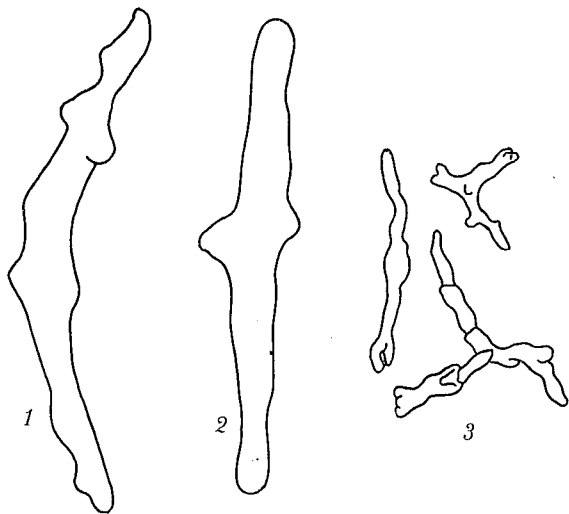


good, and the family *Gephyrothuriidae* must be placed among the aspidochirote Holothurians where it includes the genus *Pseudostichopus* and allied forms.

To my former description of this species I have little to add, but it is of the greatest value for the classification of these specimens that they have in reality a vertical pygal furrow, though



Textfig. 3. *Molpadiodemus acaudum*. 1-2, rods from the tentacles. 3, rods from the gonads. 1-3 $\times 300$.

it is not very distinct on account of the shape of the body. Further they have some few calcareous deposits in the tentacles and in the gonads (textfig. 3 1-3) though deposits, as stated, do not occur in the body wall nor in the rudimentary tube-feet. Also repeated examination did not reveal any deposits in the pygal furrow and the respiratory trees.

Not only the presence of the pygal furrow but also that of deposits in the tentacles and the gonads, though such are lacking in the body wall, places this species within the *Pseudostichopus* group. I have no doubt as to the validity of the genus *Molpadiodemus* but as to that of the species there may be some doubt, as in reality *acaudum* in several respects resembles *atlanticus* Perrier. How far these two species are in reality synonyms cannot for the present be ascertained.

Genus *Plicastichopus* Heding 1940.

Plicastichopus ingolfi n. sp.

Plate I, figs. 4-5.

Localities:

61°44' N. 30°29' W. "Ingolf" St. 18, 2137 m, temp. 3° 0 C. 2 spec.
58°20' N. 40°48' W. "Ingolf" St. 20, 3192 m, temp. 1° 5 C. 1 -

Diagnosis: *Pseudostichopus*-like Holothurians with a distinct pygal furrow and large lateral papillae each with one terminal and several lateral tubefeet. There are also tubefeet scattered all over the dorsal side, those along the dorsal ambulacra being

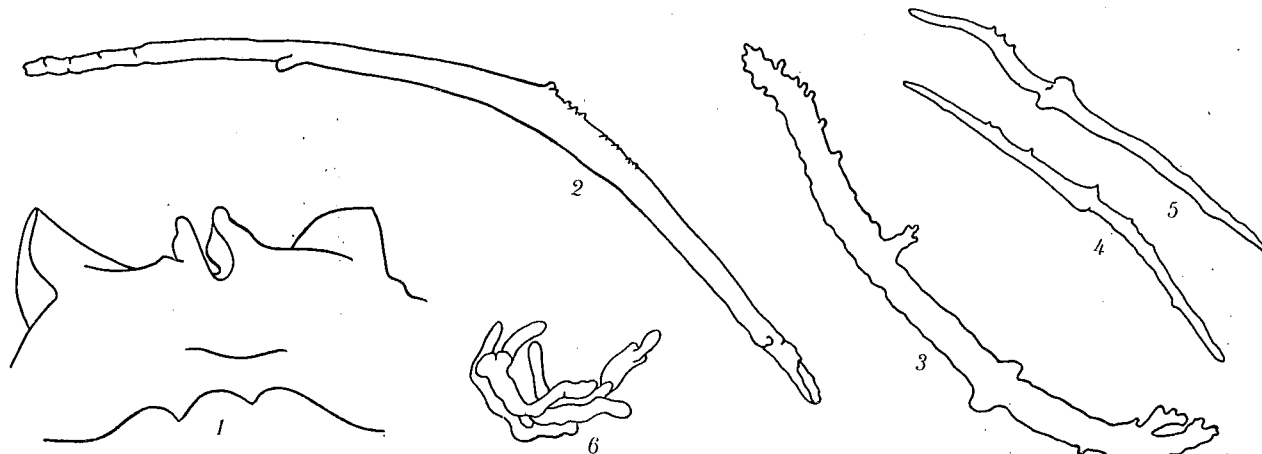


Textfig. 4. *Plicastichopus ingolfi*, a part of the left dorsal ambulacrum with three lateral papillae, showing small scattered tube-feet.

larger than the others. On the ventral side there are either no or very few and rudimentary tube-feet. Tentacles twenty. Polian vesicles one or two, and stonecanal quite lacking or very rudimentary, with faint traces of a madraporite. Respiratory trees paired but with a common origin. Calcareous deposits lacking in the body wall but present in the tentacles and in the terminal ends of the tube-feet.

