THE

AMERICAN JOURNAL

OF

SCIENCE AND ARTS.

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THIRD SERIES.

VOL. VII.—[WHOLE NUMBER, CVII.]

Nos. 37—42.

JANUARY TO JUNE, 1874.

WITH EIGHT PLATES.

NEW HAVEN: EDITORS.
1874.

PRINTED BY TUTTLE, MOREHOUSE & TAYLOR, 221 STATE ST.

have an adequate explanation of the apparent absence of organic remains from many under-clays, not only of lignites, but also of Paleozoic coal beds. That the leaching process which deprived the coal beds of all the ash ingredients necessary to vegetation, has also been instrumental in the removal of iron and organic matter from the Carboniferous fire-clays, has been often suggested; but the efficacy of the process, when combined with pressure, to obliterate all traces of the softer parts of plants and animals, imbedded in clays, has hardly been sufficiently dwelt upon. That another phase of the same agencies has been instrumental in obliterating the teeming fauna of the Port Hudson beds, whose character can now be studied only in a few limited localities, I have already shown.* And there can be little doubt that the absolute dearth of organic remains which has thus far frustrated all my attempts to gain a definite clue to the age of the "Grand Gulf" beds of the Gulf border, is largely due to the same cause, and not to the conversion of the Mexican Gulf into a "Dead Sea" during the Post-Eocene Tertiary period.

Lignite beds composed of drifted materials are not rare in the Gulf border, from the lowest Cretaceous beds to those of the Champlain era. But they are usually very much localized, and consist mainly of driftwood, which is not only over- and underlaid by sandy materials, but also intermixed with them. Beds of compact lignite underlaid to any great extent by sand, are quite exceptional.

ART. XXV.—*On recent Deep-Sea Dredging operations in the Gulf of St. Lawrence;* by J. F. WHITEAVES.

DURING the summer of 1873, the Hon. the Minister of Marine and Fisheries of the Dominion of Canada very kindly placed one of the government schooners at my disposal, for dredging purposes. These investigations, which were undertaken on behalf of the Natural History Society of Montreal, had, as their primary object, an examination into the present condition of the Marine Fisheries of the Gulf, and were supplementary to similar explorations carried out by myself in the summers of 1871 and 1872. In the present paper, a short descriptive account will be attempted of some of the most interesting zoölogical specimens collected in 1873. Nearly nine weeks were spent at sea (from July 18th to September 8th); and during this time, although the weather was often unfavorable, we nevertheless got about seventy successful hauls of the dredge. The cruises were essentially four in number, but on the whole the first yielded the greatest number of novelties.

* Smithsonian Contr. Knowl., No. 248, p. 12.

Cruise 1.—The first two weeks were devoted to an examination of the deep water in the center of the mouth of the river, between Anticosti and the Gaspé Peninsula. The most interesting specimens were obtained in from 200 to 220 fathoms, mud; and among them are the following:

FORAMINIFERA.—*Marginulina spinosa* M. Sars; a large *Triloculina* allied to *T. tricarinata*, perhaps *T. cryptella* D'Orb.; curious arenaceous forms, new to me, some of which are simple and unbranched, others widely triradiate, and a third series are irregularly cruciform, and even five and six-rayed. They are all, most likely, forms of one species; but whether they are the *Asterorhiza limicola* of Sandahl or not, I have at present no means of ascertaining.

SPONGES.—One specimen of *Trichostemma hemisphæricum* M. Sars; one of *Cladorhiza abyssicola* M. Sars; and about a dozen of the *Hyalonema longissimum*, of the same author, were taken in 220 fathoms. With these occurred another species, which is either a true *Tethea*, or belongs to a closely allied genus. In shape it is more or less pyriform, somewhat triangular in section, and with a flattened base. There are three orifices, corresponding to the three angles, of which two are basal. These are connected on two sides by a perforated canal or tube. The front basal orifice is partly closed by an outer fine open network and an inner and coarser one of siliceous spicules, the latter not very unlike those at the apex of *Euplectella;* and this opening seems to be the point of attachment to small stones, etc. The whole sponge is densely hispid with projecting spicules, which are sometimes of considerable length. These are mostly very attenuate; some of them are simple, and these are either straight or flexuous; others are simply ternate or biternate at one end; some again are anchorate at the extremity, with three or four slender flukes. In its canal connecting the three external and larger openings, and in its beautiful open network of spicules, it seems to differ generically from *Tethea*. In the shape of its spicules, but not in some other respects, it resembles the *Dorvillia agariciformis* of Mr. W. S. Kent, and the *Tethea muricata* of Bowerbank. As the Canadian sponge may possibly be the same as Dr. Bowerbank's imperfectly characterized species, I refrain for the present from giving it a name. It is only fair to add that before I had dredged this species in a living state, my friend Mr. G. T. Kennedy, M.A., had found specimens in the Post-Pliocene clays of Montreal, which are undoubtedly conspecific with it.

