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WITH A PLATE AND A MAP.



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SCIENTIFIC INTELLIGENCE.



## NUMBER XII.

## SCIENTIFIC INTELLIGENCE.



## ERRATA.

Page 20, 2d line of foot-note, for cellular, etc., *read* cellular or, etc.
" 24, line 16, for represent, *read* present.
" 24, lines 3 and 10 from bottom, for Cacteria, *read* bacteria.
" 62, line 31, for nassiform, *read* napiforn.
" 62, line 33, for -petaled, *read* -petioled.
" 80, line 8 from bottom, for 1860, *read* 1869.
" 205, lines 6 and 7, the proportion of nitre referred to is that of *fused* nitre.
" 227, line 17 from bottom, for two, *read* ten.

| STATIONS. | Difference of Longitude. | | $\chi_1 + \lambda_2$ |
|---|---|---|---|
| | *h.* *m.* | *s.* *s.* | *s.* *s.* |
| Cambridge to Salt Lake, | 2 43 | 4·367 ± ·008 | ·591 ± ·019 |
| Salt Lake to San Francisco, | 0 42 | 2.844 ± ·008 | ·242 ± ·016 |
| Cambridge to San Francisco (sum), | 3 25 | 7·211 ± ·011 | ·833 ± ·025 |
| " " (direct), | 3 25 | 7·190 ± ·007 | ·817 ± ·014 |
| Difference, | | ·021 ± ·013 | ·016 ± ·029 |
| Cambridge to San Francisco, | 3 25 | 7.190 ± ·007 | ·817 ± ·014 |
| (C. to O.) + (O. to S. L.) + (S. L. to S. F.) | | 7·194 ± ·014 | ·838 ± ·027 |
| (C. to O.) + (O. to S. F.) | | 7·183 ± ·013 | ·819 ± ·027 |
| (C. to S. L.) + (S. L. to S. F.) | | 7·211 ± ·011 | ·833 ± ·025 |
| Cambridge to San Francisco (Mean of all), | 3 25 | 7·194 ± ·006 | ·827 ± ·012 |

ART. LVII.— *Notice of the Invertebrata dredged in Lake Superior in* 1871, *by the U. S. Lake Survey, under the direction of Gen. C. B. Comstock, S. I. Smith, naturalist;* by S. I. SMITH and A. E. VERRILL.

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DURING the explorations in Lake Superior, mentioned in the last number of this Journal (page 373) the following species were obtained, together with a number of minute forms, which have not been determined.

A full account of the expedition, with descriptions of the species collected, will be published in the official report of the expedition.

### RADIATA.

*Hydra carnea* Agassiz. A beautiful *Hydra*, agreeing with Ayer's description of this species, was very abundant at the eastern end of St. Ignace, upon rocks along the shore and near the surface, frequently completely covering quite large surfaces where they were protected from the direct sunlight, and was also brought up in many of the dredgings from 8 to 148 fathoms. In 32 fathoms, Neepigon Bay, and in 59 fathoms, off Simmon's Harbor, it was brought up in abundance from a soft clayey bottom. In the deep dredgings, it frequently came up near the bottom of the clay in the dredge, and was evidently not caught while the dredge was near the surface.

### MOLLUSCA.

*Limnæa.* A species allied to *L. disidiosa* Say, was abundant among *Cladophora* in 8 to 13 fathoms on the south side of St. Ignace Island.

*Physa heterostropha* Say. In the cove at the eastern end of St. Ignace, in 4 to 6 fathoms, and young specimens, in 8 to 13 fathoms, at the locality with the *Limnæa* just mentioned.

*Physa vinosa* Gould. A very young specimen, apparently of this species, in 6 to 8 fathoms among the Slate Islands.

*Planorbis parvus* Say. Common in 8 to 13 fathoms on the south side of St. Ignace.

*Valvatu sincera* (Say sp.). Abundant with the last species, in 8 to 13 fathoms, and also, in 4 to 6 fathoms, in the cove at the eastern end of the same island.

*Sphærium* sp. nov.? Among the Slate Islands, in 6 to 8 fathoms. A single young specimen of another species of *Sphærium* was found, in 8 to 13 fathoms, on the south side of St. Ignace.

*Pisidium Virginicum* Bourguignat. On the south side of St. Ignace, 8 to 13 fathoms.

*Pisidium abditum* Haldeman. With the last species, in 8 to 13 fathoms, and also, in 4 to 6 fathoms, in the cove at the eastern end of the same island.

*Pisidium compressum* Prime. In the cove at the eastern end of St. Ignace, 4 to 6 fathoms.

