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SYMPLECTA STICTICA, *Mg.*—2 ♀ ♀.

TRIMICRA PILIPES, *F.*—♂, 18th August.

EPHELIA SUBMARMORATA, *Verr.*, 1 ♀; *marmorata*, *Mg.*, 1 ♂.

LIMNOPHILA LINEOLELLA, *Verr.*, 4 ♂ ♂ and 3 ♀ ♀; *ferruginea*, *Mg.*, 1 ♂; *ochracea*, *Mg.*, 1 ♀; *bicolor*, *Mg.*, 1 ♂; *subtincta*, *Ztt.*, 1 ♀; *nemoralis*, *Mg.*, 3 ♂ ♂ and 3 ♀ ♀.

TRICHOCERA, *sp.*?—1 ♂ and 1 ♀.

ULA PILOSA, *Schum.*—2 ♂ ♂ and 1 ♀.

DICRANOTA PAVIDA, *Hal.*—2 ♂ ♂ and 6 ♀ ♀.

AMALOPIS LITTORALIS, *Mg.*—1, imperfect.

Family TIPULIDÆ.

PACHYRRHINA HISTRIO, *F.*, 2 ♂ ♂; *quadrifaria*, *Mg.*, 1 ♂ and 4 ♀ ♀.

TIPULA LONGICORNIS, *Schum.*, 1 ♀; *lateralis*, *Mg.*, 8 ♂ ♂ and 3 ♀ ♀; *Diana*, *Mg.*, 2 ♂ ♂ and 2 ♀ ♀; *lutescens*, *F.*, 2 ♂ ♂ and 1 ♀; *paludosa*, *Mg.*, 2 ♂ ♂ and 3 ♀ ♀; *ochracea*, *Mg.*, 1 ♂.

12 ARMADALE STREET, GLASGOW.

NOTES ON SOME SCOTTISH FRESHWATER RHIZOPODS AND HELIOZOA.

By Prof. G. S. WEST, M.A., F.L.S.

I. RHIZOPODS FROM THE ORKNEYS AND SHETLANDS.

THESE were collected by my father in 1903 from various bogs, ponds, and lakes, some of them being from the plankton. The only species of interest are *Heleopera petricola*, Leidy, and *Hyalosphenia elegans*, Leidy. I append a list of those species observed, as it will augment our knowledge of the distribution of these animals in the British Islands.

Amœba verrucosa, Ehrenb.—Orkneys, Shetlands.

Dactylosphærium radiosum (Ehrenb.), Blochmann.—Shetlands.

Arcella vulgaris, Ehrenb.—Orkneys (Hoy), Shetlands.

A. discoides, Ehrenb.—Shetlands.

Centropyxis aculeata (Ehrenb.), Stein.—Orkneys, Shetlands.

Diffugia constricta (Ehrenb.), Leidy.—Shetlands.

D. pyriformis, Perty.—Orkneys, Shetlands.
D. globulosa, Duj.—Orkneys.
Lecquereusia spiralis (Ehrenb.), Blochmann.—Shetlands.
Nebela collaris (Ehrenb.), Leidy.—Orkneys, Shetlands.
N. flabellulum, Leidy.—Orkneys, Shetlands.
N. carinata (Archer), Leidy.—Orkneys (Hoy).
Heleopera petricola, Leidy.—Orkneys.
Quadrula symmetrica (Wallich), Schulze.—Shetlands.
Hyalosphenia elegans, Leidy.—Orkneys.
Euglypha alveolata, Duj.—Shetlands.
E. ciliata (Ehrenb.), Leidy.—Shetlands.
Placocysta spinosa (Carter), Leidy.—Orkneys.
Sphenoderia lenta, Schlumberger.—Orkneys (Hoy).
Assulina seminulum, Ehrenb.—Orkneys (Hoy), Shetlands.
Trinema enchelys (Ehrenb.), Leidy.—Orkneys, Shetlands.
Cyphoderia ampulla (Ehrenb.), Leidy.—Orkneys, Shetlands,

Of the foregoing list some were found in the plankton of various lochs, and these I have tabulated separately. Of the species found in the plankton few can be regarded as true plankton-forms. Only *Cyphoderia ampulla* and *Euglypha ciliata* occurred in such quantity as to be unquestionably true constituents of the plankton.

RHIZOPODS IN THE PLANKTON OF LOCHS IN THE ORKNEYS AND SHETLANDS.