Description: The specimens measure from 4 to 7 cm in length and are in shape (Plate I, fig. 4) fusiform with a fairly flat ventral side. Along the ventrolateral ambulacra there are about twenty large conical papillae, each with a large terminal and a number of smaller lateral tubefeet (cf. Plate I, fig. 5, textfig. 4). Along the dorsal ambulacra there are two rows of alternating large tubefeet or small papillae with a terminate large tubefoot.

The mouth is ventral, and the anal opening is situated in a fairly deep vertical pygal furrow. There are twenty tentacles; directly counted there are but 17, the shape of the calcareous ring, however, indicates twenty. In the type specimen there is but one polian vesicle. In the other specimens there are, however, two polian vesicles. The stone-canal is faintly developed or quite rudimentary. The respiratory trees are fairly large but with a common origin.



Textfig. 5. *Plicastichopus ingolfi*. 1, right ventral radial $\times 15$. 2 and 3, rods from the tentacles, 4 and 5, rods from the gonads. 6, spicules from the end of a minor tube-foot. 2-6 $\times 300$.

Calcareous deposits are lacking in the body wall but present in the tentacles, the gonads, and in the tips of the tube-feet (text-fig. 5 2-6). *Plicastichopus ingolfi* appears to be a well limited species; it resembles only *Pseudostichopus plicatus* Koehler & Vaney, and there are indeed some reasons for thinking that they are synonymous, but as for the present we do not know *plicatus* sufficiently well it would be unsafe to refer this very characteristic Atlantic species to the Indo-Pacific form.

Genus *Benthothuria* Perrier.

Cf. Heding 1940: Die Holothurien der Deutschen Tiefsee-Expedition p. 363.

Benthothuria funebris Perrier.

R. Perrier 1902: Holothuries, "Travailleur" et "Talisman", p. 365.

Locality: 61°50' N. 56°21' W., Ingolf St. 36, 2700 m, 1°5 C. — 1 specimen. The single 140 mm long specimen is rather badly preserved, and especially exteriorly it is not possible to ascertain

other features than the ventrally bent mouth with its twenty tentacles. There are two large polian vesicles and two large free respiratory trees. The intestine is fairly well preserved, and only a small part is disturbed, but as this part is the oesophagus, the possible presence of a coecum cannot be ascertained. The longitudinal muscles are unpaired, consisting as in *B. valdiviae* of numerous longitudinal portions.

I have no doubt that this specimen is in reality *Benthothuria funebris* Perrier, only the two polian vesicles and the shape of the longitudinal muscles justify its reference to *B. valdiviae* Heding. This latter species is however so closely related to *B. funebris* that it is fairly difficult to separate them by other features than the general appearance. Of the two main differences that of the polian vesicles cannot, as seen from this "Ingolf" specimen, be maintained.

As to the difference in the arrangement of the papillae I have already stated in the "Valdivia" report that this arrangement cannot be used for identification, owing to the usually badly preserved specimens.

Thus it might be supposed that these two species are synonyms, but the very different localities and the differences in the general appearance (*valdiviae* is the more flat) are against such a supposition.

Family Synallactidae.

Genus *Mesothuria* Ludwig.

Heding 1940: Die Holothurien der Deutschen Tiefsee Expedition II p. 117.

In the Handbook of British Echinoderms, MORTENSEN records three species of *Mesothuria* from the British Isles, viz. *intestinalis*, *lactea*, and *verrilli*, and suggests that six other species may be found in the deeper waters of the northern Atlantic.

Of these species the "Ingolf" Expedition collected but three, *intestinalis*, *lactea*, and *maroccana*, and beside these two others, *bifurcata* Hérouard and *cathedralis* Heding. It is surprising that *verrilli* was not found by the "Ingolf", and still more so that *bifurcata* was taken in the northern Atlantic, as it was previously taken only by the "Belgica" in 77°14' S. 89°14' W. It seems possible that the specimen is erroneously determined, a supposition which is the more likely because the type specimen is but a juvenile measuring 8 mm in length, and that HÉROUARD has not figured the calcareous deposits (only their bifurcate arms). In spite of this I have, however, little doubt that the "Ingolf" specimen is in reality HÉROUARD's species, and I cannot find any good reason for establishing a new one. Thus the question arises, how far the presence of *bifurcata* in the northern Atlantic indicates any bipolarity, but as I do not find evidence for bipolarity in Holothurians I think that we have here a further proof of the conformity of the abyssal faunas of the Atlantic and the Indopacific (at any rate the southern part).