ECHINODERMATA.—*Schizaster fragilis* Dub. & Koren, and *Ctenodiscus crispatus*, are common in the deep-sea mud, as are also *Ophiacantha spinulosa* M. & T., and an *Amphiura* whose specific relations are still obscure. The Ophiuridæ collected

during this cruise have yet to be studied. One living example of **Ophioscolex glacialis* M. and T. was dredged in 210 fathoms, to the southwest by south of the Southwest Point of Anticosti.

NOTE.—I am indebted to Prof. Verrill for the identification of several critical species, to whose names an asterisk (*) is prefixed; and the difficult Crustacea, whose appellations are preceded by a dagger (†), were kindly determined for me by Mr. S. I. Smith.

ACTINOZOA.—A few individuals of *Pennatula aculeata* Dan., var., and of *Virgularia Ljungmanii* Köll., were taken in the deep-sea mud, together with large tubes apparently belonging to *Cerianthus borealis* Verrill, though the animal of this latter species has not yet been taken in the Gulf. *Cornulariella modesta* Verrill was collected (in 1871) at depths of 220 fathoms, between the east end of Anticosti and the Bird Rocks.

POLYZOA.—A beautifully perfect specimen of *Flustra abyssicola* of G. O. Sars, showing the singular avicularia, so characteristic of the species, was dredged in the center of the mouth of the river, at a depth of 220 fathoms. Two examples of *Hornera lichenoides* (Linn.) and one of a peculiar variety of *Bugula plumosa?* were dredged in the same place. *Escharella palmata* (M. Sars) was also sparingly taken in deep water.

MOLLUSCA.—The most abundant species collected at greater depths than 150 fathoms are *Pecten Grœnlandicus* Ch., and *Arca pectunculoides;* but *Portlandia lucida*, *P. frigida*, *Philine quadrata*, *Cylichna umbilicata* Mont., *Dentalium attenuatum* ?* Say, and *Siphonodentalium vitreum* Sars also occurred, though more sparingly. Two living specimens of *Cerithiopsis costulata* Möll. (the *Bittium arcticum* of Mörch) were dredged in the 220 fathom locality.

CRUSTACEA.—The deep-sea Crustacea are of unusual interest. Among them is a living specimen of *Calocaris MacAndreæ* Bell, the first, I believe, that has been observed on the American side of the Atlantic. In the same region, four specimens of a crustacean were collected, which belong, in my judgment, to a new genus.† In its characters, this genus (for which I venture

* If the shell described by the late Dr. Gould as *Dentalium dentale* be really the *Dentalium attenuatum* of Say, the latter name is much prior to Stimpson's *D. occidentale*. Having received a number of Norwegian specimens of *D. abyssorum* Sars, through the kindness of Mr. Jeffreys, and compared them with the St. Lawrence longitudinally ribbed species, I cannot see any differences which in my judgment are sufficient to separate them. At the same time, *Dentalium striolatum* St. seems to me a perfectly distinct and good species.