SPECIES.	Orkneys.	Shetlands.			
	L. Kirbister.	L. Asta.	L. Beosetter, Bressay.	L. Trebister.	L. Brindister.
<i>Dactylosphaerium radiosum</i> (Ehrenb.), Blochmann					×
<i>Arcella discoides</i> , Ehrenb.			×		×
<i>Diffugia canstricta</i> (Ehrenb.), Leidy			×		
<i>D. pyriformis</i> , Perty			×		
<i>D. globulosa</i> , Duj	×				
<i>Nebela collaris</i> (Ehrenb.), Leidy				×	
<i>Quadrula symmetrica</i> (Wall.), Schulze	×				
<i>Hyalosphenia elegans</i> , Leidy	×				
EUGLYPHA CILIATA (Ehrenb.), Leidy		×	×		×
<i>Sphenoderia lenta</i> , Schlumberger	×				
<i>Assulina seminulum</i> , Ehrenb.	×				
CYPHODERIA AMPULLA (Ehrenb.), Leidy	×	×			×

II. RHIZOPODS AND HELIOZOA FROM THE SCOTTISH FRESHWATER PLANKTON.

About twenty species of these animals were met with during the investigation of the plankton of a number of lochs in the north-west of Scotland and the Outer Hebrides. Rhizopods were not very numerous in the plankton of any of the lakes, and in some the only specimens observed were empty shells of testaceous species which had doubtless been carried down into the lakes by mountain streams. I have mentioned all those observed in the collections, although few of these animals can be regarded as plankton-forms, the only ones found at all frequently in the living state being *Arcella vulgaris*, *Cyphoderia ampulla*, *Trinema enchelys*, *Euglypha alveolata*, and *E. ciliata*. Of these five species, very fine specimens of *Cyphoderia ampulla* and *Euglypha alveolata* are by no means uncommon in the plankton.

Concerning Rhizopods which occur in the plankton, Cash¹ remarks that "the open waters of a lake can hardly be considered their natural home." This is true of most of these animals, but there are certain species which undoubtedly occur constantly in the plankton, thriving well in the surface waters of lakes. Moreover, *Nebela bicornis*, described for the first time in this paper, is only known to occur in the plankton.

The table on the following page is a list of the species observed in the plankton. Those species in small capitals occurred in quantity and with a sufficient percentage of living specimens to be considered as true plankton-forms.

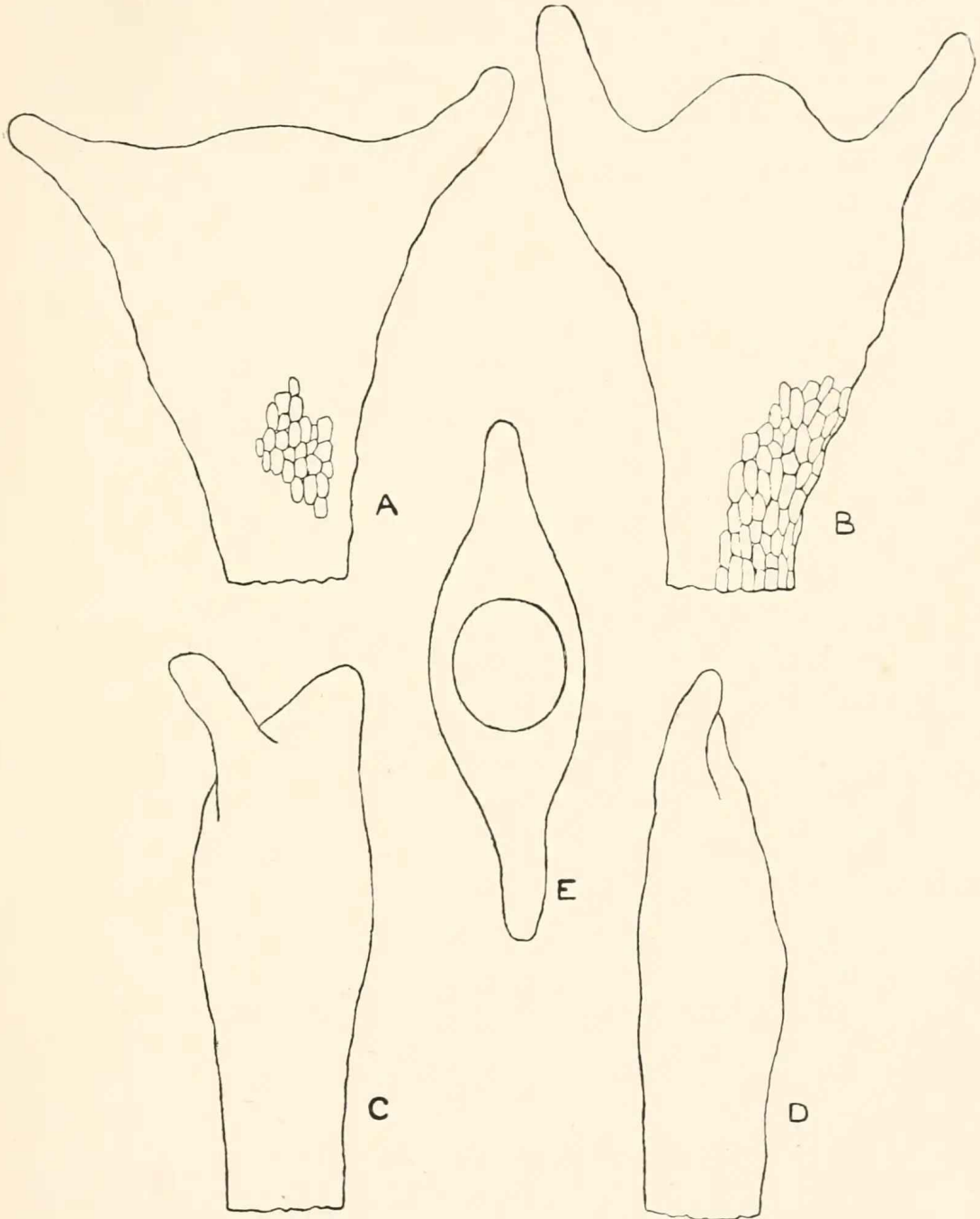
Clathrulina elegans occurred in large quantity in Lochs Luichart and Rosque, Ross.