As to *verrilli*, this species is by some authors regarded as a synonym of *intestinalis*, but PERRIER and DEICHMANN have definitely shown that it differs clearly and must be regarded as a valid species. According to DEICHMANN one of the characters which most distinctly separates *verrilli* from *intestinalis* is the presence of the so-called "reduced tables" in the tube-feet, and in this I am willing to follow her, as I regard the absence of reduced tables in the tube-feet of *intestinalis* as a character useful for separating the subgenus *Allantis* from the other subgenera of the genus *Mesothuria*.

As *M. verrilli* was not taken by the "Ingolf" Expedition the supposition is possible that the "Helga" record from S.W. of Ireland is not reliable. Owing to PERRIER's, and especially DEICH-

MANN's, descriptions, it is not easy to suppose that *verrilli* can have been confused with any of the other species found in the northern Atlantic, so I think that the record of *verrilli* from S.W. of Ireland must be regarded as valid.

As one of the synonyms of *verrilli*, MORTENSEN in British Echinoderms, mentions *H. rouli* Koehler. In the collections of the Zoological Museum of Copenhagen there is, however, a specimen of *rouli* (a cotype), the examination of which shows definitely that *rouli* is not only specifically different from *verrilli*, but that it should be referred to another subgenus.

The study of the "Ingolf" collections of *Mesothuria* in connection with the collections of the Zoological Museum of Copenhagen gives an excellent opportunity to confirm my division of the genus *Mesothuria* given in the report of the German "Valdivia" Expedition, it only appears that the subgenus *Allantis* is not so numerous in species as was previously supposed. The presence or absence of "reduced tables" must be regarded as a character which gives clear limits for the subgenus *Allantis*. Of the species which, owing to the presence of "reduced tables" in the tube-feet, must be removed from *Allantis* as strictly defined, species such as *rouli* Koehler and *carose* Fisher make a group of their own, characterized by the presence of two layers of deposits in the body wall, an outer layer of normal tables, and an inner layer of irregular rods and bodies.

This group which may be regarded as of equal rank with the subgenera *Mesothuria*-*Allantis*-*Zygothuria* may be named *Diplasiothuria* subg. nov. from the two layers of deposits, and the group including species as *cathedralis* and *verrilli* may be named *Pentochrothuria* subg. nov. from their single layer of deposits.

Thus for the present I prefer to divide the genus *Mesothuria* into the following six subgenera, which are easily separated by the key.

Key to the subgenera of *Mesothuria*.

- 1) Body cylindrical or subcylindrical, with pedicells all over ;
Body flat, with the pedicells arranged exclusively in a single or double row along the paired ambulacra, those of the dorsal side often minute. A marginal fringe often present
- 2) Deposits of the tube-feet normal tables though often

Plate I.

