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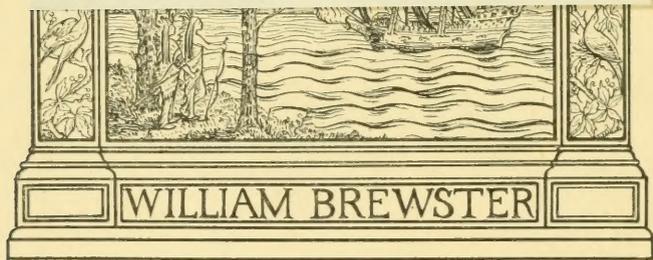
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February 2, 1921.



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Vol. 1, Apr. 1884, p. 206.

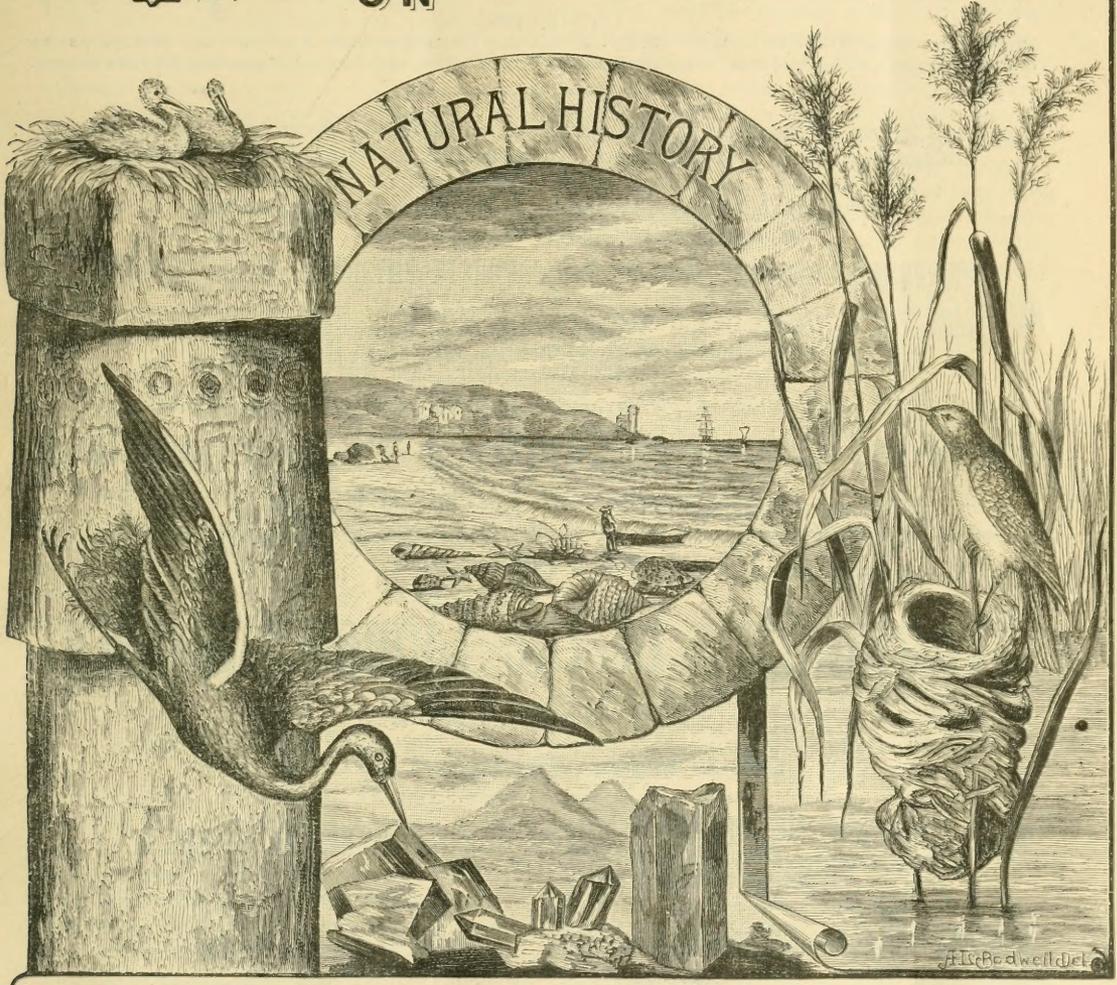
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VOL. II.

NO. I.

RANDOM NOTES

ON



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BY WILLIAM DUTCHER.

A Paper on the FISH CROW.

BY EUGENE P. BICKNELL.

A Review of the Summer Birds of the Catskills.

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Random Notes on Natural History.

Vol. 2.

PROVIDENCE, JANUARY, 1885.

No. I.

Entered at the Providence Post-Office as Second-Class Matter.

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With the present number we enter upon Vol. II. of our magazine. Aware of some deficiencies in the issue of the past year, we shall, with greater experience, endeavor to rectify them in the future, and, taking great care that the material presented shall be correct, we think our magazine will be valuable beyond the very moderate price of subscription. It contains the only reports ever published upon the mollusca and reptilia of Rhode Island, certainly valuable to amateurs and students in either of those branches, and a checking-list of the cyclostomacea of the world, beside which we aim to present papers and reports on other subjects, in a manner as popular as is consistent with scientific accuracy.

To those who have encouraged us by their subscriptions, we beg to extend our thanks.

A New Wrinkle in Taxidermy.

WISHING to turn a mounted bird into a skin and having but a limited time to devote to the task, I tried an experiment. Taking a tunnel and inserting the pointed end in the stuffing between the edges of the skin on the abdomen, I poured in a quantity of hot water (nearly boiling hot) taking care to regulate the injection so that it should be rather slowly absorbed by the stuffing, and holding the bird at various angles, that every portion of the interior might become soaked. The effect was magical; the skin quickly relaxed, and within fifteen minutes I could bend the neck and make other required changes without any risk of a break.

My first experiment was with a gull; af-

terward I tried other birds, both large and small, with equal success. I found also that the plan worked equally well with skins which had been overstuffed or otherwise badly made. In a very few minutes they would become nearly as tractable as when freshly taken from the birds, and much more so than I have ever succeeded in making them by the use of a damping-box. The only difficulty experienced was that the water, especially if turned in too fast, would escape through shot holes and other rents in the skin, thus wetting the plumage in places. Of course after the required improvements or changes have been made the stuffing is so thoroughly saturated that the skin must be placed in a very warm place to dry. I dried mine most successfully by placing them on a furnace register and leaving them exposed to the full blast of heat for several days.

WILLIAM BREWSTER, *Cambridge, Mass.*

The Cermatia Forceps.

F. E. GRAY.

This insect has been reported by a number of naturalists as being extremely rare in the New England States, but, like many others, it is quite common in localities. The *Cermatia* is very easily distinguished from other Myriapods by its long legs and extremely long antennæ, the latter being longer than the body. In the adult specimens, the body is about an inch in length, the legs (except the hind ones) $\frac{3}{4}$ of an inch, while the hind ones are in the neighborhood of 2 inches, the total length from tip of antennæ to tip of hind legs being about $4\frac{1}{4}$ inches.

The body is of a greenish-brown color, striped with green, and the legs have three green bands around them.

It is an insect that loves the shade in the day-time, and should one by any means be forced into a place where a ray of sunlight can strike it, it will scurry back into as dark a shadow as it can find. It is found in

this city in considerable numbers, and frequents the under edge of the weatherboards of houses, on the northerly side, and has been also found around tanks.

They are very voracious, and have been noticed around the electric lights in pursuit of prey. The *Dryocampa senatoria* seems to be their favorite food, and they will pass by our common night-flyers, and pay no attention to them, when a *Dryocampa* is near. They are predatory, and spring on their victim somewhat after the fashion of a spider. After once seizing their prey they will not drop it unless forced, and even then will use every endeavor to escape with it to some place of safety. They are very swift in their movements, and are difficult to capture, for while apparently motionless, when one is about to pick them up, and is quite sure of them, they exhibit the peculiar propensity of the flea in not being there, but somewhere else.

It is very hard work to obtain a perfect specimen, as they have a way of leaving their legs in one's hands. They are most common in the months of July and August.

PROVIDENCE, R. I., Dec. 16, 1884.

Shrewsbury's Mastodon—*Mastodon Americanus*.

THE remains of one of these huge creatures have just been unearthed on the farm of Mr. Wm. U. Maynard, of Shrewsbury, Mass. This being the first find in that state, is of much interest. Similar remains have been found in Ohio, Nebraska, New York, and probably some other states; and the papers have recently reported them for Rhode Island. We think this last is an error, for somewhat diligent inquiry fails to establish the location or to find any published record of the fact. A skeleton of this animal is to be seen in Boston, in Dr. J. C. Warren's collection. It is 11 feet high, 17 feet long to the base of the tail, and the tusks 10 feet and 11 inches long. Like the elephants of to-day, these animals had a large head, short neck, and a very heavy body, supported by pillar-like limbs; a long proboscis enabled them to reach the ground or the branches above them. In writing about this present find, Mr. J. A. Allen says: "These teeth belong to an animal

probably about two-thirds grown, as shown by the size and condition of the teeth.

"Although the Mastodon became extinct prior to historic time, its disappearance occurred at a comparatively recent period, geologically speaking. It seems probable that it may have lived in North America, down to within a few thousand years, probably within a few centuries of the discovery of the continent by Europeans."

A Novel Mineral Cabinet.

A DEPOT in course of erection at West Medford, Mass., in the materials of its construction presents a new departure in building, and calls forth admiration from all lovers of natural objects.

The walls of the building are of field-rock with freestone trimmings. Care has been taken to select striking pieces, and they have been set as roughly as possible, the spaces between being filled with showy minerals. A large slab of slate projects at one corner, and a huge water-worn rock, resting upon it, has a striking resemblance to a bust of George Washington.

In front is a tablet for the name, and this is surrounded by twenty-four polished squares of different granites, with round balls of red granite at each corner.

A beryl crystal two feet in diameter sets on one partition, and a column of basalt from the Giant's Causeway, Ireland, projects as an example of blackness.

In the bullions between the bay-windows are large brain-corals, shells, quartz on fluur, and smaller specimens of pink gypsum, rose quartz, etc.

Other specimens are large and choice clusters of quartz crystals from Arkansas; apatite in pink calcite, Canada; geodes of quartz crystals, and chalcedony; noble serpentine; rhomb-spar; galenite; pyrite; amethyst; malachite; purple fluorite; cyanite; garnets; and polished breccia; also fossil corals, fossil wood, and ammonites.

Among the countries and towns represented by the species peculiar to them are Siberia, England, Ireland, Cuba, Mississippi, Illinois, Colorado, Pennsylvania, Diamond Hill, R. I., Middletown, Conn., Medford, Charlestown Somerville, Lynn, Fitchburg, Lee, and Newburyport, Mass.,

Warren and Franconia, N. H., and Sebago, Me. It will rank as one of our most notable buildings, built with novel material, and presenting an object for much study.

W. S. BEEKMAN.

Precious Opal.

SINCE the time Pliny accurately described his opalus, to the present day, this handsome mineral has been esteemed a gem, though not always assigned the same rank; for fashion, in its capricious vagaries, displaces and reinstates it in favor at irregular intervals. Its innate beauty so happily characterized in the lines,

"Milky opals that gleam and shine
Like sullen fires through a pallid mist,"

coupled with the fact that it is perhaps the only stone really defying imitation, has enabled it to eventually hold its own. The high rank awarded it in ancient times was undoubtedly largely due to the comparative ease with which it could be worked, and also to the fact that unlike all other precious stones much of its beauty was revealed and available without any labor. The strange popular belief of modern days that opal is an unlucky stone to the wearer, appears to be directly traceable to Sir Walter Scott's romance of *Anne of Geierstein*. In its usual occurrence in seams or veins in porphyry and igneous rocks, it is plainly an infiltration of gelatinous silica (silica in the colloid state), often mixed with considerable crystalloid silica, and retaining more or less of the originally combined water. Indeed, precious opal proper seems, as a rule, to contain more water than the other varieties. Until within the past few years the greater part of the material for commerce has been of Hungarian and Mexican origin, but a new source of supply has been discovered in Queensland. In the variety from this locality, which may in some respects be considered unique, the usual fiery reflections are displaced partly, or even entirely, by the most splendid metallic hues — greens and blues of every conceivable shade — the individual colors in some instances being arranged in more or less distinctly defined bands or zones, or again imperceptibly melting into each other and vying with the plumage of humming-birds in magnificence. — *F. W. S., in Ward's Natural Science Bulletin.*

Genera of Pteropoda from Narragansett Bay.

Editors of RANDOM NOTES :

My attention has been called to a brief notice in your magazine of the Pteropoda, or "Sea-butterflies," forming a part of the shell-bearing Mollusca of Rhode Island. I am able to add to that notice a few genera, some of which have not previously been recorded, from this locality. All of these and several more have been collected by the United States Fish Commission and have been mentioned and described by Professor Verrill, but in many instances the localities from which the specimens collected by the Commission were obtained are outside of the limits of Rhode Island waters, while all the Pteropods here recorded were found at Newport, a few hundred feet from the shore.

The value of the present list is simply as a contribution to the local distribution of these animals. A description of two young forms of a naked Pteropod is appended. I have in preparation a more extended account of the anatomy and development of New England Pteropoda, where other stages in the growth of the last mentioned genus (*Clione*) will be described.

Of the shell-bearing Pteropoda or THECOSOMATA, the following genera occur in Narragansett Bay :

Cavolina.
Cymbulia.
Styliola.
Spirialis.

The naked bodied Pteropoda or GYMNOSOMATA are represented by at least one genus and species (*Clione papillonacea*), two larval forms of which are here described for the first time.

Cavolina.

The genus *Cavolina* is found every summer at Newport. The species resembles closely *C. tridentata* Gray, and is generally captured in the night-time.

Cymbulia.

The "boat-shaped" shell of the genus *Cymbulia* was found in 1880 at Newport. This beautiful genus, one of the largest of Mediterranean Pteropoda, is easily recognized by its slipper-shaped, transparent, cartilaginous shell, with notched and serrated edges. The single specimen was dead and

was thrown up on Bateman's Beach. It is probably *C. calceolus* Verr.

Styliola.

Several specimens of *Styliola*, probably *S. vitrea* Verr., have been found at Newport. Captured both by day and night.

Spirialis.

A *Spirialis* which is closely allied to *S. Gouldii* Stimpson, occurs at times in night fishing at Newport. Captured by day and night.

Clione.

The adult *Clione* I have never taken in Narragansett Bay, although two forms of the young of a species which is identified as *Clione papillonacea* Pallas, have been captured in surface fishing. Captured by day and night.

Stage 1.

The youngest stage of *C. papillonacea* was taken at 10 A. M., and was at first regarded as the young of Stage 2, which is undoubtedly the young of *Clione*.

The body is ovate, blunt at the anterior and more pointed at the posterior pole. Its length is 2.5 mm.

Four well-marked regions are found in the body, which is girt by four rings of cilia. Of these body regions the third, counting from the anterior, is the largest and the most posterior the smallest. The anterior or cephalic has a cup-shape, upon the posterior rim of which there is a ring of cilia, and on the top an infolding. It is separated from the second by a deep constriction just below the ring of cilia.

On each side of the median line extending backward over the anterior portion of the second body region, hang down two finger-like projections which are the beginnings of a heart-shaped organ, often called a "foot," found in that position in the adult.

In a side view one of the finger-shaped bodies last mentioned is seen in profile. From the constriction just below the first ring of cilia under this finger-shaped body, the rudiments of the future "wings" of the Pteropod appear as little buds, one on each side.

The second and third body regions, which together make the greater part of the body, have the form of swollen cylinders separated from each other by ciliated belts, the sec-

ond ciliated ring of the larva being placed on the anterior border of the segment which is second in order of enumeration, counting the head as a segment. The maximum diameter is just below the third ring of cilia. The terminal body-segment is pointed, conical, tipped by a tuft of cilia or a flagellum. The whole body of the larva is filled with large spherical globules.

Stage 2.

A second stage, intermediate between that just described and the adult, shows that both may rightly be referred to *Clione papillonacea*. It has the head much more rounded and the body more conical, tapering regularly backward to the posterior pole. In this larva one belt of cilia only was seen, viz.: the small ring which is placed near the posterior end of the body, or between it and the third body segment. The head bears two short tentacles, one on each side of a median line in which lies the mouth. The chitinous teeth are well developed. The walls of the head are covered with small papillæ. The two finger-like projections mentioned above have consolidated and formed a heart-shaped organ, the outlines of which are similar to the form of the same in the adult.

The constriction below the head in the earlier stage has broadened, and the two wing-like flappers which move so rapidly and which give the name of "sea-butterflies" to the group, have become very prominent. They are very thin and delicate, crossed by a muscular net-work of exquisite fineness.

Just below the heart-shaped organ lies a median tooth, an unpaired projection pointing backward. The whole surface of the body-walls is covered with minute papillæ. The walls are translucent, and in the body cavity at the greatest diameter, just below the wings, a globular mass more or less opaque, brown on one side and red on the other, can be easily seen. The posterior extremity of the second stage is formed of a very small segment separated from the remainder of the body by the persistent ciliated belt. This region has a bright red color.

The stage of *Clione* just described was taken in nocturnal fishing. Its length is 5 mm.

J. WALTER FEWKES.

CAMBRIDGE, NOV. 11, 1884.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER IV.

9. *Chelopus insculptus* (LE CONTE) COPE. (*Glyptemys insculpta* AGASSIZ.) The Sculptured or Wood Tortoise is found abundantly in our rivers, and is often surprised in pastures and woods some distance from any water whatever. When thus found it is leisurely crawling along, or feeding on the leaves of some favorite plant, until, disturbed, it suspends its labors and meets the intruder with hisses of defiance. On examination the shell is seen to be composed of very distinct, concentrically sculptured and brown-rayed plates; a prominent ridge being formed along the back by successive longitudinal prominences. Below, the yellow plastron is divided into twelve portions, each bearing in its posterior and outer corner a large black blotch, around which is a series of suture-like grooves, parallel with the general contour of the plate. The lower side of the limbs, neck, and tail presents a most beautiful orange color, well blending with the other shades of the body. In size the Sculptured Turtle sometimes rivals the "Snapper," specimens having been captured whose shells measured nine inches in length, though they seldom exceed seven or eight. This species is peculiar in its distribution; while I have found them very common about the Andros-coggin River, in Maine; in Massachusetts, around Boston and Plymouth, they are rare, though in Worcester County they are very abundant.

10. *Emys meleagris* (SHAW) COPE. (*Cistuda Blandingii* HOLBROOK.) This species is very rarely found in New England, though abundant in its regular habitat, the prairies of Illinois and Wisconsin. A specimen captured in Seekonk, Massachusetts (but a short distance from Rhode Island), by Mr. William Olney, is, above, of a dark green color speckled with yellow, the shell being convex, rounded, and smooth. Below, the shell has much the coloring of the Sculptured Tortoise, though it lacks the deep notch at the anterior portion, and is chiefly different in that it is provided with longitudinal ligamental hinges, which connect it with the carapace; and a transverse hinge, which

separates the six anterior plates from the six posterior. By means of these hinges the turtle, having drawn its extremities beneath the shell, is enabled to further protect them by closing the "lids" of the plastron. In size it considerably exceeds the following species.

11. *Cistuda Carolina* EDWARDS. (*Testudo carolina* LINN., *Cistudo virginea* AGASSIZ.) The common Box Tortoise is abundantly found in pastures and uplands, while seeking its food of "toad-stools" and "mushrooms." In coloration this species shows great variety, though there are constant structural characters. The first four vertebral plates are keeled; the general margin of the plastron is entire with no deep notches, and has the hinges placed as in *Blandingii*, though better developed, enabling the animal to completely enclose itself in its shell. The upper mandible is not provided with the notch which characterizes the previous species. The shell measures between six and seven inches in length, and four inches in breadth.

The Box Turtle, unlike our other chelonians, has an especial dislike for the water, and soon dies if placed in it. As regards its breeding habits, I can learn nothing.

The longevity of turtles is remarkable; they seem to live until put to some violent death. Nearly all collected show signs of great age, and often those are captured which carry dates almost incredibly old. A venerable Box Turtle, in the town of Middleboro, Mass., was recently seen which bore dates of the latter part of the last century, as well as successive dates of this. There have since been five generations in the family of the one who first carved his name on the plastron of this respected resident.

Strange Behavior of a Blue Jay.

Mr. J. W. BYSKIT, of Michigan City, Ind., writes: "Passing along the street a few days ago, my attention was drawn to a flock of English sparrows. They were making a great outcry, and upon closer observation I saw a blue jay had pounced on the flock and had secured one of them in his feet. He flew into a high tree near by, still holding on to the sparrow. Was it a case of pugilism on the part of the jay, or did he want the sparrow for food?"

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XII.

FAMILY 22. Calyptræidæ, Gray, containing twelve genera and more than one hundred species, is represented in Rhode Island by five species, as below. The Calyptræidæ, or Slipper limpets, are found adhering to rocks, or under stones, on both living and dead shells of other species, and to each other, from low water to forty fathoms. They are numerous and widely diffused, but reach their perfection in the tropics, where they attain considerable size and are remarkable for their peculiar forms and the richness of their colors. Like the oyster, when first born they are free to move about and select a place to settle, from which spot they never move again. They adapt the form of their growing shells to the inequalities of the surface on which they may be fastened.

GENUS CRUCIBULUM, SCHUM., 1817.

Shell sub-conical; aperture wide, with a cup-shaped appendage within, attached on one side to the inner wall of the shell.

SUB-GENUS DISPOTÆA, SAY. (CALYPEOPSIS, LESSON.)

24. CRUCIBULUM (DISPOTÆA) STRIATA, SAY.

Syns.:

Calyptræa striata, Say, *J. Ac. Nat. Sc.*, Phila., v., 216, 1836.

Crucibulum striata, H. & A. Adams, *Genera*, I., 366, 1858.

Shell oval, convex, covered with numerous equidistant, radiating lines; apex sub-acute, wax-yellow in color, turned a little to the left side and to the posterior end. It has a cup-like process within, attached by one side to the shorter side of the shell. Length four-fifths of an inch. Distribution, from New Jersey to the Bay of Fundy. (Verrill and Smith.) Northern N. J. (Say.) Gardiner's Bay and Montauk Point. (S. Smith.) Vineyard Sound and Buzzard's Bay, 3 to 12 fathoms. (A. E. Verrill.) Mount Desert, Me., 3 to 10 fathoms, common, and Bay of Fundy, low water to 30 fathoms, common. (A. E. V.) Whole

coast of New England. (Stimpson.) I have never found it in R. I.

GENUS CREPIDULA, LAM., 1799.

Shell oval, arched, boat shaped, with a spiral apex pressed against the margin; interior with a horizontal partition covering its posterior half.

25. CREPIDULA CONVEXA, SAY.

Syns.:

Crepidula glauca, var. Say, *J. Ac. Nat. Sc.*, Phila., II., 226, 1822.

Crepidula acuta, H. C. Lea, *Am. J. Sc.*, XLII., 108, 1842.

Crepidula convexa, Say, *J. Ac. Nat. Sc.*, Phila., II., 227, 1822.

Shell very convex, the var glauca not so much so, color from greyish-green to dark brown; apex acute, separated from the body of the shell; within, shining, dark brown; aperture oval with a diaphragm across, occupying less than half the interior, leaving a deep cavity extending to the beak; diaphragm brown, the free edge white. Length half an inch, breadth a little less. Distribution, Massachusetts Bay to Florida, common; less abundant and local to Gulf of St. Lawrence. Very abundant in Rhode Island on stones and on small univalve shells, such as *Ilyanassa obsoleta*, etc. The var glauca is found on broad and flat surfaces of stones, and larger bivalve shells. *Mya. Pecten & Ostræa*.

Gould says (*Invert. Mass.*, 273, 1870.) it is found on sea-weed, but I have never found it so, excepting a few very small, young specimens.

26. CREPIDULA FORNICATA, LINN.

Syns.:

Patella fornicata, Linn., Mart., Lister, Knorr.

Crepidula fornicata, Lam., Say, DeKay, Stimp., Gould.

Shell oval, but with one side more oblique than the other; apex prominent, turned a little to one side, not separate from the margin, externally dingy white, figured with chestnut-colored lines, and the whole surface covered with a yellowish epidermis; aperture sub-oval, the edge simple and entire, color light brown; diaphragm white, occupying one-half the aperture, one side appressed to one side of the shell, the other defined by a distinct line, the free

edge waved. Length about one inch and a half, breadth one and a quarter or less.

This shell is very common in Rhode Island, and is known by the popular name of Cuddy-boat. Its distribution is from Cape Cod south to Florida, and the northern shores of the Gulf of Mexico. North of Cape Cod it is local and not abundant to the Gulf of St. Lawrence. It is found in the miocene of Maryland and the Carolinas, also semi-fossilized at Nantucket and other places along the coast. The shells are found adhering to stones, to the surfaces of oysters and scallops, and to each other. When found on scallops they are ribbed correspondingly to the ribs of the scallop. Sometimes five or ten are found of various sizes riding upon each other, the largest at the bottom and graded according to size.

GENUS IANACUS, MÖRCH.

Shell depressed, apex posterior, but slightly lateral, lamina mostly concave in front.

27. IANACUS, PLANA, SAY.

Syns.:

Crepidula plana, Say, Gould, DeKay, etc.

Crepidula unguiformis, Stimpson, Perkins (non Lam.).

Ianacus plana, Dall.

Shell ovate, flat, as often concave as convex, white, thin, sub-transparent; apex minute, pointed, terminal; interior white, polished, iridescent; diaphragm convex, less than one-half the length of the shell. Length one inch to one and a half, breadth nine-tenths. Its common habitat is in the interior of the dead shells of other species. In dredging we almost always bring up dead shells of *Sycotypus*, *Fulgur*, and *Naticas*, inhabited by the hermit crab, and the interior of the shell lined with numbers of living *Ianacus plana*. Gould says, (*Invert. Mass.*, p. 272,) "it is found in the apertures of other shells," but it is also found on the outside of oysters and other species, and occasionally on stones. It inhabits the whole Atlantic coast of the United States, but it is not common north of Cape Cod. Its shape is very variable, as it conforms itself to the inequalities of whatever surface it may be attached.

Lamarek, in his remarkable work, *Les*

Animaux sans Vertebres, Vol. VII., p. 643, described a shell from the Mediterranean Sea as *Crepidula unguiformis*, a shell greatly resembling, but distinct from ours, and Stimpson and many other American authors have supposed it to be the same, and have given our shell the name of *unguiformis*, because Lamarek's name has the precedence by right of priority, but as it is not the same species, Say's name should be accepted as correct.

The three species described above, viz. : *plana*, *forficata*, and *convexa*, together with the variety *glauca*, which was described as a distinct species, were discovered and named by Thomas Say, and their descriptions published in the *Journal Acad. Nat. Sci.*, Phila., II., 225 to 227, July, 1822.

One other species only of this family has been found near our coasts; it is the *Capulus Ungaricus*, Linn. A. E. Verrill says, *Cat. Mar. Moll.*, 519, 1882, "Two living specimens were obtained in 1881, which appear to belong to this species. They are more delicate and have somewhat finer and more regular radiating ribs than the ordinary European form." Off Martha's Vineyard in 69 and 458 fathoms. Its habitat is Europe, from Iceland to the Mediterranean.

(To be continued.)

Ferns.

In one of the journals of the American Philosophical Society, Mr. Davenport credits New York State with being the habitat of 52 species, California 48, Arizona 47, Florida 47, Michigan 47, Vermont 45, Pennsylvania 44, Kentucky 42, Massachusetts 42. Twenty-four species are confined to Florida, and *Schirzata* to New Jersey. *Pteris aquilina* is found in thirty-nine of the states and territories. We desire to add, for Rhode Island, nearly forty species, including varieties. The rarest are *Camptosorus rhizophyllus*, *Woodwardia angustifolia*, and *Pellaea gracilis*. *Woodsia ilvensis* is also scarce, and *Struthiopteris* has never been found in fruit within our limits.

A little boy in Georgia, who wrote to Santa Claus for a pony, was wise enough to add: "Poserit: If he is a mule, Ples ty his behine legs."

CONCHOLOGICAL CHECK-LIST. XIII.

J. RITCHIE, JR.

Family. Cyclostomacea Pfr.

Sub-family. Realiea.

Realia abbreviata Pease.*acutilirata* Pfr.*affinis* Pease.*angulata* Mouss.*aurantiaca* Deshayes.*bachmanni* Grdlr.*bankaensis* Mouss.*bifilaris* Mouss.*bilirata* Mouss.*boraborensis* Dohrn.*borneensis* Mouss.*bulimoides* Hombron.*caledonica* Cross.*cattaroensis* Pfr.*ceramensis* Pfr.*cerea* Pfr.*cheneyi* Dohrn et Semp.*circumlineata* Mouss.*clavulus* Morel.*conica* Troschel.*conoidea* Mouss.*costata* Pease.*costulata* Mouss.*coturnix* Cross.*determinata* Benson.*dubia* Pfr.*egea* Gray.*elongata* Mouss.*erosa* Quoy.*expansilabris* Pfr.*exquisita* Pfr.*glabrata* Pfr.*globosa* Benson.*granum* Pfr.*gutta* Shutt.*hieroglyphica* Fer.*huaheinensis* Pfr.*longula* Mouss.*major* Morel.*malleata* Pfr.*maritima* Montrz.*moussoni* Pease.*multilirata* Pfr.*navigatorum* Pfr.*nitida* Pease.*Realia obscura* Mouss.*ochrolenca* Pease.*ochrostoma* Pease.*ovata* Pease.*pallida* Pease.*parva* Mouss.*parvula* Mouss.*perforata* Mouss.*picturata* H. Adams.*plicosa* Pfr.*producta* Pease.*pupoides* Anthony.*pyramis* Pfr.*radiata* Pfr.*rangii* Pot. et Mich.*robusta* Pease.*rosea* Gould.*rubella* Pfr.*rubens* Quoy.*rubra* Gass.*scalariformis* Pease.*scitula* Gould.*sirki* Parreyss.*solidula* Pfr.*subsoluta* Mouss.*subulata* Mouss.*tahitensis* Pease.*terebralis* Gould.*turriculata* Pfr.*turbinata* Morel.*vallata* Gould.*variabilis* Pease.*variegata* Morel.*ventricosa* Jacquinot.*viridescens* Pease.*zebriolata* Mouss.*Optedi eros marginatum* Leith.*rotundum* Fairb.*subconicum* Leith.*Cyclomorpha biangulata* Pease.*flava* Brod.*Cecina manchurica* A. Adams.

Belongs here rather than in Check-list I.

Sub-family. Bourcierea Pfr.

Bourciera fraseri Pfr.*helicinaeformis* Pfr.

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Nerita peleronta Lin, W. I.....	.05 to .10
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Purpura (Trochia) succineta Mart, New Zealand.....	.15 to .25
Ancillaria Australis Sowb, New Zealand.....	.15 to .25
Parmophorus Australis Lam, New Zealand.....	.15 to .25
Turbo Cookii Chem, New Zealand.....	.40 to 1.25
Auricula Midae Lam, New Guinea.....	.40 to .75
Struthiolaria nodulosa Lam, New Zealand.....	.50 to 1.25

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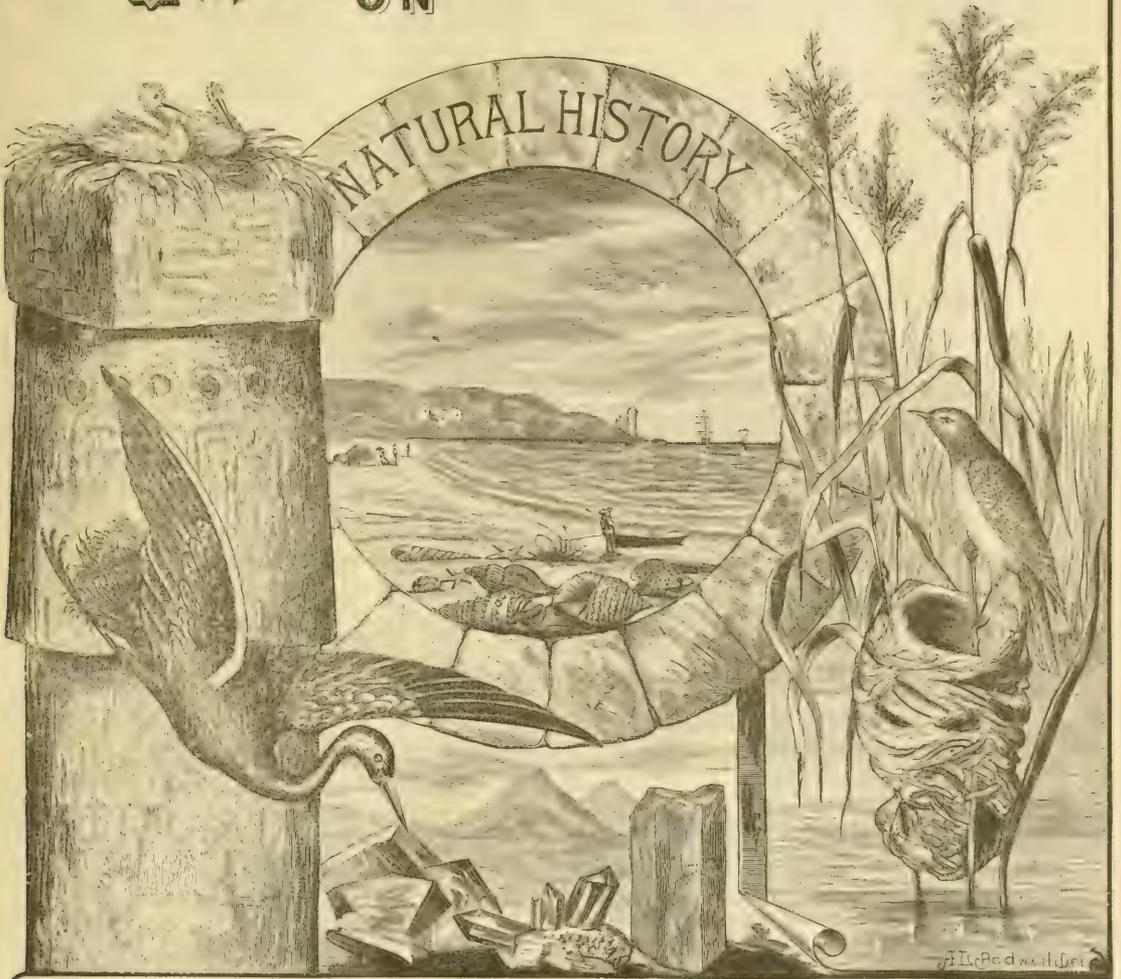
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Random Notes on Natural History.

Vol. II.

PROVIDENCE, FEBRUARY 1, 1885.

No. 2.

Entered at the Providence Post-Office as Second-Class Matter.

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WE desire Nos. 1 and 2, of Vol. I. To any person sending either of the above in good condition we will send RANDOM NOTES for six months, or if already a subscriber will add six months to his subscription.

The Night Heron.

I PROPOSE writing a few words about this real curiosity — one of nature's oddities.

He belongs to the family of wading birds, and seems to enjoy nothing better than to fill his crop with frogs, beside a reedy pond on a moonlight night, and his powers of digestion are something astonishing.

While out collecting eggs, my brother, guided by the noise which could be heard at some distance, came upon a heronry. After floundering through mud, and vaulting slippery logs, and crawling on hands and knees for half a mile she came where hundreds of these birds had built their nests in the trees — a cedar swamp — and the nests, built of sticks and placed in the forks, could be seen in every tree. Many contained young, and they were such long-legged and ill-shaped creatures that he concluded to take a couple home. They bit and scratched, and made more noise than an army of ordinary fowls. One was partly fledged, the other poorly covered with thin down. On arriving home he found his treasures troublesome; they required constant feeding. So he gave the larger one to me and the other to my brother Willie.

I called my bird Tommy. He was not in the least bashful about letting you know he was hungry, and sent forth his persuasive calls in a peculiar cackle, which he kept up incessantly, and it was indeed a

strong-minded person who could long listen to it without wishing he would stop.

I started off, and in about an hour came back with a dozen frogs and three good-sized fish; — enough rations, I thought, for a week. I was surprised to find Tommy sitting up on his straw with a very contented look on his countenance, and quiet as a mouse. Some one must have fed him. But where was Willie's bird? He was nowhere about the room. But what could that be, sticking out of Tommy's mouth? I looked closer. Good heavens! it was the toes of Willie's bird. His hunger had got the better of him, and he had bolted the companion of his youth and the sharer of his joys and sorrows. I stood in blank amazement, and when the ludicrous side of the scene presented itself, I burst into laughter. Willie came to see what I meant by such unusual mirth, and I shall not soon forget the look on his face when he saw the toes hanging out of Tommy's mouth. He did not see anything to laugh at. "It wasn't his place to laugh."

"Never mind," I said, "this is a decided improvement. We now have them both in one bird. We will go into partnership; for if Tommy goes on at this rate, it will take all the time of one active man to get him food." - Willie thought he could transfer his affections to Tommy, so we made him a nest in an old chicken-coop, where he could go and come as he pleased. We used to bring him fish, frogs, snakes, and all sorts of living things to eat, and it would have done a dyspeptic good to see him dispose of them. He used to swallow most of the animals alive, and if you wished to laugh until your sides ached, it was only necessary to give him a good-sized snake, and watch proceedings. He always came off victor, but I think it must have been a tuckering operation, for he looked, when he had forced the snake down the last time, and the internal wriggling had ceased, as if he was quite exhausted. Frogs, half the size of your fist, went down his capacious maw one after the other, like water down a

spout, and it was not until the legs of the last one were left dangling out of his mouth, that he began to think of stopping. I once gave him a large hornpout. I had heard before of getting outside of your dinner, but never expected to see it so well illustrated. Of all the gulplings, twistings, and wriggings I ever saw, that capped the lot. He could not swallow it all, and after he had worked industriously for a quarter of an hour, he laid down on the grass at full length, fish and all, to let nature digest enough so that he could swallow the rest. We had a stuffed duck, and put it in the coop to keep him company. He was very fond of it, and one day broke off the head and put it down to keep company with the other things that had gone that way. A wonderful change came over him for a day or so. He ate nothing. Poor Tommy! his last days were near. I wonder if he had any regrets for his life of gluttony and dissipation. I expected to find him dead on my next visit, but instead found in the coop the duck's head, disgorged on account of the arsenic on it, which was too much for his complexion, and Tommy was chasing the chickens around the barn, for he was fearfully hungry, having lived on nothing but stuffed duck for two days. As he grew older he killed his food before swallowing it. I think he found that to have it jumping around after it was down was gradually deranging his internal mechanism, and scattering seed of indigestion, liable to cause him regret in after life. When he was old enough to fly, he decided that rather than try to live on scanty rations, such as three frogs, two fish, and a snake or two daily, he would start on his own hook, and by dint of hard labor "keep the wolf from the door."