*Pisidium* sp. nov. A small, semi-translucent species, the same as found by Dr. Stimpson in Lake Michigan, was brought up at nearly every dredging. It was common in the cove at the eastern end of St. Ignace, on sandy and muddy bottom, in 4 to 6 fathoms, and abundant among *Cladophora*, in 8 to 13 fathoms, on the south side of that island; among the Slate Islands, in 6 to 8 and 12 to 14 fathoms; at 13 to 15 fathoms on a sandy bottom in Simmon's Harbor; near Copper Harbor, in 17 fathoms, clear sand; in 32 fathoms, very soft clayey mud, in Neepigon Bay; off Copper Harbor, in 62 fathoms, and north of Keweenaw Point, in 82 fathoms, soft reddish clayey mud and sand; and in all the deep dredging down to 159 fathoms.

## Worms.

*Lumbricus lacustris* Verrill, sp. nov. About 1·5 inches long, ·04 in diameter. Body round, distinctly annulated. Head short, conical, obtusely pointed. Setæ spine-like, strongly curved, acute, arranged two by two, those of each pair close together. Color reddish brown.

South side of St. Ignace, among *Cladophora*, 8 to 13 fathoms.

*Sænuris abyssicola* Verrill, sp. nov. Worm slender, attenuated posteriorly, about ·30 of an inch long, ·03 in diameter anteriorly. Body composed of about 28 segments, those of the posterior half elongated; those of the anterior half shorter, separated by slight constrictions. Cephalic lobe short, subconical, rounded in front. Mouth large, semi-circular. Intestine slender, moniliform, containing sand. Anus terminal, with three or four slight lobes. Setæ in four, fan-shaped fascicles on each segment, commencing at second segment behind the mouth. The two ventral fascicles are separated by a space equal to about twice the length of the setæ, of which there are five or six in each fascicle; the satæ are simple, acute, slightly curved, equal to

about one-sixth the diameter of the body. The lateral fascicles contain three to five somewhat shorter and straighter simple setæ. One specimen appeared to have four minute ocelli upon the upper side of the head.

Off Copper Harbor, 17 fathoms, sand; off Simmon's Harbor, 60 fathoms; and on the line from the Slate Islands toward Stannard Rock, fourth haul, 159 fathoms.

*Sænuris limicola* Verrill, sp. nov. Worm more slender than the preceding, attenuated posteriorly, composed of about 44 segments. Length about ·33 of an inch, diameter ·02. Cephalic lobe blunt, conical. Setæ in four fascicles upon each segment, six to eight in each fascicle anteriorly, four or five posteriorly. The setæ in all the fascicles are relatively long, slender, curved and acute. Two tortuous red blood vessels pass along the intestine, forming a loop at each segment. Intestine moniliform.

On the line between the Slate Islands and Stannard Rock, fourth haul, 159 fathoms.

*Chirodrillus*, gen. nov. Allied to *Sænuris*, but with six fan-shaped fascicles of setæ upon each segment, two of which are ventral, two lateral, and two sub-dorsal; setæ in the ventral and lateral fascicles four to nine, simple, acute, slender, curved like an italic *f*; those of the dorsal fascicles, stouter and less curved, three to six in each fascicle. Intestine wide, somewhat moniliform. Anus terminal, large.

*Chirodrillus larviformis* Verrill, sp. nov. Body rather short and not very slender, cylindrical, obtuse at both ends, distinctly annulated, composed of about 38 rings. Length about ·30 of an inch; diameter ·05. Cephalic lobe short, conical, obtuse, mouth large, semi-circular beneath. Ventral fascicles of setæ near together, with about five setæ, which are rather short, simple, acute, little curved; lateral fascicles with five or six setæ of similar form and size; sub-dorsal ones similar. When preserved in alcohol, the body is usually curved ventrally or in a simple coil. Color, when living, translucent whitish, intestine slightly greenish. A thickened smooth zone commences behind the 10th setigerous ring, occupying the space of about four segments.

Off Copper Harbor, 17 fathoms, sand; off Simmon's Harbor, 59 fathoms, clayey mud.

*Chirodrillus abyssorum* Verrill, sp. nov. Sub-cylindrical, thicker anteriorly, distinctly annulated, composed of about 42 segments. Length ·25 of an inch; diameter about ·02. Cephalic lobe short, conical, obtuse, mouth large, semi-circular. Ventral fascicles with eight or nine setæ anteriorly, five or six posteriorly. The setæ are long, slender, acute, strongly curved, those on the inferior side of the fascicles nearly twice as long as those of the upper side; setæ of the lateral fascicles five or six, slender, nearly as long as those of the ventral ones, and similar in form;

dorsal fascicles with four or five shorter, stouter, and straighter, acute setæ.

Six miles S.E. of Passage Island, 47 fathoms; on line from the Slate Islands toward Stannard Rock, fourth haul, 159 fathoms.