† *Munidopsis curvirostra*, nov. gen. et sp. External antennæ about equal in length to the carapace and its rostrum; internal ones very short, not reaching farther than about one-fourth the length of the beak. Eyes *rudimentary*, longitudinally oval, light yellowish in color; *cornea devoid of facets*. Carapace squarish, but longer than broad, with an outwardly directed straight spine on each of the front angles. Upper surface of the carapace granulate, hispid, transversely irregularly plicate. In the center there are two dorsal spines, placed one above the other, but at some distance apart. These, as are two similar spines on the tail segments, are all

to propose the name *Munidopsis*) approaches nearer to *Munida* than to *Galathea*. On some future occasion I hope to be able to give a detailed description, with figures, of this form; for the present a short diagnosis only of some of its salient points will be attempted. Of the limited genus *Munida*, only two or three species are known at present. *Munida rugosa* (Fab.) is the same as *Munida Rondeletii* of Bell, and *Astacus Bamffius* of Pennant. The other species are *M. tenuimana* of G. O. Sars, and *M. Darwinii* of Bell.

The following additional species of Crustacea were collected from the deep-sea mud: †*Hippolyte Fabricii* Kroyer; †*Diastylis*, sp.; †*Pseudomma roseum* G. O. Sars; †*Thysanopoda neglecta?* Kroyer, and another large species; *Stegocephalus ampulla* Phipps; †*Harpina*, sp.; †*Epimeria cornigera* Fab.; †*Halirages fulvocinctus* Bœck; †*Melphidippa*, sp.; *Phoxus Kroyeri* St.; *Munnopsis typica* M. Sars; *Anthura brachiata* St.; and †*Nebalia bipes* O. Fab.

Fishes.—A fine living example of *Macrurus rupestris* (Fab.), the *M. Fabricii* of Sundevall, was brought up by "tangles" from a depth of about 200 fathoms.

During this cruise we were driven into Gaspé Bay for shelter from a heavy gale, blowing outside, and were detained there about four days. At the entrance of the bay, some dredging was done in depths of from 30 to 50 fathoms. The most interesting species obtained here were *Myriotrochus Rinckii* Steenstr.; *Priapulus caudatus;* both species of *Hyas;* a species of †*Eudorella;* *Acanthozone*, nov. sp., fide S. I. Smith; †*Syrrhoë crenulatus* Goes (several); †*Vertumnus serratus* Goes; †*Pontoporeia femorata* Kroyer; †*Haploops*, sp.; †*Melita dentata* Kroyer, and an allied species; as well as some interesting sponges. †*Gammarus ornatus* Edwards was abundant at low-water in St. George's Cove; it appears to be an abundant littoral form throughout the gulf.

Cruise 2.—We left Gaspé Basin on August 2d, intending first to examine the two largest of the inshore banks, the Orphan and the Bradelle. At the outset the weather was very stormy, so we got under the lee of Bonaventure Island, and dredged out-

exactly in a line with the rostrum, and the whole four point forward. Rostrum *simple* (without the spine on each side of the base so characteristic of *Munida*), *conspicuously curved upward*, stout at the base and gradually tapering to a fine point. A single spine in the center of the first and second tail segments, the rest devoid of any. Anterior pair of legs about as long, but not longer, than from the apex of the rostrum to the end of the tail, extending a little beyond the tips of the outer antennæ. The following are the measurements of an average and apparently adult female: length, from apex of rostrum to tip of tail, 1·38 inch; of carapace, including the rostrum, ·69 inch; of exterior antennæ, ·75 inch; of anterior legs, ·94. Inhabits the center of the mouth of the St. Lawrence River, between Anticosti and the south shore, in from 180 to 220 fathoms, and probably burrows in the deep-sea mud. From *Munida* it may at once be distinguished by its curved and simple rostrum. In the rudimentary character of its eyes it closely resembles *Calocaris*, but not in many other respects.

side the northern entrance to the Bay des Chaleurs, from Cape Despair to a little below Grand Pabou. *Ophioglypha Sarsii*, of large size, was abundant here, and two specimens of *Myriotrochus Rinckii* were taken in the same place. The crustaceans from this region are unusually interesting: among them are †*Hippolyte macilenta* Kr.; *Thysanopoda neglecta?* Kr.; †*Pseudomma* (nov. sp.); species of †*Mysidæ* "near to *Erythrops* and *Parerythrops* of G. O. Sars"; †*Eudorella*, sp.; †*Leucon nasicus* Kroyer; †*Acanthostephia Malmgreni* Bœck; *Œdiceros lynceus* M. Sars; †*Aceros phyllonyx* Bœck; †*Byblis Gaimardii* Kroyer; †*Pontoporeia femorata* Kroyer; a species of †*Melita*. Also a curious fish, at present undetermined.