He would sleep part of the day and then start for the brook. One day, while upon one of these excursions, he met my friend Jones fishing in the brook. No sooner did Jones pull out a fish, than Tommy made a swoop from the top of a tree, and before Jones had time to be surprised, had gobbled down fish, hook, and sinker, and stood waiting to "do so some more." Jones gathered in his slack line, and then commenced to pull Tommy in, who began screaming, fearing he would lose his dinner. Jones was astonished and somewhat frightened. He

pulled in as much line as seemed advisable under the circumstances, cut it off, shouldered his pole, picked up his string of fish, and started for home. No sooner did Tommy see the fish than he made a rush for them, seized one, and pulled it off the string. This completely unnerved Jones, and he dropped the rest and had the satisfaction of seeing them all slide down that capacious gullet. There was a maiden lady living near us, and one morning when she went out to feed the chickens, Tommy was sitting in a tree near by making a great racket, for he was hungry. She kindly got him a piece of meat, and down he came in great haste, and got hold of the meat, along with two of the lady's fingers. She screamed, and made tracks for the house, Tommy meanwhile shutting down on her fingers like a steel trap. A boarder at the house came to the rescue, and between them they managed to get him off, when Tommy went home, doubtless feeling as if he had been swindled.

No matter how much he ate he never grew fat. Somebody said it made him poor to carry around all he consumed. He was not naturally quarrelsome — he was too busy devising means of subsistence — but self-defence came natural to him, and he did not know what fear meant. We had a fine large rooster, well spurred, and as proud as a king; the hero of many a battle. Tommy's singing was too classical for him. (It was for most of us.) So he marched up in an important manner, and pitched in without more ado. Tommy evidently thought the long-looked-for dinner had arrived. He seized the rooster by the head, and began thrashing him around in a truly fearful manner. He thought 'twas another big snake, that needed all his attention. When Tommy let go it was painful to see our crestfallen fowl. He slunk into the barn, as fast as his dizzy brain would allow him, and under the straw moped away the rest of the day, recuperating and repenting of his rash act. Pets of this kind usually come to a sad end, and Tommy was no exception. One night, about eleven o'clock, while trying to awaken sympathy by his cackle, he received a dose of cold lead. His stomach rebelled at this, and, with a shriek, he fell dead. We planted him in the garden, with a shingle to mark his resting-place.

S. F. DENTON.

R. I. Entomological Society.

THE subject of the lecture by Professor Packard before the Society on Wednesday evening, Jan. 14, was "Spiders." There are about eight hundred species known and described in the New England States, of which the type is our common garden spider. We see its web in the corners of rooms, on shade trees and shrubbery. The male is seldom seen. The eyes are eight in number, situated on the top and front of the head. The jaws are very powerful and contain the poison which is situated in a sac at the base, and is forced through a duct by pressure when anything is bitten, and forced out into the wound through minute openings at the end of the nippers. The bite is deadly to all insects, but there is a question whether it is harmful to the human family. Professor Heintz, who was considered authority on the subject, having studied them for years, claims that the bite is harmless, having caused them to bite him in different parts of the body at various times with no evil results.

But there is a species of large ones (*Lathodectes*) in Alabama, which has been reported as having caused the death of a number of persons. In Italy it is a common belief among the ignorant that the bite of the tarantula produces an uncontrollable desire in persons bitten to dance until they drop from sheer exhaustion.

One species of the tarantula, genus *Lycosa*, is quite common with us, is large and black, but spins no web. It lives in holes in the ground and has the art of gathering small leaves and forming a sort of ball, fastening them together with silk, and placing it over the nest as a protection.

The spinning glands are six in number. The thread is of fluid form until it reaches the air, when it hardens into silk, and is formed by each spinnaret uniting its contents with the aid of the feet, thus forming a single thread. In October, the young of our common spinning spiders can be seen floating over fields and gardens, often at a great height. They stand on their fore legs, elevating the hind body in the air, and draw out the silk with the hind legs, letting it float in the air until there is enough to float them with the aid of a light breeze.

The trap-door spider, or mygale, is found

in the southwest United States. It is very powerful. The trap is made in the ground, with the door flush with the surface, made to open and close by means of a hinge.

Tourmaline.

RHOMBOHEDRAL: Hardness, 7 to 7.5; Gravity, 2.9 to 3.3. Is composed of silica, alumina, and boron, with some magnesia, and perhaps a fraction of iron or lithia, and is one of the most interesting minerals in the world, on account of the facets of termination often varying at opposite ends of a crystal, and the fact that specimens dislocated and curved are not infrequent; also for the property of dichroism, which is well described in "The Tourmaline," by Dr. A. C. Hamlin, who says: "Some of the prisms, when viewed parallel to their axes, appear of a splendid crimson hue; but when the prism is slightly turned, the red color vanishes as if by magic, and the stone becomes white, or smoky, or green. Other crystals are green when viewed transversely and yellow-brown axially, or dark violet transversely and green blue axially." All specimens do not, however, possess this property.

The high-colored and transparent crystals often present in their length much diversity of color, such as deep red at one end and light pink or white at the other; or perhaps red and green, with beautiful gradations where the colors shade into each other; while others viewed at the ends, prove to be pink or red at the centre, and green outside, as if the red had been first made and then the green rolled around it. Those found at the Chesterfield, Mass. locality, are often of this sort, while those from Paris, Me., are world-renowned, and exhibit all of these wonderful peculiarities.

We must not forget to note also the electrical properties, which, when a crystal is heated, are negative at one end, and positive at the other, generally positive at the end with the greatest number of facets, and this state, says Dr. Hamlin, "may be reversed by intense cold." If one of the prisms be broken while in an electric state, excited by heat, the fragments present opposite poles, like artificial magnets. It is shown that, if heated somewhat above 212° Fahrenheit, it

loses its electricity; but, if the increasing heat is continued to a certain degree, it again becomes excited; but the electrical poles are reversed.

Schorl, is a synonymous term, applied particularly to the black variety, also called aphrisite. Rubellite, sibirite, and daorite are applied to the red varieties, achroite to white, and indicolite to the blue, sometimes almost black varieties, like those found at Chester, Mass.

Near Warwick, Mass., is a deposit of schist, containing acicular black crystals, about half an inch to an inch long, arranged here and there in groups; radiating from a centre in beautiful figures. Lately, fine colored specimens have been found at Hebron, Auburn, and Norway, in Maine. * Work has been carried on at Mount Mica, Paris, Me., and the yield for 1882 was something over 2,000, while colorless and brown specimens which cut into fair gems have been found at De Kalb, N. Y. The groups (black) from Pierpont, and the fine brown brilliants from Gouverneur, with peculiar terminations, are opaque, and have no value as gems.

The principal foreign localities for transparent specimens, are: From Siberia, a great variety of colors; Brazil, purple, green, and blue; Ceylon, green, yellow, brown, and black; the Isle of Elba white, and light or delicate tints, frequently pink. A fine group of pink crystals, on a matrix of amethyst, now in the British Museum, came from Burmah, and is valued at £1,000 sterling.

Tourmalines are found in granite, syenite, feldspar, granular dolomite, and imbedded in sheets of mica. The black variety, which is the most common, sometimes occurs quite massive, and looks much like hornblende, from which it may be distinguished as having no exact cleavage, nor fibrous appearance, and if the end of a crystal can be seen, its triangular shape is significant of the tourmaline.

Specimens of the black sort, but of rather poor quality, have been found in Rhode Island, at Johnston, and Woonsocket. S.

What is meant by the bone of contention? The jaw-bone.

* *American Gems and Precious Stones*, by Geo. F. Kunz.

Rodentia of Rhode Island.

TAMIAS STRIATUS. CHIPMUNK: STRIPED OR GROUND SQUIRREL.

THIS little fellow is common throughout the state. Not much hunted for, being such small game; always pursued by boys and dogs, and yet by no means shy, but rather inquisitive. If you stop a few moments in his vicinity, he is sure to come peeping at you from under a stump, or from a pile of rubbish. With an interrogating chirp, that sounds very like a bird, running from you as you walk, making long bounds, he disappears in the stone wall, and immediately pops out his head again, to view the situation and satisfy his curiosity. When a very small boy, in Massachusetts, I once chased a chipmunk along a fence-top. Putting all my energy into the work, I gained on and seized him, but only by the tail. He did not stop, and the skin giving way, suddenly left me, astonished, with the mite of skin and hairs in my hand, while the owner disappeared with his rat-like appendage. I am sorry to this day.

The home and nest is a hole about two inches in diameter, usually running beneath some firmly-rooted tree or a stone wall, and there he lays up a large store of food, mostly of corn, chestnuts, and shagbarks, with sweet acorns and beech-nuts when they are to be had. In gathering this store the autumn days are spent most industriously. Early and late he is running with his cheek pouches distended most amazingly — often four nuts at a time in that small mouth. The entrance to the home is always perfectly clean, and no sign of loose dirt, which he must carry away to some distance. Any sort of grain does not come amiss for food, nor are the seeds of grass and small plants despised, and in the summer, berries, larvæ, and grasshoppers. In the spring, at corn planting, he will most industriously go from hill to hill, and clean out the first two or three rows next to the stone wall, much to the annoyance of the farmer. He retires to his hole with the first cold weather of November, and, except for an occasional escapade, does not appear again until March.

One that I kept in captivity, though handled with care and well fed, remained very wild, and was continually escaping and

getting into all manner of forbidden places, much to the disgust of madame. I was obliged to let him go.

There are probably four young to a litter.

His length from nose to tail is 6 to 6½ in.; tail 4 to 4½ in.; chin and all under parts white; nose light tan with a narrow, medium, dark-brown line, two lines each of tan and dark-brown from the nose, through the eye, to the ear; sides tan color, hairs gray at roots, crown rufous mixed with black; posterior parts rufous brown; dorsal stripe black edged with rufous, with parallel stripes on either side, first gray and brown mix, then rufous brown, black, yellow-white, and black again; tail very narrow and mixed in color, the hairs being colored in bands of dark and light brown, two each. S.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER V.

II. ORDER—SAURIA. The actual occurrence of a single representative of this order within the limits of Rhode Island has yet to be recorded, though there can be little doubt of the ultimate capture of at least one or two species of forms so extremely abundant further south.

Though the Lizards (*Saurians*), as has been already said, pass so gradually into the *Ophidians* that definite lines of demarcation can with difficulty be drawn, the following points will assist to separate the closely-related orders:

The lizards have the bones of the head well joined together; the lower jaw is also united in front, preventing that lateral extension so universal among the ophidians. As a rule lizards are provided with eyelids, and the ear opens direct, *i. e.*, is not covered by the skin of the head. The most important characteristic, however, is the possession of limbs, though in some forms they are extremely rudimentary.

As regards the two lizards possibly inhabiting the state:

(1.) *Eumeces fasciatus* LINN. (*Plestiodon fasciatus* D. & B., J. A. ALLEN'S REPORT), or the Blue-Tailed Lizard, is about seven inches long. The head and body of a deep bluish black above, and

white below. Running from the anterior part of the head are six yellow stripes, the two dorsal of which unite at the occiput, the one thus formed passing along the middle of the back to the tail, where it changes to a beautiful blue color. The other four stripes change in the same manner, after having gone the length of the body parallel with the dorsal one.

This harmless little animal, though extremely rare in New England, is very generally distributed east of the Mississippi, and as far south as the Gulf of Mexico. In early morning, while tearing the bark from partially decayed trees, in Louisiana, I have surprised them numb and inactive, though later on in the day it was with difficulty that a single specimen could be captured, so lively would they become.

(2.) *Sceloporus undulatus* HARLAN. (*Tropidolepis undulatus* HOLB.) The common names applied to this form, so abundant throughout the central and southern portions of the country, are amusing. The "Brown Swift," indicative of the color and the rapidity with which it scurries away on being disturbed; the "Pine Lizard," because of its preference for pine woods, often climbing to the tops of the highest trees; "Alligator Lizard," from a fancied resemblance to that giant saurian; but why the harmless little animal should be called a "Brown Scorpion," is beyond conjecture. This lizard differs from the previous in having the body much depressed, the scales of the upper side strongly keeled, and in general marking; the "Pine Lizard" having the back marked transversely by dark brown and black waving lines, and the abdomen with longitudinal stripes and blotches.

The two representatives of the order Sauria thus treated are probably the only forms that will be found to inhabit the state. The first has been captured a few times in Massachusetts, and the second in Connecticut. There is no good reason, however, for their not having been already recorded; in fact, the warm lowlands around Kingston and Point Judith must offer extremely favorable conditions for these apparently rare forms. If our museums and collectors would turn their energy towards working up the natural history of their own localities, rather than with making fragmentary displays of exotic fauna, their results would be of much more practical value.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XIII.

FAMILY 23. Onustidæ. A peculiar family of mollusks called "carriers," from their habit of cementing fragments of shells and stones to their outside surfaces, inhabiting the tropics.

FAMILY 24. Solariidæ, also tropical.

FAMILY 25. Scalaridæ Gray, contains but one genus, *Scalaria*, with about 150 species, mostly tropical, although a few inhabit the colder waters, even to Greenland.

GENUS SCALARIA, LAM.

These shells are called by the English, wentle-traps, and by the Dutch, winding-stairs, from the step-like ring ascending spirally up to the apex. The species all resemble one another very closely, and are nearly all pure white in color, and lustrous. The Spaniards at St. Blas wear them for ear-rings. They are quite rare, inhabiting deep water. The type of the species and the most beautiful of them all is the *Scalaria pretiosa*, Linn., which used to be sold for \$200 per specimen, but can be bought now for \$1 and upwards, according to size and perfection. The animal is carnivorous, and when disturbed emits a purple liquid. Three species are found in New England, namely:

28. SCALARIA LINEATA, SAY.

Shell conical, pointed, white; whorls, eight, rounded, traversed by sixteen to eighteen ribs, not crossing the suture; a raised line originating from the junction of the lips revolves on the lower whorl, and defines the upper edge of a reddish-brown revolving band; aperture round, with a strong, white lip; no umbilicus. Length one-half inch, breadth one-fifth. Found by Mr. C. F. Shiverick, at New Bedford. Buzzard's Bay, southwards (Stimpson). Vineyard Sound and Long Island Sound (Verrill). Rare at New Haven (Perkins). New Jersey to South Carolina and Georgia. Described by Thomas Say, *Jour. Ac. Sc.*, Phila., II., 242, 1822.

29. SCALARIA MULTISTRIATA, SAY.

Shell white, solid; spire acute; whorls

eight, very convex; suture moderate; ribs from fourteen to twenty, equidistant, moderately elevated and rounded on the edges; the spaces between the ribs marked with microscopic revolving lines; aperture ovate, one-fourth the length of the shell, margined by a rib; umbilicus, none. Length one-half inch, breadth $\frac{1}{10}$. Dist., Massachusetts to Florida. Dartmouth Harbor and Buzzard's Bay (Shiverick). New Haven (Verrill and Dr. E. T. Nelson). Living and semi-fossil in South Carolina. Described by Say, *Jour. Ac. Sc.*, Phila., v., 208, 1822.

30. SCALARIA GROENLANDICA, CHEMN.

Syns.:

Scalaria planicosta, Kiener.

" *subulata*, Conth., DeKay.

" *Groenlandica*, Sby., Gould, Stimp.

Turbo clathrus Groenlandicus, Chemnitz, *Conch.*, XI., 1878, 1779.

The distribution of the two species above described is southern, and few specimens are found here at its extreme northern limit, but this species is northern, extending to the Arctic Ocean, and is rare here at its southern extreme. It also extends eastward from Greenland, Iceland, etc., to the shores of Europe, southward to Bergen. Nahant Beach, and taken from fishes caught in Massachusetts Bay, and at the Grand Banks, abundantly (Gould). Eastport (Cooper). Off Egg Rock, seventeen fathoms (Haskell). Nova Scotia (Willis). South Shoals, off Nantucket (Agassiz). Fossil, Beaufort (Dawson), and in Great Britain. It has been dredged in Block Island Sound, seventeen to twenty-four fathoms.

Shell turreted, tapering to a pointed apex, of a dead, bluish-white color; whorls ten, with eight to fifteen stony, flattened, oblique white ribs, the intervening spaces crossed by coarse revolving lines; aperture nearly round; umbilicus, none. Length one inch, breadth one-third.

FAMILY 26. Ianthinidæ, Gray. This family contains two genera, *Ianthina* and *Recluzia*, and one fossil genus, *Scalites*, Conrad.

GENUS IANTHINA, LAM.

This genus, spelled by some authors *Janthina*, contains ten species, inhabiting the Atlantic and Pacific oceans. The only

species ever liable to be found in Rhode Island is the *Ianthina fragilis*, as stated in RANDOM NOTES, No. III., p. 7.

31. *IANTHINA FRAGILIS*, DESH.

Syns.:

Helix ianthina, Linn., and all the older authors.

Ianthina communis, Lam., Lister, and others.

Ianthina fragilis, Desh., Bl. Sby., DeKay, Stimpson, etc.

Shell very thin, translucent, helix shaped; whorls three or four, forming a short spire, body whorl large, angular at the centre; below this angle the shell has a beautiful deep violet color, above it it is pale, almost white, except at the suture, where it is tinged with violet; aperture large with no operculum; outer lips very thin, waved; inner lip straight, forming an axis through to the apex. Length four-fifths, breadth one inch. These shells are called the violet snail and oceanic snails; they inhabit the open ocean, are gregarious in their habits, and float upon the surface, sleeping by day and feeding at night upon the small blue jelly-fish in immense numbers, from which they probably derive the coloring matter of the shell. They float mostly in the Gulf Stream, with the under part of the shell up, and attached to the foot is an appendage three or four inches in length, consisting of a jelly-like substance filled with air bubbles, on the under side of which are attached their eggs. As this appendage is too large to be withdrawn into the shell, an operculum would be of no use, and as they have no power to rise or sink in the water, they are at the mercy of the winds and waves. For this reason after a westerly storm they are found on the shores of the British Islands, and after an easterly gale, on the New England coast. In 1839, after a severe gale, great numbers were collected on the Island of Nantucket, and for this reason only I have included them among the mollusca of Rhode Island.

FAMILY 27. *Trichotropidæ*, is represented in New England by one species, *trichotropis borealis*, which, however, is found only north of Cape Cod.

FAMILY 28. *Turritellidæ*. Four species of this family inhabit New England, north of Cape Cod.

FAMILY 29. *Vermetidæ*, Carpenter, represented by one species out of twenty-seven of the genus *Vermetus*, Adamson, 1757.

32. *VERMETUS RADICULA*, STIMP.

Syns.:

Vermetus lumbricalis, Gould, non Lam.

" *radicula*, Stimpson, *Shells of New England*, 37, 1851.

The shell consists of a long, rough, ash-colored tube, marked its entire length with unequal raised lines. The spire consists of eight or ten closely-connected whorls, upon each of which are two sharp, elevated ridges. The shell grows spire downward, unlike any other species we have, and increases in length upward, spiral at apex, and loosely twisted afterward, lengthening out sometimes as much as ten inches. Diameter of tube, one-quarter inch. Seldom is an individual found separate, but in numbers, intertwined together. Aperture round, with a sharp edge, and closed by a horny operculum. Described by Gould, *Invert. Mass.*, 1st edit., as *V. lumbricalis*, and supposed to be identical with the shell from West Africa described by Gmelin under that name. Stimpson, in 1851, proved it to be a distinct species, and gave it its present name. Found by Mr. S. I. Smith at Gardiner's Bay, at the eastern end of Long Island, and by Professor Adams in New Bedford Harbor, in several groups. One group contained about fifty specimens, living and inseparably intertwined.

(To be continued.)

Winter Notes.

MR. H. A. Brush, Milton, Vt., writes us as follows: "A Great Blue Heron was procured by me Dec. 22, on the bank of the Lamoille River. His feet were frozen, and he had lived on fish from a little brook which empties into the river. At the date of his capture the ice was from six to eight inches thick. This is the only specimen that was ever seen in this town as late as this. Last winter I procured two Great Gray Owls."

A Prairie Warbler, just killed, was brought to us Dec. 4th, and a Baltimore Oriole was reported amongst a flock of English Sparrows at Uxbridge, by Mr. A. R. Taft.

CONCHOLOGICAL CHECK-LIST. XIV.

J. RITCHIE, JR.

Sub-order. Ectopthalma Pfr.

Family. Helicinacea Pfr.

Sub-family. Stoastomea Pfr.

Stoastoma agassizianum C. B. Adams.
 alderianum Chitty.
 anthonianum C. B. Adams.
 blandianum C. B. Adams.
 chittyanum C. B. Adams.
 cumingianum C. B. Adams.
 fadyenianum C. B. Adams.
 gaskoinianum Chitty.
 gouldianum C. B. Adams.
 grayanum Chitty.
 greyvillianum Chitty.
 hollandianum C. B. Adams.
 jadzenianum C. B. Adams.
 jayanum C. B. Adams.
 layardianum Chitty.
 leanum C. B. Adams.
 lindsleyanum C. B. Adams.
 livesayanum Chitty.
 moricandianum C. B. Adams.
 moussonianum Chitty.
 petitianum C. B. Adams.
 pfeifferianum C. B. Adams.
 philippianum C. B. Adams.
 pikerianum Chitty.
 pisum C. B. Adams.
 redfieldianum C. B. Adams.
 reeveanum Chitty.
 succineum Sowerby.
 tappanianum C. B. Adams.
 wilkinsoniae C. B. Adams.

Sub-family. Helicinea Pfr.

Trochatella callosa Poey.
 chrysostoma Shutt.
 conica Pfr.
 constellata Morel.
 crassicostata Sow.
 elegantula Pfr.
 excavata Pfr.
 josephinæ C. B. Adams.
 luteo-apicata Poey.
 methfesseli Pfr.
 mouhoti Pfr.
 opima Shutt.
 petitiana Orb.
 petrosa Gundlach.
 politula Poey.

Trochatella pulchella Gray.
 regina Morel.
 rubicunda Gundlach.
 rupestris Pfr.
 semilirata Pfr.
 sloanei Orb.
 stellata Velasq.
 subunguiculata Poey.
 tankervillei Gray.
 virginea Lea.

Lucidella aureola Fer.
 leana Fer.
 lineata Fer.
 reana Pfr.
 undulata Pfr.

Helicina acuta Pfr.
 acuminata Velasq.
 acutissima Sow.
 adamsiana Pfr.
 adpersa Pfr.
 agglutinans Sow.
 albocincta Hombron.
 alboviridis Wright.
 altivaga Mouss.
 amoena Pfr.
 ampliata C. B. Adams.
 anaensis Mouss.
 andamanica Benson.
 angulata Sow.
 antillarum Sow.
 antoni Pfr.
 arakanensis Blanford.
 arenicola Morel.
 articulata Pfr.
 aurantia Gray.
 barbadensis Pfr.
 bayamensis Poey.
 behniana Pfr.
 bella Pease.
 bellula Gundlach.
 beryllina Gould.
 beskei Pfr.
 biangulata Pfr.
 bicolor Pfr.
 blandiana Gundlach.
 borneensis Martens.
 botteriana Pfr.
 bracteola Rangel.
 brazilensis Gray.
 brazieri Pease.

✦ EXCHANGE. ✦

WE herewith give a list of the commoner skins and eggs we desire. Also a list of what we have for exchange. We want fine skins only and nicely prepared, and positively identified eggs. Those having any we want will oblige us by sending lists of the same, with the prices at which they are willing to exchange them, taking ours at list prices; and also state what they want in exchange. We shall be pleased to hear from those desiring to exchange who can get what we want but haven't it at present.

SKINS WANTED.

1. Wood Thrush.	322. Yellow-bellied Flycatcher.	534. Pectoral Sandpiper.
3. Gray-cheeked Thrush.	335. Ruby-throated Hummingbird.	536. Bonaparte's Sandpiper.
4a. Olive-backed Thrush.	354. Whip-poor-will.	537. Baird's Sandpiper.
10. Sage Thrasher.	359. Ivory-billed Woodpecker.	541a. Western Sandpiper.
61. Bewick's Wren.	366. White-headed Woodpecker.	549. Yellow-legs.
63. House Wren.	375. Red-headed Woodpecker.	550. Solitary Sandpiper.
67. Long-billed Marsh Wren.	376. Lewis's Woodpecker.	555. Bartram's Sandpiper; Field Plover.
67a. Tule Wren.	385. Road-runner; Chaparral Cock.	556. Buff-breasted Sandpiper.
71. American Titlark.	387. Yellow-billed Cuckoo.	560. Eskimo Curlew.
81. Golden-winged Warbler.	395. American Long-eared Owl.	565. Wilson's Phalarope.
86. Orange-crowned Warbler.	396. Short-eared Owl.	572. Virginian Rail.
87. Tennessee Warbler.	402a. Florida Screech Owl.	574. Sora Rail. Spring.
90. Cape May Warbler.	405. Great Horned Owl.	575. Little Yellow Rail.
93. Summer Yellow Bird.	405b. Arctic Horned Owl.	582. Whooping Crane.
120. Mourning Warbler.	406. Snowy Owl.	588. Whistling Swan.
138. Philadelphia Vireo.	414. American Peregrine Falcon; Duck Hawk.	589. Trumpeter Swan.
150. Northern Wax-wing.	420. Sparrow Hawk.	591. Snow Goose.
151. Cedar Wax-wing.	426. Swallow-tailed Kite.	591a. Lesser Snow Goose.
152. Purple Martin.	433. American Goshawk, adult.	594a. Hutchin's Goose.
154. Barn Swallow.	443. Broad-winged Hawk, adult.	613. Wood Duck; Summer Duck.
155. White-bellied Swallow.	459. Passenger Pigeon.	634. Ruddy Duck. Spring.
157. Bank Swallow.	479. Sage Cock.	638. Hooded Sheldrake.
181. American Goldfinch. ♂	480. Bob-white; American Quail.	643a. Florida Cormorant.
186. Snow Bunting.	481. Mountain Quail.	675. Bonaparte's Gull. Adult.
188. Smith's Longspur.	489. American Egret.	683. Cabot's Tern.
191. Baird's Bunting.	490. Snowy Heron.	693. Black Tern.
198. Yellow-winged Sparrow.	491. Reddish Egret; Peale's Egret.	722. Wilson's Petrel.
201a. Nelson's Sharp-tailed Finch.	496. White-crowned Night Heron.	723. Leach's Petrel.
244. Rose-breasted Grosbeak.	515. American Golden Plover.	729. Western Grebe.
248. Indigo Bunting.	523. Mountain Plover.	731. American Red-necked Grebe. Spring.
251. Painted Bunting.	525. American Woodcock.	732. Horned Grebe. Spring.
271. Baltimore Oriole.	528. Stilt Sandpiper.	736. Loon. Spring.
285. Maximilian's Nutcracker; Piñon Jay.		740. Red-Throated Diver. Spring.
287. Yellow-billed Magpie.		
318. Olive-sided Flycatcher.		

EGGS WANTED.

2. Wilson's Thrush.	354. Whip-poor-will.	497. American Bittern.
68. Short-billed Marsh Wren.	357. Nighthawk.	498. Least Bittern.
*99. Chestnut-sided Warbler.	360. Hairy Woodpecker.	500. Wood Ibis.
135. Red-eyed Vireo.	371. Pileated Woodpecker; Log-cock.	516. Killdeer.
139. Warbling Vireo.	378. Yellow-shafted Flicker.	520. Piping Plover.
140. Yellow-throated Vireo.	397. Barred Owl.	523. Mountain Plover.
158. Rough-winged Swallow.	405. Great Horned Owl.	525. American Woodcock.
161. Scarlet Tanager.	425. American Osprey Fish Hawk.	558. Long-billed Curlew.
248. Indigo Bunting.	426. Swallow-tailed Kite.	566. American Avocet.
257. Bobolink.	432. Sharp-shinned Hawk.	567. Black-necked Stilt.
280. American Raven.	443. Broad-winged Hawk.	569. Red-breasted Rail.
291. Florida Jay.	449. Golden Eagle.	582. Whooping Crane.
318. Olive-sided Flycatcher.	451. Bald Eagle; Gray Eagle.	583. Sandhill Crane.
335. Ruby-throated Hummingbird.	459. Passenger Pigeon.	613. Wood Duck; Summer Duck.
351. Chimney Swift.	480. Bob-white; American Quail.	638. Hooded Sheldrake.
353. Chuck-will's-widow.	495. Black-crowned Night Heron.	643a. Florida Cormorant.
		681. Royal Tern.

* And fine sets of almost any of the other warblers.

SKINS FOR EXCHANGE.

5. Dwarf Thrush.	262. Red-and-white-shouldered Blackbird.	530. Purple Sandpiper.
36. Tufted Titmouse.	269. Hooded Oriole.	542. Sanderling.
54. Pigmy Nuthatch.	272. Bullock's Oriole.	552. Willet.
56. Cactus Wren.	295. Arizona Jay.	563. Northern Phalarope.
75. Prothonotary Warbler.	306. Western Kingbird.	592. Ross's Snow Goose.
77. Worm-eating Warbler.	307. Cassin's Kingbird.	595. Brant.
79. Blue-winged Yellow Warbler.	336. Black-chinned Hummingbird.	596. Black Brant.
103. Yellow-throated Warbler.	339. Broad-tailed Hummingbird.	610. Cinnamon Teal.
119. Kentucky Warbler.	343. Calliope Hummingbird.	619. Barrow's Golden-eye.
124. Hooded Warbler.	362. Red-cockaded Woodpecker.	656. Black Skimmer.
166. Pine Grosbeak.	365. Strickland's Woodpecker.	663. Great Black-backed Gull.
173. White-winged Crossbill.	367. Black-backed Three-toed Woodpecker.	666a. American Herring Gull.
192. Ipswich Sparrow.	369a. Red-naped Woodpecker.	679. Gull-billed Tern.
199. Henslow's Sparrow.	369b. Red-breasted Woodpecker.	681. Royal Tern.
200. Leconte's Sparrow.	374. Gila Woodpecker.	685. Forster's Tern.
216. White-winged Snowbird.	402. Little Screech Owl.	686. Common Tern.
218. Oregon Snowbird.	436. Red-tailed Hawk.	687. Arctic Tern.
219. Pink-sided Snowbird.	442. Swainson's Hawk.	690. Least Tern.
220. Gray-headed Snowbird.	456. Band-tailed Pigeon.	691. Sooty Tern.
226a. Oak-woods Sparrow.	482. Californian Quail.	709. Greater Shearwater.
239. Green-tailed Towhee.	522. Wilson's Plover.	732. Horned Grebe. Young.
253. Black-faced Seedeater.	529. Knot; Robin Snipe.	752. Sea Dove; Dovekie.
261a. Red-and-black-shouldered Blackbird.		764a. Brunnich's Guillemot.

EGGS FOR EXCHANGE.

56. Cactus Wren.	274. Brewer's Blackbird.	640. American White Pelican.
63a. Western House Wren.	277. Boat-tailed Grackle.	642. Common Cormorant.
145. Bell's Vireo.	301. Scissor-tailed Flycatcher.	649. American Anhinga; Snake Bird.
149. Loggerhead Shrike.	317. Black Pewee.	650. Gannet.
149a. White-rumped Shrike.	378b. Red-shafted Flicker.	656. Black Skimmer.
182. Green-backed Goldfinch.	411. Whitney's Pigmy Owl.	663. Great Black-backed Gull.
201. Sharp-tailed Finch.	465. Ground Dove.	666a. American Herring Gull.
202. Sea-side Finch.	477. Prairie Hen.	673. Laughing Gull.
204. Lark Finch.	487. Great Blue Heron.	679. Gull-billed Tern.
204a. Western Lark Finch.	492. Louisiana Heron.	680. Caspian Tern.
217. Black Snowbird.	507. American Oystercatcher.	685. Forster's Tern.
240b. Californian Brown Towhee.	522. Wilson's Plover.	723. Leach's Petrel.
260. Yellow-headed Blackbird.	552. Willet.	742. Razor-billed Auk.
261a. Red-and-black-shouldered Blackbird.	581. The Limpkin.	743. Common Puffin.
270. Orchard Oriole.	585. American Flamingo.	760. Black Guillemot.
272. Bullock's Oriole.	601. Mallard.	763a. California Guillemot.
	627a. American Eider.	

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— BEWARE OF IMITATIONS. —

The New Orleans Exhibition.

PROBABLY all of our readers are aware that the United States Congress appropriated \$1,000,000 for the purpose of assisting the State of Louisiana to inaugurate and carry on for six months a grand exposition of the manufactures and natural products of the world, to be called the "World's Industrial and Cotton Centennial Exposition," to be opened in December, 1884, at New Orleans. A most fitting celebration in honor of the increased production of cotton in America during the past decade. In 1784 America exported six bags of cotton, and now we find reported a supply of 3,405,000, 000, or 85 per cent. of the production of the world.

We have been for the past two months in constant receipt of varying reports regarding the financial condition and success of the fair, the insufficient accommodations, bad management in some departments, bad weather, deep mud, etc. Many of the exhibitors were late in applying for space, and it

seems also possible that the managers of the affair did not at first realize the magnitude of their undertaking; but in spite of all drawbacks a most notable exposition is well under way.

Having accepted the office of Commissioner of Rhode Island, Mr. Arnold B. Chace proceeded promptly to develop the resources of our little state, and her exhibit was in a very complete condition on the opening day. About the middle of July Mr. Chace delegated to our firm the arrangement of the Zoology and Mineralogy of the state. The time was short and much of the material scattered abroad and to be collected. With considerable misgivings we set about it, and on the fifteenth of November we shipped to New Orleans twenty-five large cases of goods in charge of Mr. Hermon C. Bumpus, of Brown University, and to his energy we are indebted for the fact that our exhibit is reported as having been the first one that was absolutely in order in the Government and State Building.

(Continued on page xi.)

Random Notes on Natural History.

Vol. II.

PROVIDENCE, MARCH 1, 1885.

No. 3.

Entered at the Providence Post-Office as Second-Class Matter.

Random Notes on Natural History.

A MONTHLY DEVOTED TO THE DISTRIBUTION OF USEFUL KNOWLEDGE CONCERNING THE VARIOUS DEPARTMENTS OF ZOOLOGY, MINERALOGY, AND BOTANY. 50 CENTS A YEAR.

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AN egg check-list has just appeared, published by Oliver Davie. It will meet a long felt want, not only with beginners, but the more advanced oologist. It is to be regretted that a simpler form was not chosen, that of *comparison* rather than wholly descriptive. For instance, had Mr. Davie described as accurately as possible the egg of the Wood Thrush and then compared the Wilson's and Hermit with it, as being lighter colored, smaller, etc.; then the Robin's as exactly the same color but larger, and that large specimens of the one and small of the other were indistinguishable, we think it would have been better.

The Russet-backed Thrush's egg would be another type to which the Mocking-bird's, Tanager's, and Rose-breasted Grosbeak's could be compared. A comparison of the unknown with the known gives a better impression than the finest description of close shades of color. For the identification of almost anything else Mr. Davie's descriptions would be admirable, but, alas! of what avail are the most careful descriptions of a large portion of our birds' eggs when, with their variety and similarity, they cannot be identified by the practiced expert.

Mr. Davie proposes in the near future to publish another edition, and invites suggestions and corrections. We note a few of the most prominent errors which we gleaned during a hasty perusal. The number of Robin's eggs is *ordinarily* not more than four, instead of five or six. Several of the Warblers should be credited with four or five, instead of three or four. The White-bellied Nuthatch rarely stops at four, but lays from five to nine. Bald Eagles given two to four, but rarely three, two being the

usual number. Passenger Pigeons lay but *one* egg, despite the assertions to the contrary, which, however, no one seems able to prove. * Roseate Spoonbill, two or three, usually three or four. American Oystercatcher given two to four, *very* rarely over three. Limpkin given ten to fifteen. Another author recently stated two or three. Our experience has been considerable with this species, and the number is usually four to seven. Flamingo given two. According to Mr. Maynard this is exceptional, one being the usual clutch. Noddy and Sooty Terns given two to three. We know several who have collected these species, but only one egg to a set.

The Ipswich Sparrow in Rhode Island.

THE last week in November found me at Point Judith. After one day's fruitless search for this sparrow in the meadows on the rocky portion of the shore, I repaired on the next day, Nov. 27th, to the sandy beach to the westward, along which is a double row of sand hills extending a distance of about a mile and a half. Upon these hills is a scanty growth of long grass, but not expecting to find anything here I kept along the beach around the hills to the marsh, hoping that I might find the birds I so much desired to get. But finding none, I returned to the beach, pursuing my way back, when a chirp attracted my attention to the sand hills, and a moment later I had an Ipswich Sparrow.

Having now discovered where to find them I took the upper row of hills and my companion the lower, and in this manner probably started all the sparrows on the hills, and secured seven out of eight birds shot at, six being Ipswich sparrows and the other a Savannah. We started three or four others.

When started they would fly from fifty to one hundred yards, usually alighting in the grass in the hollow between the hills.

* See *Random Notes*, Vol. I., Nos. 3, 4 and 5.

Two of them flew down on the beach, and another was shot from the top of a weed.

After this day's experience I considered them an easy bird to obtain, but the next day's quite undeceived me, for I went out alone and succeeded in starting but three birds, which were very wild, two of which I shot at and saw them fall but could not find them, as they were probably only wounded and took care of themselves.

The third day my wife went with me, as on the first. I started but one bird, and that after walking about half the length of the hills. It would rise about forty yards in advance of us and fly with long undulations, usually until hidden from sight by some intervening sand hill.

After chasing it almost the entire length of the hills we made a circuit, and then began the chase back. There was little danger of its escaping us, as the sand hills were so narrow it would not permit us to pass by.

Several snap shots were made when it arose, and finally it was killed at the end of the hills, after a chase of fully two miles. I am positive that this chase of two miles was for the same identical sparrow.

Song and Tree sparrows were both common along this range of hills, but were distinguishable at a glance.

Bird Migration.

In a letter from Mr. Francis Bain, of North River, Prince Edward Island, he says: "I observe in a report of Dr. Merriam's in *RANDOM NOTES*," that the date of the first appearance of the nighthawk in Prince Edward Island in 1884 is given as June 1st.

Now we observed this species at North River on May 25th; and from records of its arrival, kept for fifteen years past, I find that there has been but a slight variation from that date during this period. On six years the date of its arrival is May 26th, and on the remaining nine years it never varied more than four days from that date.