NEBELA BICORNIS, sp. n.—Shell rather small, from the front view triangular-pyriform, lateral margins and apex generally slightly convex, the two upper angles each produced into an outwardly diverging, obtuse process or horn, which may be straight or curved and is scarcely attenuated; close to the mouth with parallel margins; mouth very slightly

¹ J. Cash in "Jour. Linn. Soc. Zool." xxix. 1904, p. 219.

SPECIES.	Perth.		Inverness.					Ross.		Lewis.						Harris.		
	Loch Tay.	River Lochay.	Loch na Cloiche Sgoilt.	Loch na Criche.	Loch Gorna.	Loch Morar.	Loch Shiel.	Loch Luichart.	Loch Rosque.	Loch Cuthaig.	Loch Langanabhat.	Loch Roinebhall.	Loch an Sgath.	Loch Shubhall.	Loch Stranabhat.	Loch Diracleet.	Loch a Mhorghain.	Loch Laxadale.
Rhizopods.																		
ARCELLA VULGARIS, Ehrenb.																		
A. discoides, Ehrenb.																		
Centropyxis aculeata (Ehrenb.), Stein																		
Diffugia pyriformis, Perty																		
D. globulosa, Duj																		
Nebela collaris (Ehrenb.), Leidy																		
N. flabellulum, Leidy																		
N. dentistoma, Penard																		
N. carinata (Arch.), Leidy																		
N. BICORNIS sp. n.																		
Quadrula symmetrica (Wall.), Schulze																		
EUGLYPHA ALVEOLATA, Duj																		
E. CILIATA (Ehrenb.), Leidy																		
Assulina seminulum, Ehrenb.																		
TRINEMA ENCHELYS (Ehrenb.), Leidy																		
CYPHODERIA AMPULLA (Ehrenb.), Leidy																		
Heliozoa.																		
RHAPHIDIOPHYS VIRIDIS, Archer																		
Acanthocystis chatophora (Schränk), Leidy																		
CLATHRULINA ELEGANS, Cienkowski																		

and irregularly undulate. Side view of shell narrowly sublanceolate, apex obtusely conical and rarely curved, horns often bent. Basal view of shell elliptical with produced



Nebela bicornis, sp. n. A and B, two shells from the front view ; C and D, two side views ; E, basal view of shell showing mouth. ($\times 520$.)

extremities, mouth subcircular or rotund elliptic. Shell composed of minute plates, somewhat irregular in shape and longer than their diameter, with no definite disposition.

Length of shell, inclusive of horns, 96-117 μ ; breadth

across horns, 86-101 μ ; breadth of mouth, 23-25 μ ; thickness of shell, 29-38 μ .

Hab. Plankton of Loch Shiel, Inverness.

This species is readily recognised by the pair of diverging processes or horns, which are sometimes bent upwards almost parallel to the length of the shell. The region of the mouth is also rather peculiar in being almost cylindrical, the actual edge of the mouth showing a slight undulation. The structure of the shell is that of a true species of *Nebela*, the small plates of which it is composed being very irregular with no definite order of arrangement, but mostly disposed with their long axes parallel to the length of the shell.

In the presence of the horn-like processes the shell somewhat resembles that of *Campascus cornutus*, Leidy, but there is no curvature in the region of the mouth, and its structure is quite different.

The specimens were all preserved in 4% formalin, and all the individuals examined were more or less encysted, the body-protoplasm exhibiting the form of a globular mass in the widest part of the shell. The nucleus stained readily with hæmatoxylin or ammonia-carmin. Species of this genus are, however, all discriminated by the characters of the shell, and *N. bicornis* is no exception.

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MICROSCOPIC LIFE OF ST. KILDA.

BY JAMES MURRAY.

DURING a flying visit paid to St. Kilda in the early summer of 1904, an attempt was made to ascertain what microscopic life was to be found on the island. As our stay was very short, only three hours being spent on shore, there was little time for making natural history collections. As moss everywhere harbours an abundant population of micro-organisms, I gathered a quantity of it with a view of getting some idea of the micro fauna and flora of the island. Very little moss was, however, to be seen, the soil everywhere