOMSON, LL.D.	Rev. Dr. LINDSAY ALEXANDER.
Prof. DOUGLAS MACLAGAN, M.D.	J. H. BALFOUR, M.D., F.R.S.

General Secretary—Professor TAIT.

Secretaries to Ordinary Meetings.

Professor TURNER.
Professor CRUM BROWN.

Treasurer.—A. GILLIES SMITH, C.A.

Curator of Library and Museum—ALEXANDER BUCHAN, M.A.

Councillors.

Professor CAMPBELL FRASER.	Professor A. DICKSON.
Professor GEIKIE.	The Right Rev. Bishop COTTERILL.
Rev. Dr. CAZENOVE.	Rev. Professor DUNS.
DAVID STEVENSON, M.Inst.C.E.	Dr. RAMSAY TRAQUAIR.
Professor CHRYSTAL.	JOHN MURRAY.
ALEXANDER FORBES IRVINE of Drum.	WILLIAM FERGUSON, of Kilnmundy.

By a Resolution of the Society (19th January 1880) the following Hon. Vice-Presidents, having filled the office of President, are also Members of the Council :—

HIS GRACE THE DUKE OF ARGYLL, K.T., D.C.L.
SIR ROBERT CHRISTISON, BART., M.D., D.C.L.
SIR WM. THOMSON, LL.D., D.C.L., F.R.S., Foreign Associate of Inst. of France.

Sabella, fragt.
Nemertes, n. sp.
Phascolosoma.

Station 10. ?
Tomopteris onisciformis.

Report on the HOLOTHURIOIDEA. By Dr. Hjalmar Théel.

This Report was received by the late Sir C. Wyville Thomson in November 1880.

Lætmogone violacea, Théel (*Preliminary Report on the Holothuridæ of H.M.S. "Challenger,"* vol. i.; *Bihang Till K. Sv. Vet. Akad. Handl*, Bd. 5, No. 19, Stockholm, 1879, p. 11).

Station 4, 555 fathoms. Several hundred specimens.
Station 5, 515 fathoms. One specimen.
Station 6, 630 fathoms. One specimen.

It is a somewhat surprising and highly interesting fact that this beautiful animal should be found in abundance in a locality so far from Australia (Station 164, lat. 34° 8′ S., long. 152° 0′ E.) where the two specimens hitherto known were dredged up during the "Challenger" expedition, at a depth of 950 fathoms. Moreover, it is impossible to discover any characteristic by which these almost antipodal specimens may be distinguished one from the other.

Some species of Elasipoda vary a good deal in the number and size of the processes and pedicels; in *Lætmogone violacea* as well as in *Oncirophanta mutabilis*, Théel, and *Lætmogone wyville thomsoni*, Théel, this variation is so great that scarcely any one individual resembles another completely. Many forms of Elasipoda appear to congregate in very great numbers on the deep-sea bottoms, walking together in large flocks. During the "Challenger" expedition it was not uncommon to procure at the same time and in the same locality a great many individuals of the same species, sometimes a hundred or more; and this very summer Mr. Murray has found several hundred individuals of *Lætmogone violacea* living together in the same place.

The Elasipoda are essentially deep-sea forms. With few exceptions all hitherto discovered genera and species of this order belong to

the oceanic abysses.* Only *Elpidia glacialis*, Théel, has as yet been observed living at comparatively small and moderate depths, about 40 to 100 fathoms, in the Sea of Kara, but the same species was also obtained not far from Greenland, during a Swedish expedition, at a depth of 950 fathoms. The Norwegian Arctic dredging expedition also procured from great depths many specimens larger than those from the Sea of Kara; and the "Challenger" expedition brought home an individual, dredged at Station 160, lat. 42° 42′ S., long. 134° 10′ E., south of Australia, in a depth of 2600 fathoms. From this it is manifest that while *Elpidia glacialis* is able to exist at a great variety of depths, it is really a deep sea form.

Only two forms (*Ilyodæmon maculatus*, Théel, and *Orphnurgus asper*, Théel) are known to live at a depth less than 500 fathoms, and a few from 500 to 1000 fathoms; the remainder, about thirty species, are found at depths ranging from 1000 to 2900 fathoms. The order Elasipoda seems to be represented in all oceans, and the largest, most peculiar, and most characteristic forms prefer the greatest depths. The number of deep-sea dredgings being small in comparison with the large area of ocean, it is as yet almost impossible to arrive at any exact idea of the distribution of genera and species. As a matter of fact, however, the genus *Elpidia*, for instance, has a very wide distribution, its species having been observed at almost all parts of the sea, from the Arctic Ocean to lat. 60° 52′ S., long. 80° 20′ E. south of Kerguelen Islands, and not very far from the antarctic circle, as well as in more scattered localities around the world. As to the distribution of species it has already been mentioned that *Elpidia glacialis* and *Lætmogone violacea* appear to be very widely distributed, and *Oneirophanta mutabilis* has also been procured by the "Challenger" expedition at seven different stations around the world, but not in the Atlantic Ocean.