In comparing my notes with those of other observers, I find that the night hawk reaches this island at much the same time as it is seen at the opposite New Brunswick shore."

MONTAGUE CHAMBERLAIN,
St. John, N. B.

Editors of Random Notes:

I must range myself on the side of Mr. F. A. Lucas in the matter of making the opening cut from well up on the sternum, especially in the case of skins to be set up with spread wings, and also in the lower order of birds, such as loons, grebes, etc., where the legs are far back. But I would like to ask Mr. Lucas if he does not have trouble with skins of large birds where the wings are tied as he advises in last number of *Ward's Bulletin*. I have tried it in small birds where the humerus is cut away; but on eagles, hawks, owls, etc., I find that if all the wing bones are left in and tied through the double bones, on returning the skin the humerus is sure to push up into the neck. With this exception I like the wing-tying, because it keeps them in place better, both in the skin and the mounted specimen.

RANDOM NOTES recently queried as to the first using of a hard body. In *The Useful Companion and Artificer's Assistant*, by H. B. Allen, a chapter on taxidermy is given, culled, evidently, from an English source, in which a body of *wood* is advocated.

We have recently taken a song sparrow, partially albino, the throat, breast, and scapulars pure white. A white cliff-swallow and bobolink have been observed in this vicinity this season.

G. G. DICKEY.

ACWORTH, N. H.

We make the opening incision on the back of all Geese, Ducks, Loons, Grebes and other water-birds which have short, thick feathers on the breast. The advantages are as follows: the breast is left in one unbroken piece; there being no incision there are no grease stains; and if the bird has been kept long, there is not the danger of losing the breast feathers that there would be if the tender portion were along the opening cut.—*Ed.*

A CHEWINK was seen by Mr. Seamans Dec. 20th, which was by far the coldest day of the month.

Mr. H. L. Clulee, Wallingford, Conn., reports the capture of two Purple Grackles Dec. 31st, and that a Kingfisher is to be seen daily below the mill dam.

On the Blow-Pipe Reactions of Cryolite.

HAVING occasion a short time since to use a very easily melting flux, I thought of cryolite for this purpose, as all authorities on the subject speak of its extreme fusibility.

Before relating my experience with this fusible mineral, I wish to quote a few of the many works I have consulted on the subject.

"Very fusible into a white enamel, fusing in a candle flame."—*Booth's Ency.*, 1853.

"Melts below a red heat and forms an opaque glass on cooling."—*Watt's Dict. Chem.*, 1870.

"In the forceps fuses very easily, coloring the flame yellow. On charcoal fuses easily to a clear bead, which on cooling becomes opaque."—*Dana's Text-Book of Min.*, 1883.

"Easily fusible in the flame of a candle."—*Brush's Determinative Mineralogy*, 1878.

It would appear from these quotations and many others of a like tenor, that authors copy each other's statements, without verifying facts by actual experiment.

Now for the facts. I first tried to melt a small piece of cryolite in the flame of a Bunsen burner, which, as everyone knows, is very many times hotter than any candle, lamp, or gas flame; it did not fuse; secondly I threw a small piece into a hot coke fire, used for melting gold in quantity. I stood and watched it for about ten minutes and then removed it with a pair of tongs, in the same condition it went in, excepting that it was whiter in color but not fused even on the edges; then having a large crucible full of melted copper (it takes 2500 degrees of heat to melt copper), I laid some cryolite on the melted metal, shut up the cover and left it there; after some time I opened the fire and the mineral was there just the same. The fact is, that by long continued blowing, cryolite is difficultly fusible on thin edges before the blowpipe. Why should statements of this kind be repeatedly copied into every work published on these subjects? I hope in future editions this mistake will be rectified. Yours truly,

H. F. CARPENTER.

"To the Editors of *Random Notes*."

To the amateur student, especially if working without a teacher, such an experience

as the above is worse than perplexing. It is most unfortunate that so marked an error should appear in standard books of reference.—*Ed.*

Ozocerite, or Mineral Wax.

[BY FRANKLIN S. SMITH, B. S.]

OZOCERITE, from the Greek, "Ozein," smell, and "keros," wax, is a mineral consisting of carbon and hydrogen, and resembles paraffin, or dirty wax. Its color is generally yellowish brown. It is found in Turkistan, east of the Caspian Sea; in the Carpathian Mountains in Austria; in the Apennines in Italy; in Texas and California, and specimens have recently been found in New Jersey. Commercially, it is worked chiefly in Austria and other portions of Europe, although we have in Utah a larger deposit than in any other place.

Ozocerite from Baku was found by Peterson to have a specific gravity of 0.903, and fused at 70° C. By distillation it gave:

Paraffin	81.8
Gas	13.8
Coke	4.4

100.0

Ozocerite from Zietriská in Moldau, had a specific gravity of 0.946, fusing point 20.50° C., and distilled at 300° C. It occurs in thin layers of brown to yellowish-brown color. Its structure is leafy, and its fracture resembles mother-of-pearl. It dissolves in turpentine, naphtha, and fatty oils, but little in ether or boiling alcohol, and has a weak odor of coal oil.

"Earth-wax," or ozocerite, has been supposed to be a residuum of oil that has evaporated. It is dug out with picks and shovels, and is about the consistency of clay. The shafts are from 350 to 600 feet deep, and very close together; so close that in a piece of land containing not over fifty acres, there are ten thousand shafts. The walls of these shafts are curbed with timbers, but at the depth to which they go they are so very thin that scarcely a day passes without some of them caving in, breaking the timbers like pipe-stems, and often burying human beings beneath the great masses of earth. The earth taken out of the shafts is carted away a short distance and dumped.

These huge piles of earth which accumulate exert such a pressure near the honey-combed land, that the wax is often forced out of the cracks with such rapidity that the workmen are unable to save themselves. It once happened in a shaft 321 feet deep, that the entire shaft was suddenly filled to the mouth with wax. The veins of wax are from sixteen to nineteen inches thick. These layers render the strata rather uncertain — that is, they slip on each other. Great fires have also occurred in the mines. At Borislau, in Galicia, in 1864, the mines produced 45,000 hundred weight of earth wax.

The paraffin is softer and less transparent than that from brown coal tar, and has a fusing point of 60 deg. C., although sometimes as low as 45 deg. C. All ozocerite oils on purification give a beautiful light yellow oil of 0.81 specific gravity, of great illuminating power and with a weak, mild odor. The lowest specific gravity of ozocerite is 0.74, while the highest is only 0.828, hence the oil has a low specific gravity and a high boiling-point. Its inflammability is therefore less than that of petroleum. The lightness of ozocerite oil, together with its large paraffin content, contradict the general idea that ozocerite is formed by the evaporation of petroleum. It must have been formed in some other way, of which we are still in doubt, perhaps, as Perutz states, by the oxidation of naphtha.

Ozocerite seems to change slightly by exposure to the air. A piece exposed to the air for a year became ash gray upon the upper surface, while on the bottom it remained a blackish brown. Ozocerite has been found in South Amboy, N. J., in the clay field of Mr. Otto Ernst. In a letter to Professor Smock, of Rutgers College, he says: "I do not think it likely I shall find any paying quantities of it, though I recollect finding a lump ten times as large some years ago. Its low specific gravity probably carried it here by water, from the petroleum fields. An analysis of this specimen gave:

Carbon.....86.46 per cent.
Hydrogen.....12.82 "

99.29 per cent.

Very little has been made public concerning improvements in making paraffin from ozocerite, and manufacturers keep their experience as secret as possible. In Vienna

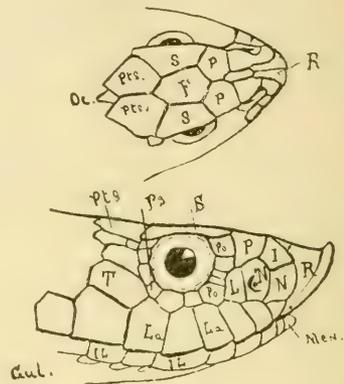
there are five factories in which are made white wax, wax candles, wax matches, yellow beeswax, and colored tapers. In Europe large quantities of ozocerite are used to wax the floors of the houses.

In the United States the most important uses made of ozocerite are to make chewing gum and to adulterate beeswax.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER VI.



- | | | | |
|------|---------------|------|----------------|
| F. | FRONTAL. | OC. | OCIPITAL. |
| GUL. | GULARS. | P. | PREFRONTALS. |
| I. | INTERNASALS. | PO. | PREORBITALS. |
| IL. | INFRALABIALS. | PS. | POSTORBITALS. |
| L. | LOREAL. | PTS. | PARIETALS. |
| LA. | LABIAL. | R. | ROSTRAL. |
| MEN. | MENTAL. | S. | SUPRAORBITALS. |
| N. | NASALS. | T. | TEMPORALS. |

THOUGH the snakes of our state are few in number they are, nevertheless, likely to be confounded, the several species, having considerable range of variation, giving the amateur no little trouble in the determination of their identity. Many, during their earlier growth, are quite differently marked from their adult stage, and even the adults of the same species, from different localities, exhibit considerable variation. The only characters which can, to any extent, be relied upon are those presented by the arrangement of the scales, and by the dentition. The plates of the head and scales of the abdominal region are particularly valuable in separating the genera, and to this end will be used in the following plan. It

should be borne in mind, however, that not unfrequently, adjoining plates may coalesce, and that the larger plates may subdivide.

The first divisions of Rhode Island Ophidia are based on the non-possession or possession of poison glands and fangs. (It is a popular belief that the tongue is the "poison fang." The fangs, properly speaking, possessed only by venomous snakes, are two long curved teeth in the upper jaw so perforated by a canal that the poison, secreted by the salivary glands, situated above the roof of the mouth, has exit near the point of the tooth, making it thus at once a lance and injecting instrument.)

On examining several snakes, some will be found to have the scales along the back provided with a longitudinal rib; such scales are said to be "keeled"; the common Garter Snake has scales of such a character, while the scales of the Black Snake are perfectly smooth. The abdominal plates are the broad scales by the movement of which the serpent is enabled to crawl; the last is often divided. By the use of the following *plan*, the several *genera* which are likely to occur in the state can be determined.

- A. Serpents not provided with *poison fangs*.
 Scales of the back prominently *keeled*.
 No scales between *labials* and *orbit*.
Loreal plate present.
 TROPIDONOTUS.
Loreal plate absent,
 STORERIA.
- Scales between *labials* and *orbit*.
 HETERODON.
- Scales of the back *smooth*, or nearly so.
 Last *abdominal plate* divided.
Nasal plates separate.
Labials seven.
Preorbitals two, unequal.
 COLUBER.
Preorbitals two, about equal.
 DIADOPHIS.
Labials eight.
Preorbital one.
 ELAPHIS.
Nasal plates undivided.
Preorbital one.
 CYCLOPHIS.
 Last *abdominal plate* entire.

Nasal divided.

Preorbital one.

OPHIBOLUS.

- B. Serpents provided with *poison fangs*.

Frontal plate divided.

CROTALUS.

Frontal plate entire.

ANCISTRODON.

Embryology of Fulgur Carica.

At a recent meeting of the Philadelphia Academy of Natural Sciences, Mr. John Ford reported the finding of capsules of *Fulgur carica*, containing living embryos, near South Atlantic City, on November 16, 1884.

As he had already secured live specimens in December, 1883, and in each of the six months following, this would prove the deposition of capsules by the species mentioned during the largest part of the year, instead of in the spring months only, as was formerly supposed. Living embryos of *F. canaliculata* were also obtained monthly, during the same period.

Several other strings of capsules, including some of *F. canaliculata*, were secured on the same occasion, but exposure to the sun for a day or two had killed the embryos.

At the same locality were discovered two species of living Pholades, *P. crispata* Linn. and *P. truncata* Say, also a fine colony of living *Littorina irrorata* Say; all of these species being new, it is believed, to that part of the coast.

It is probable that the billet of wood in which the Pholades were found had drifted from some distant locality, as there do not appear to be any conditions favorable to their existence between Brigantine Inlet and Great Egg Harbor Bay.

In regard to the habitat of the *Littorina* there could be no doubt whatever, as they were present in large numbers, and in a flourishing condition, although dwelling literally upon the sand, instead of on broken rock or pieces of timber, where the species is usually found. It is southern in distribution, rarely occurring north of the mouth of Chesapeake Bay.

WHY can't a fisherman be generous? Because his business makes him sell-fish.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XIV.

FAMILY 30. Cæcidæ, Carpenter, with one genus.

GENUS CÆCUM, FLEMING. 1824.

Shell while young discoidal, when adult tubular, cylindrical, arched, decollated. It is born as a flat, spiral shell, but after making two or three turns it suddenly leaves the spire and grows out in a slightly arched curve; soon it drops the spire, plugging up the broken end with a mammillated septure, so that when adult it resembles a tusk, with the small end decollated. They are found in worm-eaten passages of dead shells, and are carrion-feeders.

33. CÆCUM PULCHELLUM, STIMPSON.

Shell clavate, arcuated, contracted at both ends, pale yellowish horn color, and sculptured with about twenty-five strong, rounded ribs, giving the shell a waved appearance; aperture round, entire; operculum multi-spiral, of eight whorls, corneous, concave on the outer surface. Length one-tenth inch, breadth one-fortieth at its widest part. It inhabits the Laminarian zone, and was dredged in New Bedford Harbor, adhering to groups of *Vermeti*, and was described by Wm. Stimpson, *Proc. Bost. Soc. Nat. Hist.*, iv., 112, 1851. It probably inhabits Rhode Island waters, but has never been found, to my knowledge, its minute size preventing its being collected.

34. CÆCUM COOPERI, SMITH.

Distribution, Gardiner's Bay, L. I., and Vineyard Sound, Mass., four to ten fathoms. In 1863 Dr. P. P. Carpenter described a shell which he called *Cæcum Cooperi*. In 1870 Mr. S. I. Smith described and figured a shell which he found in Gardiner's Bay, in the *Ann. Lyc. Nat. Hist.*, N. Y., ix., 394, which he also called *Cæcum Cooperi*. In the March number of *Silliman's Journal* of 1872, Prof. A. E. Verrill, of Yale College, published a list of the species of mollusca found on the dredging expedition of 1871, at Wood's Holl, Mass., which were new to science, and of those previously described,

but omitted or overlooked in Binney's Gould. (*Invert. Mass.*) published in 1870. Among other shells in this list is a *cæcum*, dredged in Vineyard Sound. This proved upon examination to be the same as the *Cæcum Cooperi* of Mr. S. I. Smith, but not the original *Cooperi* of Carpenter. As the specific name was thus pre-occupied, he proposed the name of *Cæcum costatum*, Verrill.

The above explanation was read from a paper by the author, on the "Conchology of Rhode Island," before the Providence Franklin Society, Nov. 22, 1872. In the *Report upon the Invertebrate Animals of Vineyard Sound and Adjacent Waters*, published by A. E. Verrill and S. I. Smith in 1874, page 355, Sanderson Smith is credited with having described this shell in *Ann. Lyc. Nat. Hist.*, N. Y., vii., 154, 1860, with the following remarks: "The first description of this species was overlooked by me; as it antedates the description of the Californian species to which Dr. Carpenter gave the same name, the present species must be called *Cooperi*." I have never seen the original description or the shell.

FAMILY 31. Eulimidæ, contains seventeen genera, many sub-genera, and about four hundred and fifty species, the greater part of which are fossil. The genus *Eulima*, with forty-nine living and forty fossil species, is represented in New England by one species, the *Eulima oleacea*, Kurts & Stimpson, *Proc. Bost. Soc. Nat. Hist.*, iv., 115, 1851. It has been dredged in Buzzard's Bay, several miles from land, in soft gray mud, eight fathoms. It has not been found, to my knowledge, in Rhode Island waters.

The genus *Stylifer*, found only imbedded beneath the skin of star fish and sea urchins, is represented in New England by one species, *Stylifer Stimpsonii*, Verrill, *Am. Jour. Sci.*, iii., 210 and 283, 1872. Off New Jersey, thirty-five fathoms; George's Bank, sixty fathoms; off Block Island, thirteen to twenty-seven fathoms, 1880.

FAMILY 32. Turbonillidæ, twelve genera, is represented in New England by five genera, two of which inhabit Rhode Island.

GENUS TURBONILLA, RISSO.

Shell slender, many whorled, elongated, longitudinally ribbed; apex sinistral; aper-

ture simple, ovate; peristone incomplete; columella straight, not plaited; operculum horny, sub-spiral. Seven species inhabit New England, two of which have been found in Rhode Island.

35. TURBONILLA INTERRUPTA, TOTTEN.

Shell small, slender and pointed, pale brownish white, glossy; surface reticulated by twenty-five to thirty blunt ribs, crossed by fourteen revolving lines, which are interrupted by the ribs; on the lower portion of the body whorl the ribs vanish, but the fine revolving lines remain uninterrupted; whorls eight to ten, a little convex; suture well defined; aperture one sixth the length of the shell, ovate, angular behind; outer lip simple and sharp; inner lip slightly everted. Length, $\frac{1}{4}$ inch; breadth, $\frac{1}{10}$ inch.

This beautiful little species was first discovered by Colonel Totten, in Newport harbor, R. I., and described by him in *Silliman's Journal*, xxviii., 352, 1835, under the name of *Turritella interrupta*. It has since been found in various localities from Cape Cod to South Carolina. It is not common anywhere. I have found but six specimens in Rhode Island in over twenty years. It is more abundant in Vineyard Sound and Buzzard's Bay than in any other known locality. Obtained by dredging in three to ten fathoms.

36. TURBONILLA ELEGANS, VERRILL.

This *new* species was discovered in Vineyard Sound, on a shelly bottom in eight to ten fathoms, by Prof. A. E. Verrill and Mr. S. I. Smith, during the dredging expedition of 1871. Mention is made of the species in the March number of *Silliman's Journal* for 1872, and a quite lengthy description in the April number, page 282. It resembles the preceding species, but is not as slender and the whorls are more rounded. The color of the shell is light yellowish; whorls ten; spire acute. Length $\frac{2\frac{2}{10}}{10}$ inch; breadth $\frac{7}{100}$. I have never seen the species, but it is mentioned in *Cat. Mar. Moll.*, 538, 1882, as having been found in Long Island Sound, off New Haven, and in Narragansett Bay. Of the other New England species referred to above, *Turbonilla nivea*, Stimpson, inhabits the Maine coast. *T. equalis*, Say, Vineyard Sound. *T. Emertonii*, same locality, and Verrill's new species, *costulata*,

areolata, *striata*, etc., off New Haven, Conn., and Vineyard Sound. Perhaps some of these may eventually be found in Rhode Island.

GENUS ODOSTOMIA, FLEMING.

The genus *Odostomia* differs from *Turbonilla* principally by having smooth shells, instead of being ribbed, a less number of whorls, and in having a tooth or fold upon the columella. The species are numerous, distribution universal, from *high* water mark to forty fathoms. I emphasize this word *high*, as authorities say *low* water, etc., and will explain my reason for saying this in the next chapter.

Four species of *Odostomia* have been found, and seven are liable to be collected in Rhode Island, descriptions of which will be given.

(To be continued.)

The Color of Birds' Eyes.

I HAVE been much interested in your notes on the color of birds' eyes. You give that of the California woodpecker as white; a friend in California who sent me mine, wrote that the eye was pink.

Two specimens of the pileolated woodpecker had red eyes, and I once mounted a fine ♂ sheldrake, who had eyes nearly black; also, a ♀ long-tailed duck, whose eyes were certainly white. I once saw an avocet in full plumage with eyes nearly black, though I believe they are usually red. I observe that some taxidermists use brown and others blue eyes in the English jay. What is right? I should suppose brown, judging by the rest of the family, though the Guirds jay does have blue.

E. J. SMITH.

We have invited observers to report to us upon this important subject, and shall be glad to publish any new notes.—*Ed.*

EARLY in November a Snowy Owl was captured at Newport. This is the only one reported to us.

THE winter thus far has been characterized by few winter visitors from the North. Several parties in Maine, New Hampshire, Vermont, and New Brunswick report taking Hawk Owls, from five to a dozen individuals each.

CONCHOLOGICAL CHECK-LIST. XV.

J. RITCHIE, JR.

Family. Helicinacea Pfr.

Sub-family. Helicinea Pfr.

Helicina brevilabris Pfr.

briarea Poey.

bryanti Pfr.

callida Weinl.

campanula Pfr.

candida Pfr.

caracolla Moric.

carinata Orb.

catalinensis Pfr.

chiapensis Pfr.

chrysochasma Poey.

chrysocheila Shutt.

ciliata Pfr.

cinctella Shutt.

cingulata Gass.

citrina Grateloup.

colorata Pease.

columbiana Phil.

columellaris Gundlach.

concentrica Pfr.

concinna Gundlach.

constricta Pfr.

contermina Semper.

convexa Pfr.

cordilleræ Sallé.

cornea Sow.

coronula Shutt.

costata Gray.

crassilabris Phil.

crocea Benson.

crossei Semper.

culminans Mouss.

cumingi Sow.

decolorata Mouss.

delicatula Shutt.

depressa Gray.

diaphana Pfr.

discoidea Pease.

diversicolor Cox.

draytonensis Pfr.

dunkeri Zeleb.

dysoni Pfr.

egregia Pfr.

elongata Orb.

exigua Pfr.

Helicina exserta Gundlach.

faba Pease.

fasciata Lam.

festiva Sow.

fischeriana Montrz.

flammea Quoy.

flavescens Pease.

flavida Menke.

foveata Pfr.

fragilis Morel.

fulgora Gould.

fulva Orb.

fuscata Gundlach.

gallina Gass.

gambieni Paz.

ghiesbreghti Pfr.

glabra Gould.

globosa Gray.

globulosa Orb.

gonochila Pfr.

gouldiana Forb.

granum Pfr.

guadaloupensis Sow.

guttula Pfr.

hæmistoma Moric.

hanleyana Pfr.

heatei Pfr.

heloisæ Sallé.

hemisphærica Shutt.

hainanensis Mölldf.

hernandezii Wright.

herveghiana Pfr.

hialmarsoni Pfr.

inconspicua Pfr.

interna Mouss.

jamaicensis Sow.

japonica A. Adams.

jucunda Gundlach.

jugulata Poey.

kieneri Pfr.

küsteriana Pfr.

laciniosa Mighels.

lazarus Sowerby.

lens Lea.

lifonana Cross.

lindenii Pfr.

lineata C. B. Adams.

(Continued from page x.)

These goods when placed in position occupied fifty-five feet by four of glass counter cases, and twelve by six of upright black walnut museum cases. All the stuffed mammals, with one exception, a Jumping Mouse, were actual residents of the state. Among them was a fine Otter, a Wild Cat, three species of albinistic Squirrels, and one partially Albino Muskrat. The season of the year was unfortunate for procuring them in good peltage, and it was only a few days before the goods were shipped that we secured a specimen of the Varying Hare, while the Raccoon escaped us altogether; we could not collect one, and a genuine state specimen brought in to be mounted was refused us; the owner would neither loan nor sell.

In representing the birds we were obliged to be satisfied to considerable extent with skins, as again the time allowed was not sufficient to mount them. This department is represented by 338 specimens of 126 species, including one case of stuffed small specimens arranged as a wall picture, and several single specimens of the larger sort, such as Eagle, Loon, Heron, etc.

This was followed by an arrangement of the Turtles, mounted and naturally tinted, including all the varieties likely to be found in Rhode Island, except perhaps two of the marine forms. Our other reptiles and batrachians were represented by alcoholic preparations, and the paucity of species is in marked contrast with those of the Southern States.

The Crustaceans, Lobster, Horse-shoe Crab,

(*Limulus polyphemus*) and a dozen other species, all found within the waters of the state, were carefully stuffed and painted (generally from living models) as nearly as possible to the brilliant hues of life, such as could hardly be conceived of by those who have not seen them fresh from the water.

Our exhibition of insects is not very commendable, being confined to one exhibition case containing about two hundred of the most notable or brilliant forms.

The Conchology we were able to represent by about one hundred species.

For our exhibition of fossil forms, as we do not deal in them, we are indebted to the kindness of Brown University. The collection loaned contained nearly all the carboniferous flora of the state, being particularly valuable, as the identification has been demonstrated by Professor Leo. Lesquereux, the only living authority.

In like manner while we carry a full stock of fine minerals for exhibition or study purposes, to obtain some of the fine local specimens we were obliged to draw freely upon private cabinets. To these friends we are much indebted. This part of the exhibition embraces all the species of any importance that occur, but might have been extended much further in individual and handsome specimens, if space had not been limited.

The specimens belonging to us are for sale, and we are prepared to estimate at any time for similar collections, wholly or in part, correctly labeled, and mounted on cherry or ebonized blocks, or in card-board trays.



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THE AUK is published under the editorship of Mr. J. A. Allen, with the assistance of Dr. Elliott Coues, Mr. Robert Ridgway, Mr. William Brewster, and Mr. Montague Chamberlain.

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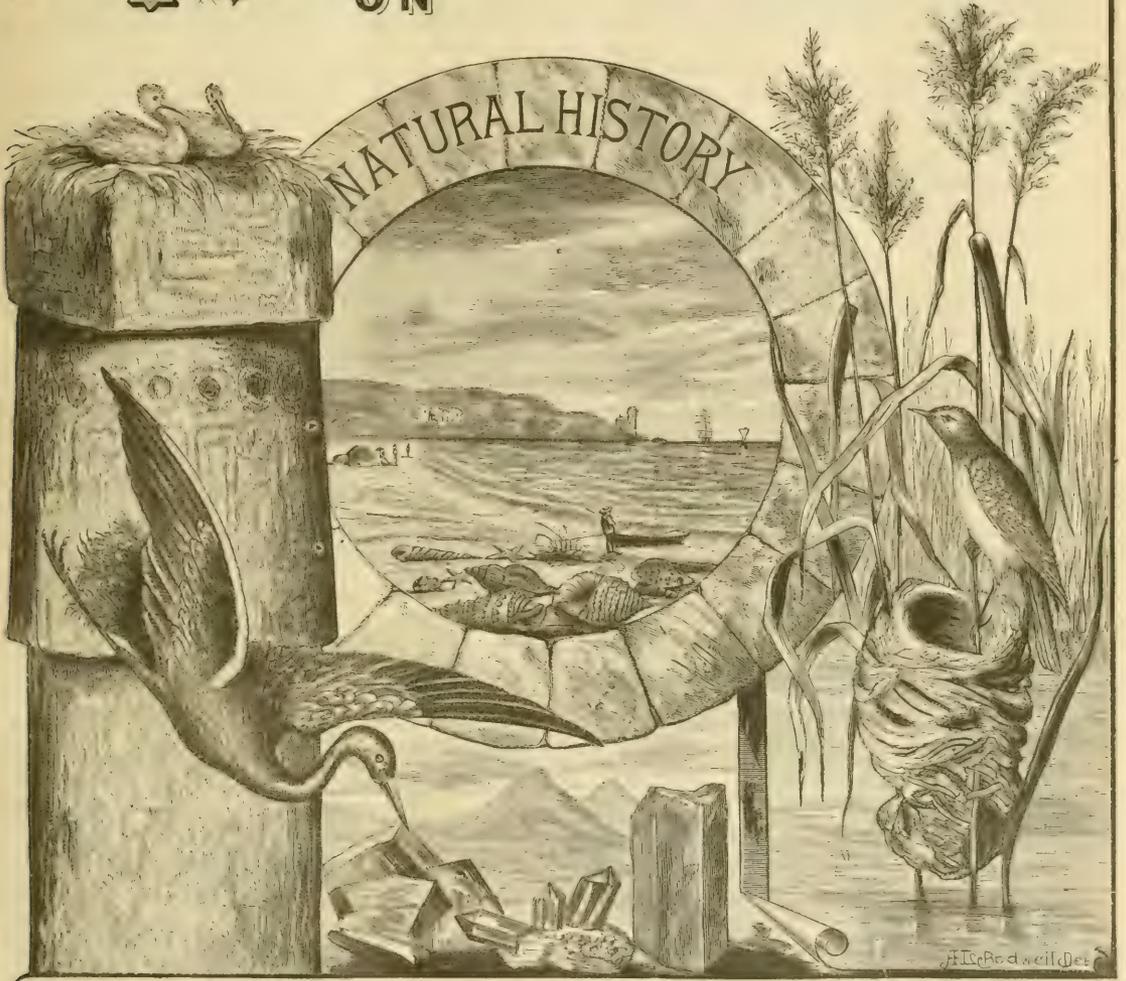
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VOL. II.

NO. IV.

RANDOM NOTES

ON



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Random Notes on Natural History.

Vol. II.

PROVIDENCE, APRIL 1, 1885.

No. 4.

Entered at the Providence Post-Office as Second-Class Matter.

Random Notes on Natural History.

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THE statements in an article on cryolite in a previous issue and our editorial having been called in question, we have made various experiments desiring to correct any false impressions. We found that before the blow-pipe on charcoal, cryolite in small quantities fused to a liquid; in the pincers, with a well-directed R. F., it reduced and changed form; in gas-flame we were able to turn ends and thin edges to a white enamel, and in candle flame, by carefully introducing a fragment into the hottest part a limited fusion was produced.

It does not, like stibnite (noted as No. 1), melt and drop. The term "easily fusible" seems to admit of much greater latitude of meaning than we had imagined.

A Collecting Trip to Cape Cod.

CHATHAM is the southeastern point of Cape Cod. To the eastward, at a distance of one-half to three-quarters of a mile, is the sand-bar, and between are the flats over which a sail-boat can float at high water, while at low tide so much is bare that there is not enough water in the channels to get a row-boat across.

We reached Chatham about noon of May 21, 1883, and lost no time in putting on our hunting-clothes, as the tide was ebbing, and we wished to spend the afternoon on the bar. As we were being pulled across a fog was beginning to settle, which was soon very thick, and three birds, one apiece, were all we obtained.

Our row back to town was an eventful one, which we shall not soon forget, for, mistaking the roar of the ocean at the inlet for the rush of the incoming tide across the

flats, we came very near being swamped, and not till our boat was partly filled with water from the rolling billows, did we pull into still water, to await the clearing up of the fog, or morning, we knew not which. Being strangers, we left the rowing to our boatman, a boy of sixteen, who thought he knew where he was going, and did not want to admit that he did not. Suffice to say, when we pulled away from the threatening danger, we found a sail-boat moored, which, being recognized by the boatman, our correct course was laid, and we were soon doing justice to our host's well-spread table.

The day following was also foggy, and poor was our success, a few Wilson's Terns, Piping Plover, and Turnstones being all, until, approaching a small sand bar on our return, a group of birds loomed up looking much larger than reality, but a shot laid out one Black-bellied Plover and one Red-breasted Sandpiper, both fine specimens.

Before daylight of Wednesday, the 23d, we were on our way to the bar. The two preceding days, besides being foggy, had been windy and considerable rain had fallen, but with our gossamer coats and hip boots we were well protected. The present day was, however, free from fog, and for the first time we could look about us.

Most plentiful of all were the Terns which were to be seen flying in every direction, while on certain sand-bars they were resting in large numbers. When a school of small fish is discovered the Tern pauses in its flight, and hovering over them, turns its head with bill directly downward, and an instant later descends the same as a Kingfisher. Others follow, and soon the whole flock are diving, rising to the proper height, and diving again. Occasionally a Tern approached within gunshot, and if shot others would pitch over it, and several could be secured. We had in this way cut down several Arctic Terns and a few Bonaparte's Gulls, two or three wounded of which were drifting away from us, and I had run to where our boat was beached in order to row out and secure them.

We came across in the early morning on the ebb tide, and now, several hours later, the tide was coming in and at the present time was running swiftly. Just before I reached the boat my attention was attracted to a few small birds about three hundred yards away. Their motions were exceedingly graceful, and they appeared as light as bubbles on the water. They seemed to be at play, constantly springing from the water and flying first one way and then another, as if playing tag or puss in the corner. The instant I caught sight of them I involuntarily said "Phalaropes."

(To be continued.)

Notes on the White-breasted Nuthatch.

(SITTA COROLINENSIS.)

FOLLOWING the idea of John Burroughs, I procured some beef bones and nailed them on a large willow tree in such a position that I could readily see them from my study window; with the intention of attracting and noticing a few habits of our friend, the Downy Woodpecker.

Rather to my gratification I found that one of my little friends, a White-breasted Nuthatch, appreciated my kindness more than the Downys. The bones appeared to remain for several days entirely unnoticed, and I had almost given up hope, but on one snowy Sunday morning I happened to see my little friend busy at the bones; he would tug hard at a piece of fat until he pulled it off, if it happened to be a small one he would eat it, and if any rather longer piece was secured he would adjourn to a crack in the bark not far off and very neatly hide it in the crevice, and in a few cases would fly to an adjoining tree, and do the same with other pieces taken from the bones. By watching through an opera-glass I could see the end of the meat thus hidden protruding from the crack. What his idea was in so doing I cannot say, unless he acted on the principle of the dog who buries his bones, "to lay by for a rainy day."

One day when watching him work he stopped to take a look around, and caught me standing at the window, when he took his immediate departure, as if he thought he was intruding on private property and

was under danger of immediate arrest by myself. Loath to return so long as I was at the window, he kept flying from tree to tree, looking to see if I was about, and not till I left my place did he venture back.

Another rather interesting little instance happened about these bones. One morning while my little friend was busily partaking of his meal of beef, there came upon the scene a female Downy Woodpecker (the males have the red crown, this bird not having any). The Nuthatch immediately on the fresh arrival turned away from his feast, and quietly went around the trunk of the tree in search of other food. Whilst Miss Downy was helping herself there came upon the scene with a great chirruping several English Sparrows, who arranged themselves along a small branch directly over the bones, and in silence eyed the above mentioned lady. No sooner had Miss Downy left, than the sparrows came down in a body on a large knot just below the bones, but they could not get within reach of the prize, for, unlike the Nuthatch and Woodpecker, they had not the power of running up the side of a tree. It was very amusing to witness the apparent disappointment of the sparrows on finding themselves so badly baffled in their designs.

JOHN H. STEELE.

APRIL INSECTS.—The first flowers of spring teem with insects of many orders, but especially the Hymenoptera of the genera *Andrena*, *Halictus*, *Melissodes*, and *Nomada*, which have issued from their underground nests. The honey-bee (*Apis mellifica*), the carpenter-bee (*Xylocopa virginica*), and the bumble-bee (*Bombus*) are conspicuous. Among Coleoptera, the blister-beetles (*Meloidæ*) and the tiger-beetles (*Cicindelidæ*) are noticeable; and the painted clytus (*Cyllene pictus*), with its black-and-yellow banded coat, will be common in houses where hickory-wood is used in the fires. Among Lepidoptera, the blues (*Lycenidæ*), the monarch or milk-weed butterfly (*Danais archippus*), the Graptas and *Eudamus bathyllus* will be seen. Among Orthoptera, the *Acridium americanum* and *Cædipoda phænicoptera* will be noticeable among wintering forms on account of their large size.—*Science Almanac.*

Insect Collecting.

F. E. GRAY.

THIS is a subject about which much has been written, and there are many different ideas about the methods used, so that something new may be gained from each writer. I have been asked many times, what poison I used, and how I made my lure for night collecting. My experience may develop some points that will be of advantage to others.

The first thing to be thought of is the poison to be used to kill the specimens. Some have a preference for ether, others for cyanide of potassium. I find that the best chloroform is by all odds the safest, cheapest in the end, and produces better results than any other poison. Ether requires a longer time to kill than chloroform, while cyanide will not answer with many of our delicate-colored insects unless they are removed from the collecting bottle very shortly after being caught, for if left in a minute too long, the powerful poison will act on the delicate coloring matter and either completely destroy it or render it several shades lighter, thus spoiling the insect as a specimen. And what collector would wish to stop, should he be on the jump for an hour at a time, in a locality where insects are plenty, and no time to pause without the risk of losing some rare specimens, for it takes but a few minutes to spoil a specimen, so quickly does the cyanide eat into the tissues of the body and wings. It answers very well on our larger coleoptera, as they are very hard to kill, but even then, care has to be taken, for it is dangerous to handle, or even to breathe the fumes, as it is, with one exception, our deadliest poison. I have used chloroform for several years, and it has given me the best of satisfaction, with no danger in the handling. Cyanide stiffens the muscles of insects so that it is very difficult to set up a specimen after being killed, even if it is softened by exposure to steam; while chloroform merely stiffens them for a few moments, they quickly relax, and can be set up with ease several hours after being killed. I have had some of our most delicately colored moths soaked with chloroform in a collecting bottle for nearly half a day, and within two minutes

after their removal the chloroform would evaporate, and the colors come out as bright and clear as in life, and even after remaining in my cabinet for years, show no change in color, and for this reason I am inclined to think that it tends to fix the coloring matter, instead of hurting it.

Experience has taught me that few boxes and bottles are necessary, unless for an extended trip of several days. For a hunt around the suburbs of the city, I provide myself with a folding net, with a handle about four and a half feet long, for lepidoptera, a large-mouthed bottle holding a half-pint or so, and a smaller one for coleoptera, for in dying, the hard bodies and sharp tarsi of the beetles are apt to injure the wings of moths and butterflies, when put in the same bottle. Then, with a half dozen small boxes of different sizes lined with cotton, and a "digger" (a broad-bladed old chisel) for working around stumps and trees, I am fully equipped. The chloroform I carry in a small vial in a vest pocket. In preparing my collecting bottle, I cut three thicknesses out of cotton batting to fit inside the bottle, and glue lightly around the edges to prevent slipping, and when on the ground I pour ten or more drops of the chloroform on the cotton, renewing it in about an hour. When I have a number of insects in either bottle, I remove them to the boxes, and add to the same until they are full, for I find there is less danger of damaging specimens when closely packed than when only two or three are placed in each box. Paper cut for the purpose is a good thing to carry for large, fine specimens.

For a lure for night collecting, I have found that the best is made with a pint of ale or beer, either fresh or stale, with about a pound and a half of dark brown sugar thoroughly dissolved in it. Many collectors put the lure on the trees in the daytime and then collect from them in the evening; but I have found that when this is done the ants, those pests of insect society, will generally cover the lure before I am ready for work at night, and in such numbers that it is impossible for a moth to alight. About sunset I lure eighteen or twenty trees, putting one or two brushfuls of the lure on each, and then, after waiting fifteen minutes or so, find that it works to a charm. For

a lantern I use a large size "bull's eye." The best nights for collecting with the lure are those in spring when the weather is what we call "muggy." In the spring of 1883, when collecting from a lure, I captured 120 moths, besides a number of beetles, from a clump of eleven trees. The moths caught in spring are mostly the Noctuids and Geometrids. Night collecting with lure can be commenced about March 1st, and continued until the flowers bloom; then taken up about the middle of August, when our beautiful catocala moths can be taken in considerable numbers, besides many of our rarer Geometrids. I find that it is almost useless to lure the walnut or hickory tree, as very few insects will be taken from them, for what reason I cannot explain. If there is any tree where the sap is running freely in the spring, either from an abrasion of the bark or a cut from an axe, don't neglect visiting it day and night, as many insects will be caught thus which would not visit a lure.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER VII.