The breeze moderating, we at once made for the Orphan Bank, and devoted three days to dredging on it, remaining on the ground during the night so as to lose no time. The Orphan Bank, which is situated nearly opposite the entrance to the Bay des Chaleurs, is a stony patch, as are most of the fishing banks, many of which are not mapped out in the charts.

The masses of rock are often of large size, and consist chiefly of a reddish sandstone (perforated by *Saxicava* and *Zirphæa crispata*) associated with a few scattered pieces of Laurentian gneiss, &c. Soft-bodied organisms are peculiarly plentiful on this bank. The most characteristic of these are *Alcyonium rubiforme* Ehr., small varieties of *Metridium marginatum*; *Ascidiopsis complanatus*, of unusual size and abundance; various other Tunicates; and quantities of common Ophiurids and Asterids. †*Metopa glacialis* Bœck was occasionally met with between the inner and outer tunic of *Ascidiopsis*. The stones are often covered with encrusting sponges, of two or three species, together with a slender, cylindrical, and rarely branched, form; *Grantia ciliata* was frequent, and with it there occurred another calcareous sponge which Prof. Verrill has identified as the *Ascortis fragilis* of Hæckel. Hydrozoa and Polyzoa are exceedingly abundant on this bank; the former seem to be mostly common northern forms. Among the latter, *Myriozoum subgracile* D'Orb.; *Celleporaria incrassata* Lam.; *Cellepora scabra* Fab.; *Eschara cervicornis?* Pallas; *Caberea Ellisii*; and other species, were fine and frequent. Two fine specimens of *Porella lævis* (Fleming) were dredged at this locality. **Boltenia ciliata* Möller; **Molgula pannosa* V.; *Cynthia pyriformis* (Rathke); and *C. monoceros* Möll., occurred sparingly among the other Tunicates.

Among the Echinoderms are *Pteraster militaris*, *Asterias Grœnlandicus*, and *Psolus phantapus*. The rarest of the Orphan Bank Mollusca are *Amicula Emersonii* (Couth.), fine and frequent; *Mamma immaculata* (Totten); *Trophon craticulatus* (O. Fab.); *Buccinum tenue* Gray; *Neptunea Spitzbergensis* (Reeve); *Tritonofusus Kroyeri* Möll.; *Astyris Holbollii* Beck; and a few

Astarte lactea of Brod. and Sowerby. Crustacea are peculiarly plentiful on this bank, particularly the two species of *Hyas; Eupagurus; Pandalus annulicornis; Crangon boreas; Nectocrangon lar* (fine); *Hippolyte spina;* †*H. Phippsii;* and †*H. pusiola.*

The Amphipods are represented by *Acanthozone cuspidata* (Lep.); *Tritropis aculeatus* (Lep.); and *Eusirus cuspidatus.* The Isopods by *Idotea marmorata* Packard, and by a *Bopyrus* which was found burrowing under the carapace of the common *Pandalus.* A small species of *Nymphon* was also dredged here.

At the end of the third day a stiff breeze from the southwest sprung up, accompanied with rain, and in consequence of this we made for Miscou Island for shelter. As soon as the gale moderated we proceeded to the Bradelle Bank, and on our way made one cast of the dredge between it and Miscou. In this haul, specimens of †*Hippolyte macilenta;* †*Pseudomma,* nov. sp.; †*Byblis Gaimardii;* †*Ampelisca,* sp.; †*Ptilocheirus pinguis* St.; †*Melita dentata;* and †*Pontoporeia femorata,* as well as many Annelids, were collected.