Echinocucumis typica, Sars (*Ofversigt af Norges Echinodermer* Christiania, 1861, pp. 102–108, pl. x. figs. 11–20, pl. xi. figs. 1–17),

Station 7, 530 fathoms. Four specimens.

Thyone raphanus, Düb. and Koren (*Ofversigt af Skandinaviens Echinodermer*; *Kongl. Sv. V. Akad. Handl.*, 1877, pp. 311–312, pl. xi. fig. 58–59, pl. v. figs. 49–55).

* As far as our present knowledge goes, no Elasipoda are found living at depths less than 40 fathoms.

Station 6, 530 fathoms. One specimen.

Station 7, 530 fathoms. Nine specimens.

All these individuals differ from the typical form described by Düben and Koren in their small size, the largest being only about 15 mm. in length, and 10 mm. in breadth, and some other unimportant differences also exist. The pedicels being scattered over the whole body, seem to be more numerous along the three ventral ambulacra, forming there, more or less conspicuous rows. Pedicels with a few small arcuate spicula, and a small irregular terminal plate. Tentacles with larger and smaller, straight or arcuate spicula, the ends of which are enlarged and perforated. Anus with fine, small, elongated, perforated plates resembling teeth.

Stichopus (?) *tizardi*, nov.

Station 6, 530 fathoms. Two rather incomplete specimens, and some fragments.

Station 4, 555 fathoms. Some fragments.

In consequence of the fragmentary condition of the specimens which have been at our disposal, it has been quite impossible to obtain an exact idea of their form, or to fix the genus to which they belong. The viscera having been ejected it could not be ascertained whether respiratory organs were present or not. The bottle in which the specimens were stored contained also the posterior part of an intestine with two respiratory trees, and it seems probable that these organs belong to the larger specimen. As they bear some resemblance to *Stichopus* I propose, for the present at least, to refer them to that genus.

Body elongated, the length of the larger specimen being about 130 mm. Bivium with some small retractile processes arranged in a row around its foremost part, and with a few larger ones scattered on the back. Trivium with small retractile pedicels. It is impossible to state how the processes and pedicels are arranged on the larger specimen, but the fragments plainly show that the bivium is provided with tubercles or processes all round the body, and that the pedicels are disposed in rows on the bivium. Mouth anterior ventral; anus posterior, terminal, subdorsal. Tentacles twenty of almost equal size, their terminal part rather large, with some retractile processes. Integument very thick and soft, with two kinds of calcareous deposits; small G-shaped spicula; and other bodies representing the form of a

cross or star, composed of four long, straight arms with the ends more or less enlarged, flattened and pierced with one large and a few small holes; sometimes the enlarged ends of the arms are connected with one another, forming a more or less round, perforated plate; the centre of the cross always with a large and straight tower or steeple, directed outwards from the body of the animal, and composed of four long, straight, parallel columns, held together by three to seven transverse bands. The pedicels and processes with numerous rather large, more or less arcuate spinous spicula, and the former with a rudimental perforated terminal plate.

Only one pyriform sac, rather slender and cylindrical, the length being about 35 mm. The madreporic canal dorsal, very small, with numerous small spicula, curved in the form of a C, and resembling those of the integument. Each of the powerful longitudinal muscles is double. Genital tubes dichotomously branched, arranged in two rather large clusters, one on each side of the dorsal mesenterium, each cluster being again divided into from five to seven smaller ones. The respiratory trees (if they really belong to these animals) are two, undivided, almost of equal size, about 45 mm. in length, and bearing along their whole length a great many small processes or branches. Colour in alcohol light grey; terminal parts of the tentacles yellowish with some dark points.

Report on Echinoidea. By Professor Alex. Agassiz.

I have examined the things and send you a list. There is nothing new, but I am very glad to have good specimens of *Phormosoma uranus* and *placenta*, which I had not seen, as well as good young specimens of *Echinocardium pennatifidum*, which are interesting.

Dorocidaris papillata, A. Ag.	St. 1	305 fms.
Porocidaris purpurata, W. Th.	St. 7	530 ,,
Phormosoma uranus, W. Th.	St. 4	555 ,,
,, *placenta*, W. Th.	St. 4	555 ,,
	and St. 2	530 ,,
Echinus norvegicus, D. & K.	St. 7	530 ,,
	St. 1	305 ,,
	St. 3	53 ,,
,, *acutus*, Lamk.	St. 3	53 ,,
,, *melo*, Lamk.	St. 3	53 ,,
Echinocyamus pusillus, Gray	St. 3	53 ,,