HAVING, by aid of the plan given in the previous number, determined the *genus*, the reduction to *species*, when we have several species under a single genus, as is the case with *Tropidenotus*, is, for Rhode Islanders, a comparatively simple operation. It will be noticed, however, that the several descriptions do not follow the artificial order of the plan, but are arranged in their natural order, the highest form being treated first.

1. *Crotalus horridus* LINNÉ. The Banded Rattlesnake was described by Linné, in 1758, as the most venomous of the serpent tribe, growing to a length of six feet, and as thick as a man's arm. Through the observations of later naturalists, however, the "rattler" seems to be a reptile venomous only to a slight degree, when compared with such forms as the deadly cobra of India. Though the sting of *Crotalus* may be extremely painful, it should never prove fatal if properly attended to. Sucking or cauterizing the wound, and drinking large quantities of spirits, are said to generally

check the serious effects of any ordinary attack. In our state the rattlesnake is occasionally met with among the northern hills. On being surprised it is lazy, and, instead of at once taking the offensive, ordinarily gives its alarm, provided it is old enough to possess a rattle, and then, if further pressed, may strike. Even if this happens the venom is not necessarily forced from the fangs, the snake seeming to realize that its supply of poison is not unlimited and if once exhausted it will be compelled to remain harmless until the glands have secreted enough to again fill the reservoirs. This is not the only form which makes its presence known by an alarm. Many of our "adders" when in dry leaves, by rapidly vibrating the tail, produce a sound so nearly resembling that of the "rattler," as to even deceive an expert. The rattle, a most common cabinet curiosity, is made up of a series of horny rings, each consisting of a posterior tongue-shaped portion, which is held in the hollow, cup-like, anterior portion of its succeeding fellow by a terminal knob, the so-called "button." It will thus be seen, that if a portion of the rattle is broken off, a "button" will always remain. As such an accident is not unfrequent, and since several new rings may be added during a season, the number of rings can in no way indicate the age of their possessor. It might further be added that many common snakes are provided with an horny appendage at the termination of the tail. This should not be mistaken for a rudimentary rattle by the amateur; the young as well as the old rattlesnakes are armed with poison fangs which at once distinguish them. In general form, *Crotalus* is short and stout, seldom four feet long.

2. *Ancistrodon contortrix* BAIRD AND GIRARD. (*Trigonocephalus contortrix* Linné.) The copperhead, viper, or deaf adder, has been placed among the Rhode Island snakes because of the numerous instances of its capture in neighboring localities. I can find no native specimen in such local collections as I have examined, nor any instance of its capture. This with the previous species are the only poisonous varieties likely to be found in our limited area, or in fact anywhere in eastern United States. Any facts in regard to either form would be particularly valuable.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. I.

It is the purpose of the writer to prepare for RANDOM NOTES a series of brief articles upon the trees indigenous to Rhode Island. Avoiding, as far as consistent with accuracy, mere technical terms and descriptions, it is intended to record such facts concerning our native species of trees as will afford an intelligible and fairly complete view of them at the time of writing. Whatever is peculiar to their growth or appearance, in this locality, will, so far as known, be stated. The local effects of climate and exposure, and of the different soils, upon the growth and production of the different species will receive attention. The economic value of the different kinds will be noted. And, finally, the relationship which our trees sustain to us as beautifiers of our homes and landscapes will receive occasional mention.

The necessity for brevity in the sketches to be given compels the omission of much that might be of interest, especially to the general reader; but it is hoped that what may be offered will, in some degree, promote the objects for which this periodical is published.

Generally speaking, the country comprised within the limits of New England is a natural forest region. The denudation which has taken place within Rhode Island has been gradually effected, as the settlement of the region demanded the land for agriculture, and the forest growth for timber and fuel. The islands of the state, once heavily wooded, have long since been laid bare; and a considerable part of the land bordering upon the Narragansett Bay and in the immediate vicinity of the larger towns, has shared the same fate. Sterility has frequently followed the destruction of the forest upon large areas; but where the denuded tracts have been neglected by the plow and have been protected from browsing by cattle, the natural tendency of the soil shows itself in a new growth of trees.

But there are still considerable tracts of the hard, stony lands, in the remoter parts of the state, almost exclusively devoted to the growth of wood; and, in nearly all parts of the state there are copses and

rows of trees preserved for their protection or as "wind breaks," and great numbers of small groups and of single specimens are allowed to stand for their shade and landscape beauty.

The state is believed to be notably rich in the variety of its natural ligneous growth. About fifty species of native trees (growing to thirty or more feet in height) are found here. Taking lead among these, in number of species, in economic value and scenic attractiveness, are those of which we first treat,— the

CUPULIFERÆ, OAK FAMILY.

QUERCUS, OAK.

Quercus alba, White Oak.

The oaks, here and elsewhere, are naturally divided into two sections:

1. Those which mature their acorns during the autumn of the first year. 2. Those which do not mature their acorns until the autumn of the second year. *Annual-fruited* Oaks, and *biennial-fruited* Oaks. Of the former the White Oak, *Q. alba*, may be regarded as the type. In Rhode Island it is a stately tree, found in numerous localities, in all parts of the state. It is found in company with other species of the oak, with the hickories, and various other trees, and is frequently mingled with a straggling growth of pitch pines and white birches. In certain localities it occupies the ground almost to the exclusion of other trees. Many years ago, when there was an active demand for ship-timber, for water-wheel shafts, etc., the hillsides and valleys of the state were culled for the best timber of this oak. This work made serious inroads upon the tree. A few specimens, too sturdy and rugged for the axe, escaped. To-day they are among the noblest trees of the state. The following specimens may be mentioned as especially noteworthy: A large symmetrical tree, upon Mr. Chas. E. Hall's farm, Fruit Hill, North Providence; height, 65 ft.; spread, 87 ft.; girth, 4 ft. up, 15 ft. 2 in. A large, finely proportioned tree, one mile below Hamilton Mills, North Kingstown; girth, 3 ft. up, 13 ft. 4½ in. The body is short, but it has a magnificent spread of top. The "Catholic" oak, in Lonsdale, is worthy of special note. The tree now has a spread of 86 ft. It was probably much greater before its original branches were

cut off. Its height is 70 ft., and its girth, 5 ft. up, is 15½ ft. Dr. C. W. Parsons has taken several measurements of this tree, the first being in January 1858, when its girth, 4 ft. up, was 13 ft. 4 in. It is said that, through the agency of the Rev. J. C. Richmond, acorns of this tree have been distributed through many towns of Germany, where its progeny are now growing. The religious services, which in former years were often held under this tree, have clothed it with a sacredness which reminds us of the venerated oaks of Europe in the days of the Druids.

The characteristics of this tree in Rhode Island, as it appears in well developed specimens, grown upon open ground, may be summed up as follows: Size, 1st class; short body, wide-spreading top, generally symmetrical, limbs stout, often much contorted, the branchlets short and stiff, striking out at wide angles; buds, small; leaves without bristles (the same is true of all the species in the White Oak division), presenting beautiful models of curving; acorns small, in a deep cup, sweet and edible; bark white, in loose scales. The tree is of slow growth, and may be called young at the age of a century.

Such has been the destruction of this tree that it is doubtful if there are a hundred well-grown, fully-developed specimens in the state.

Of all our northern oaks this is the most valuable for timber, ranking next to the southern "Live oak," and it is excellent for fuel. The distribution of this species is very extensive, it being found in nearly all sections of the United States, and as far north as Lake Winnipeg. It finds a congenial home in Rhode Island.

MR. E. J. SMITH writes: "I have lately tried an experiment in cleaning shells. I boiled some cones and a few others for three or four minutes in a strong solution of potash, and the epidermis came to pieces and fell off, leaving the shell clean and smooth, with no evil effect at all. Three or four ounces of Babbitt's potash to a pint of water is about the proper strength. (The mixture may be saved and used many times.) Scrub the shell with a stiff brush, and when it is dry rub with a cloth very slightly oiled, to obtain a fine gloss."

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XV.

37. ODOSTOMIA BISUTURALIS, SAY.

Syns.:

Jaminia exigna, Couth. Kuster.

Odostomia exigna, Gould. Stimp.

Rissoa rupestris, Forbes.

Chemnitzia bisuturalis, Stimp.

Turritella bisuturalis. Say.

Odostomia bisuturalis. Modern authors.

"Shell thin, pellucid, small, conic; whorls five, wrinkles almost obsolete, a revolving impressed line near the suture; suture not deeply impressed; spire gradually tapering, rather longer than the aperture; aperture rounded at base and perfectly entire. Length rather more than one-tenth inch. Inhabits Boston Harbor."

The above is Say's description. *Journ. Ac. Nat. Sci.*, Phila., II., 244, 1821.

Gould's *Invert. Mass.*, p. 328, 1870, says: "First found by Mr. Couthouy at Chelsea, near the ferry landing, adhering to decaying wood." Couthouy described it in the *Journ. Bost. Soc. Nat. Hist.*, II., 92, 1838, under the name of *Jaminia exigna*. How can this be? If Couthouy discovered it first, its name should be *Odostomia exigna*, as it belongs to this genus and not to *Jaminia* or *turritella*, but Say described it in 1821 as above, although not accurately in all points, yet enough so to give his name priority. The revolving line just below the suture, making the suture to appear double, gives it its specific name, which is most appropriate. The shell is one-fifth inch in length and one-tenth in breadth. It is white or light greenish in color, under a brownish epidermis, its apex is obtuse, and at the base is a small umbilicus, near which, on the inner lip, is a transverse white tooth or fold. It is one of the most common species in our bay, but from its minute size is liable to be overlooked. It is found on oysters and other living and dead species from the bottom of the bay, but is more plentiful on stones and dead shells between tides, and is found abundantly in the shell sand thrown up on the shore by storms. I have taken nearly a hundred living speci-

mens off a stone no larger than my hand lying nearly at *high-water mark*. It inhabits Massachusetts Bay to Long Island Sound.

38. *ODOSTOMIA TRIFIDA*, TOTTEN.

This species was discovered on the Island of Rhode Island by Colonel Totten, on valves of scallop shells (*Pecten irradians*, Lam.), and described by him in *Am. Journ. Sci.*, xxvi., 368, 1834, under the name of *Actæon trifida*. It inhabits the same localities as the preceding species, and is as abundant in Rhode Island, if not more so. It closely resembles *bisuturalis*, but is a little more slender in appearance, being one-fourth inch long by one-tenth wide. Its apex is acute, color glossy white, whorls eight in number, flat, separated by a sharp depressed suture, with three revolving lines below the suture and numerous fine lines on the front of the body whorl; the outer lip showing on the sharp edge the impressed lines; otherwise it resembles in all respects the above *bisuturalis*.

39. *ODOSTOMIA PRODUCTA*, ADAMS.

Syns. :

Jamina producta, Adams.

Chemnitzia producta, Stimp.

This species also inhabits the same localities as the two preceding, but is not at all common in Rhode Island. It is light brown in color, with eight whorls, nearly flat. It is more slender than either of the others, being a little over one-fourth inch in length by one-fifteenth in breadth; the apex is blunt, as if one or more whorls were removed; the surface is faintly marked by lines of growth; aperture about one-fourth the length of the shell, ovate, rounded in front, columella flexuous. It also differs from the others in having no umbilicus. It was discovered by Professor Adams, near Fairhaven, in 1839, and described in *Bost. Journ. Nat. Hist.*, iii., 322, 1840.

40. *ODOSTOMIA FUSCA*, ADAMS.

Syns. :

Pyramis fusca, Adams.

Jamina fusca, Adams.

Chemnitzia fusca, Stimp.

This species was discovered by Prof. C. B. Adams, at New Bedford, clinging to planks near low-water mark, and described in *Bost. Journ. Nat. Hist.*, ii., 282, 1839. It

resembles the preceding, but differs in several points. The apex is more obtuse than in *bisuturalis*, it has one to three more whorls, with a smooth surface and no revolving line under the suture; the aperture is broader and modified by a twist of the columella; the color is violet brown, glossy, darker at the tip. It is quoted from Vineyard Sound to New Jersey. Quite rare in Rhode Island. Length one-fourth inch, breadth three-fortieths.

41. *ODOSTOMIA DEALBATA*, STIMPSON.

"Shell ovate-conic, white, smooth, pellucid; whorls six, rather convex; aperture ovate, hardly effuse; furnished with a small inconspicuous fold. Length $\frac{17}{100}$ inch, breadth $\frac{6\frac{1}{2}}{100}$. Dredged in Boston Harbor, three fathoms, on a shelly bottom." (Stimpson.)

New Haven, Conn. (Perkins). "I have never seen this species."

42. *ODOSTOMIA SEMINUDA*, ADAMS.

Syns. :

Jamina seminuda, Adams.

Chemnitzia seminuda, Stimp.

Turbonilla seminuda, H. & A. Adams.

Shell acute-conic, white and glossy, translucent; whorls six or seven, the upper ones and one-half the body whorl covered with numerous ribs or folds crossed by three revolving equidistant lines, making the surface to appear covered with net work, while the lower half of the body whorl has four revolving lines, not reticulated; outer lip thin, scalloped by the lines. Length $\frac{15}{100}$ inch, breadth $\frac{7}{100}$.

This species was discovered by Prof. C. B. Adams, at Dartmouth, adhering to the valves of scallop shells, and described in *Bost. Journ. Nat. Hist.*, ii., 280, 1839.

Inhabits from Massachusetts Bay to South Carolina. Common in Vineyard Sound and Buzzards Bay, in 2 to 10 fathoms. (Verrill.) Greenport and Huntington, L. I. (S. Smith.) Fort Macon, N. C. (Coes.) Not very common in Rhode Island.

The only other species which might possibly inhabit our shores is the *Odostomia impressa*, Say, *Journ. Ac. Sci.*, ii., 244, 1822, being quoted from Long Island Sound to South Carolina. Say saw but two specimens, which he collected on the coast of Maryland.

(To be continued.)

CONCHOLOGICAL CHECK-LIST. XVI.

J. RITCHIE, JR.

Family. Helicinacea Pfr.

Sub-family. Helicinea Pfr.

Helicina lirata Pfr.

littoralis Montrz.

littoricola Gundlach.

lundi Beck.

lutea Lesson.

macgillivrayi.

macmurrayi Pfr.

maculata Sow.

malleata Pfr.

margaritacea Lea.

marginata Gundlach.

martensi Issel.

maugeriae Gray.

maxima Sow.

mediana Gass.

microdina Morel.

mittochila Cross.

miniata Less.

minuta Sow.

moquiniana Recluz.

moreletiana Pfr.

multicolor Gould.

musiva Gould.

nemoralis Gupp.

neritella Lam.

nicobaria Phil.

nitida Pfr.

nobilis C. B. Adams.

nodæ Arango.

notata Sallé.

nuda Arango.

occidentalis Gould.

occulta Say.

oceanica Pease.

oleosa Pfr.

orbiculata Say.

orbigny Pfr.

oweniana Pfr.

oxytropis Gray.

pallida Gould.

paraensis Pfr.

parva Sow.

parvala Pease.

pellucida Sow.

pfefferiana Arango.

phasianella Sow.

Helicina pisum Phil.
 platychila Mhlf.
 plicatilis Mouss.
 plicatula Pfr.
 poeyi Pfr.
 politula Poey.
 porphyrostoma Cross.
 primeana Gass.
 psorica Morel.
 pulcherrima Lea.
 pygmæa Pot. et Mich.
 pyramidalis Sow.
 raresulcata Pfr.
 reeveana Pfr.
 reticulata Pfr.
 rhodostoma Gray.
 rhynchostoma Shutt.
 rohri Pfr.
 rostrata Morel.
 rotella Sow.
 rotunda Orb.
 rubella Wright.
 rubicunda Pease.
 rubromarginata Gundlach.
 rufescens Pease.
 rugosa Pfr.
 rustica Pfr.
 sagraiana Orb.
 salleana Pfr.
 salvini Tristr.
 sanguinea Pfr.
 seropulorum Morel.
 scrupulum Benson.
 semperi Mouss.
 shanghaiensis Pfr.
 silacea Morel.
 similis Sow.
 sinuosa Pfr.
 solida Pease.
 solidula Gray.
 sophia Brazer.
 sordida King.
 sowerbyana Pfr.
 spectabilis Gundlach.
 sphaeroidea Pfr.
 straminea Morel.
 straminea Pease.
 strebelli Pease.

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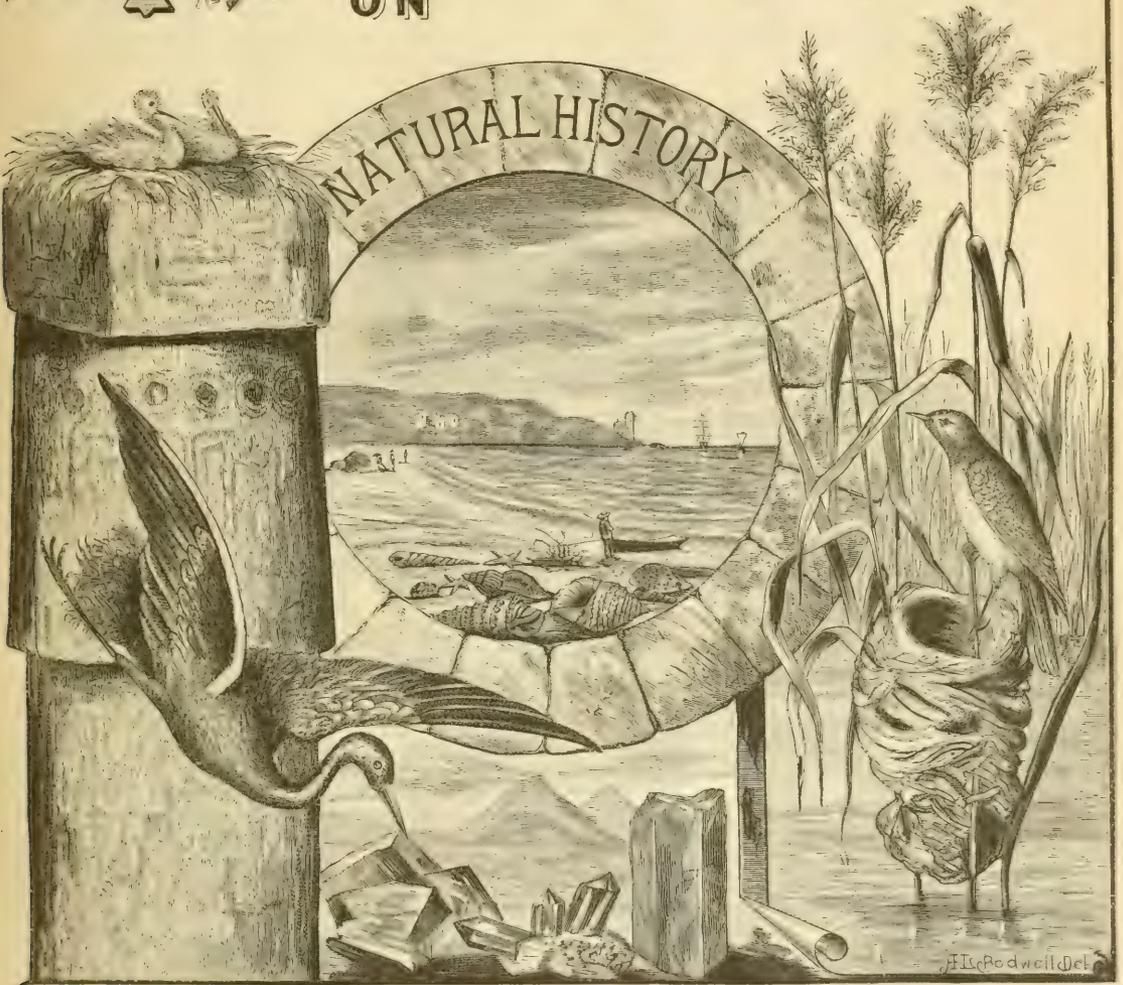
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Vol. II.

PROVIDENCE, MAY 1, 1885.

No. 5.

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A Collecting Trip to Cape Cod.

(Continued.)

As soon as the boat was in the water I was making for those birds for all I was worth, and in a few moments a pair of Northern Phalaropes lay upon the water about forty yards apart. While picking them up, the boat drifted by the swiftly incoming tide, was several hundred yards from where it started, and after beaching it at the nearest point I hastened to my companion, whom I dispatched for the two lads who rowed for us, while I put cotton in the mouths of the birds we had taken and did each up in a paper. The boys were loth to leave their decoys to hunt the new birds, even when we offered them five cents each for every bird that was killed, no matter who killed it. The boys did not pull very energetically until a flock of thirty or forty were sighted, when they partook of some of our enthusiasm. This flock was moving against the tide with the same playful motions, those in the rear flying over and dropping in the water in front of the others, and in this way about one quarter of them were in motion all the time.

Our lads succeeded in pulling alongside at a distance not to scare them, and, getting ahead, we paused broadside directly in their course. On they came, entirely unconscious of danger, and our fire killed and wounded seven or eight. We drifted nearly half a mile northward while picking them up, and then began the hunt for them again. This time we sighted them nearly half a mile south of where they were previously, but, though the lads pulled hard, they were unable to get in front of them

again, or even within gunshot from the side. Over and over one another they went, keeping the same distance ahead and to one side, until, reaching the narrows, they wheeled, and flew away to the north, farther than we could keep our eyes upon them.

We put about and met them coming, as before, and secured a couple, after a hard pull. Repeating this a few times more, with poor success, we found the flock had separated into smaller ones and pairs, and we had little trouble in securing them. They were now resting or swimming, and not constantly leaving the water. One bunch of nine was all cleaned up with our four barrels. In less than three hours' time the boys earned \$1.85 each, and had a very good opinion of Phalarope hunting.

The next day, at flood tide, we found another flock of considerable size on the flats and succeeded in getting sixteen more. This flock was about the inlet, and we followed them as far to the ocean as it was safe for a dory to go. We now saw where we had been on the Monday night previous, actually into the edge of the breakers.

The female Northern Phalarope is much handsomer than the male, and though not able to equal the Wilson's in beauty, yet in spring dress it is one of the very handsomest of our shore birds. These Phalaropes are known to fishermen as "whale birds," and are usually to be met with off shore, and probably not within several miles of the land.*

After the Phalaropes had gone upon the ocean we set out our decoys and secured a fine lot of Red-breasted Sandpipers, Turnstones, and Sanderlings. We saw flocks of Black-bellied Plover, but could not decoy them, as they are very shy and difficult to obtain in the spring, and if one individual is among a flock of other birds, it leads and usually keeps them out of danger.

Arctic and Wilson's Terns were abundant,

* Mr. Dutcher, in the January, '84, *Auk*, writes of the abundance of this bird at Long Island during the same two days that I met them.

but each seemed to keep in flocks by themselves. But one Roseate Tern was obtained. A few pairs of Least Terns breed on the sand bar. They seemed to be mating, for they were flying in pairs at a height of 100 yards from the ground, one chasing the other almost constantly. One Greater Yellow-leg and a single pair of Red-breasted Snipe were observed. A flock of about thirty Bonaparte's Gulls, all in the young plumage, would fly about and very near us, seeming less shy than any of the Terns. We obtained from a boy one set of Piping Plover's eggs just before our departure on the 29th, and when we left nearly all the migrants had passed, except Sanderlings.

May Insects.

In this month the hibernated legion is warmed to new life, and the number of species occurring is too great to warrant special indication. The large tiger swallow-tail (*Papilio turnus*) darts swiftly about, while a lot of humbler butterflies are seen. Those gigantic beauties of the night, the *Cecropia* moth (*Platysamia cecropia*) and the *Polyphemus* moth (*Telea polyphemus*), are seen hanging listless as they just issue from their cocoons, or pass bat-like at dusk overhead.

Some of the hawk-moths (*Sphingidae*) already begin to hover at twilight over honey-yielding flowers. The carpenter moth (*Xyletus robiniae*) will be found early in the morning, resting on the trunk of the black locust, from which the empty pupal exuvium sticks out as an index. A host of *Hymenoptera* make their advent; and noticeably the gigantic saw-fly (*Cimbex americana*) will be found ovipositing in willow leaves, and the pigeon Tremex (*Tremex columba*) in old maple trunks. The buffalo-gnat (*Simulium*) swarms in the lower Mississippi country. The fruit-grower finds the plum curculio (*Conotrachelus nenuphar*) making its dreaded crescent-mark on his fruit, and the canker-worms blighting his apple-trees. The housekeeper observes with dread the various clothes-moths (*Tinea*) and the carpet-beetle (*Anthrenus scrophulariae*). But the latter part of the month is chiefly characterized, first, by hosts of delicate May-flies (*Ephemeroidea*); second, by the swarms of May-beetles (*Lachnosteria fusca*), which begin to defoliate oak-groves and poplar trees.—*Science Almanac*.

In reply to a letter concerning the breeding habits of White-bellied and Violet-green Swallows, Mr. R. P. Chandler writes: "The White-bellied Swallow nests in dead limbs of trees and old nest-holes of woodpeckers, and lines the nest with feathers. It has a strange habit of flying around with sharp turns whenever the nest is disturbed, and if a feather is tossed from the nest into the air it will invariably dart after it, and catching it in its mouth will return with it at once, and without regard to the collector replace the feather in the nest. I have known of a number, and have taken three myself by placing my hand over the hole after the swallow had entered. The Violet-green Swallow, while nesting in similar situations, is very shy, and also does not build to any extent in the valley, being found only (to my knowledge) in or near the mountains."

CORRECTION. — In our issue of last March, in an article by Mr. E. J. Smith on the color of birds' eyes, Pileolated Woodpecker should read pileated; Guiard's Jay, Guiana Jay, and the plumage of the Avocet should read fall instead of full plumage.

COMMON CORMORANTS IN RHODE ISLAND. — A fine specimen of this bird in full breeding plumage was sent to us from Newport, R. I., March 27, and another was received which was killed at Nayatt Point April 10. These are the first specimens taken in this state that have come under our observation.

MORE HAWK OWLS. — One taxidermist reports receiving eighty and another twenty Hawk Owls during the past season. A remarkable fact concerning this bird is that while it visited our three northern states and New Brunswick by the hundreds, to our knowledge not a single specimen has been taken as far south as Massachusetts.

MR. H. C. CHAMPLIN writes us that he has received a partially Albino Robin. The following day we received a similar specimen from Washington Territory. Among our birds the American Robin, or migratory thrush, is oftener than any other species found in an albinistic form. During the past nine years we have owned six fine specimens, one of which, a pure white, is now in the collection of Mr. F. T. Jencks.

The Rodentia of Rhode Island.

(Continued.)

THE FLYING SQUIRREL (SCIUROPTERUS VOLUCELLA), (PALLAS), GEOFFREY.

THE nocturnal habits of this beautiful species render an estimate as to its abundance rather difficult. The specimens that have come to our notice have been obtained in Cranston, Johnston, West Greenwich, and Bristol, and it is probable that it is by no means scarce.

The hours of daylight are usually spent in sleep, in hollow trees, often in old nest-holes of woodpeckers, where are born from four to six naked young. April 16, 1884, Mr. Charles Doe found a nest lined with soft hair, like that of a rabbit, with four young, estimated to be only a few days old. It was situated about five feet from the ground, in an old stump so much decayed that it was easily tumbled over and broken in pieces. The mother ran a little distance and stopped, and when pursued made little more exertion than was necessary to keep out of reach, seeming with a method to entice the intruder away from her home. Early in May Mr. Doe found another nest, fifteen feet from the ground, in a maple, and an interesting incident in connection was the fact that in a tree only six feet away was a Red-shouldered Hawk's nest, from which four eggs were taken.

Late in April, 1883, a female was brought to us, and shortly after, four young were born. We fed the family on nuts and fruit; they grew rapidly, and by the middle of July were well furred and nearly as large as the mother. They were charming pets.

According to Dr. C. Hart Merriam, they maintain a liberal diet of nuts, seeds and buds, beetles and perhaps other insects, and do not hesitate to eat flesh, in confinement eating birds' eggs and dead birds, the heads of which they particularly relish.

The mature animal is about six inches long, the tail five inches; the fur is very plentiful and silky; all the upper parts are dark gray, washed over with brown; all the under parts a glistening white, often with a creamy tint; the tail is flat, very closely furred, and usually carried out behind in a graceful curve, or allowed to drop below the body. The large and prominent eyes are a most notable feature; the skin on

either side of the body grows out, presenting, when the limbs are extended, a flat surface from the wrist to the ankle. By means of this development it is able to make, with no apparent effort, most astonishing flights or leaps from the tops of tall trees. As Audubon says, "One would be seen darting from the topmost branches, and with wide extended membranes and outspread tail, gliding diagonally through the air, till it reaches the foot of a tree about fifty yards off, when at the moment we expected to see it strike the earth it suddenly turned upward and alighted on the body of the tree."

In the Rhode Island State collection, now at New Orleans, is an albino specimen, reported as captured in Johnston. The entire peltage is a smoky white.

We have never known of a capture during the winter months, nor of the taking of a specimen of the larger species, the Northern Flying Squirrel (*Sciuropterus volucella hudsonius*) (*Gmelin*) Allen. The probabilities are that it does not occur with us. S.

A Seasonable Diet.

MERGANSER GOOSANDER FISH DUCK. — This bird is perhaps the greatest fish murderer extant. Much has been said about the Mink, Otter, Herons, Loons, and Cormorants as fish destroyers, but in many years of experience in preparing specimens I have never before found such a gorge in any of them, and think they are respectable denizens compared to our present subject, which was recently killed at Lake Ontario. I removed 127 fish from its throat, ranging from one and a quarter to three and a half inches in length, and consisting of full-grown minnows, young bass, and others. Whether these were intended for a meal or a lunch only, is hard to determine. The bird evidently was observing Lent with some relish. THOS. W. FRAINF.

ROCHESTER, N. Y., March 26.

MESSRS. DICKEY & ALLEN write: "The iris of the Snowy Owl is straw, of the Sharp-shinned Hawk red, as observed from living specimens. The White Owl was sent from Dakota. We have given him a very large cage. He takes his beefsteak regularly and is not averse to eating roast or stewed beef.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. II.

QUERCUS OBTUSILOBA — MICHEAUX.

QUERCUS STELLATA — *Willdenow.*

Post Oak — *Rough or Box Oak.*

The *Q. obtusiloba* is not a common tree in Rhode Island. There is but one locality in the state, known to the writer, where it is found, and that is in the vicinity of the northern bend of Wickford harbor, in North Kingstown. About three miles from Davisville station, on the Stonington railroad, less than a mile from "Devil's Foot Rock," south, and near to, the "Driftway" road leading to the residence of Hon. Joseph Spink, is an interesting group of this species of oaks. They grow upon some ridges of drift or coarse gravel, which slope to, and join, low marshy ground extending to a spur of the harbor. I have been unable to find record of this tree growing upon any other spot so far north as this. Micheaux speaks of it as a notable fact that he found the tree on the west bank of the Hudson opposite New York; and attributes its occurrence at this point to the softening influence of the sea breezes. At Oak Bluffs, Martha's Vineyard, are found many trees of this species, forming, near the shore, a characteristic and attractive feature of the scenery there. The existence of these trees at the Wickford locality is one of several facts connected with the ligneous growth of the state, going to show that in Rhode Island the distinctive floras of the northern and central sections of the country to a considerable extent meet and mingle with each other.

This tree, when well developed, is one of very marked characteristics. In open ground, it forms a low, orbicular head of remarkable density. The branchlets and leaves lap over each other in such a manner as to suggest a thatched roof, and standing beneath it one could hardly catch the sunlight. The tree limbs very low, the branches striking out at first at right angles, later, bending downward, and, generally, much contorted. The leaves have strikingly notable features. They are coriaceous, stiff, dark-green, and very rough on

the upper surface; on the lower, whitish, softer and downy. They are on short, stiff, footstalks, and are so arranged at the ends of the branchlets, in close-set, stellated tufts, as to suggest the term, "*stellata*." The typical leaf has a deep sinus on each side, about one-third from the base, the upper portion being divided into three divergent lobes, which are often subdivided. The buds are short, thick, and rounded, but not large. The acorns are small, nearly sessile, in a broad cup, covered by numerous smooth, close scales. They are sweet and edible, neat and attractive. This oak belongs to the annual-fruited section, and is closely allied with the *Q. alba*. The bark is grayish-white, rough, deeply furrowed, and broken into oblong portions. The wood is highly esteemed for timber, having most of the valuable characteristics of the *Q. alba*, or white oak. This tree grows well on a light, sandy, or gravelly soil, and would probably do so in sheltered places anywhere in Rhode Island. It should be stated that different specimens of the Wickford group of these trees vary so much in essential points as to furnish reliable evidence of their hybridizing with other species of oaks.

Lecture by D. W. Hoyt, on Soundings in and Around Narragansett Bay.

The twelfth and closing lecture in the Franklin Society course was delivered by Mr. David W. Hoyt, vice-president of the society. His subject was "Studies of Soundings in and Around Narragansett Bay." It was illustrated by maps and diagrams.

After alluding generally to the results of deep-sea soundings, Mr. Hoyt directed the attention of his hearers to a colored map of Narragansett Bay, one color representing the water that is between fifty and one hundred feet deep at the present time, and another color representing the water that is more than one hundred feet deep. He then showed what would be the outline of the coast if the continent were raised fifty

feet. In this case every island in the bay would disappear, all of the islands being merged with the main land. Of the bay, only a small river would remain, running from northeast to southwest. This river would be generally half a mile wide, and in no place more than two miles wide. If the continent were raised one hundred feet, all that would be left of Narragansett Bay would be a little patch of water, which would be out some distance in the present Atlantic. This bay that would remain would be very shallow, and about nine miles long and seven miles wide. Long Island Sound would become a small bay, Block Island and Long Island would be one, but Block Island and Martha's Vineyard would not be one. All the islands in this locality would become parts of the main land. Buzzard's Bay would disappear. If the continent were raised 200 feet, all that would be left of Long Island Sound would be two little lakes, all the shoals fifty-five miles southeast of Nantucket would become part of the dry land, and Cape Cod would become extended north to the latitude of Boston. All the water thirty-four miles south of Beaver Tail would disappear. Narragansett Bay would be a deep-seated feature of the earth's surface, many miles south of its present location. The lecturer then went on and explained in detail the wearing away of the coast to its present form, the glacial theory, with which scientists are familiar, and the new theory of the school of younger scientists, who maintained that the earth is rigid, and that the changes on its surface have been caused by the rise and fall of the water. The theory is propounded to account for the change of level that at one pole or the other, great accumulations of ice changed the centre of the earth's gravity, which drew towards themselves the water, and the water being thus drawn towards the ice, changed the level. There is no question that the unglaciated pole would have its water lowered. To the lecturer this theory commended itself in preference to the one that has previously prevailed. In the course of his remarks the lecturer said that Narragansett Bay was not caused by glacial action. It runs back farther than that, although it was doubtless in some respects modified by such action.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER VIII.

3. *Ophibolus doliiatus* var. *triangulus* COPE. The Milk Snake, or Chequered Adder, was undoubtedly at one time quite abundant, though its fearlessness in approaching cellars and other frequented places while in search of mice has so often resulted in its death that the species is now becoming quite rare. It is a most beautiful animal, of a milk-color above and ornamented with a dorsal row of brown blotches and two lateral rows of spots of a similar color. The abdomen is silvery-white, tessellated with black. The general outline of the body is slender, the reptile sometimes reaches the length of four feet.

4. *Diadophis punctatus* BAIRD and GIRARD (*Coluber punctatus* LINNÉ). This bright-colored little fellow, the Ring-necked Snake, is quite abundant in certain portions of the State, and is at once distinguished by its white collar and black tie, dark green back and bright orange-yellow front, the ventral scutes often bearing one or more dots. In its habits the Ring-Snake is a most timid animal, spending much of its time hid beneath the bark of old logs or under stones. From its beautiful coloring and pleasing habits this form is often made a pet of, and soon becomes accustomed to its new surroundings. Its food consists of grasshoppers and other insects, to capture which it is often seen, especially after showers, some distance from its place of concealment.

5. *Cyclophis vernalis* GUNTER. The Green Snake is a most gentle and harmless ophidian, allowing itself to be handled in the roughest way without offering the least opposition. Specimens are often captured and made pets of, living in confinement for considerable periods of time. In nature they are found in the moist meadow-lands, where they are concealed by their protective color, and where they find an abundance of insect life well suited for their food. The Green Snake is not alone found on the ground, however, but is an active climber, and may not infrequently be seen entwined among the branches of bushes and low trees.

6, 7. *Elaphis guttatus* var. *vulpinus* GARMAN (*Scotophis vulpinus* B. and G.). This form, the Fox Snake, has not been recorded in Rhode Island, nor has its congener, the Alleghany Black Snake *Elaphis alleghaniensis*. This latter form has received considerable attention from its distribution. It was first detected in New England along the Connecticut Valley, where it attracted attention as a black snake having the scales keeled, the ordinary *Coluber constrictor* having the scales smooth. Both representatives of *Elaphis* have been captured in Massachusetts.

8. *Coluber constrictor* LINNÉ, or the Black Snake, is too well known to need specific description. It is found all over the Eastern United States, ranging from Nova Scotia to Texas, and most often found in the neighborhood of water, being particularly partial to thickets of alders, where it can find toads, mice, and birds. As it is an excellent climber, it is often seen among the branches of small trees and bushes, hunting for young birds "in the nest." While on these plundering expeditions the reptile is often followed by a troop of small birds in the greatest flutter of excitement. The Black Snake does not always remain in unfrequented localities, however, but is often surprised in old fields, by the roadside, and will even enter barns and seize chickens. At these times the rapidity with which it retreats on being disturbed has given the animal the name of "Racer." As long as retreat is offered there is no resistance, though if cornered, or during the breeding season, the usual mild temper gives place to a most irascible disposition, which is very characteristic of the animal when in confinement, as it is always quarreling and biting its fellow-prisoners as often as the opportunity presents itself. That he is a constricting snake, as the name would imply, is extremely doubtful, as no representative has ever been observed to kill its prey by pressure of the encircled folds of the body.

The young of this species are peculiar; instead of being black as the parent, they are an olivaceous color, ornamented with a dorsal series of dark-edged brown spots, with lateral rows of spots of still darker shade. The head is dark chestnut mottled with brown.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XVI.