The Bradelle Bank, which is situated almost due south of the one previously described, is also a stony patch, but the pieces of rock are usually small, and there is an admixture of gravel, coarse sand and mud. Its fauna is characterized by the abundance of its Mollusca, and by the apparent absence on it of many of the softer organisms so abundant on the Orphan Bank. The Hydrozoa and Polyzoa of the two banks are very similar, but on the Bradelle fine specimens of *Tubulipora lobulata* Hassall, were collected. The most abundant shells on the Bradelle are *Astarte lactea* Brod. and Sow., *A. elliptica,* and *A. Banksii; Venus fluctuosa* Gould; *Cardium Grœnlandicum; Crenella nigra; C. lævigata; C. glandula; Macoma calcarea; Panopœa Norvegica;* and *Cyrtodaria siliqua.* Its greatest rarities are a single living example each of *Tritonofusus latericeus* Möller, and *Volutopsis Norvegicus* Chemn. *Rhynchonella psittacea,* of large size, is common on both banks. *Astrophyton Agassizii; Ophioglypha Sarsii,* large; *O. nodosa;* and *Psolus phantapus* are frequent on the Bradelle, where also a fine living specimen of *Ophiocoma nigra* Müller was obtained. The Crustacea of both banks are for the most part similar, but on the Bradelle a few additional species occurred. These are *Crangon vulgaris;* †*Diastylis,* sp.; †*Ampelisca,* two species; †*Haploops,* sp.; †*Byblis Gaimardii;* †*Ptilocheirus pinguis;* †*Harpinia,* sp.; †*Paramphithoë pulchella* Bruz.; †*Œdiceros lynceus;* †*Vertumnus serratus;* and †*Nebalia bipes.*

These two banks seem to be outliers, so to speak, inhabited by a purely arctic fauna, and surrounded almost entirely by a more southern assemblage. The shores of the Magdalen Group, of Prince Edward and Cape Breton Islands, as well as the whole of Northumberland Straits as far north as the southern entrance

to the Bay des Chaleurs, are tenanted by a somewhat meager Acadian fauna. Owing to the shallowness of the water on these two banks, the temperature is probably higher by some four or five degrees than the average of that in the northern part of the gulf. In sailing from Point Miscou to the Bradelle Bank we found the temperature of the bottom (Miscou Point, bearing northwest half north, 22 miles distant) was 42° Fahr. After examining the Bradelle Banks, we made for Pictou, Nova Scotia, and arrived there on the afternoon of August 11th.

Cruise 3.—Leaving Pictou on the 13th of August, we dredged to the S.W. and S.S.W. of Pictou Island, then to the N.E. and N.N.E. of Cape George (N. S.), and from there to a little distance off Port Hood, C. B. We next stood over to the east point of Prince Edward Island, dredging at intervals on the way. After this we examined the Milne Bank, also various parts of the bottom from there to Cape Bear (Prince Edward I.), and to the north of Pictou Island, and got back to Pictou on the 16th of August.

From Pictou to Port Hood and along the west side of Cape Breton, the sea bottom consists of red clayey mud, in which annelids are remarkably numerous and often of large size. At almost every cast of the dredge, tangled masses of tubicolous annelids (inhabiting tubes of from the $\frac{1}{16}$th to a quarter of an inch or more in diameter, and from one or one and a half inches to nearly eight inches in length came up in handfulls. These, together with large naked species, are so abundant as to form more than two-thirds of the whole number of specimens taken. One specimen of †*Diastylis quadrispinosus* G. O. Sars, was dredged off Pictou Island. Hydrozoa and Polyzoa are tolerably abundant, and sometimes very fine, in the red mud; these have not yet been examined, but among them are *Sertularia argentea* of unusually large size, and a bushy species of *Gemellaria*. *Alcyonium carneum* Ag., is one of the characteristic species of the eastern part of this area, as is also an apparently undescribed species of *Priapulus*, very distinct from *P. caudatus*. Tunicates are not unfrequent in the red mud; the commonest of which are *Pelonaia arenifera* and *Eugyra pilularis*, while **Glandula fibrosa* St., occurred more rarely. With these, about sixteen species of shells were collected; they are all characteristic Acadian species. The temperature of the mud seems to range from 40° to 42° Fahr. Off Port Hood, two large specimens of a Holothurian were taken, which exactly agree with the drawing and description of the *Cucumaria pentactes* of O. F. Müller, as given by E. Forbes in his British Starfishes.