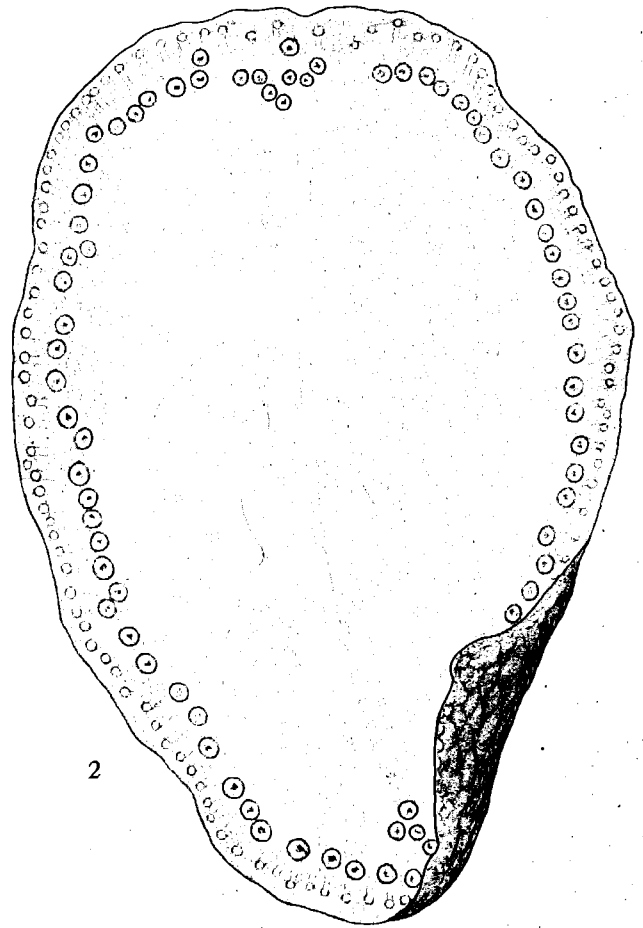
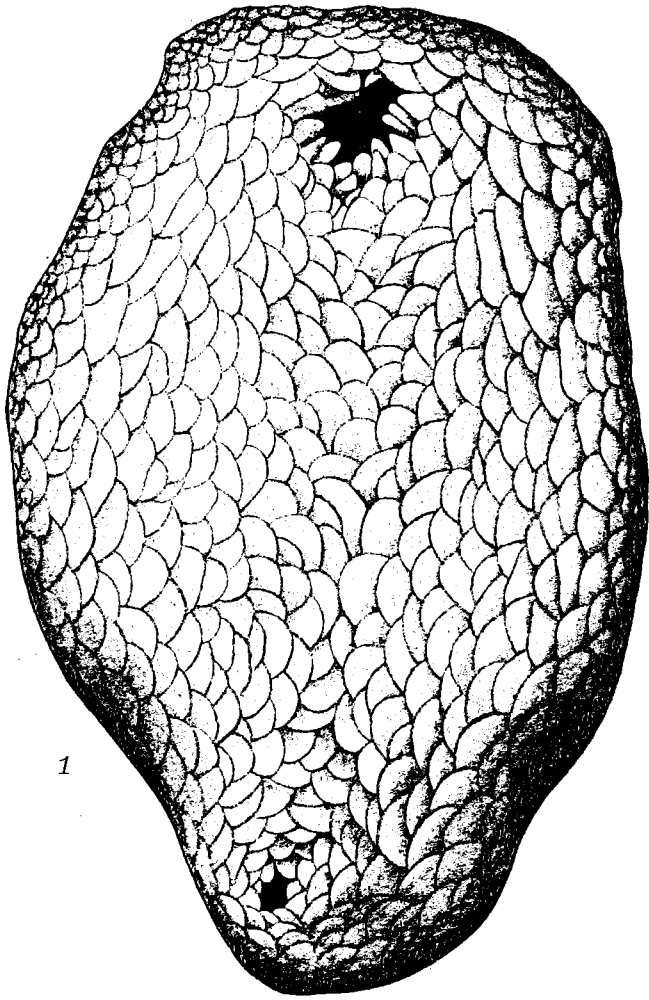
- Fig. 1. *Psolus pourtalesii* var. *dyscritus* n. var.
Type specimen seen from above, showing the arrangement of scales.
- 2. *Psolus pourtalesii* var. *dyscritus* n. var.
Type specimen seen from the sole, showing the arrangement of the tube-feet.
- 3. *Psolus hypsinotus* n. sp.
Type specimen seen from the side, showing the large

oral and anal scales, and the few large tubercles on the dorsal scales.

Figs. 4-5. *Plicastichopus ingolfi* n. sp.

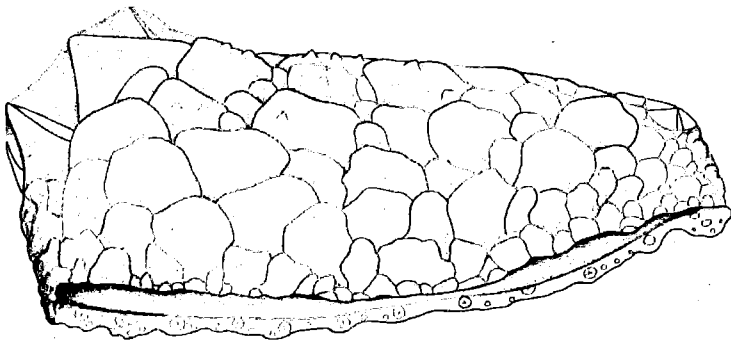
4. Type specimen seen from the ventral side, showing the arrangement of the large papillae.

5. Left side of the pygal portion, showing the large papillae and the scattered small tube-feet.

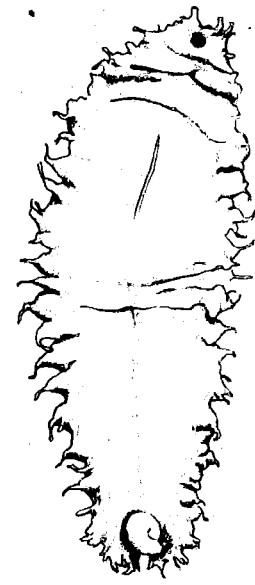


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