FAMILY 33. Pyramidellidæ, Gray. Not represented in New England.

FAMILY 34. Littorinidæ, Troschel, consists of eight living and two fossil genera. The littorinas or periwinkles are mostly littoral shells, feeding upon sea-weed, and are found on the sea-shore in all parts of the world. Two genera, *Littorina* and *Lacuna*, are found in Rhode Island.

GENUS LITTORINA, FERUSSAC.

Distribution, 175 species, four of which inhabit Rhode Island. Shell turbinated, thick, pointed, few whorled; aperture rounded, outer lip acute, columella flattened, imperforate; operculum pancispiral. Animal edible.

43. LITTORINA PALLIATA, SAY.

Shell globular, solid, smooth and shining, color extremely variable, from pure white, through yellow, orange, reddish, slate and brown to nearly black; sometimes banded, striped or spotted with light and dark shades, but generally of some uniform color; whorls four, the body whorl very large, the others small and scarcely rising above it; spire depressed; apex obtuse; suture very faintly marked; aperture nearly circular; outer lip beveled within to a point, inner lip broadly flattened, white. This shell rejoices in some eight or more synonyms. It was described by Say, *Journ. Ac. Nat. Sci.*, Phila., II., 240, 1822, under the name of *Turbo palliatus*, and has been found from New Jersey to the Arctic Ocean; Greenland, Spitzbergen, Finmark and Norway, also in the British Isles. In Europe, it is known under several names, by authors who do not recognize Say as its discoverer. Gould gives its length as eight-tenths of an inch, breadth, nine-tenths. There can be no locality where they are more abundant than in Rhode Island, but they never grow here to near the size mentioned. They are found at Rocky Point abundantly, and in all other places in our bay where there are rocks, feeding upon the rockweed. They are equally abundant

on the ocean rocks at Newport, and far up the river where the water is only slightly salt.

44. LITTORINA RUDIS, DONOVAN, 1800.

This shell has more than twenty different names. It is very variable in size, shape, etc., and these varieties have been named over and over again by different authors. It inhabits from Long Island to the Arctic Ocean; Greenland, Iceland, and Europe, and as far south as Spain. The English shells are much larger and more solid than the American, but a variety found there, and called *Littorina patula*, Jeffries, almost exactly resembles our Rhode Island species. Gould gives its length as one-half inch, breadth, two-fifths; but in this little state shells do not seem to attain the size of those in Massachusetts; at least, some species do not.

This species is found in company with the preceding, on rocks, but generally much higher. They are the first shells to be uncovered by the tide, and are often to be found above high-water mark, where they are only occasionally reached by the spray. They frequent old wharves, and are found more plentifully on small stones than *palliata*, which prefers rocks.

The principal distinguishing characteristics of *rudis* and *palliata* are as follows: *Rudis* has an elevated spire, with a distinct sutural line; *palliata*, as described above, is precisely opposite; the surface of *rudis* is covered with conspicuously cut revolving lines; *palliata* is smooth and shining; the lip in *rudis* is compressed in front so as to form an angle; in *palliata* it is nearly round, and the color of the shell is generally of a uniform ashy gray, or slightly yellowish or olive, although sometimes banded with white, but does not exhibit the variety of colors of *palliata*. There are several other minor points of difference, but these will sufficiently distinguish the species.

45. LITTORINA TENEBROSA, MONTAGUE.

Prof. A. E. Verrill, in *Invertebrate Animals of Vineyard Sound*, page 357, 1874, considers this species only a variety of *rudis*, but most authors will not indorse this opinion, and, I think, although it resembles *rudis* very much, its habitat and a close examination of the shell and animal will

prove its non-identity. The three species, *palliata*, *rudis*, and *tenebrosa*, inhabit the same extended range, but not the same kind of locality. It is found in salt marshes, on stems of grass and on mud. When the tide comes in it tries to avoid it by climbing up the stems of the grass, and as the tide retires it crawls downward. It observes the same peculiarity of habit when found, as it sometimes is, upon wharves and bridges where the water is sluggish. It would not be found where the current is strong, as under India Point or Red bridge, or on rocks, or exposed to the surf of the open ocean. It is covered by the salt water but a very brief period during the day, and can live out of the water several days. The animal has a dark, olive head; that of *palliata* is orange. The shell is about the size of *Littorina rudis*, with a spire not so elevated as in *rudis*, but more so than in *palliata*; it has five or six whorls (one more than the other two), marked with revolving lines, but not so heavily as in *rudis*; its color is dark brown, checkered with interrupted lines or spots of buff color; this is the most prominent characteristic; the interior of the aperture is purplish brown, that of *rudis* is brown edged with yellowish white, and that of *palliata* is tinged by whatever color the exterior happens to be.

46. LITTORINA LITTOREA, LINN.

This shell is *the* periwinkle par excellence; the most abundant shell of Northern Europe, and is consumed as an article of food in immense quantities. Two thousand tons are annually eaten in London alone, employing a thousand people in gathering it. In Liverpool every street corner has its winkle stand, kept by old women, who sell the luscious univalve, boiled and ready to be eaten, just as we have, in their season, baked peanuts, roasted chestnuts, etc.. The animals are picked out with a pin, and the shell thrown in the gutter.

In some manner, this species was introduced into Halifax, N. S., where it became naturalized, and has gradually spread down the coast. In a paper by the writer, read before the Providence Franklin Society, Nov. 21, 1871, the remark was made, that "this species has been found on the

(Continued on page xix.)

CONCHOLOGICAL CHECK-LIST. XVII.

J. RITCHIE, JR.

Family. Helicinacea Pfr.
 Sub-family. Helicinea Pfr.
Helicina striata Lam.
 striatella Pot. et Mich.
 striatula Sow.
 subdepressa Poey.
 subfusca Menke.
 subglobosa Poey.
 sublævigata Pfr.
 submarginata Gray.
 substriata Gray.
 sulcata Pfr.
 sylvatica Orb.
 tahitensis Pease.
 tamsiana Pfr.
 tectiformis Mouss.
 tenuilabris Pfr.
 tenuis Pfr.
 testudinalis Mouss.
 theobaldi G. Nevill.
 tilei Pfr.
 titania Poey.
 togatula Morel.
 trochiformis Sow.
 trochulina Orb.
 tropica Jan.
 trossula Morel.
 turbinata Wgm.
 uberta Gould.
 umbonata Shutt.
 unidentata Pfr.
 unifasciata Gray.
 variabilis Wagn.
 vernalis Morel.
 versicolor Pfr.
 vinosa Shutt.
 viridis Lam.
 vitiensis Mouss.
 wrighti Pfr.
 zebriolata Pfr.
 zephyrina Duclos.
 zoæ Pfr.

Schasicheila alata Menke.
 bahamensis Pfr.
 minuscule Pfr.
 nicoleti Shutt.
 pennacea Morel.

Alcadia brownei Gray.
 citrinolabris C. B. Adams.

Alcadia consanguinea C. B. Adams.
 dissimulans Poey.
 dubiosa C. B. Adams.
 gonostoma Gundlach.
 gossei Pfr.
 hirsuta C. B. Adams.
 hispidula Pfr.
 hollandi C. B. Adams.
 incrustata Gundlach.
 macilentata C. B. Adams.
 major Gray.
 mamilla Weinl.
 megastoma C. B. Adams.
 microstoma C. B. Adams.
 minima Orb.
 palliatata C. B. Adams.
 pusilla C. B. Adams.
 rubella Pfr.
 solitaria C. B. Adams.
 succinea Pfr.
 velutina Poey.

Phaneta everetti H. Adams.

Sub-family. Georissea Pfr.
Georissa blanfordiana Stoliczka.
 fraterna Theob. et Stol.
 frustillum Benson.
 illex Benson.
 liratula Stoliczka.
 pyxis Benson.
 rawesiana Benson.
 sarrita Benson.

Chondrella striata Pease.

Family. Proserpinacea Pfr.
Ceres salleana Gray.
Proserpina bidentata C. B. Adams.
 depressa Orb.
 discoidea C. B. Adams.
 colina Duclos.
 globulosa Orb.
 linguifera Jon.
 nitida Gray.
 opalina C. B. Adams.
 pisum C. B. Adams.
 pulchra.
 swifti.

Proserpinella berendti Bland.
Cyane.

(Continued from page 39.)

coast of Maine, and perhaps before many years will find its way into our bay, and become one of our staple articles of food." In 1880 I noticed it at Newport, and in 1882 at Nayatt Light-house, and last summer it was found everywhere in our bay. It is abundant enough with us now to feed the entire population of the state, and no doubt, when its virtues become known, will prove a very valuable and popular edible. I throw out a hint to owners of oyster-beds, if they are troubled with an excess of sea-weed, to gather quantities of these shells and scatter them over the beds, [as they live upon sea-weed and will do the oysters no harm. The shell is variable, but is always quite solid, a little glossy, about one inch or more in length, sometimes an inch in breadth, generally black or brown in color, with six or seven whorls, apex acute, and suture simple, fine and well marked. Gould's *Invertebrata of Mass.* has a page and a half of description of this species.

(To be continued.)

RANDOM NOTES for January, 1885, contained a list of rare eggs and skins from Arizona; February, a long list of skins and eggs wanted, and of what we have for exchange; and April, a price-list of mammals and turtles, and a supplement to our new price-list of eggs. Any of the above numbers, 6 cents each.

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7	05	50	02	12	35
8	07	60	02	14	40
9	08	70	03	16	50
10	09	80	03	18	70
11	10	90	04	20	80
12	12	100	04	22	85
13	14	110	04	25	100
14	17	120	05	35	140
15	19	130	06	45	160
16	20	140	07	50	180
17	23	150	08	60	200
18	26	160	09	70	220
19	28	170	11	85	250
20	32	180	14	110	300
21	40	200	18	150	350
22	50	250	20	175	400
23	60	300	22	200	450
24	70	350	24	225	500
25	80	400	28	300	600
26	90	450	34	350	700
27	100	500	40	400	800

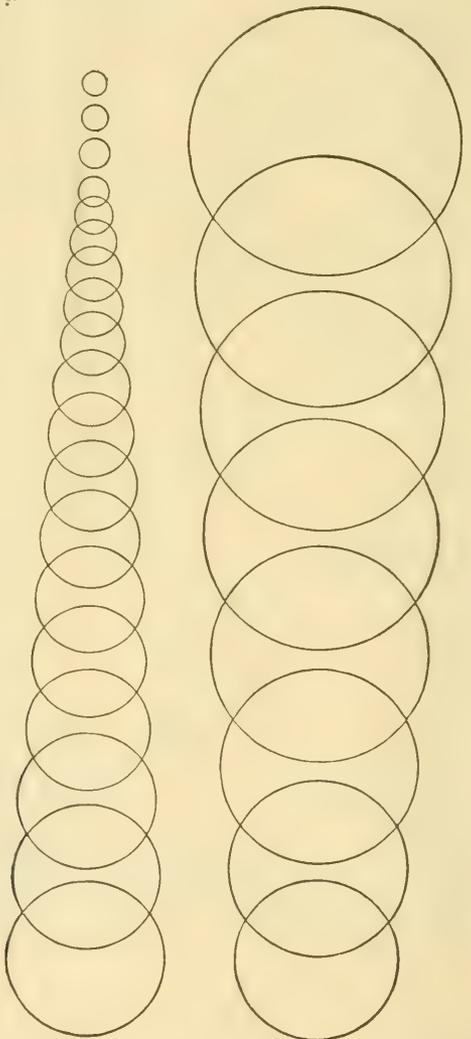
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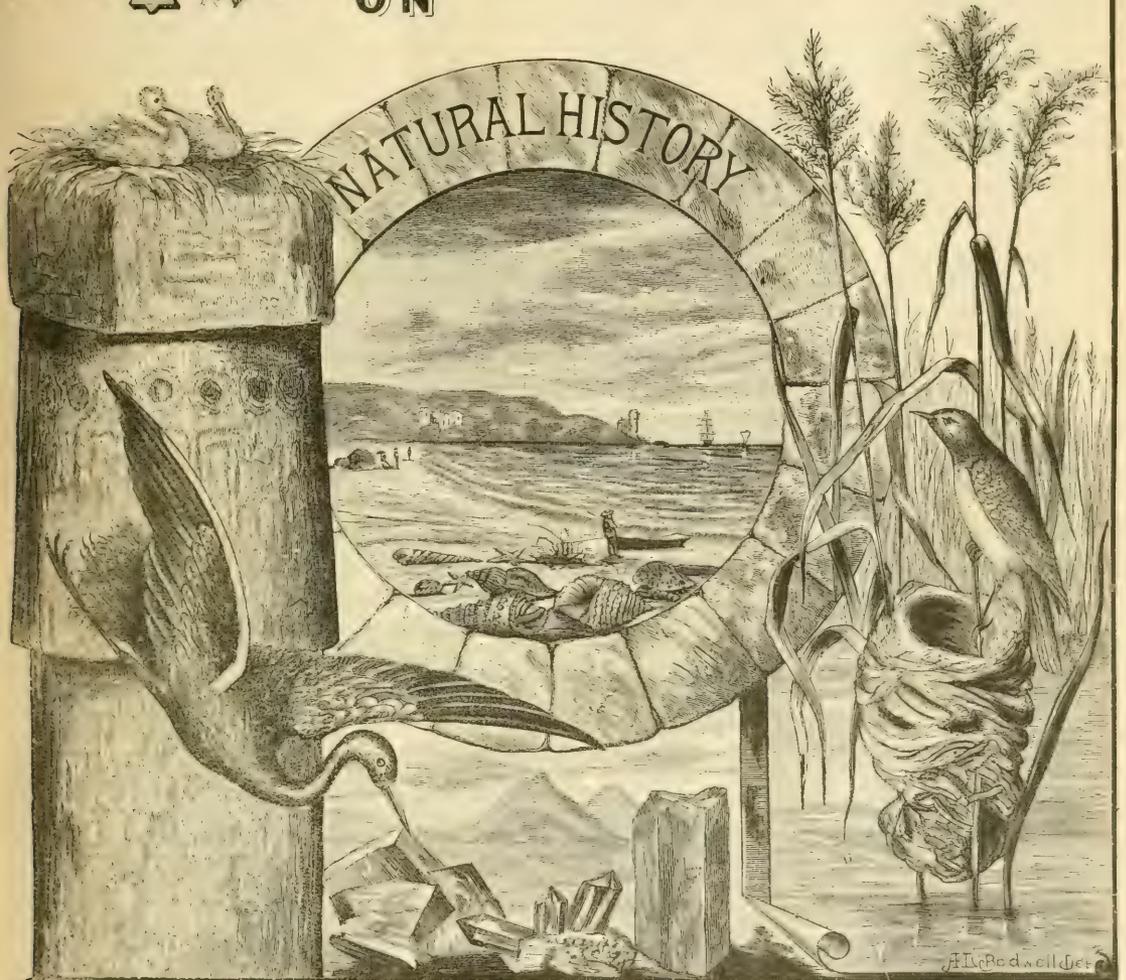


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THE annual meeting of the Newport Natural History Society was held Thursday evening at the Redwood Library. The special fund deposited for the aquarium amounts to \$1,298.80. Prof. Raphael Pumpelly was elected president for the ensuing year.

The report of the curator contained so many pertinent suggestions relative to the making of natural history collections, that we can do no better than to print, for the benefit of small societies, so much of it as our space will permit. After preliminary remarks, the curator said: "A list of the donations is appended to the present report; and the objects themselves, it is satisfactory to state, have during the last few days been deposited in a room, which, after careful consideration, has been rented for one year by the society, as a central depot. This room is in the rear of the Sanitary Association's office, opposite the Redwood Library, on Bellevue Avenue; and, while singularly modest in its dimensions, your council believe it may suffice for some time for the purposes in view. These are to preserve carefully the donations presented, and to have a central point to which further contributions can be sent.

Referring to section V. of your by-laws, I beg respectfully to point out that you have there provided that only such objects as have a scientific value are admissible to

your museum. This is a salutary provision, without which, natural history collections are apt to degenerate rapidly into a heterogeneous assemblage of odds and ends, devoid of scientific value, and elucidating no leading features or principles.

Your avowed aim is that which should be the guiding theory of all local museums, namely, the formation of collections illustrating the local geology, the local fauna and the local flora, both terrestrial and marine. Such an aggregation of collections, when carefully classified and named, would in time be well worthy of a special building or museum for its reception. To the man of science it would be invaluable for reference; and to our teachers of youth it would be a potent aid in grafting on the minds of our boys and girls that love of natural history, which, wherever their lots may be cast in mature life, cannot but prove an unending source of pleasure and improvement.

The second class of objects to be concentrated in your Newport museum of the future, though much less important, must not be overlooked. Specimens belonging to any branch of natural history from other parts of the United States, and series of objects from foreign countries, have a positive value; and it would be a mistake to ignore the deep interest which the general public take in miscellaneous objects of this character.

Section V. of your by-laws reserves space for such; but what is respectfully and earnestly contended for in this report, is the necessity of subordinating this miscellaneous element (which can find appropriate and full development in the general museums of large cities like New York, Boston, or Philadelphia) to the main object our society should keep in view, namely, the formation of local collections.

Some practical suggestions may possibly not be regarded as out of place from your curator in such an initial report as the present one. The following branches of natural history do not present much difficulty in their practical investigation; many of the

members may, during the coming summer, collect in the selected departments now specified, namely, minerals, carboniferous and other fossils, shells, of which one member might undertake the littoral, a second the fluviatile, and a third the land shells; insects, one undertaking the Lepidoptera, a second the Coleoptera, and a third the spiders or Arachnida; marine Algæ or sea-weeds, the collection and manipulation of which are well suited for lady members, as their preparation requires both patience and delicacy of touch; plants, one undertaking the grasses, another the ferns, another the flowering plants, and so on. Limitation to one family of a class is a good rule for a collector, for, if too wide a class be attempted, a partial and imperfect list is often the result.

These seem to be the simplest methods by which collections can be set afoot; and afterwards brought into your depository, where the specimens may be identified, named, and a scientific arrangement begun.

All collectors should bear in mind to note carefully the locality from which specimens are obtained, with any special circumstance bearing thereon. In some classes of objects, such as lithological specimens, unless details are recorded with perfect accuracy, and accompany the fragments of rocks, the specimens themselves become quite worthless for any scientific purpose.

These suggestions, admittedly imperfect in their extent, are respectfully laid before you, in the hope that some real out-of-door work may be commenced by the members this year, in the field, on the shore, and on the surrounding waters.

Such work is in itself a reward; and it should be remembered that no matter how small or incomplete our collection may be at first, if investigation be steadily continued, the persistent accumulation of typical specimens in any branch of natural history is virtually the recording in visible forms of actual facts in the domain of nature. Upon such tangible facts, when combined and compared with the mental inductions that follow from previously ascertained phenomena, is formed the true basis on which all scientific conclusions rest.

I have the honor to be, ladies and gentlemen, your obedient servant,"

A. O'D. TAYLOR, *Curator.*
NEWPORT, R. I., May 7, 1885.

The Rodentia of Rhode Island.

(Continued.)

MUSKRAT: MUSQUASH, FIBER ZIBETHICUS
(LINN.), CUVIER.

AMONG the wild animals found in this state, the Muskrats are the most plentiful, found everywhere, by pond and river, and frequently in little mud-holes, surprisingly close to active business enterprises. They are, however, armed with abundant cunning and caution, and their presence would, to a casual observer, be unsuspected on account of their nocturnal habits. In some of the streams and ponds in the vicinity of Providence in the early spring and near sundown, they are very active, and even earlier in the day a practiced eye will detect them sitting snugly on some old stump or stone; the chances are, however, that the rat will make the first discovery, and flounce with lightning speed and a noisy splash into the water.

Their summer houses are burrows in the banks and the entrance under water, often at quite a distance from shore. The burrow slants upward towards the surface of the ground and often has side galleries and several points of entrance. I have information of a burrow in Lincoln that can be traced back for thirty feet in a direct line. In these burrows the young are born, from six to eight of them; these large families enable the species to hold its own against its many enemies, gunners, trappers, and, as reported, the fox, mink, owls, and hawks.

The winter huts are composed of grass and roots with very little mud. The shape is that which would naturally occur from piling up matted bunches of grass, about a mouthful at a time, and the entrance is under water. Dr. C. Hart Merriam suggests that these houses serve in part as food. I cannot discover that such is the case in this state, but our winters are not very severe, and there is seldom anything to prevent the obtaining of fresh food, preferable to the dead and dry material of the hut; aside from aquatic plants and an occasional foray upon some vegetable patch, fresh water clams (*Unio*) are their favorite food. These they carry to certain chosen spots before eating them, and the

empty shells are found in very considerable piles. I have carefully examined these shell heaps, and, although I sometimes find on the edge of the valves what might be a tooth-mark, the majority of them were uninjured and the others were so slightly broken that it could have done no possible harm to the mollusk. How the animal obtains entrance to the shells remains therefore a mystery. Dr. John D. Godman, in *The Rambles of a Naturalist*, says it is by inserting the claws between the valves and tearing them open by main force. I do not think it possible, as the application of any force would break the delicate edges and the thinnest knife-blade can hardly be introduced between the valves when the mollusk is in a healthy condition.

There seems abundant testimony that some Muskrats eat fish, and perhaps each other. It is certain that they fight furiously among themselves, but of positive cannibalism, or the finding of any fish bones on their feeding grounds, I cannot learn anything.

Mr. N. W. Thatcher, to whom I am indebted for much information, has had large experience, and does not know of any case applicable to Rhode Island, his traps have, however, been several times visited by mink and the confined rat mutilated or demolished, while there are several instances of dead Muskrats lying unmolested for days in ponds where there were other living ones.

Mr. Thatcher bears evidence to their ability to remain under water an astonishing length of time; swimming swiftly away, their course can be determined with some accuracy by minute bubbles that rise to the surface. A most remarkable instance happened in a fresh-mown meadow in East Providence, where the spring rains had left a pond not over two feet deep and entirely surrounded by gently sloping land. My friend with a companion drove a Muskrat into this pond, where it dove and disappeared. After waiting twenty minutes, during which the glassy surface of the water was unruffled, knowing that the creature could not have a burrow in such a place, Mr. Thatcher waded all around the pond and finally across it, discovering through the shallow and clear water the rat

lying close on the bottom, where he remained until Mr. Thatcher, coming up carefully behind, planted one foot firmly on him and finally crippled him with the other.

The animal will average twenty-two inches from tip to tip. The upper parts and outside of hind legs are very dark brown, a chestnut brown on the belly sides of head and body, but on parting the hairs an under peltage of light bluish gray is very noticeable, the tail, black, flattened, covered with small scales and sparsely dotted with hairs, is about seven inches long.

*The Muskrat has a wide range through North America and maintains its foothold successfully against the destructiveness of mankind. It extends from the Atlantic to the Pacific, and from the Rio Grande to the barren grounds of Arctic America. The species is quite abundant in Washington Territory, and extends almost to the extreme northwestern point of America.

A specimen curiously albinistic was taken in Cranston, Nov. 11, 1883, and reported in the issue of this magazine, February, 1884.

This article, already too long for our limited space, does not by any means exhaust the subject, and for a most entertaining description of the animal and its habits we recommend our readers to Vol. II. of the *Transactions of the Linnean Society*, of New York. S.

BESIDES the White-cheeked Warbler which is in my collection, taken May 30, 1879, the capture of which was recorded in the *Nuttall Bulletin*, I have seen one other. It was in the spring of 1880, in a swamp amongst the twigs of a large blooming blueberry bush, sipping the nectar from the little white bells. I was but a few feet from it, and readily recognized it. It was very tame and too near to shoot, but during my efforts to get at a proper shooting distance, it took alarm and vanished from view. J. N. CLARK.

SAYBROOK, CONN.

REMEMBER two very important objects in ventilation, and two which go hand in hand: To warm the air, and, at the same time, to keep it moist.—*Sanitary Gleanings*.

* Pacific R. R. Survey, Vol. VIII.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER IX.

WE now come to a genus very generally represented throughout the more temperate regions of the globe, and having in our state three species, all of which are familiar forms.

9. *Tropidonotus saurita* SCHLEGEL, or the Ribbon Snake, is at once recognized by its elongated form, the tail equaling one-half the length of the body from snout to anus. In general coloring it resembles the next species, though the longitudinal bands are generally better defined. This is one of our most abundant reptiles and may be counted by the dozens, by a careful observer, during a half-day excursion in our more moist and sunny fields bordered by hedges. With *T. sirtatis*, it is called the Striped or Garter Snake by those who have not taken the trouble to compare the two. The present species was described as *Entœnia saurita* by the early writers, a name that is still preferred by some.

10. *Tropidonotus sirtatis* (*Entœnia sirtatis* LINNÉ). The Striped or Garter Snake is by far our most abundant ophidian, and is seen everywhere; by the road-side, in stone-heaps, under fences, on lawns, and not unfrequently in old cellars and under out-houses. So familiar is this animal, that a description seems almost superfluous, but that it may not be confounded with the Ribbon Snake, the following points will assist. The body is rather stout, and the tail short, it being only one-fourth the length of the body from snout to anus. In coloring it is rather darker than *T. saurita*, being of a deep brown or black; the dorsal stripe narrow and more or less irregular, and the lateral stripes broad, more or less spotted, and passing gradually into the green olivaceous color of the abdomen.

The two species just described are perfectly harmless, their diet is exclusively insectivorous, and that they should, from a spirit of malicious destruction or from mere prejudice, be mercilessly put to death whenever seen, is the result of a popular tradition of which every liberal-minded man should be ashamed.

11. *Tropidonotus sipedon* HOLBROOK (*Nerodia sipedon* BAIRD and GIRARD). The Water Snake or "Water Adder," is one of our harmless reptiles which are regarded, by many people, as poisonous to the extreme. It differs from the two already mentioned species of the genus, not only in general ornamentation, being of a uniform dark brown color above, shading into reddish on the sides and mottled with dark brown, but in having the scales of the body arranged in a greater number of rows; those of *T. sirtatis* and *saurita* never exceeding twenty-one, while *T. sipedon* has at least twenty-three. This animal is quite abundantly met with along the borders of brooks and ponds, and not infrequently crawls into the neighboring meadows and low lands in search of frogs, where it often meets its death from the scythe. In the water it is very active, often being seen some distance from the shore, swimming around among the lily-pads in search of frogs or fishes, which it is very expert in catching, a pickerel a foot long having been taken from the mouth of one, which was, however, being rather worsted by its "Tartar."

The genus *Storeria* is represented in Rhode Island by two small species. The first has three large, irregular, white blotches just back of the occipital plates, arranged in transverse order, and the scales in fifteen rows, while the second is without the occipital ornamentation, is of a lighter color, and has the scales arranged in seventeen rows.

12. *Storeria occipitomaculata* BAIRD and GIRARD. The Spotted-necked Snake is not uncommonly found along road-sides, where it basks in the sun and finds small insects, on which it feeds.

13. *Storeria dekayi* BAIRD and GIRARD. Like the previous species, is not uncommon. It is fond of the neighborhood of meadows, where it captures grasshoppers, crickets, and other insects. Specimens have been captured from different localities east of the Mississippi, from Maine to Louisiana.

14. *Heterodon platyrhinus* LATREILLE. The Hog-nosed Snake, or "Blowing Adder," or "Flat-head," is quite abundantly found throughout the state, being generally an inhabitant of the more dry and sandy localities. With all its fierce appearance and demonstrations, it is perfectly inoffensive

and cannot be induced to bite. On irritation, it seems to become perfectly exhausted with fear, and will act more like a huge caterpillar than an able-bodied ophidian. The peculiar shaped snout, which is seen in a previous number, in the cut illustrating the plates of the head, is said to be used as a shovel in burrowing. The name "Blowing Adder," has been given from its habit of inflating and spreading itself when surprised.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. III.

QUERCUS BICOLOR — *Swamp White Oak*.

Of the annual-fruited oaks the two, *Q. alba* and *Q. obtusi loba*, treated of in the previous articles, belong to the lyrate-leaved sub-division, while the remaining annual-fruited oaks of this state are classed with chestnut-leaved sub-division, so called from the resemblance of their leaves to those of the chestnut, *castanea*.

Q. bicolor is frequently met with in the moist springy grounds of Rhode Island. Here, as in the eastern counties of Massachusetts, it forms a notable characteristic in the scenery of swampy regions. It thrives well, too, on ground dry enough for cultivation, if the subsoil be retentive of moisture. This species does not commonly mass itself in forest groups, as other oaks often do, to the exclusion of most other trees; but the specimens are found scattered about in spots specially suited to them, frequently overhanging streams and pools of water. The tree itself is an object of picturesque beauty, often made more so from the situation in which it grows. As finely shaped specimens are found in this state, probably, as anywhere in the country, although they grow larger further south and west. They form a cylindrical head, reaching, in this region, from forty to sixty feet in height. The limbs begin very low, but the lowest are short, irregular and bushy, bending downward as though to reach the ground. An intricate interlacing of the branches is a characteristic of the tree, particularly in exposed situations. The bark on the trunk and larger limbs is whitish, the older portions attached in long,

loose scales. The bark of the young branchlets is of a light, grayish green. The foliage is dense. The leaves are wedge-shaped at the base, much expanded above, scarcely toothed, but coarsely sinuate-crenate, downy underneath, particularly when young, having 6 to 8 pairs of primary veins from the prominent mid-rib, which are covered with a rusty down. The leaves are on short foot-stalks, six to seven inches long, two to four inches broad. Several leaves come out close together, the lower ones being much the smallest, and but slightly sinuous. They are thick and leathery, and dark-green above, turning to dull yellow hues in fading. It is easy to distinguish a branch in winter by the short, rounded, obtuse buds. The blossoms appear, in this climate, during the last of May, the male blossoms on threads two or three inches long, from the lower buds only. The female blossoms appear from the axils of the expanding leaves above, single or in twos, upon foot-stalks which increase in length until autumn, when they bear fruit two inches or more from the base. The acorns are roundish-ovate, broad and pointed, in a deep cup, rough outside, sometimes fringed on the margin. The fruit is sweet, not usually abundant.

The wood is tough, compact, and firm, forming timber scarcely inferior to that of the white oak. The heart-wood is dark, the sap-wood light in color, — hence, the term "bicolor." The trees of this species, in this region, exhibit many variations, both in their general appearance and in their details.

Fine specimens of this tree are still growing in Providence, especially on the open lots in the vicinity of "Cat Swamp." The largest in this region, known to the writer, are by the borders of the "Ten-Mile River," below "Hunt's Mills." Its northern limit is the southern part of Maine, but it is found in many localities south to the Gulf states, and west to the Mississippi River. It is a fine, vigorous tree in Rhode Island.

A KNOWLEDGE of science obtained by mere reading, though infinitely better than ignorance, is knowledge of a very different kind from that which comes from contact with fact. — *Huxley*.

The Shell-Bearing Mollusca of Rhode
Island.

BY HORACE F. CARPENTER.

CHAPTER XVII.

47. LITTORINA IRRORATA, SAY.

Syns.:

Turbo irroratus, Say. *Jour. Acad. Sci., Phila.*, II., 239, 1821.

Phasianella sulcata, Lam. *Animaux sans Vert.*, VII., 54, 1822.

Littorina sulcata, Deshayes.

Shell thick, greenish, with numerous raised, revolving, equi-distant lines, dotted alternately with brown and white spots, some round and others like a little dash; the lines growing larger and more raised as they approach the body whorl; spire acute; aperture white, the outer lip thin and lined with chocolate, the inner lip yellowish brown. Length one inch, breadth three-quarters.

This shell is of southern distribution, ranging from Maryland to Florida, and the northern shores of the Gulf of Mexico. The finest specimens I have ever seen were sent me by Mr. John Ford, of Philadelphia, who obtained them at Atlantic City, N. J., and was surprised at finding them so far north. (See Mr. Ford's article in the March number of RANDOM NOTES, page 21.)

The reader may ask, why, after the above remarks, do you include this species among the Rhode Island Mollusca? In reply I quote from Verrill's *Invert. An. of Vineyard Sound*, page 357, 1874: "Vineyard Sound, sparingly. Long Island Sound, near New Haven, rare. Stratford, Conn., on high sedge (Linsley). Huntington, Long Island, (S. Smith). Many of the shells of this species found on our shores have undoubtedly been brought from Virginia and Maryland with the southern oysters planted in our waters, but it is probably indigenous in certain localities." There are probably more southern oysters planted in Narragansett Bay and Providence River than in any other spot in the world, yet with all our facilities for examining them, I have never heard of *Littorina irrorata* being found, dead or alive, in Rhode Island.

GENUS LACUNA, TURTON.

Etym.:

Lacuna, a fissure.

Syns.:

Temana Leach.

Dist., sixteen species.

Shell small, ovate conical, thin; aperture semilunar; columella flattened, with an umbilical fissure. One species only inhabits Rhode Island, belonging to the

SUB-GENUS EPHERIA, LEACH.

48. LACUNA (EPHERIA). VINCTA,?
MONTAGUE.

Syns.:

Turbo vinctus, Mont., Turt., Wood., Dillwyn, etc.

Turbo quadrifasciatus, Fleming.

Lacuna pertusa, Conrad.

Lacuna vincta, Gould, DeKay, Stimpson, and others.

Shell ovate conic, encircled by four or five purplish-brown bands and very numerous minute undulating lines; spire pointed, composed of five whorls, separated by a fine sutural line of a dingy white or purplish horn color; aperture nearly orbicular; outer lip sharp, thin; inner lip white, flattened and excavated by a smooth crescent-shaped groove, terminating in an umbilicus. Length one-half inch, breadth three-tenths.

New York to the Arctic Ocean; Greenland, Iceland, Lapland, Scandinavia, Great Britain, France; Pacific Coast to Puget Sound; Long Island Sound; Watch Hill, R. I. (four to five fathoms); Vineyard Sound; Buzzard's Bay; very abundant north of Massachusetts Bay; Maine to Labrador.

The names of many shells, as well as of animals and plants well known to naturalists in Europe, have been applied to American species by European and American authors, because they resembled at first sight those with which they were previously acquainted. Upon closer examination, naturalists find those species which were considered identical with those from other countries, to be entirely distinct, and consequently have to be re-named, while their former names, together with their synonyms, are dropped, as they apply to other species. Many naturalists are of the opinion that there are no species of animal or

vegetable life, common or identical in two countries separated by an ocean, excepting those introduced by accident or intentionally, thus becoming acclimated.

I do not believe a single species of *terrestrial* or *fluvial* shells inhabiting the American Continent, to be identical with one from any other country, excepting such species as *Hyalina cellaria*, *Tachea hortensis*, and a dozen or so of others which can easily be accounted for. In the case of the *marine* shells, a few of the Arctic species may be identical in Great Britain, Norway, Iceland, Greenland and British America. Thus, *Lacuna vineta* is an European species, is common in England, and was described by an English author. I have specimens from the coast of Maine which resemble the European shell very much and may be the same species, but those found in Rhode Island do not resemble the Maine specimen or the English ones at all. The description does not apply and its habits differ entirely from that given by authors, viz.: "Found alive among the roots of *Laminaria* and other marine plants, attached to stones or shells, dragged up by storms from deep water."

We find them in our bay on the sea-weed in company with *Bittium nigrum*, by wading in the water a foot or more in depth, and even above low-water mark, and on floating sea-weed also. Our specimens are not over one-quarter of an inch in length, the bands on the body whorl varying from one to four, generally a brown narrow line just below the suture, then a broad band of light color, and then two alternate lines of dark and light; some of them have a white line near the suture and another at the base, with a broad brown band between; one specimen I have seen has an ivory-white line at the suture, then a narrow chocolate line, then an ashy-gray broader band, then another narrow chocolate line and another white one, followed by two more alternate brown and white ones, terminating in a brown base.

These shells all have the peculiar fissure at the umbilicus, proving them to be *Lacunæ*, and as no other species of this genus appears to inhabit this section, may it not be a new species? Possibly they are all young shells, as I have never seen any but full-grown ones from other localities. I

shall be pleased to have the opinions of other conchologists on this subject.

FAMILY 35. Planixidæ, three genera and about eighty species, all absent from our fauna.

FAMILY 36. Cerithiidae, six genera and about three hundred species, is represented in Rhode Island by two genera, *Cerithium* and *Triforis*, descriptions of which will be given in the next chapter.

(To be continued.)

June Insects.

DURING this leafy month, when nature's pulses beat most strongly, insect-life is at its acme. The army-worm marches through meadow and grain-field, and a host of destructive species gather force and spread dismay. The woods and meadows abound in gaudy butterflies, and multiform caterpillars feed voraciously. The commoner firefly (*Photinus pyralis*) rises slowly from the moist ground at eve, and intermits its soft, glowing light. But the month is chiefly characterized by the appearance of that singular periodical, or seventeen-year Cicada (*Cicada septendecim*), with its *tredecim*, or thirteen-year race. The woods rattle with its hoarse beat about the first of the month, and broods appear in some locality or other nearly every year. The present year (1885) is a memorable one; for a very extensive seventeen-year brood, which appeared last in 1868, and has been fully recorded every seventeen years since 1715, may be looked for on Long Island and in Monroe County, N. Y., in southeastern Massachusetts, in parts of Vermont, Pennsylvania, Delaware, Maryland, Virginia, District of Columbia, in northwestern Ohio, in southeastern Michigan, in Indiana, and in Kentucky. — *Science Almanac*.

POWDER made from the pounded flowers of different species of *Pyrethrum* is a deadly poison to the most of insects, while it is innocuous to man. It is now being cultivated in enormous quantities in California under the name *Buhach*. — *Canadian Science Monthly*.

VENTILATE your sleeping apartment every day after arising; but warm it to comfort before sleeping in it again. — *Sanitary Gleanings*.

The Shad Fishery.

PROFESSOR Spencer F. Baird, of the United States Fish Commission, telegraphed yesterday to Mr. Henry T. Root, of this city, of the State Commission, that one million more of shad would be sent from Washington for the tributaries of Narragansett Bay; and that they were to be placed in the Palmer River. This stream has its head waters in Massachusetts, in the vicinity of the old Orleans, or "Shad Factory," and empties into the bay through the town of Warren. This river for years has been renowned for the immense quantities of shad taken from its waters, its natural conditions being especially favorable for the propagation of this kind of fish. That the United States Government is aware of this is shown by the fact that the number of fish to be placed there now is just double the number sent here in 1881, 500,000 being sent on and placed in the same spot.