Off the east point of Prince Edward Island the bottom is sandy, and as the depth where we dredged does not exceed

fifteen or twenty fathoms, the summer temperature is high, being affected by surface conditions. Three small specimens of *Echinocucumis typica* M. Sars were collected here, as well as examples of **Molgula papillosa* V. and *M. producta* St. On the Milne Bank we dredged quantities of the common *Echinarachnius;* an abundance of fine Hydroids and Polyzoa; a few shells; and some small algæ.

Between Cape Bear and Pictou Island the bottom is sandy, with shells and a few small stones. Three kinds of sponges were collected here, many hydroids, echinoderms (all common forms), annelids, crustacea, and tunicates. Among the latter are specimens of **Molgula littoralis* V. Shells were particularly abundant, among them are *Pecten tenuicostatus*, *Modiola modiolus*, *Crenella nigra*, *Astarte undata* Gould, *Cyprina Islandica*, *Callista convexa*, *Pandora trilineata?*, *Crepidula fornicata*, *Lunatia triseriata*, *Mamma immaculata*, and several species of *Bela.*

The fauna of the region north of Pictou, between the west coast of Cape Breton and the east of Prince Edward Island, is essentially of an Acadian type. To the north, northwest, and west of Cape Breton, the deep water assemblage has probably an Arctic character.

In the marine slip at Pictou, I collected specimens of *Teredo navalis* and *T. Norvegica*, burrowing into the black birch of which the roller frames of the cradle are composed. At Souris, (Prince Edward I.), the common periwinkle of England (*Littorina littorea*) was plentiful, and it was subsequently observed at Charlottetown. An *Argulus*, closely allied to *A. Alosæ* of Gould, if not identical with it, was taken off Pictou Island, in towing nets, attached to *Gasterosteus biaculeatus?* and other small fishes. *Idotea irrorata* Say, was common on the surface at the same place, and was subsequently obtained at Shediac Bay, and elsewhere. On the shores of the Magdalen Islands it is tolerably common.

Cruise 4.—In the last cruise we endeavored to explore both sides of Northumberland Straits, and dredged from Pictou as far to the northwest as Miramichi Bay. Leaving Pictou on the 19th of August, we first dredged a little to the N.N.W. of Pictou Island, and were then compelled by stormy weather to take shelter in Shediac Bay. Being detained at Point du Chene for two days, we availed ourselves of the opportunity to examine the oyster beds of Shediac Bay. On these beds, from low water mark down to three fathoms, the following species were met with:

Crustacea.	Mollusca.
Cancer irroratus *Say.*	Ostrea borealis *Lam.*
Crangon vulgaris *Fab.*	O. Virginiana *Lister.*
†Gammarus ornatus *Edw.*	Mytilus edulis *Linn.*
Idotea irrorata *Say.*	Modiola modiolus *Linn.*

Mercenaria violacea *Schum.*
Gemma Tottenii *St.*
Callista convexa *Say.*
Petricola pholadiformis *Lam.* and var. dactylus.
Mactra solidissima *Chemn.*
Mya arenaria.
" truncata.
Angulus tener *Say.*
Thracia Conradi (fine and frequent).
Pandora trilineata? *Say.*
Solen ensis, v. Americana.
Teredo, sp. (in a spruce log).
Haminæa solitaria *Say.*
Cylichna pertenuis *Migh.*
Lottia alveus *Conrad.*
Crepidula fornicata *Linn.*
" unguiformis *Lam.*
Paludinella minuta.
Odostomia trifida *Totten.*
Turbonilla interrupta *Totten.*
Lunatia heros *Say.*
Bittium nigrum *Totten.*
Nassa obsoleta *Say.*
" trivittata *Say.*
Astyris lunata *Say.*

ECHINODERMATA.

Asterias vulgaris *St.*
Cribella sanguinolenta.
Echinarachnius parma.
Echinus Dröbachiensis.
Caudina arenata (*Gould*).