*Tubifex profundicola* Verrill, sp. nov. A rather stout species for the genus, about 1 to 1·5 inches long, ·05 in diameter anteriorly, more slender posteriorly (·02 in diameter). Cephalic lobe short, conical; one specimen apparently had two minute ocelli. Mouth large, semi-circular. Intestine moniliform, with two simple red blood-vessels running along its whole length and uniting at the constrictions. In the first five or six segments there are slender vessels of nearly uniform size, which form lateral loops in each segment. Anus terminal, wide, with about ten small lobes. Setæ in four fascicles upon each segment. Those of the lateral fascicles three anteriorly, often but two, short, slightly curved, mostly with minute forked and hooked tips; those of the ventral series in fascicles of four to six, three or four times longer than the upper ones, considerably bent, the ends minutely hooked and forked.

Neepigon Bay, 32 fathoms.

*Nephelis fervida* Verrill, sp. nov. Leech two or three inches long, ·20 to ·30 wide, elongated and slender in full extension, very little depressed, most so posteriorly, often round and tapering anteriorly. Mouth large, nearly circular, subterminal, the upper lip, in contraction, short and rounded; corrugated within the œsophagus with three conspicuous folds, eyes eight, blackish, conspicuous, two pairs, a little apart, on the first ring of the head; two pairs wider apart and farther back on the third ring. Color bright brick-red, when living.

In 8 to 13 fathoms, south side of St. Ignace.

A small specimen, probably the young of this species, taken in 13 to 15 fathoms, in Simmon's Harbor, was translucent, tinged with flesh color, with a dark brown intestinal line posteriorly.

*Nephelis lateralis* Verrill (*Hirudo lateralis* Say). A small specimen, about 1 inch in length, of an obscure liver-brown color, was taken, in 6 to 8 fathoms, among the Slate Islands, which probably belongs to this species.

*Ichthyobdella punctata* Verrill, sp. nov. Body, in extension, slender, in the preserved specimen, about ·5 of an inch long, ·06 in greatest diameter, rounded, thickest posteriorly, tapering anteriorly to the anterior sucker, which is broad and thin, sub-circular, about three times as wide as the neck where it is attached. Ocelli four, on the upper side of the anterior sucker, the two larger, black ones, in front, and two minute ones wider apart and farther back. Posterior sucker large, rounded or oval. Color translucent greenish, with minute black specks arranged in transverse bands.

Among the Slate Islands, 6 to 8 fathoms.

*Procotyla fluviatilis* Leidy. Numerous specimens, apparently of this species, were obtained in 8–13 fathoms on the south side of St. Ignace. They were, when living, dirty white, mottled with brown.

In addition to the preceding species of worms, a few were obtained which have not yet been fully determined.

## Crustacea.

*Mysis relicta* Lovén. The occurrence of this and the following species, identical with forms from Lake Michigan, and the lakes of northern Europe, is mentioned in the last number of this Journal. It was brought up with sand and mud from 12 to 14 fathoms at the eastern end of St. Ignace, from 8 to 13 fathoms, with *Cladophora*, on the south side of the same island, and from deep water in a large proportion of the hauls from 73 to 148 fathoms.

*Pontoporeia affinis* Lindström. This species was found at every haul from the shallowest to the deepest.

*Crangonyx gracilis* Smith, sp. nov. Eyes slightly elongated, black, composed of few facets. Antennulæ slender, slightly more than half as long as the body; secondary flagellum but little longer than the basal segment of the primary. Antennæ much shorter than the antennulae; the flagellum and peduncle of about equal length, the peduncle being a little longer than the peduncle of the antennulæ. Gnathipoda sub-equal in both sexes, the second pair being only slightly larger than the first; propodus in the first pair quadrate, the palmary margin transverse, nearly straight, and armed with slender spines, of which one or two at the prominent posterior angle are much larger than the others; propodus in the second pair like those of the first, but a little more elongated and the palmary margin slightly oblique. Third, fourth and fifth pairs of pereiopoda equal in length and the margins of their basa spinulose. Ultimate pleopoda reaching to the tips of the penultimate; the outer ramus nearly twice as long as the peduncle, and armed with slender spines; the inner ramus very minute, shorter than the width of the outer. Telson scarcely as long as the bases of the ultimate pleopoda, slightly broader than long, and the posterior margin with a triangular emargination, either side of which the extremity is truncate and armed with several spines.

The incubatory lamellæ of the female are very large, projecting much beyond the coxæ of the anterior legs, as in *C. recurvatus* Grube, which our species much resemble in the form of the antennulæ, antennæ, gnathepoda, etc., while it differs much in the ultimate pleopoda and in the form of the telson. Length, 5 to 7$^{mm}$.