The theory in regard to placing these shad is, that they mature in three years and then return to spawn to the waters where they were originally placed. That is, these shad that are placed there now will strive to get back there in 1888, wherever they may happen to be. This is pretty thoroughly demonstrated by the fact that the 500,000 which were put there in 1881 did return in 1884, for shad had never been so plentiful in a great many years as they were in 1884, and are now. Formerly the price was from twenty-five to thirty cents a pound; now good shad are retailing at twelve cents. These fish come gratuitously from the government and cost the state nothing, except the expense of handling them when they get here.

The fish are hatched artificially in Washington in glass jars, under the direction of the United States Fish Commission, the detailed management being under Col. Marshall McDonald, and the government appropriates for this business \$250,000 per year. The eggs from which the fish are hatched are taken every day, while the shad are running, from the fish in the Potomac River, and being impregnate with a very small quantity of milt from the male shad, are taken to Washington every night where they are hatched. The government has stations all along the Potomac River, where the fish are caught in

seines. After being hatched they are about half an inch long, and in this form are sent to the various streams throughout the country favorable to the propagation of shad.

Formerly these eggs were hatched in wooden boxes in the current of the Potomac river, but various improvements have been made lately in this hatching process, and now they are hatched in cylindrical glass vessels. The top of the jar is closed by a metallic disk, perforated with two holes five-eighths of an inch in diameter, one admitting the tube which introduces the water into the jar, and the other a tube which serves as an outlet for the water and the removal of the dead eggs from the surface. The current of water flowing in through one of the tubes is introduced at the bottom and filters up through the eggs, enveloping each egg in a stratum of fresh water, and placing each under the best possible conditions of development. The dead eggs will all remain at the top, while the fertile eggs will keep together at the bottom. As soon as the fish are hatched out they begin to swim around vigorously in the hatching jar. They pass into the exit tube and are carried over into the receiver, in which they may be collected to any number desired, being retained there without injury until it is convenient to make a shipment. From 15,000 to 18,000 eggs may be readily placed in each jar. The station where this operation is carried on has the capacity of hatching 21,000,000 at one time, and a capacity of 900,000,000 for one season. This process of hatching is a great improvement over the old system, the incubation of eggs being at first effected in troughs having the bottoms covered with a layer of gravel, upon which the eggs were placed, and over which a current of fresh water was allowed to flow. The system now in use was developed by Col. Marshall McDonald, and was exhibited in May, 1881, before a meeting of the Biological Society held in the basement of the Smithsonian Institution, and in the spring of 1882 it was decided to convert the old Armory building into what is now known as the Central Hatching and Distributing Station.— *Providence Journal*, May 9, 1885.



and Collectors of ORNITHOLOGICAL SPECIMENS. Send for Illustrated Circular of POCKET SHOT GUNS, especially adapted for Small Birds; goods WARRANTED, circular FREE. J. A. ROSS & CO., 16 & 17 Dock Sq., Boston, Mass. Name paper

* RARE BIRDS AND EGGS. *

REPORTS from our collectors in all directions seem to indicate that we shall receive LARGE AND VALUABLE COLLECTIONS from them, containing many species rarely offered for sale. We have already received from Florida several sets of Bald Eagle's Eggs, and a few skins of the same; also some White Pelicans; and expect shortly, from that quarter, not only a fine lot of American Egrets and Snowy Herons, and other common birds, but one Flamingo, some Roseate Spoonbills, Ivory-billed Woodpeckers, Great White Herons, etc.

Our Stock of Texan Birds and Eggs will probably be the finest ever offered for sale. From Washington Territory we have received one case containing several species of Gulls, among which are the Glaucous-winged, Pacific Kittiwake, and others of more common occurrence on the Pacific coast; Oregon Ruffed Grouse, and other Oregon species and varieties. Specimens in that section have a tendency to run to rich dark brown tints.

From Southwestern California and the Rocky Mountains we also have great expectations.

We receive most of our spring collections through July and August, so be on the look-out for September and October RANDOM NOTES.

SKINS LATELY RECEIVED.

15. Curved-billed Thrasher.....\$1 75	414. Duck Hawk..... 3 50
16a. Leconte's Thrasher..... 3 00	455. Black Vulture..... 3 50
33a. Western Golden-crowned Kinglet... 75	471.a Sooty Grouse..... 4 50
38a. Gray Titmouse..... 2 00	473b. Oregon-ruffed Grouse..... 4 00
41b. Oregon Chickadee..... 75	563. Red Phalarope..... 4 00
147. Gray Vireo..... 3 00	568. Mexican Jacana..... 3 50
191. Baird's Bunting..... 2 00	576. Little Black Rail..... 8 00
194. Titlark Sparrow..... 2 50	578. Purple Gallinule..... 3 50
230b. Rock Sparrow..... 3 00	627. European Eider, one pair taken on the coast of Maine; per pair... 8 00
232. Aleutian Song Sparrow..... 5 00	628. Pacific Eider..... 8 00
297b. Smoky-fronted Jay..... 2 50	645. Brandt's Cormorant..... 5 50
359. Ivory-billed Woodpecker, ♂14 00	662. Glaucous-winged Gull..... 4 00
“ “ ♀12 00	729. Western Grebe..... 6 00
“ “ pair.....25 00	744. Horned Puffin..... 6 00
390. Groove-billed Crotophaga..... 2 00	748. Crested Auk..... 7 50
409. California Pigmy Owl.....\$3 50— 5 00	

ALBINISTIC SPECIMENS.

One Western Robin, partial. \$0.75 | One Grass Finch, crown white..... \$0.75

RARE EGGS.

16a Leconte's Thrasher, set of four ...\$12 00 | 215 Black-chinned Sparrow, nest and three \$9 00

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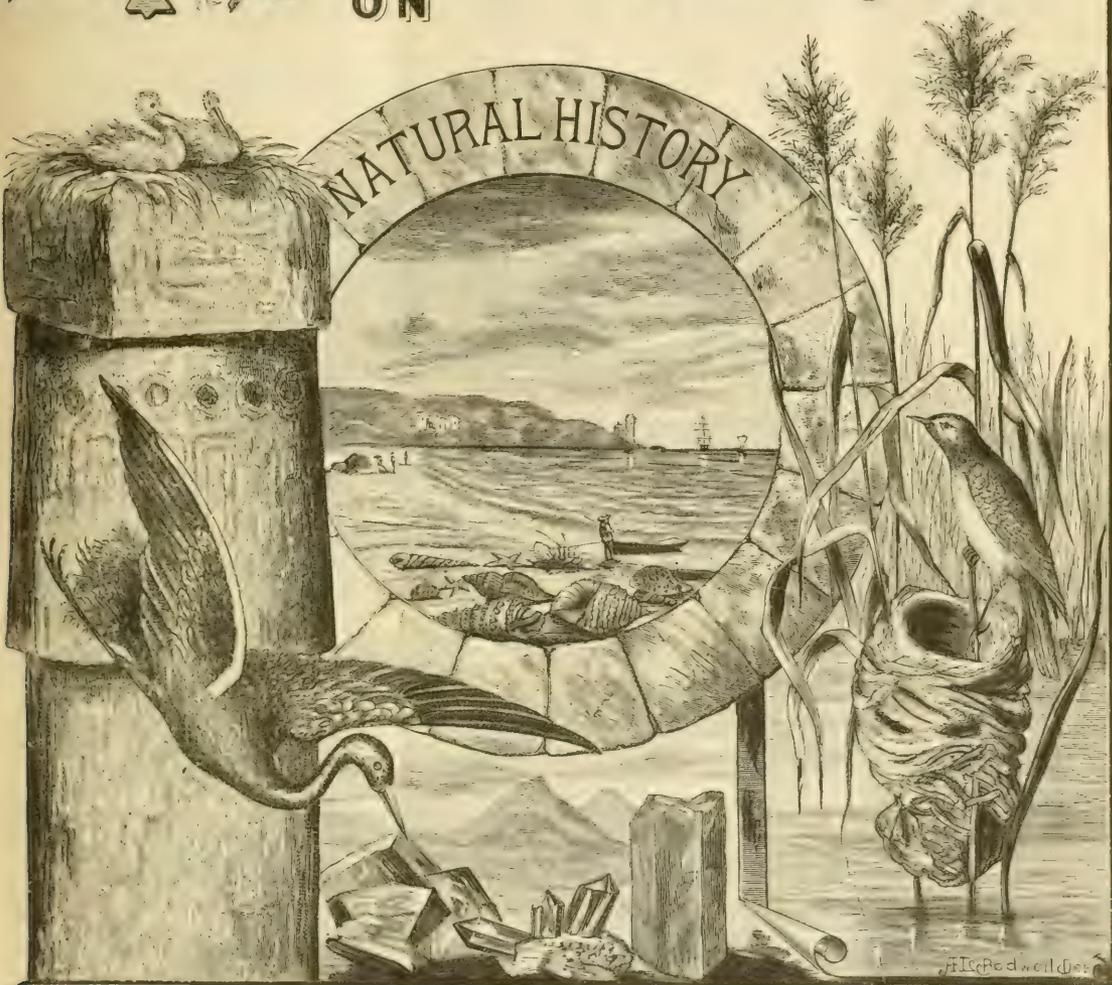
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VOL. II

NO. VII.

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ON



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PROVIDENCE, JULY 1, 1885.

No. 7.

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Wingless Birds.

African Ostriches.—Well-known examples of wingless or brevipennate birds, all belonging to the true *Cursores*; are the Ostriches, the Emu, and the Cassowaries. The best known species is the Ostrich, *Struthio camelus*, an inhabitant of the African continent. This bird, which has been celebrated since the most remote antiquity, and a dish of whose brains was an epicurean dish in Old Rome, measures from six to eight feet in height; its feet consist of only two toes; the head and neck are nearly naked, the general plumage very lax, the quill feathers of the wings and tail remarkable for the length of their barbs, which, though furnished with barbules, are completely separate from each other, and form the well-known ostrich feathers of commerce. The ostriches live together in large flocks, feeding upon grass, grain, wild melons, etc., and, like the gallinaceous birds, which they resemble in their food, have an enormous crop and a strong gizzard. In a state of nature it picks up and swallows small pebbles; but in confinement it has swallowed brickbats, knives, old shoes, scraps of wood, tenpenny nails, bits of iron, and feathers; one went to the length of swallowing in succession the whole of a brood of young ducks; whether impelled by normal hunger, a morbid appe-

tite, or sheer mischief, is an open question. Another tried to swallow its blanket. The voracity of the Ostrich formerly gave rise to the belief that it fed on iron. The African ostrich is polygamous and gregarious. The female scratches a hole in the sand, in which she lays ten or twelve eggs in an upright position. The male and female both sit upon the eggs during the night, and this sitting, supplemented by the heat of the sun, hatches those in the middle of the nest, the outer ones, when the centre eggs are hard and the young birds nearly hatched, being quite fit for food; the eggs weigh upon an average three pounds, and are regarded as great delicacies. Though equal in weight to twenty-four hen's eggs, one is not thought enough for a meal, and in one instance two men finished five eggs in the course of an afternoon. The approved method of cooking is to place the egg upright on the fire, break a hole in the top, through which a forked stick is forced. This is made to rotate by rubbing with the hands, and so beats up the contents while cooking.

American Ostriches.—The American Ostriches contain two species, *Rhea Americana* and *R. Darwinii*, and are scarcely more than half the size of the African species, from which they also differ in having the head and neck covered with feathers, and the feet furnished with three toes. The feathers of the wing and tail, though elongated, possess none of the beauty of the African ostrich, and are only employed in the manufacture of light dusting-brooms. They are very abundant in the large plains of America. The food consists mainly of grasses, roots, and other vegetable substances, but they will occasionally eat animal food, being known to come down to the mud-banks of the rivers for the purpose of eating the little fish that have been stranded in the shallows. Darwin, who had frequent opportunities of observing these birds, has given an excellent account of their habits. He says: "They take the water readily, and swim across broad

and rapid rivers, and even from island to island in the bays. They swim slowly, with the greater part of the body immersed, and the neck extended a little forwards. On two occasions I saw some ostriches swimming across the Santa Cruz River, where it is 400 yards wide and the stream rapid." It is polygamous; the male bird prepares the nest, collects the eggs, which are frequently laid by the females at random on the ground, and performs all the duties of incubation. Darwin says four or five females have been known to lay in the same nest, and the male, when sitting, lies so close that he himself nearly rode over one. At this time they are very fierce, and have been known to attack a man on horseback, trying to kick and leap on him.

The Australian Emu.—The Emu of Australia, *Dromaius Novæ Hollandiæ*, is nearly as large as the African ostrich, measuring from five feet to seven feet in height. It has three toes on each foot, and these are furnished with nearly equal claws. The head and neck are covered with feathers, the throat being bare; the plumage of the body, closely resembling long hairs, hangs down on each side of the body, from a central line or parting. These birds, at one time abundant in Australia, are now becoming extinct, for natives and Europeans are fast thinning them, the former eating the eggs, and hunting down the emeus for food, but not allowing boys or women to partake of it, the flesh being reserved for warriors and counselors. Europeans and settlers run it with dogs, trained on purpose, for food, sport, and also for a valuable oil, of which as much as six or seven quarts are yielded by a single emeu. This oil is of a light yellow color, is used as an embrocation for bruises or strains, and, not readily congealing or becoming glutinous, is also useful for oiling the locks of firearms. The birds are monogamous, the male performing the office of incubation; the nest is made by scooping out a shallow hole in the ground in some scrubby spot, and in this depression a variable number of eggs is laid. Dr. Bennett remarks that "there is always an odd number, some nests having been discovered with nine, others with eleven, and others with thirteen." These eggs are nearly as large as those of the Ostrich, but of a dark

green color, and the young, when first hatched, are elegantly striped with black and gray. In defending itself it does not kick forward like the Ostrich, but sideways and backwards like a cow.

The Cassowary and the Mooruk.—The Cassowaries, of which there are two—the Cassowary proper, *Casuaris galeatus*, and the Mooruk, *Casuaris Benetti*—are natives of the Eastern Archipelago. The former, standing five feet high, is distinguished by the possession of a peculiar horny crest or helmet upon the head, by the wings being furnished, instead of feathers, with about five cylindrical stalks, destitute of barbs, and by the large size of the claw on the inner toe. The head and neck are naked and wattled, and of a bright red, variegated with blue. The rest of the body, which is very stout, is clothed with long, glossy black pendent feathers, more closely resembling hair than those of the Emu. It feeds upon herbs, fruit, and seeds, and, like the Ostrich, swallows hard substances. The eggs are of a greenish tint. The eye is fierce and resolute, and the character of the bird is tetchy, and apt to take offence without any apparent provocation. Scarlet cloth excites its ire, and it has a great antipathy to ragged and dirty persons. The height of the Mooruk is three feet to the top of the back, and five feet when standing erect. The color is rufous, mixed with black on the back and hinder portions of the body, and raven-black about the neck and breast; the loose wavy skin of the neck is colored with iridescent tints of bluish purple, pink, and an occasional shade of green; the feet and legs are large and strong, of a pale ash-color, and exhibit a peculiarity in the extreme length of the claw of the inner toe of each foot, it being nearly three times the length of the claws of the other toes. Instead of the helmet-like protuberance of the Cassowary, it has a horny plate resembling mother-of-pearl darkened with black-lead.

The Penguins.—Another set of birds, if not wingless, must also be mentioned. These are the Penguins, in which birds the wings are reduced to a rudimentary character, are destitute of quills, and are covered with a scaly skin, forming flat, fin-like paddles, the scales being rudimentary feathers. In the water, which appears

their natural element, they use them in swimming and diving. On shore they use the paddles as anterior legs. From the backward position of their feet the Penguins can only stand in a very upright attitude, in which position they may be seen in countless numbers arranged in as compact a manner and in as regular ranks as a regiment of soldiers, and classed with the greatest order, the moulting birds in one place, the young ones in another, the sitting hens by themselves; the clean birds in another place, etc. So strictly do birds in a similar condition congregate, that, should a bird in a moulting state intrude amongst those which are clean, it is immediately ejected from among them. — *J. W. Worsfor, Brighton, Eng.*

Our Rhode Island Violets.

To all English speaking people the violet is dear. Perhaps this is from the manner in which it has become enshrined in our literature. The verses of Chaucer, Milton, Shakespeare, Tennyson, Wordsworth, Bryant, are redolent with its sweet perfume. While here in America we have many species of violet, none compare in odor with the familiar English species, the *Viola odorata* of gardens. The first of the native species to bloom here, say about the 20th of April, is the arrow-leaved or *Viola sagittata*. It is found more commonly on uplands, and in meadows, and has leaves ranging from ovate through halberd-shaped, to sagittate. We next find, in more moist localities, say near the margin of swamps, or in wet copses, the *Viola canina*, or Dog Violet. One must not confuse the name of this with the pretty liliaceous plant, called dog-tooth violet, the *Erythronium* of botanists. About the first of May, also in moist places, we begin to pick up the little white violet, with beardless petals, the lower prettily streaked with lines, and with round, heart-shaped or reniform leaves. The flowers are delicately odorous. Growing with this, but usually a few days later, appear the two white species, *V. lanceolata*, and *V. primulifolia*.

The yellow, round-leaved violet, *Viola rotundifolia*, is one of our rare plants. It is a dainty little thing with leaves an inch broad at the time of flowering, but increas-

ing to a goodly size later in the season, and finally lying flat on the ground. It is stemless, whereas our other species of yellow violet is leafy-stemmed. This is the downy yellow, or *Viola pubescens*, of which there are two distinct varieties besides the typical plant. These last mentioned yellow violets are quite frequently found in our state, and when found are usually abundant. They are among our choice wild flowers, and are easily cultivated. In a garden they are too prone to spread and prove troublesome.

The blue violet, *Viola cucullata* is common everywhere in low, wet, or marshy grounds, and, as Gray says, "is very variable in size, shape of leaves and sepals, and in the color and size of the flowers, which are deep or pale violet blue or purple, sometimes nearly white, or variegated with white." Of it we have one distinct variety, *palmata*, with leaves cleft or parted.

Our most showy violet is the Bird-foot, *Viola pedata*, which makes, as Hawthorne says, "a gush of violets along a wood-path." Nothing gives us finer masses of color. Take it, as we have seen it, near the Stonington railway, or the Narragansett Pier road, and it is a thing to remember. We read of the field of the cloth-of-gold. Here are meadows painted with most delicate lavender. A very handsome variety, *V. pedata*, var. *bicolor*, is sometimes found, with "two upper petals deep violet, and as it were velvety, like a pansy." The plant does well in cultivation, increasing in size. I should think *Viola Canadensis* might turn up in the state, but I have never found it. I should look for it near Wallum Pond or on the borders of Connecticut.

W. W. BAILEY.

PICKLE FOR SKINS. Three-quarters of a pound of alum, and one and three-quarters pounds of salt to a gallon of water. Mix and heat to boil; cool in a wooden vessel.

Mr. William G. Smith writes us from Loveland, Col.: "I took a nest of Cook's eggs, on May 30, and after forty-eight hours attempted to blow them, when I found young chicks in them still alive. I placed the remainder under a domestic hen, and, after sitting a few hours, she hatched one out, and prospects are good for hatching them all.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER X.

CLASS — BATRACHIA.

WE have now disposed of those animals of our state which are known as *reptiles*; which have the body covered to a more or less extent with scales, and the toes, when present, armed with claws; and we come to the lower Batrachians, which have the skin unprovided with protective horny outgrowths and the toes clawless.

As was remarked in connection with the reptiles, there has been as yet but little work done in this department, and the number of known species must of necessity be greatly increased by a little exertion on the part of collectors, especially in the more southern portions of the state, where, in localities, the flora is said to resemble to no little extent that of the Southern States.

Our Batrachians may be divided into two branches: Anura, including those forms that, when adult, are tailless, like the Toads and Frogs, and Urodela, the tailed Batrachians, of which the salamanders are illustrative. Of each division there are about ten representatives liable to be found in the state.

1. ORDER ANURA. The genus *Bufo* is represented by the common Toad, *B. americanus* of Le Conte, and *B. lentiginosus americanus* of Cope, an animal inhabiting the entire eastern portion of the continent, and known by all at sight.

In the early spring, and remaining sometimes until late in June, these animals congregate in the warm, shallow pools of our meadows and fairly make the air ring with their trills. While thus calling they seem to be unmindful of danger, and with "croaking bag" inflated, they may be roughly handled without evincing any other signs than those of annoyance. They seem to have no anxiety except that their kin, of afar off, may know of their whereabouts and direct their course accordingly. Hibernation is performed in some shallow burrow in an old field, or possibly in the mud of some pond or spring. Mr. Allen mentions a case where an old well, on being cleaned out, was found to contain several

individuals of this species, all in a state of hibernation, and some, judging from the depth of the debris that had collected over them, apparently having been entombed for a length of at least ten or fifteen years; the temperature of the well being considerably lower than that at which they naturally become active.

The eggs of this species are the long slimy ribbons seen so often in the spring, floating or attached to aquatic plants. The tadpoles, the time of the development of which depends on the temperature, are small and black, and can be easily distinguished from the large larvæ of the frogs.

In its distribution the toad is singular, being a more or less local animal, in some situations abounding, while in others it is seldom seen. It is crepuscular, sauntering out during early evening, and often choosing as its route a frequented path, where it is often injured by the careless pedestrian. The day is spent in some retired hollow of the animal's own construction, or under a board or flat rock. The amount of destructive insect life captured in a single evening's stroll by one of these harmless animals is truly amazing. It need never be confounded with any other anurous batrachian, as the jaws are toothless, the toes webbed, and the skin warty — characters which at once distinguish it.

2. *Scaphiopus holbrookii* Baird (*S. solitarius*) Holbrook. The Spade-foot Toad is undoubtedly heard in Rhode Island at times, though of its capture I am not aware. It differs from the common toad in having the jaws provided with teeth, and from the frogs in having the web of the hind feet but poorly developed.

Though a small animal, the Spade-foot's voice is described as being far more powerful than that of the combined energies of all its relatives, and so peculiar as to attract the attention of the most indifferent. Aside from this distinctive peculiarity, however, the animal is characterized by a horny scale on the inside of each metatarsus, which is used in burrowing, and gives origin to the peculiar name "Spade-foot."

As to the habits of this rare animal, they are peculiar indeed. The appearance is only periodical and at chosen localities; sometimes not being heard for years, and then, possibly on the occurrence of proper

conditions of weather, appearing in perfect multitudes, only to disappear again so soon as the breeding season is over, and the droughts of summer begin. It is thought that they burrow to some depth in the soft soil of the lowlands, and there remain in a partially torpid state until urged into activity by the advent of a genial spring.

The Breeding-Places of Millions of Sea-Fowl.

At sunset we bade the land good-bye at Sea Wolf Island, and laid our course for Bird Rock, in the mighty Gulf of St. Lawrence. All night and all next day not a sheet was touched, the wind holding fair and steady, and at dark we shortened sail that we might not run by the rock in the night, or worse yet, run into it. Our pilot was a young fellow of eighty-one, who all his life had been a fisherman, and had been to the Labrador coast so many times that he had lost the record. Coming on deck that evening, I found the staunch old man on the lookout forward, as we had sworn friendship before this. We sat and talked as the schooner slipped quietly along through the dark water.

I told him of how, in boyhood's days, I had read of the great Bird Rock in Audubon; how in later years, in distant lands, I had visited the breeding places of many different birds, but this rock was my earliest love, and of my anxiety to see it. Touched by my eloquence, the old man swore he would make no errors, and that next morning early we would be there. "For," said he, "with the wind a leetle in my favôr, I can smell it twenty-five mile off."

With which assurance I was fain to trust to him and turn in, and sure enough at daylight there was the great rock looming up ahead, and what a sight it was, well worth the trip for itself alone. Many able pens have described it, and, as I think, having seen it, with poor success, so I will not attempt it; but you must try to imagine a high, triangular-shaped rock, with precipitous sides 400 feet in height, towering up in the lonely waste of waters, fifty miles or so from the nearest land, each face of the

rock a half a mile in length. Against its foot the waves break and roar eternally, and all the seams and ledges of its steep face above the seething sea are white with breeding sea-birds, as though a heavy snow-storm had just visited it, and all the air around it for miles is filled with flying, circling, plunging sea-fowl. Here, for ages past, the gannets, gulls, auks, guillemots or murre, etc., have nested in safety, as numberless as the blades of grass of a vast prairie.

It was a sight to see, not to describe, and the most thoughtless youngster on board gazed in wonder at a scene I warrant he will not forget.

(The Canadian government has now, at great expense, placed a light on the summit of the rock, and the birds, alas! will have to scatter, and find another resting-place. Where they may go it is hard to say, for there is none so secure as that. Vast numbers will linger there for years to come, no doubt, but the bulk of them will seek new quarters.)

At Murr Rocks, behind which we ran for shelter, we found a couple of fishermen's huts, and going ashore we bought several bucketfuls of murre's eggs, which had been gathered earlier in the season, and put in brine. In this way they keep good a year. The way fresh eggs are made sure of is this: A party visits the rock on which the birds breed by the tens of thousands, selecting a place of an acre or so, they smash every egg on it. Marking the spot, they go again in a couple of days, and all the eggs they find there are of course fresh. In former years a regular business was carried on by the eggers, and vessels were loaded with them for the Canadian markets. This wasteful method promised soon to exterminate the birds, and the Canadian government very properly put a stop to it. Now they are once more abundant, and supply the natives with a very important item of food. The murr egg is one of the most curious in nature. It is as large as a domestic duck's, but pear-shaped; the ground color is either green or white, and it is dotted, splashed, and streaked with blotches and lines of black and dark amber. Each bird lays one egg on the bare rock.—*Deck, in Prov. Sunday Telegram.*

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XVIII.

THE Cerithiidae family, or Cerites, are a very numerous group of turreted shells, with a notch or canal in front. They are found in all parts of the world, but the typical species are tropical in their distribution. They inhabit salt, brackish, and fresh water. The genus *Potamides*, Brong., or fresh water Cerites, numbering about fifty species, are all tropical or sub-tropical, living in fresh and brackish water (streams and swamps). The genus *Cerithium*, Brug., contains about one hundred and forty species, distributed among thirteen sub-genera, two of which, *Bittium* and *Cerithiopsis*, are represented in Rhode Island, each by two species.

49. CERITHIUM (BITTIUM) NIGRUM, STIMPSON.

Syns. :

Cerithium reticulatum, Totten, *Am. Jour. Sci.*, xxviii., 352.

Pasithea nigra, Totten, *Am. Jour. Sci.*, xxvi., 369.

Cerithium Sayi, Menke, Gould, DeKay, Stimp.

Dist., Mass. Bay to South Carolina.

Shell small, turreted, whorls six to eight, the upper ones of a dark bluish or blackish color, the lower ones of an ashy gray; surface covered with about twenty ribs, reticulated by revolving lines, of which there are six on the second whorl, five on the next above, and so on; on the body whorl the net work extends downward to the centre; below this are six revolving lines, without the ribs; aperture one-fourth the length of the shell; outer lip sharp, scalloped by the revolving lines; canal a mere fissure; shell umbilicated. Length three-tenths, breadth one-tenth inch. The young of this species are found very abundantly on the sand between tides at Nantucket, Martha's Vineyard, New Bedford, Narragansett Bay, and Long Island Sound. These are always reddish black and have a round aperture, or

nearly so. The adults are found from low water to eight fathoms on algae and eel grass. They attain their growth in two or three years, and when full grown have an oblique aperture, flaring at the base and suddenly everted.

50. CERITHIUM (BITTIUM) GREENII, ADAMS.

Shell small, reddish black (resembling very closely the young of the preceding species), elevated-conic, whorls ten to twelve, flattened, traversed by numerous ribs, of which there are on the body whorl, from twenty to twenty-five, crossed by three revolving lines, producing three sets of granules, the lower one the largest, so that the base of each whorl appears to jut over the other; as these lines revolve up the spire, the lower one disappears, then the middle one, and finally the last one vanishes, leaving the upper part of the shell near the apex quite smooth; two black threads emerge from the aperture and revolve around the base of the shell; aperture one-eighth the length of the shell, nearly circular, with a deep but short canal, partly closed over by the lips. Length one-fifth of an inch, breadth one-twentieth. Found by Prof. C. B. Adams on seaweed in Dartmouth Harbor, a few feet below low water mark, and described by him in the *Jour. Bost. Soc. Nat. Hist.*, II., 287. It inhabits the same localities as *nigrum*, but is not at all common in Rhode Island. Very rare at New Haven (Perkins). Boston Harbor (Stimpson). Long Island (S. Smith). Fort Macon, N. C. (Coues).

51. CERITHIUM (CERITHIOPSIS) EMERSONII, ADAMS.

Shell small, conical, glossy, reddish-brown; whorls sixteen or seventeen, flat, each with three rows of granules; suture deeply impressed; aperture small, one-sixth the length of the shell, with a short, twisted canal; outer lip crenulated. Length one-half inch, breadth one-eighth.

Discovered at Nantucket, and in New Bedford harbor, by Prof. C. B. Adams, and described in the *Jour. Bost. Soc. Nat. Hist.*, II., 284, under the name of *Cerithium Emersonii*, in honor of the president of the society, Mr. G. B. Emerson. Huntington and Greenport, Long Island (S. Smith).

Cape Cod to South Carolina (Verrill). I have found but one specimen in Rhode Island.

52. CERITHIUM (CERITHIOPSIS) TEREBRALIS,
ADAMS.

This species inhabits the same localities, and is of the same shape and size as *C. Emersonii*, but the surface of the shell, instead of being granulated, has three sharp, elevated revolving lines on each whorl, of which there are ten, and numerous fine, longitudinal lines between the ridges. It was discovered at New Bedford by Mr. C. F. Shiverick, and described by Prof. C. B. Adams, in *Jour. Bost. Soc. Nat. Hist.*, III., 320.

GENUS TRIFORIS, DESHAYES, 1825.

Shell sinistral, turreted, sculptured, granular; aperture small, produced anteriorly into a closed tubular canal.

Dist., about one hundred species, one of which inhabits Rhode Island.

53. TRIFORIS NIGROCINCTUS, ADAMS.

Shell small, blackish red, granulated by three revolving series of beads; whorls twelve, reversed, the aperture being sinistral or left-handed, differing in this respect from any other marine shell we have within our limits; spire acute; aperture oval, one-fifth the length of the shell, ending in a twisted canal one-third the length of the aperture, situated on the left side of the shell. Length three-tenths inch, breadth three-fortieths.

The name, *nigrocinctus*, was not well chosen for this species, as the shells when fresh are of a uniform color, the black revolving line at the suture being scarcely distinguishable. In faded or light colored specimens it is very apparent. However, it cannot be mistaken for any other species inhabiting our coasts. It was discovered by Professor Adams in Dartmouth harbor on seaweed, and described by him in *Jour. Bost. Soc. Nat. Hist.*, II., 286. Gould's *Invert.* gives no other locality. Perkins says they are rare at New Haven. Verrill gives from Cape Cod to South Carolina. We find them here on *Ostræa Virginica*, attached to the dead shells lying in the heaps thrown out by the oyster-openers in different parts of the city.

(To be continued.)

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. III.

QUERCUS PRINUS — CHESTNUT OAK.

Var. monticola.

There are at least three varieties of the *Q. prinus* in Rhode Island. The variety *monticola*, rock-chestnut oak, is found upon some of the rocky hills of the state, quite abundantly upon the ridge of which the Diamond Hill granite quarries form a part. The trees now standing upon this ridge are generally small, being mostly sprouts from a growth cut ten or more years ago. It is rare to find a well-developed tree of this species in this state. The largest which I have seen are not more than a foot and a half in diameter and about twenty-five feet high. In the open ground the tree grows to a low, rounded head, symmetrical and of considerable beauty. The leaves which I have gathered average seven inches in length, including the petiole, which is about one inch long. The general shape is obovate, considerably narrowed at the base, the widest part being fully half its length. The margin is distinctly, but not deeply toothed. The midrib sends out from six to twelve pairs of straight, prominent veins, which determine the number of teeth. The leaves are of a shining green above, lighter, and, when young, downy beneath. They clothe the tree with a dense foliage.

The tree fruits but sparingly, and the acorns, being very sweet, are quickly taken by the squirrels, so that it is difficult to get well ripened specimens. The acorns are large, in rough cups, not distinctly scaled, borne upon footstalks about one inch long. The branches come out at sharper angles than is common with most other oaks, and are finely divided at the extremities. The bark is smooth until the tree is quite old, when it becomes divided by clefts, long, but not deep, and quite near each other. The bark resembles that of the chestnut tree, but is somewhat lighter and very compact.

Where this tree is found in sufficient quantities it is highly esteemed both as timber and fuel; but in Rhode Island it is so scarce that its characteristics are but

little known. It will thrive among rocks and in the fissures of ledges, in the dryest places, wherever it can get a foothold. Upon many rocky hills of this state it would be valuable for propagation.

Var. humilis.

CHINQUAPIN OAK.

We are accustomed to associate strength, massiveness and grandeur with the name "oak"; but the *Q. prinoides*, commonly known as the *chinquapin oak*, is a pigmy in the family, growing only from two to four feet high and an inch or two in diameter. Its native habitat is upon dry, sandy, or gravelly plains and ridges and among ledges where little soil is found. Its usual companion is the "scrub" oak, which, although but a large shrub in size, quite overtops it, and obscures it from ordinary observation. It usually sends up a half dozen or more shoots from one root, although occasionally but a single stem, it then being a perfect miniature tree, laden with flowers, in early June, or with fruit in autumn. The catkins of sterile flowers appear in clusters, two inches or more in length, a rich saffron in color, graceful and beautiful. The acorns, although small compared with those of many other oaks, often bear the stems to the ground with their weight. They are set in dainty, obscurely scaled cups, narrowed at the base, nearly sessile, each being usually accompanied by one or two abortive acorns. The acorn itself is ovoid or subglobose, of dark brown, almost ebony color, and shining when ripe. Wild animals, birds as well as quadrupeds, and swine devour the acorns with avidity, which are sweet and nutritious. The leaves are obovate in shape, considerably narrowed at the base, upon foot-stalks one-half inch in length, dentate—wavy upon the edge. They have a prominent midrib, sending out seven or eight pairs of straight, alternately arranged veins, distinctly reticulated with each other. The branches are straight, coming out at sharp angles, and are of a light-gray, or ash color, the main stem being nearly black and frequently variegated by light patches of lichens. The bark is excessively bitter, abounding in tannin.

The use of this tree is evidently as a "nurse," or protector, for certain timber

trees, when young. Such trees planted among the "chinquapins" would get established, and overtopping them, leave them to die, or as a harmless undergrowth. When forestry shall have attained its proper place in this country, the utility of some of our shrubby growths, now regarded as worse than worthless, will be duly recognized.

I first learned of the existence of this interesting member of the oak family in this state, by reading the remarkable works of Micheaux, the elder and the younger, upon the trees of North America. He says that it is found in abundance upon the plains of Providence. My search was first rewarded by finding it in North Providence, among the "scrub" of the unsettled parts, where it still exists. Since then, I have often come across it in rambles in various places, but in nearly every instance upon sterile soil. Emerson speaks of it as often occurring in Middlesex County, Mass., and as occupying, almost exclusively, acres of ground upon Martha's Vineyard.

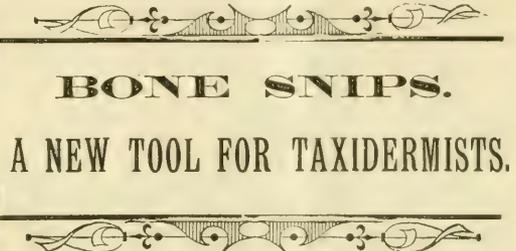
Color of Birds Eyes.

- Downy Woodpecker, dark red, hazel.
- White-headed Woodpecker, red.
- Red-shafted Woodpecker, red or brown.
- California Woodpecker, white, sometimes yellowish, bluish, or brown.
- Williamson's Woodpecker, red brown.
- Ivory-billed Woodpecker, yellow.
- Pileated Woodpecker, yellow.
- Black-backed Woodpecker, brown.
- Banded-backed Woodpecker, brown.
- Red-bellied Woodpecker, red.
- Yellow-fronted Woodpecker, red.
- Red-headed Woodpecker, brown.
- Lewis' Woodpecker, brown.
- Hawk Owl, yellow.
- Great Gray Owl, straw.
- Saw Whet Owl, yellow.
- Long-eared Owl, yellow.
- Short-eared Owl, yellow.
- Richardson's Owl, straw.
- Little Screech Owl, straw.
- California Screech Owl, yellow.
- California Pigmy Owl, yellow.
- Burrowing Owl, yellow.
- Great Horned Owl, yellow.
- Barred Owl, dark brown iris, deep blue pupil, effect black.

NOTICE.

We beg to urge upon our Customers the necessity of Writing Carefully and Distinctly all Names and Addresses.

We have almost continually two or three letters filed away that have not been signed at all, or else the writer gives his name and the city, and neglects to make mention of the state. This last we frequently rectify by referring to the envelope. If these letters contained stamps or postal note, the writers usually write again after a time, explanations are then in order, and matters easily adjusted; but in the interim, and about some others that are never explained, we are doubtless subjected to many railing accusations.



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Siderastrea radians.....	10 to 50
Porites asterœoides.....	25 to 1 00
Red or Yellow Sea Fans, selected, each	25 to 50
“ “ “ assorted, per doz.	2 00
Sea Plumes, selected.....	25 to 75
“ “ assorted, per doz.....	2 00
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Xipidogorgia citrina.....	40 to 75
Muricea sp. ?.....	20 to 75

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Strombus pugilis cleaned, per doz....	1 25
“ “ uncleaned, “ 	75
Trochus pica, handsome black and white, with silver mouth..	10 to 25
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FROM PANAMA.

Shells.

Cuma tectum, Gray.....	5 to 25
Cuma Kiosquiformis, Ducl.....	5 to 15
Uvanilla Buehii.....	5 to 20
Turbo (Callopoma) saxosus, Wood....	5 to 25
Murex regius, Wood.....	25 to 1 50
“ bicolor, Val.....	50 to 1 50
“ radix, Gme.....	50 to 1 50

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“ “ Nail-head Calcite.	50—2 00
“ “ Specular iron & quartz	50—1 50
“ “ Hematite (Kidney ore)	50—2 50
“ “ Fluor (small cubes)..	25—2 00
“ “ Blende (Black Jack)..	10—10 00
“ “ Iridescent Pyrite....	50—5 00
“ “ Campylite.....	75—1 25
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“ “ Eggs.....	3 00
503 Glossy Ibis.....	3 50 to 4 00
“ “ Eggs.....	65
593 White-fronted Goose.....	3 50 to 4 00
“ “ Eggs.....	1 50
671 Mew Gull.....	2 00 to 2 50
“ “ Eggs.....	35

Young Birds in the Down.