Leaving Shediac by daybreak on the 22d of August, we dredged from that place to the Egmont Bank, and stood back again to the south shore the same evening. The Egmont Bank is a small rocky patch, situated between Shediac Bay and Cape Egmont, Prince Edward Island. The depth on it is less than ten fathoms, and the bottom consists of coarse sand and stones, the latter covered with *Laminariæ* and smaller algæ, and perforated by *Petricola pholadiformis*. Annelids are numerous in the sand, from which also about twelve species of shells were collected. Early the next morning (August 23d), we stood over to the Prince Edward Island side, and dredged along the outside of Bedeque Bay, from off St. Jacques to a little to the south of Sea Cow Head. In the afternoon a falling barometer indicating the imminent approach of a storm, we made for Charlottetown, and reached there only just in time to weather out the memorable gale of the 24th of August. We subsequently managed to dredge in Hillsborough Bay, also, on the opposite shore, off Pugwash Harbor, N. S., and off Shediac, Buctouche and Richibucto, in New Brunswick, and on the 9th of September I left the schooner and proceeded home. On the Prince Edward Island side of Northumberland Straits proper, the bottom is usually a red (Triassic) clayey mud, while on the New Brunswick side it is generally sandy. The fauna of the Straits is of a meager Acadian type. A few sponges, hydriods and crustaceans collected here have yet to be studied. The annelids are fine and frequent, but the echinoderms are all very common species. At depths of more than four fathoms, in Northumberland Straits, the following species were collected:

CRUSTACEA.

Homarus Americanus (fry.)
Crangon vulgaris.
†Hippolyte pusiola *Kr.*
× †Diastylis lucifera.
× † " sculpta? *G. O. Sars.*
†Pontoporeia femorata.
†Unciola irrorata *Say.*
†Amphithöe, *sp.*
†Ptilocheirus pinguis.
†Melphidippa, *sp.*
†Idotea phosphorea *Harger.*

TUNICATA.

*Eugyra pilularis *V.*
Pelonaia arenifera *St.*

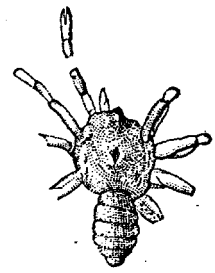
Mollusca.	
Pecten tenuicostatus *Migh.*	Petricola pholadiformis *Lam.*
Yoldia limatula *Say.*	Mactra lateralis *Say.*
" sapotilla *Gould.*	Pandora trilineata? *Say.*
Nucula delphinodonta *Migh.*	Turbonilla interrupta *Totten.*
Astarte undata *Gould.*	Lunatia triseriata *Say.*
Cyprina Islandica *Linn.*	Nassa trivittata *Say.*
Cardium pinnulatum *Con.*	Buccinum undatum *Linn.*
Callista convexa *Say.*	Sipho pygmæus *Gld.*
	Bela cancellata *Migh.*

Art. XXVI.—*Notice of a new Fossil Spider from the Coal Measures of Illinois;* by O. Harger.

Arthrolycosa antiqua*, gen. et sp. nov.

The fossil spider, represented in the accompanying figure, was found by Mr. S. S. Strong, in one of the well known ironstone concretions from Mazon Creek, Grundy County, Illinois, in "the lower part of the true Coal Measures," and is now preserved in the Museum of Yale College. The specimen, as seen upon the fractured surface of the concretion, presents for examination only the dorsal surface, and the other half of the concretion, or the cover, adds little or nothing to the knowledge of the fossil.

The outline of the cephalothorax in the specimen is indistinct, but measures about 10mm (·4 in.) in length by 9mm (·35 in.) in breadth. Near its anterior margin is a tubercle, which seems to present traces of a median longitudinal division, as if a pair of oval eyes had occupied its lateral portions. Behind this tubercle and near the middle of the cephalothorax is a pit or impression in the surface, and a little posterior to this a transverse ridge, somewhat convex forward. Other depressions and irregularities upon the surface seem to be unsymmetrical, and are probably accidental, or perhaps evidence that it has been flattened from an originally convex form. In front of the cephalothorax are two short, stout, divergent organs, apparently the mandibles, only one of which is shown in the figure. Upon the upper interior surface of the left mandible are two shallow longitudinal grooves, separated by a narrow rounded ridge. On the left side of the cephalothorax, and behind the mandible, are four appendages, probably the palpus and the first three legs, the fourth leg on the left side being absent. The first of these four appendages shows, in connection with the cephalothorax, two segments and a part



* From ἄρθρον, *a joint*, and λύκος, *a spider*, referring to the segmentation of the abdomen.