Among *Cladophora*, in 8 to 13 fathoms, on the south side of St. Ignace.

*Gammarus lacustris* Smith, sp. nov. Eyes slightly elongated, black. Antennulæ not quite half as long as the body, and furnished with a few short hairs; first and second segments of the peduncle equal in length, third much shorter; flagellum twice as long as the peduncle. Antennæ a little shorter than the antennulæ; ultimate and penultimate segments of the peduncle equal in length, the basal segments short; flagellum considerably shorter than the peduncle. Gnathipoda about equal in size; propodus in the first pair elongated and much narrowed toward the articulation of the propodus; palmary margin slightly concave, continuous with the posterior margin, and furnished, like it, with several stout spines and numerous long hairs, dactylus slightly curved and fully half as long as the propodus; propodus in the second pair a little broader, the lateral margins nearly parallel, the palmary margin somewhat oblique, slightly concave, and furnished with a thin raised margin, and several stout spines, the posterior margin without spines, but furnished with numerous fascicles of hairs. Pleon rounded above, the fourth and fifth segments each with three fascicles of two or three small spines. Third, fourth, and fifth pairs of pereiopoda sub-equal, their basa narrow and the margins furnished with few minute spines. Rami of the posterior pair of pleopoda very slender, the edges furnished with long hairs and a few spines, inner only a little shorter than the outer. Length, 15 to 20$^{mm}$.

Color in life uniform, obscure, dark brownish-green, without spots or markings of any kind.

Common in company with the last species in 8 to 13 fathoms; also at Simmon's harbor, in 13 to 15 fathoms, and among the Slate Islands, in 4 to 6 and 12 to 14 fathoms.

*Asellus tenax* Smith, sp. nov. Head broad, with a large rounded sinus in the margin on each side opposite the eye, back of which the margin projects in a rounded lobe, so that the head is not narrower posteriorly than the anterior margin of the first segment of the pereion. Eyes small, prominent, and separated from the margin of the head by more than their diameters. Antennulæ much shorter than the peduncles of the antennæ. Antennæ half as long as the body; the flagellum longer than the peduncle. Propodus in the first pair of gnathipoda narrow and elongated, but considerably stouter in the male than in the female; dactylus more than half as long as the propodus and its palmary edge armed with acute spines, of which the distal ones are larger. The succeeding pairs of legs all similar, the carpal and propodal segments sub-equal in length and armed with short spines along the posterior

edges; the dactyli short, armed with a few spines on the posterior margin, and bi-unguiculate at tip. Pleon narrowed posteriorly, and the extremity obtusely rounded. Posterior pleopoda slender, the outer ramus only half as long as the inner. Length, 8 to 13$^{mm}$.

Color above dark fuscous, spotted and mottled with yellowish.

Common with the last two species, among the *Cladophora*, in 8 to 13 fathoms; also in 4 to 6 fathoms at the eastern end of St. Ignace, and in 6 to 8 fathoms among the Slate Islands.

Numerous species of Entomostraca were collected at many places, but they have not yet been examined sufficiently for an enumeration of the species.

In addition to the species of the groups already mentioned, insect larvæ and pupæ were obtained at nearly every haul. Several species of *Chironomus*, or of closely allied genera, were common, a slender translucent species being found down to 147 fathoms; an Ephemerid lava occurred at 32 fathoms in Neepigon Bay, and two species of *Phryganeidæ* larvæ were common among *Cladophora* in 8 to 13 fathoms on the south side of St. Ignace.

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ART. LVIII.—*On Kilauea and Mauna Loa;* by Rev. TITUS COAN.
(From a letter to J. D. Dana, dated Hilo, Aug. 30.)

DURING the present month I have, in connection with my pastoral labors, visited Kilauea and the whole coast of Puna. I had not seen the volcano since July, 1869, more than a year after the great earthquake and eruption of April, 1868. At this visit, in 1869, I found the crater very quiet. The central and *convex* part had subsided some four hundred feet, forming a vast *concave*, and leaving a high, serrous, black ledge around the circumference of the crater. The south lake was not included in the central basin or depression; but it formed a much deeper pit within the southern rim of the black ledge. The whole crater of Kilauea was then quiescent, with light puffs of long, white steam rising here and there. There were no demonstrations, and so nearly cooled was the bottom of that great south lake—Halemaumau—that I went down into it some *twelve hundred feet below the upper rim of Kilauea*, and measured across the floor. I found the diameter five-sixths of a mile, the pit being more than a mile wide from the upper north to the upper south rim. There were several places, however, at that time, where the incandescent rocks were seen boiling fiercely, through fissures, in caverns fifty to one hundred feet below. Such was the state of the crater on my visit in July, 1869.

On my recent visit, two years later, I found great changes. The south lake had been filled with molten lavas, and successive