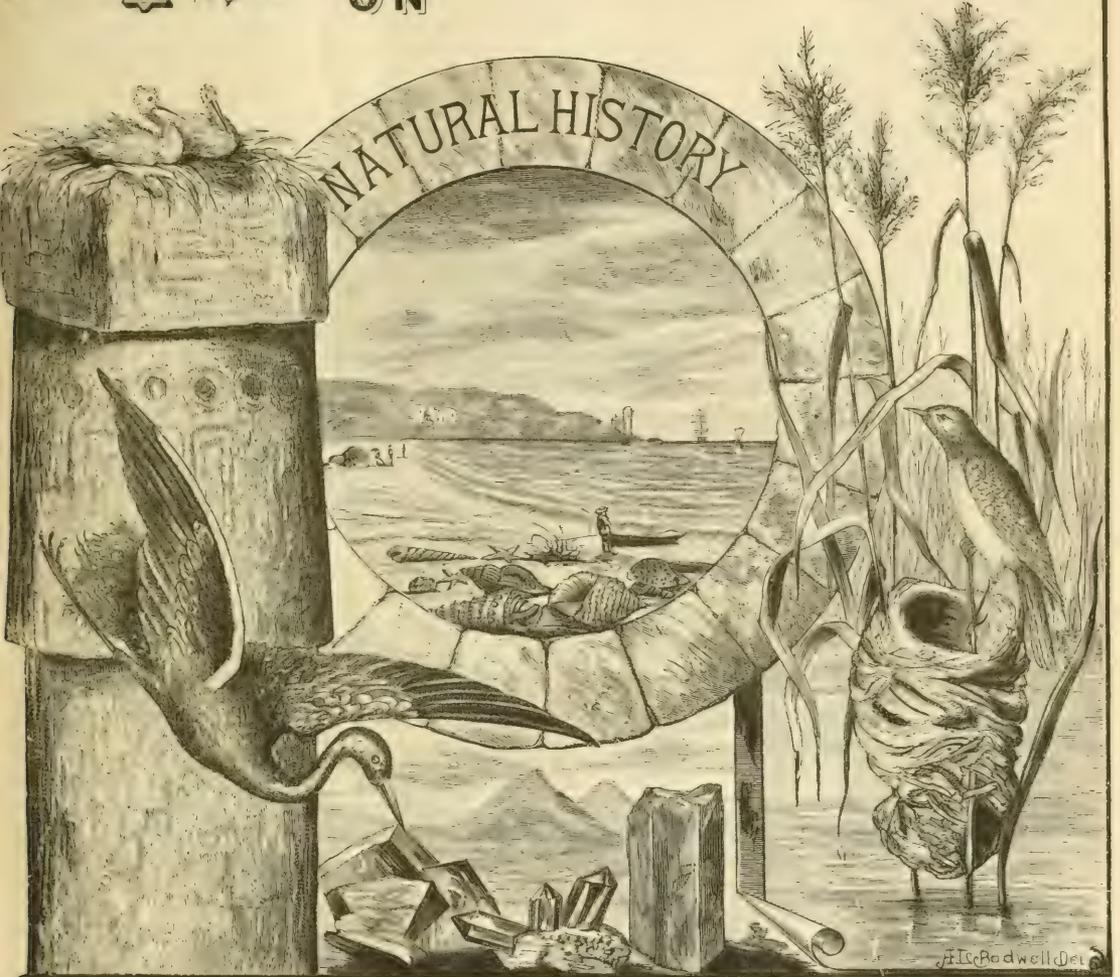
White-tailed Eagle.....	2 50
Red-necked Phalarope.....	3 00
Glossy Ibis.....	2 00
Golden-eye Duck.....	2 00
Scaup Duck.....	2 00
Pintail Duck.....	2 00
Eider Duck.....	1 50
Red-breasted Merganser.....	1 50
Mew Gull.....	1 50
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NO. VIII.

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ON



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Vol. II.

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No. 8.

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Notes on Food of Raptorial Birds.

BY CHARLES DURY.

THE hawks and owls are popularly regarded as very injurious birds, and always killed when opportunity presents itself.

The food of many species varies much with the season, and it is rather astonishing that our resident species are enabled to find subsistence during very severe winter weather. I give, in a brief manner, the result of the dissection of the bodies of the following species, from my note-book of 1884 and 1885:

RED-SHOULDERED HAWK (*Buteo lineatus*).

Dec. 4, 1884. Male. Filled with grasshoppers. Bird killed near Winton Place.

Nov. 13, 1884. Male. The stomach was filled with distention with grasshoppers (*Caloptenus femer rubrum*).

Dec. 2. Male. Filled with grasshoppers and mice. Several others examined during winter, contained mice.

The remarkable fact here is, that this species feeds on grasshoppers, and can find them as late as Dec. 4th.

BALD EAGLE (*Haliaeetus leucocephalus*).

Nov. 10. Young female contained fish.

Jan. 15. Young (very large) female contained balls of rat-hair.

ROUGH-LEGGED HAWK (*Archibuteo lagopus*).

Jan. 15. Female. Stomach filled with parts of four large field mice.

Jan. 27. Male. Filled with mice.

This is rather a rare bird in this locality.

GREAT HORNED OWL (*Bubo Virginianus*).

Several examined were empty, but the

stomach of one male on May 13th, contained a few feathers, a small bunch of hair, and a beetle (*Lachnosterna fusca*).

Nov. 20. Female. Contained a quail.

Nov. 24. Male. Contained part of a chicken.

BARRED OWL (*Syrnium nebulosum*).

Nov. 11. This bird contained a partly-digested screech-owl (*Scops Asio*), feathers, body and feet.

Nov. 30. Male. Contained mice.

Jan. 16. Female. Contained mice.

Jan. 16. Male. Stomach contained part of a red-bellied woodpecker, including head and bill.

SHORT-EARED OWL (*Brachyotis palustris*).

Nov. 9. A male was filled with mice — several others contained mice.

Nov. 11. A female contained two European sparrows, for which service she deserved a better fate than to be shot.

COOPER'S HAWK (*Accipiter Cooperii*).

May 11. Stomach contained young bird.

May 24. Male. Stomach contained partly-digested hermit thrush.

Feb. 7. Stomach contained one European sparrow.

BARN OWL (*Strix Flammœ*).

Since my paper published in the JOURNAL, Dec., 1883, several others have been taken in this vicinity; in all of them were mice and their remains.

SHARP-SHINNED HAWK (*Accipiter fuscus*).

Jan. 18. A sharp-shinned hawk, a male, pursued a European sparrow into a store on Third Street, this city, and captured the sparrow inside the store. The door was closed and the hawk secured alive.

SCREECH-OWL (*Scops Asio*).

This species has been unusually abundant; very many have been examined. I enumerate a few of these.

April 10. Male. Filled with insects, mostly beetles.

May 22. Female. Contained beetles.

Oct. 10. Eight owls, in all of which were insects, mostly beetles.

Nov. 8. One owl contained millipedes.

Nov. 24. One owl, male, contained insects.

Dec. 5. One owl contained mice.

Dec. 11. One owl contained mice.

Jan. 13. One owl contained thirteen large larvæ, commonly called cutworms (larvæ of *Agrotis*), and several millipedes.

Jan. 25. One owl contained mice and one European sparrow.

These little owls are very beneficial birds. They seem to feed on insects, in preference to anything else, if they can get them. I have been puzzled to tell where the owl of January 13th obtained the cutworm larvæ. The bird seemed to be a resident, as its feathers were soiled with black coal soot, commonly seen on the birds that linger long in the vicinity of the city. The raptorial birds are almost always very fat, proving they take good care of themselves.

NOTE. — Since the reading of this paper, the letter appended has been received. It explains itself:

CIRCLEVILLE, March 5, 1885.

MR. CHARLES DURY:

Dear Sir — I noticed a report in yesterday's *Daily Enquirer*, of a paper read by you before your Society of Natural History, on Rapacious Birds.

Allow me to add some testimony to our much-needed knowledge of birds of this class.

For many years I have personally known the value of our large horned owl as a "ratter," and will cite one instance in particular as proof.

About eight years ago, one of my men discovered a pair of owlets of the large-horned variety, in an old sycamore stub, near my stables on my farm, and concluded to capture them alive. With some risk to himself, he succeeded in securing them, but not without a regular fight with the old ones, who gave him a few wounds. In the nest where he got the young owls, he noticed several full-grown Norway rats, with their skulls opened, and the brains removed. On descending to the ground, he also noticed the bodies of many rats around the tree, and out of curiosity counted them, and found the bodies of 113 rats, most of them full-

grown. They all appeared to simply have had their skulls opened, and the brains removed; and from their undecayed appearance, must all have been captured within the previous week, or ten days.

On account of their nocturnal habits, from my personal experience and observation, I consider the owl, especially the great horned owl, a bird of great value to the farmer, especially as a ratter.

Yours, O. E. NILES.

Journal of the Cincinnati Society of Natural History, April, 1885.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. IV.

Quercus prinus.

(Variety unnamed.)

OF the biennial-fruited oaks found in Rhode Island there is a single specimen belonging to the chestnut-oak division, which deserves special mention. I do not find any description in botanical works by which it can be identified as any named variety. I am inclined, with some of our local botanists, to regard it as a hybrid, probably of the *Q. alba* and *Q. bicolor*, both of which are found abundantly near it.

So far as the writer can learn, no other specimen of its peculiar characteristics is known in this state or elsewhere. The view of this being a hybrid is the more probable from the well-known tendency of the oaks to cross.

This tree is located in Providence, a half mile from Seekonk River, in an unimproved lot near the junction of Arlington and President avenues. It is about forty feet high, with wide-spreading top, the lower limbs striking out horizontally, but not having the contortions common to the white oaks. The general aspect of the tree, however, in the distance is that of the white oak. The bark resembles that of the sub-division to which it belongs, being much like that of a chestnut tree. The leaves are peculiar. They average with the petiole, which is about an inch long, seven inches in length,

and half as wide. They are ovate in shape, narrowed at the base.

The prominent mid vein sends out six or seven pairs of prominent lateral veins, at sharp angles, which determine the number of divisions of the leaf blade. The margin is deeply indented, the sinuses being fully an inch cut, with one-third that width. This gives a more prominently toothed division to the leaf than is found in other varieties. The branchlets are heavily foliaged, the leaves lying upon each other in an imbricated manner. The young leaves are slightly downy underneath, pale green, darker above. The foliage of the tree is certainly characteristic and remarkably attractive.

The fruit marks the tree as varying from the named varieties of the *Q. prinus*. It is fully one and a fourth inches in length, in a cup one third as deep, prominently tubercled. The fruit resembles that of the English oak, *Q. robur*.

The wood, as examined from a dead branch, is coarse grained, and of dark color.

The tree described is dying rapidly. One half will not leave out again; the other part appears vigorous at this writing, and is fruiting abundantly, this year. It has fruited but sparingly for several years, last year not at all. The variety is certainly worth propagating, not alone from its rarity, but from its beauty as a shade tree.

It should be remarked that the soil upon which this tree grows is a rich loam, moist but not swampy, and it is in a sheltered situation, with ample room for development.

This completes the list of annual-fruited oaks in Rhode Island, unless a doubted report should prove true, that the mossy-cup white oak, *Q. macrocarpa*, is to be found in the northwestern corner of the state.

Recapitulation of the annual-fruited oaks:

WHITE OAK DIVISION.

Q. alba — White oak.

Q. obtusiloba — Post oak.

CHESTNUT OAK DIVISION.

Q. prinus.

Var. bicolor — Swamp chestnut oak.

Var. monticola — Rock chestnut oak.

Var. prinoides — Chinquapin oak.

Var. not named.

WHAT is meant by the bone of contention? The jaw-bone.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XI.

WE now come to the arboreal Batrachians, the tree-frogs, or, as they are more commonly called, the "tree-toads." These animals have teeth in the upper jaw and on the palatine bones, the latter appearing in the center of the roof of the mouth. The toes are all provided at their extremities with sucking-disks, and those of the hind limbs are more or less united by a web. By means of these sucking-disks, and assisted by a viscid fluid, secreted from the lower surface of the toes, the tree-toads can, not only secure their hold on the slender branches of the trees and fearlessly jump from bough to bough, but they can crawl up the smooth surface of a window-pane or the perpendicular walls of a room. The palmation of the hind limbs is of use with our forms only during the breeding season, when the males and females congregate in the warm pools and shallow pond holes, making the air ring with their shrill pipings.

Hyla versicolor Le Conte. The common tree-toad is one of the most beautiful members of the genus, and well merits its specific name, as it possesses the power of changing its hue to a most remarkable degree. Ordinarily when found it is of a greenish white shade, a color giving the crouching animal the appearance of a piece of putty. In the angles of the legs, as well as on the sides of the abdomen, a beautiful bright yellow obtains. The pale white is, however, soon changed to darker shades and may become almost brown, a shade which harmonizes with the limbs of the trees on which the animal lives. The length of the body, exclusive of the hind limbs, is about two inches. The "trill" of the tree-toad is familiar to all as a call heard during the warm, sultry evenings of spring and summer, and resembling the noise produced by a watchman's rattle.

When thus calling, the animal may be easily found by a person locating himself near the base of the tree in which the animal rests, and observing the bases of the several limbs as they spring from the trunk. The animal generally chooses this situation for his calling tower, and so interested is he

in his vocal powers that rather than leave off in the midst of his piece, he will allow himself to be taken in the hand.

In captivity the tree-toad makes an interesting, though noisy pet. A starch-box containing some damp moss and a small dish of water, and well supplied with insect life, will render the animal perfectly contented, and he will live in health during the season. Even in their out-door life, the tree-toads seem to be of a most contented disposition. An individual has been known to remain in a single tree for months at a time, and possibly for successive years. Specimens have been found hibernating in the dead wood at the bottom of hollow trees, and also in the soil among the roots.

The Rodentia of Rhode Island.

(Continued.)

WHITE-FOOTED MOUSE; DEER MOUSE;
FIELD MOUSE; HESPEROMYS LECOPUS (RAF)
LE CONTE.

I HAVE before me ten specimen skins of this small Rhode Island Mouse, the peltage varying from leaden gray with a slight rufous tint along the sides, the under parts and feet white, in a young specimen taken Nov. 19, 1884, to the full coloring of adults taken at different seasons, which is a soft yellow brown color above with the back dark, where the hairs are tipped with a darker shade nearly black, all the under parts, the feet and the under part of the tail, pure white. The average length from nose to tail is three and one-half inches, the tail nearly as long as the head and body. The eyes are mild, round and full, standing out prominently from the head.

I have found this species abundant in the central and eastern part of the state, and as it seems to adapt itself to almost any sort of field or woodland, it is probably plenty everywhere. It is a nimble little creature, and the second one I ever caught sought safety by running up a slender tree some twenty feet, and when my companion followed it jumped boldly off, and very nearly escaped me. The memory of that large man shinning a tree for one small mouse is now a little amusing.

Mr. Daniel Seamans caught, May 18, near

Rockland, R. I., a fine female, and for two days I had her alive. She allowed any amount of handling, without attempting to bite, and I anticipated much pleasure in studying her habits; but the following morning she was missing, and the head was eaten from a dead snake that had been left near the cage. During captivity she ate freely of crackers, canary seed, cheese, meal, and clover. The afore-mentioned incident proves also some carnivorous propensities.

From three to six young are said to be produced at a birth, at any time from April to November, and there are probably several litters each season.

All the nests that I have found were of grass and dead leaves, nearly round and slightly matted, and placed in holes in trees from a foot to five feet above the ground. Dr. Merriam says, that in certain open situations, they excavate chambers in the earth several inches below the surface; in these various situations they hibernate somewhat irregularly during the coldest weather. Mr. J. A. Allen, in the Bulletin of the Museum of Comparative Anatomy, says he has found as many as five huddled together in a torpid state, while Dr. Merriam reports them as abroad except during the most severe weather. For their winter needs they lay up a large store of seeds. Dr. Merriam says he has removed two quarts of shucked beechnuts from a single hoard.

It would seem that Hesperomys, like the common House Mouse, sometimes exhibits remarkable vocal powers, a song well continued of considerable compass and very soft and clear. In the *American Naturalist*, May, 1871, and December, 1871, are two interesting reports upon this subject.

✓
THE King Rail, in my collection, was taken in Saybrook, January 14, 1876, near the west shore of the Connecticut River. It was started by the dog from a patch of rushes, whence it rose and flew a short distance, its flight resembling that of a duck, which, at first sight, it was supposed to be. I have heard of the Rail hunters securing others, but this is the only one I have had. I once found a nest of this bird here, and have some of the eggs yet, but it was many years ago that I took them. J. N. CLARK.

Buttercups.

FEW persons realize how many different kinds of buttercups we have here in Rhode Island. The bulbous species, which is naturalized from Europe, and mostly restricted to our Eastern sea-board, is the first to appear. It fills one with joy, as does the first dandelion. Its bright yellow cup, polished and shining, is well beloved of children. They gather large handfuls of buttercups to test their own appreciation of butter. Ere the bulbous species has entirely disappeared from our lawns and meadows, comes the later *Ranunculus acris*, very handsome in leaf and flower, but in neither so showy, in our opinion, as is the creeping buttercup, found in wet places. The early crowfoot, *Ranunculus fascicularis*, is very local with us. We have found it but once, in East Providence. The bright yellow flower is an inch broad, and the plant is known at once by its cluster of thick, fleshy roots.

Besides these species, we have the two curious aquatic species, one with white flowers (*R. aquatilis*), and the yellow-flowered *R. multifidus*. The last, which is smooth when growing in water, becomes hairy in its occasional terrestrial forms. It is, when in water, isolated from insect molestation, but, when the water is removed, requires to protect itself by pubescence. One of the noticeable things about the white water-crowfoot, is its frequent development of two sorts of leaves. Of these, the immersed kind consists of long, capillary divisions, while the floating ones are round, flat, and lobed. Again, we have the larger and smaller spear-worts, though these are local in their distribution. The seaside species, *R. cymbalaria*, is more commonly seen. It is found also near salt springs or lakes, as in New York State, in Nevada, and in Utah. Two very small-flowered species of buttercup we now find in blossom in damp woods. These are the species *abortivus* and *recurvatus* of botanists. To us they possess beauties, perhaps not obvious to those who fail to perceive that a weed is "but a flower in disguise."

It will be seen from this list that we are well provided with buttercups. Undoubtedly many of them are unmitigated weeds, to be warred upon always and everywhere.

But we must be pardoned for thinking that without any buttercups one would be less rich. Their gold is cheap, it is true, but it is sterling. We could better spare some more pretentious flowers.

W. W. BAILEY.

JUNE 5, 1885.

MR. S. Schollfield, of Providence, has brought to our notice a rose in full bloom. From its centre among the stamens had grown out a new stem, terminating in a perfect and quite well developed bud. We referred the specimen to Professor W. W. Bailey, of Brown University, and he has favored us with the following article:

MY DEAR SIR: The rose you send me illustrates what is known as proliferation of the flower. It is interesting as bearing upon the theory of metamorphosis as made known nearly simultaneously by Wolff and Goethe. It is in effect a flower reverting to a leafy branch. Often the change, especially in roses, is complete, the petals changing into green leaves. We understand a flower to be a branch metamorphosed or changed, or perhaps it is better to say, *specialized*, for the accomplishment of reproduction. Upon this branch the leaves are modified into petals, stamen, and pistils, a higher grade of organs than foliage-leaves. But unusual circumstances, such as excess of moisture, may induce a branch which had begun to develop into a flower, to revert to the lower function of leaf-producing. This is what has happened here.

MR. Geo. H. Ragsdale, Gainesville, Texas, sends us a double nest, about which he writes as follows: "The two nests sent last week in the bunch of mistletoe I take to be those of the Orchard Oriole and Lark Finch, the latter built in and on the former, probably after the Orioles had vacated. The nests were placed in a Black Jack tree thirty feet high."

A MAGAZINE writer asks: "How shall we utilize the Indians?" This is a difficult question to answer, but perhaps the best plan would be to petrify them and sell them for cigar-store signs. This idea is worthy of consideration.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XIX.

FAMILY 37. Melaniidæ, comprises several hundred species of *fresh water* shells, inhabiting all the warmer parts of the world excepting North America.

FAMILY 38. Strepomatidæ, are also fresh water shells, about five hundred species, mostly confined to the United States, but not known to inhabit New England.

FAMILY 39. Rissoididæ, not represented in Rhode Island.

FAMILY 40. Rissoidæ, contains an immense number of species, inhabiting all parts of the world, some genera in fresh water, and others in salt water, while some are amphibious. The animals are all herbivorous. This family is divided into seven sub-families, viz.:

- SUB-FAMILY 1. Bythininæ, two genera.
- “ “ 2. Skeneinæ, one genus.
- “ “ 3. Rissoininæ, four genera.
- “ “ 4. Rissoinæ, three “
- “ “ 5. Hydrobiinæ, fifteen “
- “ “ 6. Lithoglyphinæ, six “
- “ “ 7. Pomatiopsinæ, one genus.

SUB-FAMILY 1. Bythininæ, not represented in America.

SUB-FAMILY 2. Skeneinæ, contains one genus, *Skenea*, Fleming. Represented in New England by one species.

54. SKENEA PLANORBIS, FABRICUS.

Shell minute, flat, discoidal, deeply umbilicated, showing all the whorls, three in number; apex slightly elevated; aperture round, dilated, in contact with, but not forming any part of the preceding whorl. Length, one-twentieth of an inch, breadth one-thirtieth. Habitat, on and under stones at low water mark, on rocky ocean shores, and among the roots of our common corallina. Dist., France and England, Norway, Spitzbergen, Iceland, Greenland, and Labrador to Long Island Sound.

Found in Rhode Island only at Watch Hill, so far as now known.

SUB-FAMILY 3. Rissoininæ, not represented on our coasts.

SUB-FAMILY, 4. Rissoinæ, not represented in Rhode Island.

SUB-FAMILY 5. Hydrobiinæ, contains twelve genera, two of which, *Littorinella* and *Amnicola* are represented in Rhode Island.

SUB-FAMILIES 6 and 7. Lithoglyphinæ and Pomatiopsinæ are not found in Rhode Island, although one species of *Pomatiopsis* is found in the western parts of Massachusetts and Connecticut.

GENUS LITTORINELLA, BRAUN.

Syns.:

Paludinella, Loven (not Pfr.). *Littorinidea*, Eyd and Soul.

Dist., World wide, in brackish or salt water.

55. LITTORINELLA ACULEUS, GOULD.

Syns.:

Cingula aculeus, Gld., DeKay.

Rissoa aculeus, Stimpson.

Shell minute, ovate-cylindrical, elongated, light yellowish horn color; whorls six, separated by a deep suture; apex obtuse; surface of the shell covered with regular microscopic revolving lines; aperture one-third the length of the shell, oval, oblique; lips simple, just touching the body whorl, leaving a small umbilicus. Length three-twentieths of an inch; breadth one-fifteenth. Found on stones at low water mark. It resembles the next species very much, but is distinguished by its habitat and by the revolving lines. Long Island Sound to Greenland. Common at New Haven, Conn. (Verrill). Gull Island (Smith). East Boston (Gld.). Watch Hill, R. I. (Verrill). Whole New England coast (Stimp.).

56. LITTORINELLA MINUTA, TOTTEN.

Syns.:

Turbo minutus, Totten.

Cingula minuta, Gould, DeKay.

Rissoa minuta, Gould, Stimp.

Shell minute, ovate-conic, elevated, yellowish-green, usually coated with a dark pigment or vegetable growth; whorls five, apex obtuse, suture distinct. Operculum horny. The shape of the shell and of the aperture, umbilicus and operculum is almost exactly like those of the preceding species, but the surface is destitute of revolving lines and the breadth of the shell is one-

tenth of an inch (aculeus is one-fifteenth), while the length of the two species is the same, three-twentieths. It was described by Col. Joseph G. Totten in *Silliman's Journal*, vol. xxvi., page 369.

GoULD says of this species: "It is found plentifully on seaweed and on moist banks, about high water mark, especially on the thread-like plants which grow in ditches and brackish pools, in company with *Littorina tenebrosa*."

I have never been able to find *one* on seaweed, or in any situation where *Littorina tenebrosa* is found. I have found them on empty clam-shells between tides, and in shell sand thrown up above high water mark, about one-quarter grown, and have had just such looking specimens sent me from Massachusetts and Maine, but the best locality in Rhode Island is on the sand between tides, in water almost fresh and a little muddy. I collected at one time a great number of specimens of extraordinary size and perfection at Bishop's Bend, between Ingrahamville and Bucklin's Island on the Seekonk River.

57. LITTORINELLA EXARATA, STIMP.

This species I know nothing of, but include it here on the authority of Prof. A. E. Verrill, who obtained it at Watch Hill, among rocks and algae in four or five fathoms water. He says it inhabits from Stonington, Conn., to Gulf of St. Lawrence.

GENUS AMNICOLA, GOULD AND HALD., 1841.

The fifty-seven species of Rhode Island shells which have been described in these papers thus far are all *marine*, or inhabitants of salt water. The species forming the genus *Amnicola*, however, are all *fluvial* or fresh water species, not merely brackish, but confined entirely to ponds, fresh water rivers, etc. *Amnicola* is confined to the United States, and contains about ten species, two of which inhabit Rhode Island.

58. AMNICOLA LIMOSA, SAY.

Syns.:

Paludina limosa, Say.

Paludina porata, Ad. Philippi.

Amnicola porata, Gould, non Say.

Amnicola limosa, Binney, Hald., Perkins.

Shell small, conic-globose; smooth, usually covered with mud or slime, but under this coating, dark brown to light olive-green

in color; whorls four, convex; suture deeply impressed; aperture nearly circular; lips sharp; inner lip just touches the body whorl, leaving a large and deep umbilicus. Length three-tenths of an inch; breadth one-fourth. Gould, in the *Invert. Mass.*, first edition, calls our shell the *Amnicola porata* of Say; later authorities pronounce it *A. limosa*, Say, and state that *porata* does not inhabit New England. W. G. Binney, in *Land and Fresh Water Shells of N. A.*, gives the only habitat of *porata*, Say, Cayuga Lake, Big Sioux River, and Moose Factory, B. A. In a letter to the writer, Mr. John G. Anthony said: "*A. limosa*, Say, is not positively known to conchologists, and I doubt the Rhode Island shells belonging to that species." I hope these remarks will bring out some opinions from other workers in this direction, as we have an abundance of the shells and would like to have its name settled. It is found in our rivers, ponds, brooks and ditches, adhering to submerged sticks and plants, but seems to prefer stones and the empty valves of *Unios* and *Anodons*.

59. AMNICOLA GRANA, SAY.

Syns.:

Paludina grana, Say.

Amnicola Brownii, H. F. Carpenter.

This species is found abundantly in Cunniff's Pond, at Elmville, three or four miles south of Providence, and in no other locality in Rhode Island, that I am aware of. I discovered them in 1870, and supposing them to be a new species, I named it as above, and read a description of it in a paper before the "Providence Franklin Society," Tuesday evening, March 26th, 1872, and published the same in the *Central Falls Weekly Visitor*, the next week. I have sent specimens of these shells to very many conchologists, and as they pronounce them to be Say's *A. grana*, my name is dropped. The following is my original description, which is not exactly like Say's in all respects, but it is correct: "Shell small, thin, translucent, of a light green color, when divested of the thick, dirty epidermis which covers it, turritid, elongate, composed of five gibbous whorls; operculated and umbilicated; apex very obtuse; suture very deep; aperture nearly circular, a little broader at the base; lips continuous, sim-

ple, the superior edge of the inner lip not touching the preceding whorl, except in young specimens. Average size one-tenth inch in length by one-fourteenth in breadth. Diameter of aperture one-twenty-fifth inch. Full grown specimens attain a length of three-twentieths inch."

(To be continued.)

A Hint to Conchologists.

THE following easy way of removing the smaller species of univalve mollusks from their shells without injuring the latter, may prove of interest to our conchological friends:

As the old saying goes, 'first get the shells,' then drop them into a pan of water close to the boiling point, and let them boil from one to two minutes, but no longer. Then, by inserting the point of a pin into the foot and turning the latter toward the inner lip or columella,—revolving the shell at the same time in an opposite direction,—the animal may be extracted without the slightest trouble. As soon as possible thereafter the shells should be carefully brushed, using a soft tooth-brush for the purpose, and those having an outward gloss well rubbed with a fine cloth or chamois skin, while those that are naturally dull, or covered with an epidermis, should be oiled lightly with the *purest of olive oil* only. Cotton-seed oil will make them offensive to the touch as well as to the sight. Unfortunately this boiling process will not answer for large specimens, as the amount of time required to sever their muscular attachments inevitably destroys the internal naere, and therefore the value of the shells. It is pleasant to know, however, that the small and more delicate species can be so easily managed, saving, as the operation does, much valuable time to the student, and many a trial of his patience and temper as well.

JOHN FORD.

PHILADELPHIA, PENN., June, 1885.

"WHAT nose is more brilliant than a wine bibber's? Volca-nos, to be sure. And the chief glow comes from the 'crater.'"

Mylacris Packardii.

THE above name has been lately given to an insect of the Carboniferous Age, by the great American authority, Professor Scudder, editor of *Science*, Cambridge, Mass. Its locality was Bristol, R. I., on the shores of Narragansett Bay, south of Peck's Rocks. The possessor, the Rev. Edgar F. Clark, gave it the temporary name of *Blatta Americana*. The canonical name given by Professor Scudder was in honor of Professor Packard, of Brown University, who also possesses large entomological reputation. The insect belongs to the cockroaches of geologic antiquity, of peculiar form.

Color of Birds Eyes.

California Barn Owl, nearly black.
 Glossy Ibis, brown.
 White-faced Glossy Ibis, red.
 White Ibis, pearly blue.
 Scarlet Ibis.
 Roseate Spoonbill, carmine.
 Wood Ibis, dark brown.
 Great Blue Heron, pale yellow, straw.
 Great White Heron, pale yellow, straw.
 White Egret, pale yellow, straw.
 Snowy Heron, pale yellow, straw.
 Louisiana Egret, red.
 Reddish Egret, red.
 Little Blue Heron, yellow.
 Green Heron, yellow.
 Night Heron, red; young, brown.
 Yellow-crowned Night Heron, orange.
 American Bittern, light yellow.
 Least Bittern, light yellow.
 Florida Gallinule, red or brown.
 Mallard Duck, brown, hazel.
 Black Duck, brown.
 Pin-tailed Duck, brown.
 Gadwall, reddish brown.
 Wigeon, brown.
 Green-winged Teel, brown.
 Blue-winged Teel, brown.
 Cinnamon Teel, orange.
 Shoveller Duck, orange-red.
 Wood Duck, red.
 Greater Scaup Duck, yellow.
 Lesser Scaup Duck, yellow.
 Red-head Duck, orange.
 Canvas-back Duck, red.



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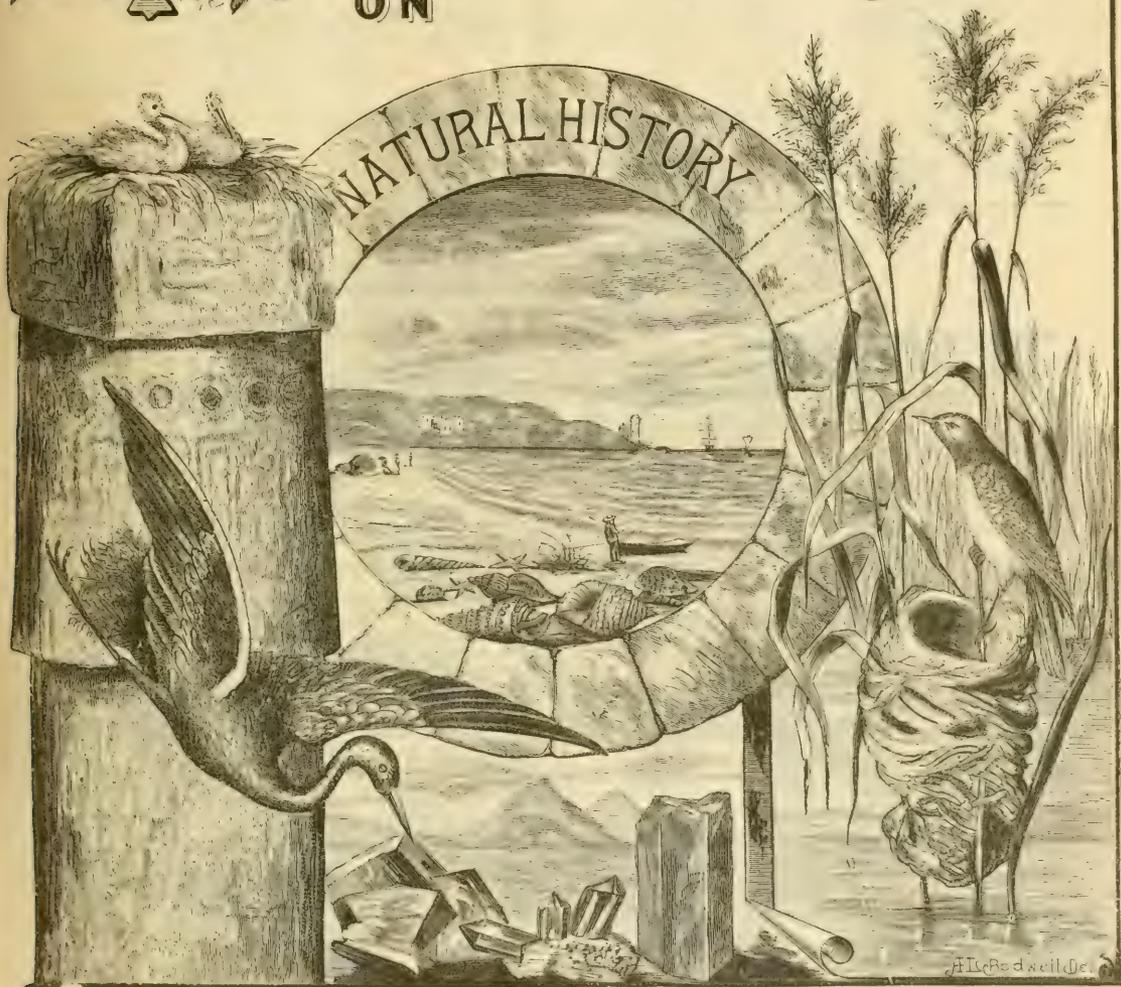
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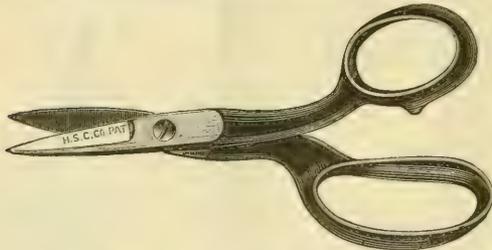
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Lines

READ AT THE FIELD MEETING OF THE PROVIDENCE FRANKLIN SOCIETY, AT STIRLING, CONN., JUNE 6, 1885, BY PROF. W. WHITMAN BAILEY, OF BROWN UNIVERSITY.

PRAY who are all these "ists" and "ites" ?
What mean these unaccustomed sights ?
Who come with hammers and with boxes
To thus disturb the dens of foxes ?
What cause for this uncouth attire,
Adopted both by dame and squire ?
Are these State Farmers on a spree ?
Or is this some society ?
What do they here across the line,
Where wooden nutmegs grow from pine ?
Methinks the average rustic may
Address himself in some such way,
And call us, of the desks and schools,
Perhaps, who knows ? a set of fools,
To go rampaging o'er the stones,
At mortal risk to flesh and bones,
Just to "corral" some snake or lizard,
Or pop a blue jay through the gizzard.
There are more things in heaven and earth,
Horatio, than are given birth;
And 'tis by these that savants learn,
Who fossiliferous bowlders turn,
Or "yank the yarbs" up by the stem,
And clap long Latin names on them.
'Tis but a little that we know,
For all our most prodigious show.
Yet there are those, you know them well,
Assembled here, who from a shell
Or stone of some historic beach,
A sermon eloquent can preach ;
Can, from a fern, produce the life
That once upon the earth was rife ;
Or, from some meteoric dust
Create our planetary crust.
There are those, too, who'd stir your marrow
With tales suggested by an arrow,
A trifling bit of flint or glass
Which we more careless ones would pass.
If I interpret signs aright,
Our Chairman may, or surely might,
From his own note-book read a page
Of many a forest monarch's age ;
For all of us, of course, agree,
He's most at home when "up a tree."
There is another of our band
Whom I could never understand,
Who calls him old ? Just let him try

To walk him off his legs; not I.
Who knows, as he does, all the nooks ?
The forest glens, the bubbling brooks ?
The well where hangs the shiniest dipper ?
The spot where blooms the lady slipper ?
Where first you'll find the Epigæa
Or liverworts, each vernal year ?
Where the shy orchis' spike is seen ?
And where the ferns are earliest green ?
Why ! put him in the wood alone,
He'd find his way by lichen'd stone,
Or some mysterious sign, that we
Less favored mortals cannot see.
His voice is calm ; his words are few
And simple, but we heed them too ;
For ripe experience tells him then,
Just what to say, and where, and when.
But pardon me ! I'm not to toast
Each member here ; but two at most.
My jingling rhymes must now give way,
Let's hear what others have to say ;
Let each one open up his box
And show his share of plant or rocks,
Or if his treasure's in his head,
We'll hear his learned talk instead.
Forgive the doggerel I have read.

A Rhode Island Clambake.

HISTORY OF THE CLAM FROM THE MUD
TO THE TABLE.

A THOUSAND people—men, women, and children, old and young, rich and poor, of all sorts and conditions, seated in rows on stools at long, uncovered, white-painted deal tables, and engaged in the discussion of a clam dinner, is a sight without a parallel under the sun, is impossible to picture or describe, and must be participated in *in actu* to have any small realization of what it may be like.

The name of the man who first discovered that a Rhode Island clam was a delicacy is lost in oblivion. Let it remain so ; the honor would be too great for any one name to support. But the clambake on the shores of Narragansett probably dates further back than the Williams' family cemetery. Old people yet living remember the days before excursion steamers, rival "resorts," and clambake clubs, when a day's trip "to the shore" was the proper thing, and the bake both the picnic meal and its main attraction. Clams are baked, to-day, too, as they were years ago, and no one wants them different.

Not only is the bake the same old bake with all its old fashioned flavor—a real antique in a world of would-be ancient and-irons, blue china, and ancestry, but also is the clam the same old clam. Science distinguishes the Rhode Island long-necked clam from its low quality relation, the Coney Island quahaug, by terming it a *mya arenaria*. Few Rhode Islanders care about the distinction; they can tell a real clam with their eyes shut. A New Yorker may turn up his nose at the delicacy and chew on his quahaug, which must afford him about as much satisfaction as a piece of A. W. Faber's rubber. Rhode Island has clung to this dear old clam, despite all opposition and sneers—as she has to other as sacred and worthy institutions.

As at present served, a clam dinner prepared to fill, as it often is, from five to fifteen or twenty thousand people in the course of a few hours, is a stupendous affair, and from the bottom up is a work to be admired as a whole, and wondered at in its details; and few of the thousands who in the course of the summer season sit down to clam dinners, appreciate the work entailed in its preparation.

THE PIECE DE RESISTANCE.

First and foremost there is the clam. Most of the clams used at the shore resorts of Narragansett Bay come from the flats across the bay from Nayatt, on the Conimicut shore and on Green's Island. As far up as Pawtuxet and about Sabin's Point, the clams are considered hard, glue-shelled and gritty; but across at Bullock's Point they are good, and the Bullock's Pointers get their clams right at home. Two-thirds of the clams are got by "churning." The clam gang wades out over the bed and shovels up mud and clams and everything that comes along into big wire baskets, which, when about full, are lifted out of the water, and a rinsing and shaking washes out the mud and leaves the clams. Two men and a boy attend to each basket, one man shoveling in the mud, the second getting out the clams and the boy "culling" them. Churning can only be done at about half-tide, when the water is two or three feet deep. The suction on the shovel is tremendous, and they are made exceptionally strong. When there are good tides, on the full and change of the moon, the

clams may be raked out after the manner of the non-professional digger; a shovelful of mud is turned up at a time and the clams it contains are raked out with the clam hoe. Consideration of either of the above methods is sufficient for a true understanding of the happiness of the clam at high water. The clam ordinarily lies in the mud from two to eighteen inches; a clam that would bury itself much deeper than eighteen inches is not to be looked upon with favor. It is a wearing-life that the clam diggers lead, working as they do in the water and so hard as to be constantly wet with perspiration.

At Rocky Point alone last year some 4,000 bushels of clams for the bake alone were used. The regular clam gang is seventeen or eighteen men, but on big days it is necessary to increase the force to fifty or sixty men. This year the clams on Green's Island are only one year old, and are ready for the bake—a remarkable case of clam growth. It appears that when the clams are in great abundance they grow very slowly, and those used last year from Green's Island were about three years old; but, being few of them "set" one year ago, they grew large enough for use very rapidly.

As the men are paid for their digging by the bushel it is evident that on skill and hard work depends the amount of money the digger gets, while "churning" is evidently more profitable than "raking." They get about eighty cents a bushel and every shore resort has its "thoroughbred" digger, who can get out more clams in a given time than any other man.

Well, once the clams are out of the water and in the boats they are towed to shore where they are piled in a shed, picked over, and carefully washed. Five or six men are employed constantly at this work at the larger resorts. The preparation of the pile on which the clams are to bake is the next step, and this is done on much the same plan everywhere: a pile of wood is laid, on every layer of which cobble stones are placed and the burning of the wood heats the stones and makes them ready to have the clams thrown on top. At Rocky Point, instead of building the pile on the ground, it is laid on a surface of stone, cemented with fire clay, and some such plan has been adopted in other places. This allows of the

stones being pulled off after the wood is consumed and the plate swept clean of ashes; when the stones are piled on it again. Over the hot stones a mass of rockweed is piled, and the sight of a line of waiters with tubs of clams between them, running at breakneck speed for the pile, forming a circle about it, and emptying the tubs on top with a concerted effort, is familiar. Over the whole the canvas is laid, seaweed is heaped and a fragrant steam arises from the pile. Twenty minutes later the clams are ready for the table. And the accompanying dishes of clam-cakes, baked fish, fish chowder, lobster, green corn, brown-bread, and water melon. Between twenty-five and thirty waiters are required to serve all up in the larger dining-halls.

The shells are about the only things left after a well organized excursion party has attacked a clambake. These are carted off and dumped on some stretch of waste land. The accumulated shells of a season of some eighty days, is considerable. They lie in the sun until the following spring. Then they are spread over the roads, and prime roads they do make.

Said Capt. J. H. Northup, who has been the captain of the Rocky Point clam gang for some eleven years, "Do I expect the clams will get run out entirely? Well not just yet, and at present the prospect is something wonderful for next year. I never saw such a 'set' of clams as are all along the shore now; if they all lived, there would be enough clams to supply the world next year. Just come with me and take a look."

The tide was about half in, and the mud flats were scattered over with all sorts of refuse, shells and weed. The captain bent down and picked up what looked at first like a minute, broken-off bit of clam-shell, but, as it lay in his hand, a closer look revealed it a perfectly formed clam shell, a beautiful object, not as big as a baby's little finger nail, as white as alabaster, and the light showing pink through its delicate substance; the least pressure would have crushed it to almost invisible atoms. "That's a clam," said the captain, "that's maybe three weeks old, and you'll find millions about here. As quick as they get any size they will begin to burrow down into the mud. The whole shore is covered with them, and in all my experience of thirty years I

never saw such a 'set.' They are so thick that the prospect is they will not grow fast, and it will take two or three years for them to get big enough to bake unless they die off. A handful of these will make more'n a bushel when they are grown up."

Pawtuxet has very aptly been termed "Clamtown," as that is the chief industry of the village, there being no less than sixteen firms and persons engaged as dealers, employing during the summer season from one to fifteen men each, making a total of seventy-five men engaged in the business. Besides furnishing the clams for several shore places, each of the fifteen employers deliver them in Providence by team, and several barrels are shipped each day to distant places. The total number of clams dug each day and delivered by the several dealers, average, during the present season, not less than one hundred and fifty bushels.

— *Providence Journal.*

ONE frosty morning, early in November, as I was watching a small flock of Yellow-rumped Warblers skipping and frolicking amongst the rustling plants in my garden, I noticed one very peculiar bird amongst them, and in a few moments had it in my hand. It resembled a very small Vireo, and a drop of blood on its beak, enlarging it, strengthened the illusion, so that I was confident that I had some new species of that family. But upon examination I recognized a rare old acquaintance, the Tennessee Warbler. I had never before seen one so late in the autumn.

J. N. CLARK.

The Rocky Mountain Goat.

APLOCERUS MONTANUS.

OF late we have had from Europe several calls for skins of this rare species. While we hope in time to be able to supply these specimens, the great difficulty of obtaining them should be appreciated.

The creature has a general resemblance to a goat, while the body is much like a sheep, but it is after all more nearly allied to the antelopes. It is rather larger than the average domestic sheep, and the very long hair, which is of a yellowish white color, coarse and brittle, falls down all over the body, tail, and upper part of the legs,

and a beard or tuft of the same hangs from the chin; the horns, hoofs, and edges of the nostrils are black; the horns are much like those of the chamois,—smooth, conical, and turned slightly backward.

Under the long hair is a thick coat of silky white wool. An article by John Keast Lord, F. Z. S., in an old number of *The Student and Intellectual Observer*, published in London, gives a most interesting description of the animal, its habits, and the use which the Indians of British Columbia and Vancouver's Island made of this wool, using rude looms, and weaving blankets—often of good designs and colored patterns, sometimes mixed with feathers, but oftener with the silky hair of certain dogs, which they bred with great care for that purpose.

The highest levels of the Rocky Mountain and Cascade ranges are its almost inaccessible home, and there among the little stretches kept green by the melting of perpetual snow, where its food of grass, moss, and young fronds of *Pinus contorta* is to be found; the young, probably one at a time, are dropped in May or June, and are seen running with their mothers in July. From Professor Ward's *Natural Science Bulletin*, we copy the following:

“The Rocky Mountain Goat is one of the most difficult to procure of our North American mammals. Not only are the herds few in number, but they live high up in the mountains in the most inaccessible places, taking refuge—so say the hunters—where even a dog cannot follow them, and it sometimes happens that after a goat has been killed the body cannot be reached, or else falls from a cliff, and is so mangled as to be useless. Even after specimens have been secured and ‘backed’ to camp, the trouble is by no means ended, for in order to get them to the nearest station it is necessary to transport them over rough and rocky mountain passes and across swollen and turbulent rivers, at imminent risk of loss. Specimens received have been on the road for over four months. The following are extracts of letters from two of our (Professor Ward's) correspondents in the region where the mountain goat is found:

“The Mountain Goat is very scarce—only found in a few places. They range very high up among the rocks and cliffs. They do not seem to be a shy animal, but

after killing one it is extremely difficult to get it out. I have on two occasions killed a goat, and could not possibly get to the animal.

“Could you see, or I describe to you, the configuration of the mountain chasms and peaks where the Indians procure the animals in question, you would understand what a task it is to procure a specimen that is not mangled, torn, and utterly ruined (except for food), by a fall of perhaps thousands of feet into some gloomy abyss, when the shot is fired that kills. In this connection I may be allowed to mention that last autumn, the Indians while bringing me a carcass of a goat, a distance of eight miles to reach my ranch (at the foot of the main range), lost horse and carcass over a precipice, so that to avoid trouble with the Indians, I purchased horse as well as goat.”

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XII.

2. *Hyla pickeringii* Le Conte. (*Hylodes pickeringii* Holbrook.) The Piping Tree Frog, or March Peeper is one of our most abundant *Batrachians*, myriads being heard at certain seasons of the year, though, due to their small size and unobtrusive ways, they are seldom met with by the more casual or indifferent person. When searched for, however, they are, especially during the months of spring, found in large numbers, usually about the dead grass or dry leaves bordering some warm shallow pool, or inundated field.

The amateur, bent on seeing a March Peeper, quietly steals towards the pool where hundreds are calling, but is surprised to find that long before he reaches the orchestra all music has ceased. This timidity on the part of the musicians is very remarkable. A passing bird, or even a shadow will often produce immediate silence. The Peeper is a restless fellow, however, and soon to the attentive eye, a slight disturbance betrays his whereabouts, as he endeavors to crawl out on some floating leaf or half submerged mass of straw, before he inflates himself for work.

The method of calling is interesting. Having drawn in a long breath, the male

(the females are dumb), by means of two slits, each near the angle of the jaw, inflates a loose sac, lying below the transverse muscles of the floor of the mouth, and thus retains it until a sufficient number of "peeps" have been given to exhaust the supply of air, or until disturbed, when the sac immediately disappears. Before thus peeping it has been observed that the frog invariably crawls from the water to some slightly elevated spot.

By the middle of May or the first of June the breeding season is over with, and the exhausted animals retire to the neighboring woods and gardens to live in silence for a few weeks, but they are soon heard again during the sultry days of August, now, not from the meadows, but from the trees of the uplands. At this season, however, they are less noisy, and their numbers being scattered, they attract but little attention. As they are, with the wood-frog, the first of the *Batrachians* to appear in spring, so they are the last to retire in the fall, and even in mid-winter a few warm days are sufficient to encourage their musical powers. While hibernating they are known to remain under dead leaves.

Many interesting facts in connection with this animal have been published by Mary H. Hinckley. The eggs, which differ from those of our other frogs in that they are laid singly instead of in strings or groups, in from seven to twelve days after their deposition, give rise to tadpoles.

When in the water these unfortunate animals are preyed upon by many enemies, of which newts, larger frogs, the larvæ of insects, birds and smaller mammals are the most destructive. A spider, *Dolomedes sex-punctatus*, was observed to walk out on the surface of the water, and dive and secure the helpless tadpoles as if to make of them a regular diet. Long before their tails have become absorbed, to escape the war of extermination waged against them, these miniature frogs climb up on the stalks of grass or on floating leaves and there, out of dangers way, await the approach of some unsuspecting mosquito or small fly.

The extreme small size, pale reddish brown color, sucker-like toes and the cruciform ornamentation of the back prevent this species from being confounded with any other.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. V.

Quercus rubra — RED OAK.

IN the previous numbers of this series, the annual-fruited oaks of the state have been treated. In this article, and several subsequent ones, the biennial-fruited group will receive attention. It should be here recalled, that the chief point of separation into these groups is, that of the time required from the blossoming to the ripening of the fruit,—the first perfecting it the first season; the second, in the autumn of the second year. In the "biennials," the acorns appear hardly larger than a pin's head during the first season, the new growth of the branches shooting out beyond them, so that in the second season, when they begin to grow, they seem to come directly from the branchlets, without the usual preparation of blossoms.

Another noticeable distinction is, that the "annuals" have leaves with lobes or teeth rounded or blunt at their extremities, while the lobes of the "biennials" are all terminated by sharp bristly points. The wood of the "annuals" is, as a group, much better for most purposes of timber than that of the "biennials."

The *Quercus rubra*, red oak, gives name, from its abundance and prominent characteristics to the group the "red oaks." *Q. rubra* is not very abundant in Rhode Island; still, there are scattered trees by the cool banks of the streams, and in the northern part of the state, among the hills, they are occasionally seen in groups. In central New England, and especially in Massachusetts, they reach their perfection of growth and beauty. In Providence some fine specimens of forest red oaks may be seen near the Blackstone Park brook; and a well-grown tree, of remarkable beauty and symmetry, is now standing upon the steep, sloping bank of the river, just below the Merino mill.

The tree, in full development, forms a magnificent rounded head, with a massive trunk and numerous smooth, clean-looking

limbs, usually striking out from the trunk and each other in sharp angles. The bark is notably smooth, even up the main stem, until the tree is twenty-five, or more, years old. The color is generally greenish gray, varying with age and location. It becomes furrowed upon old trees, but is less rough than that of most oaks.

The foliage varies greatly upon different trees, but the characteristic leaf is oblong, wider towards the end and narrowed at the base. There are five or six sinuses on each side, rounded, but not deeply cut, giving rise to as many lobes, each terminated by a bristly point.

The fruit need not be mistaken. It is the largest of that of any native oak. It is placed in a wide, shallow cup covering very little of the acorn. The acorn is extremely bitter, but is readily eaten by swine.

The wood is so porous and brittle as to be of little value for most timber work. It is extremely difficult to dry out the sap of the wood; hence, the woodmen say that it will never season. But for chair work, especially for artificial steam-bending, it is in high repute, and for that purpose and for barrel staves, the forests are being culled of this tree.

It is a tree of very rapid growth and well adapted for a shade tree. The leaves are of a bright, shining green all summer, and change to fine tinges of red in the autumn. It is always a clean, healthful-looking tree, and rarely harbors disagreeable insects. It is a difficult tree to transplant, as are most nut-bearing trees, and for resetting the trees should be started in a nursery, and there treated to tap-root pruning.

The tree varies so much in Rhode Island as to give rise to at least two marked varieties besides the typical red oak; one growing sparingly upon the banks of the Seekonk River, perhaps elsewhere, having very long, lance-like leaves, usually somewhat one-sided, often with a crooked midrib; another variety grows quite plentifully upon the borders of the Pawcatuck River and other portions of the southern part of the state. This has much smaller acorns than the typical ones and in a deeper cup, and the leaves are correspondingly small. I have also seen specimens of this variety near the Diamond Hill station.

It may be added that the range of this

oak is very great, growing farther north than any other oak, even to near the Hudson Bay, and upon the slopes of the Alleghanies as far south as they extend. It will also flourish upon all kinds of soil, from a swamp to the crevices of the rocks high up the mountain sides, where it forms itself into burls and low impenetrable heads yards wide but not a foot high, the last of the deciduous trees to defy the blasts.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XX.

FAMILY 41. Assiminiidæ, contains one genus, *Assimineæ*, Leach, one species of which inhabits Rhode Island.

60. *ASSIMINEA MODESTA*, H. C. LEA.

Syns:

Assimineæ Grayana, Verrill, non Leach.
Cingula modesta, Lea.

Shell small, conical, imperforate, smooth, thin, glossy, light chestnut brown, tinged with greenish or grayish from the seaweeds on which it lives; whorls five or six with an acute tapering spire; last whorl large, round. Length, one-eighth inch; breadth, one-twelfth.

This species was found by H. C. Lea, on the under surface of stones near Brooklyn, L. I., and described by him in *Proc. Bost. Soc. Nat. Hist.*, I., 205, 1845, under the name of *Cingula modesta*. It has since been found at Huntington, L. I., between tides. In 1880 Prof. A. E. Verrill discovered a shell at Newport, R. I., at high water mark, on decaying seaweeds, between the docks, together with *Alexia myosotis*, and *Truncatella truncatula*. He supposed it to be the European shell *Assimineæ Grayana*, Leach, introduced to this port by shipping, and so described it in his *Cat. Mar. Moll.*, 1882. Since then he has compared these Newport specimens with the English ones, and has become satisfied not only that they are unlike, but that they are the same as Lea's *modesta*, and in the second *Cat. Moll.*, 1884, he gives a full description of the shell, with extended remarks on the same, calling it *Assimineæ modesta*, (Lea) Verrill.

FAMILY 42. Valvatidæ, contains one genus, Valvata, Müller, inhabiting ponds and ditches and sluggish streams. There are three sub-genera, two of which are found in New England, each represented by a single species.

61. VALVATA (TROPIDINA) TRICARINATA,
SAY.

Syns.:

- Cyclostoma tricarinata, Say, 1817.
- Valvata tricarinata, Say, Desh, Menke, Hald., Gld., DeKay, Adams.
- Valvata carinata, Sowb.
- Valvata bicarinata, Lea.
- Valvata uncarinata, DeKay.
- Tropidina tricarinata, Chenu.

Shell small, depressed, thin, nearly transparent, of a greenish color; whorls three to four, flattened at the apex, and separated by a canaliculate suture; the whorls are encircled by three keels; umbilicus broad, deep, and funnel shaped; aperture circular, lip simple; breadth one-fifth inch.

This is a very curious species, and is subject to much variation in form, and in the number of carina. The bicarinata of Lea, having two keels, and the uncarinata of DeKay, having but one, are referred to this species. Professor Adams found in Vermont specimens perfectly simple and round, having no carina, to which he gave the name of var simplex. Specimens are found having all degrees of carination, showing them all to be the same species. Say found his specimens in the Delaware River and afterward in the Missouri; DeKay in Lake Champlain and in the Erie Canal; Lea in the Schuylkill; Adams in Vermont; Perkins says, 1870: "It is common in all the ponds and streams around New Haven, Conn." It has not been observed in Rhode Island, but may yet be found here, as it has a very extended range.

Haldeman says of this species: "The ova are deposited from the first day of March to the end of July, in transparent masses, one-twentieth of an inch in diameter, each containing a number of germs of a bright green color, dotted with yellow.

62. VALVATA (LYOGRUS) PUPOIDEA,
GOULD.

Shell small, imperforate, elongated-oval, opaque, chestnut-colored when divested of the rough, dirty pigment which usually cov-

ers it; whorls four to five, minutely wrinkled; apex obtuse; the body whorl disjoined from the preceding one; aperture circular; lip simple, not touching the body whorl; operculum horny, concentric, apex central. Length one-tenth inch, breadth three-fourtieths.

This shell was described in *Silliman's Journal*, vol. xxxviii., page 196, 1840, by Dr. A. A. Gould. It was first found at Fresh Pond, Cambridge, Mass., on stones and submerged sticks, and since then in Canada, Maine, and Connecticut. On this account I include it among Rhode Island shells, as it has not yet been found here, and I have never seen the shell, and know it only by the description and figure in Gould's *Invert. Mass.*

FAMILY 43. Paludinidæ, contains three genera of fresh water shells, which are conical or globular in shape, with a thick olive-green epidermis. Two of these genera are represented in the United States, and one, Paludina, Lam., in Rhode Island. The genus Paludina contains about one hundred species, divided among seven sub-genera, three of which inhabit our country, viz.: Paludina (restricted) or Vivipara, Melanthis, and Tulotoma. Our shell is the

63. PALUDINA (MELANTHO) DECISA, SAY.

It would be useless here to give the very extended synonymy of this species. Mr. Binney, in his *Fresh Water Shells of North America*, gives the names of twenty synonyms of this shell, five of which are certainly distinct species. Our shell was described under the name of *Lymnæa decisa*, by Thomas Say, in 1817, in *Nicholson's Ency.* In 1819 he changed the name to *Paludina decisa*. This name was adopted by Gould, Haldeman, Adams, DeKay, Kuster, Reeve, Binney, and others. In 1862 Mr. Wm. G. Binney applied the name of *Melanthis decisa* to it, which name it has retained.

So many descriptions have been given by various authors to shells referred to this species, that I can do no better than to quote the original description by Say: "Shell sub-conic, olivaceous, truncated at the apex; whorls four, wrinkled across, entire; within bluish white; operculum coriaceous, elevated on the disc, and concentrically striated. Length one inch, breadth three-quarters." It is found in ponds and

muddy streams. Several years ago, when the water of the Blackstone River was drawn off at Pawtucket, I examined the bed of the river, just above the upper dam, and among several other species, was an abundance of these shells buried in the mud, where, under ordinary circumstances, their existence would not be suspected, or if so, they could not be obtained, being under several feet of water. Sometimes they are found under shelving banks or in mud near the margins of large ponds. They are stout and solid shells, varying in color from yellowish-green to dark olive. Our Rhode Island shells have a uniform dark olive green epidermis, and the apex is invariably decollated. At Albany, N. Y., where *Melantho decisa* and *integra* live together in the Hudson River, this species is always decollated, while the apex of *integra* is perfect. They do not deposit ova like the other fresh water snails, but retain the young within the shell, and when they make their advent into the world they are provided with a shell of three complete whorls.

All the shells thus far described in these papers are marine or salt water species, excepting five species which are fresh water shells. These five are *water breathers* and live at the *bottom* of our ponds and rivers, and are not obliged to come to the surface to obtain a supply of air. They are also provided with an operculum, or door, with which they close the mouth of the shell. It is attached to the foot of the animal, and when the animal retires into its shell, the operculum is the last portion to go in and completely closes the aperture. This operculum is not composed of carbonate of lime like the shells of mollusks, but of phosphate of lime and animal matter, like the shells of crabs and lobsters, and much resembles horn. There are also very many other fresh water snails, which breathe *air* and are *not* furnished with an operculum. These belong to a different sub-class from those heretofore described and from many others to follow, but will be taken up in their order at a future time.

(To be continued.)

CHECK-LIST OF BRITISH FRESH-WATER SHELLS.

J. RITCHIE, JR.

- | | |
|---|--|
| <i>Pabudina</i> <i>contecta</i> Millet.
<i>vivipara</i> Linn. | <i>Planorbis</i> <i>dilatatus</i> Gould.
<i>glaber</i> Jeffreys.
<i>lineatus</i> Walker.
<i>nautilus</i> Linn.
<i>nitidus</i> Müller.
<i>spirorbis</i> Linn.
<i>vortex</i> Linn. |
| <i>Bythinia</i> <i>leachii</i> Sheppard.
<i>tentaculata</i> Linn. | <i>Ancylus</i> <i>fluviatilis</i> Müller.
<i>lacustris</i> Linn. |
| <i>Hydrobia</i> <i>similis</i> Drap.
<i>ulvæ</i> Penn.
<i>ventrosa</i> Montagu. | <i>Sphaerium</i> <i>corneum</i> Linn.
<i>lacustre</i> Drap.
<i>ovale</i> Fer.
<i>rivicola</i> Leach. |
| <i>Valvata</i> <i>cristata</i> Müller.
<i>piscinalis</i> Müller. | <i>Psidium</i> <i>annicum</i> Müller.
<i>fontinale</i> Drap.
<i>nitidum</i> Jenyns.
<i>pusillum</i> Gmelin.
<i>roseum</i> Scholtz. |
| <i>Neritina</i> <i>fluviatilis</i> Linn. | <i>Unio</i> <i>margaritifera</i> Linn.
<i>pictorum</i> Linn.
<i>tumidus</i> Retz. |
| <i>Linnæa</i> <i>auricularia</i> Linn.
<i>glabra</i> Müller.
<i>glutinosa</i> Müller.
<i>involuta</i> Thompson.
<i>palustris</i> Müller.
<i>peregra</i> Müller.
<i>stagnalis</i> Linn.
<i>truncatula</i> Müller. | <i>Anodonta</i> <i>anatina</i> Linn.
<i>cygnea</i> Linn. |
| <i>Physa</i> <i>fontinalis</i> Linn.
<i>hypnorum</i> Linn. | <i>Dreissena</i> <i>polymorpha</i> Pallas. |
| <i>Planorbis</i> <i>albus</i> Müller.
<i>carinatus</i> Müller.
<i>complanatus</i> Linn.
<i>contortus</i> Linn.
<i>corneus</i> Linn. | |

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6	05	45	02	10	30
7	05	50	02	12	35
8	06	60	02	14	40
9	07	70	03	16	50
10	08	80	03	18	70
11	10	90	04	20	80
12	12	1 00	04	22	1 00
13	14	1 20	05	25	1 20
14	17	1 50	05	35	1 40
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22	50	4 50	20	1 50	
23	60	5 25	22	1 75	
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25	80	7 00	28	2 50	
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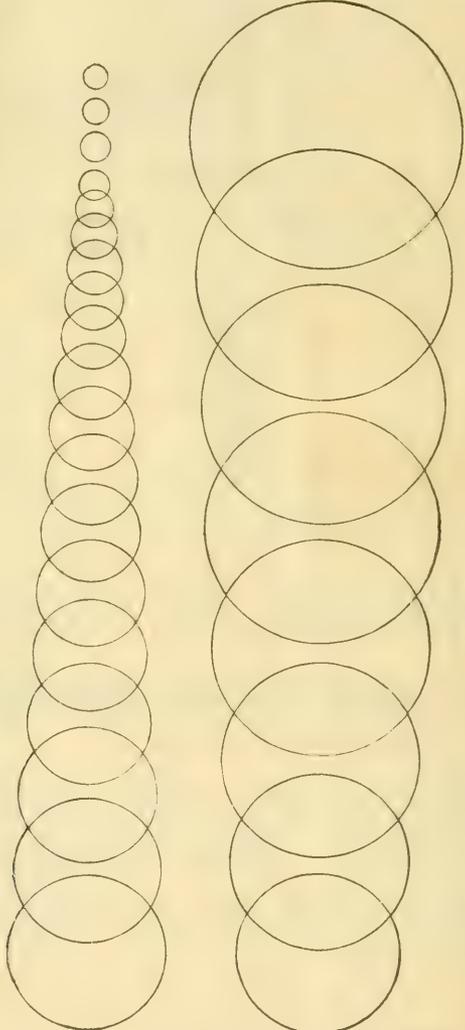
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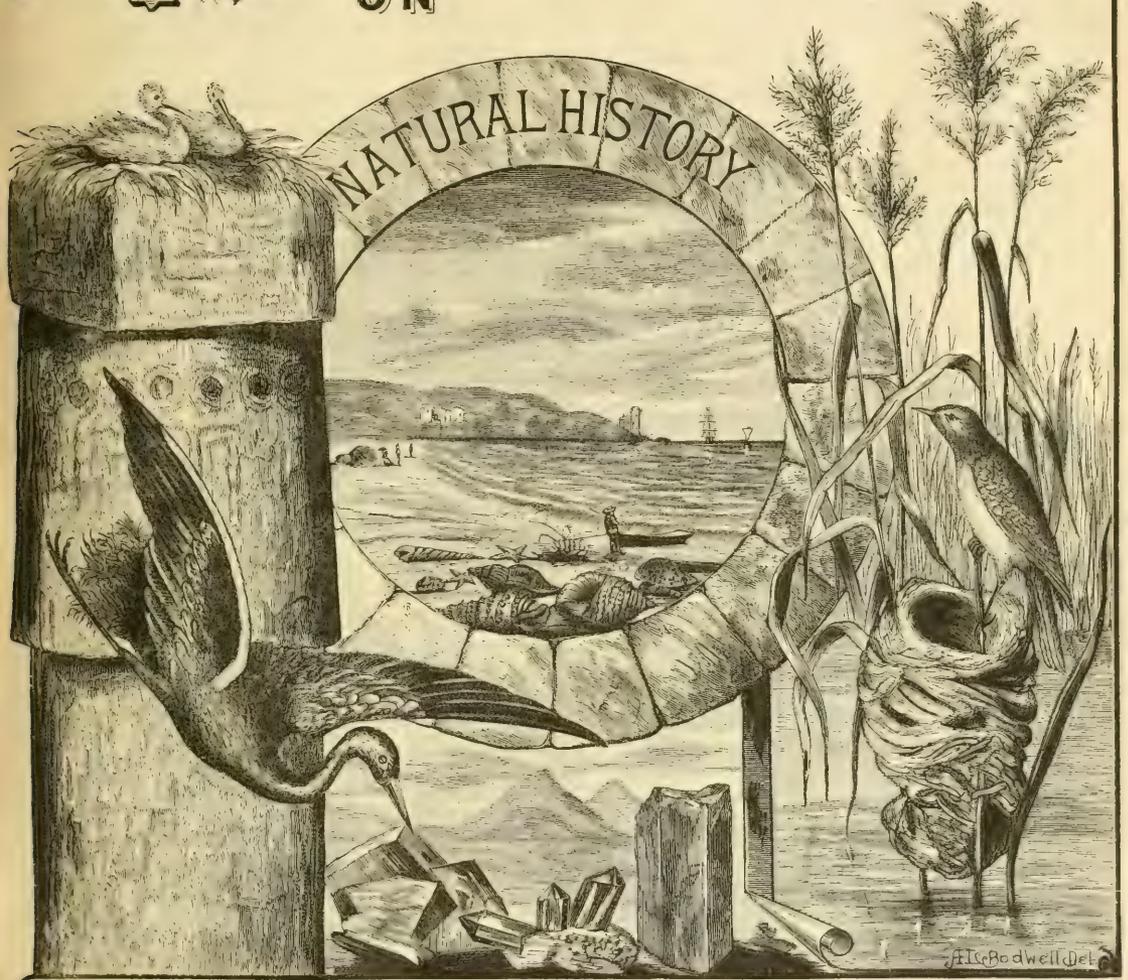


VOL. II.

NO. X.

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ON



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Mammal Skins.

REMOVE the skins with the least possible delay, particularly in warm weather, and from the smaller specimens. Make a straight cut from the breast, between the fore legs, along the belly, to the vent. Be careful not to cut through into the cavity and intestines, and do not at any time stretch the skin. Cut off the legs close to the body, so as to leave all the bones in them. Push them carefully out of the skin, down to the claws, or as far as can possibly be done, without cutting it entirely free. Clean all the meat thoroughly from the bones, if the specimen is to be made up dry. Cover them and the skin with Arsenic Preservative, or Arsenical soap, wind a very little cotton or tow around them, to prevent their contact with the skin, and turn them back. Then withdraw the bones from the tail; this can be done by the nails of the finger and thumb of the left hand, or two flat slender pieces of wood held firmly at the root of the tail, or place around it the small opening that occurs in a pair of scissors, just back of the blades and forward of the finger holes, then with the right hand pull the bones steadily, and they will come out of the skin. Now turn the whole skin backward, (inside out) until the junction of the ears and skull is reached; use particular pains in separating these and the eyes from the skull. If the lids of the eyes are cut they will often tear further and make a conspicuous damage. Cut the ears off close to the skull; carelessness in this respect leaves a large and unsightly hole where the ear opens through the skin. On large specimens it is well to

skin the ears as far as possible, and thoroughly poison the whole, putting back the cartilage. Proceed to the mouth, and cut the lips off close to the gums. In the thick lips and eyelids of large animals, pass the knife between the inner and outer skin, and see that the preservative is well introduced there.

Clean the whole skin thoroughly, from fat and flesh, (the specimen will soon become next to worthless unless this is done), poison every part thoroughly. It is a good plan to puncture the tip of the tail. In the larger specimens with long fur, like foxes and wolves, raccoons, etc., it insures the introduction of the poison the whole length, and admits to air for quick drying.

The lips are now caught lightly together by two or three stitches on the inside, the skin turned back, and filled lightly with cotton or tow, to its proper shape, and the opening stitched lightly together. It is well to introduce a wire or small stick into the tail when it is small and slender, as with mice, rats, etc. Long and large tails should be brought forward between the legs, or turned over the back; the legs should be brought snugly together under the body, and the whole specimen thoroughly dried, not in the sun or by a fire. Do not leave skins turned wrong side out; do not leave them to dry twisted out of shape, and the legs pointing in every direction. A well made skin of a small mammal is as pretty as that of a bird, and will sell better and mount better than the offensive looking specimens commonly seen. Clean the skull thoroughly, poison it, and mark it distinctly on a label to correspond with the number of the skin, or fasten it securely to the hind legs of the specimen.

On account of the space they occupy, and cost of transportation, large skins should be filled out but very little, or not at all, and after drying can be folded as snugly as possible.

In curing skins use always, when it is to be obtained, arsenical soap or a mixture of powdered alum and arsenic, in proportions

of six and four parts by weight respectively. An application of spirits of turpentine to the nose, ears, feet, or any spot that seems tender and likely to shed its hair, is very beneficial.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. VI.

Quercus tinctoria — BLACK OAK.

Q. tinctoria, commonly known as the black oak, is the most abundant member of the biennial oaks in Rhode Island. It still occupies, for all the ruinous tree-cutting of our people, numerous areas of many acres each, almost to the exclusion of other trees. On the plains of Providence, and below along the bay, it has notably had possession of the ground. With many well-preserved groups still standing, there are scores of single specimens now growing, which from their symmetry and beauty, and in some instances their massive proportions, appeal alluringly to lovers of trees. A few of these will be mentioned later.

The general appearance of this tree in its full development, which is nowhere finer than in this state, is that of a widely expanded orbicular mound of well-balanced limbs, supporting a dense foliage of shining green. This, in open ground, supported by a short sturdy trunk.

On approaching these trees we find the bark black, thick, deeply furrowed, and transversely broken, so as to make irregular oblong pieces, firmly united underneath. The inner surface is yellowish in color and excessively bitter, which quality extends to that of the smallest branches. The young branchlets are brownish, tinted with red or green, and somewhat furrowed. Before the recent discoveries in dyeing materials, the inner bark was much used for coloring, giving, primarily, shades of yellow, but, mixed with other, a variety of beautiful colors. It was largely shipped from Philadelphia.

The fertile blossoms come from the axils of the leaves, and like those of all the biennial oaks, do not develop their fruit until the second year. The staminate flowers are long, pendent catkins, forming a pretty appearance, as they do upon the oaks generally.

The acorns are flattish at the base, about one-half an inch long, usually finely striped from base to apex with alternate bands of dark and lighter brown. The meat of the acorn is yellowish and very bitter, like the bark. The acorn is set in a deep cup, made up of scales with recurved tips: The fruit is very abundant, and it would seem should serve some good purpose besides that of propagating its species, and of feeding wild animals. The leaves are the glory of the tree. They are on long, slender foot-stalks, deeply cut, sometimes almost to the mid-rib, by rounded sinuses, showing three pairs of lobes and a terminal on each, ending with a bristly point. They are a lively green covered with a natural varnish which heightens their beauty of form. In the autumn the leaves turn into shades of orange and yellow, often slightly tinted with red.

The wood is probably the best, as timber or fuel, of any of the biennial oaks. It should, however, be fastened, in work where durability is important, with wooden pins, as it decays readily around iron nails.

One of the grandest specimens of this tree in the state is now standing in the rear of the barn in Roger Williams Park. It is upon a sloping bank bordering the swampy ground which its roots probably reach. This tree is about twelve feet in circumference near the ground, and seventy feet high. Its age must be very great, but it is still vigorous. In the vicinity of the Broad Street entrance to the Park, both within and outside its limits, are some finely developed trees of this kind. Indeed, the Park owes much of its sylvan attractiveness to the numerous trees of this species occupying the dryer wooded portions.

It is rare to find this tree further north than the southern part of Maine and New Hampshire, but it is common in the middle Atlantic states, and its range extends far to the south and west. It is notably variable, running into some other species by almost insensible gradations.

As a substitute for the white, mealy appearance seen around the eyes of birds, the following is recommended: "In a coffee-pot of water put scraps of slightly sized white paper, boil six hours; take out and squeeze through a colander, pound in a mortar to a fine paste, dry well and pound again to a fine powder."

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XIII.

WE now come to the frogs proper, of which there are in this state five species, all included in the single genus *Rana*. The frogs differ from the tree-toads by having their toes unprovided with viscous disks and in being aquatic and terrestrial; they are at once distinguished from the toads in that the upper jaw is provided with teeth, and they are separated from the Scaphiopidae in being unprovided with the spur so characteristic of that family.

1. *Rana sylvatica* Le Conte. The Wood Frog is one of our most abundant Batrachians, as it is one of the most beautiful and interesting. Often the writer has been told of a peculiar looking frog that was seen in some grove, hopping about on the fallen leaves and, though away from water, seemingly perfectly at home. To the query: Had it a black patch on each side of the head? the answer has always been "yes." This very dark brown patch is characteristic, and though specimens be captured, ranging in length from one to four inches, all will be found to bear this badge.

Though most abundant in the dry oak groves, the wood frog is not unfrequently met with in open meadows and about brooks and other small bodies of water. In the latter situations it is to be found early in March, as it is one of the first frogs to awake from winter sleep and begin domestic duties. It is probable that the eggs are well matured before hibernation begins. To pass this period, a warm slope is selected where there is an abundance of fallen leaves, into which the reluctant animal, often not until driven to it by snow, works a small burrow and awaits the return of warm weather.

In its coloring this species is very variable and is an interesting form on which to note the changes, so characteristic of the members of this class. Not only does a single individual often change its hue in a few minutes of time, but the hues are limited, to a greater or less extent, by the season of the year. In the spring often the play of shades is limited to the dark

browns and blacks, though as the season advances, lighter shades are adopted, specimens of a light flesh-color being not infrequently met with in mid-summer. It is a mistake to maintain that this change of color is influenced by surroundings, as the change often goes on while the surroundings remain the same. It may be true, however, that the animal not infrequently takes advantage of this power, and thus renders its efforts at concealment more effective.

In its geographical range *R. sylvatica* is found along the valley of the St. Lawrence as far west as Wisconsin, and along the Atlantic slope to Virginia. The Western Wood Frog, a variety of the present, extends the habitat to the Pacific Ocean.

Color of Birds Eyes.

Golden-eye Duck, golden yellow.
 Barrow's golden-eye, golden yellow.
 Butter-ball, } brown.
 Buffle-head, }
 Long-tailed Duck, } brown.
 Old-squaw, }
 Harlequin Duck, reddish brown.
 Stellar's Eider, brown.
 American Eider,
 Pacific Eider,
 King Eider,
 American Black Scoter, brown.
 Velvet Scoter, yellow.
 Surf Duck, pale yellow.
 Ruddy Duck, reddish brown.
 Merganser, carmine.
 Red-breasted Merganser, carmine.
 Hooded Merganser, yellow.
 Common Gannet, white, cream.
 Brown Gannet, white.
 White Pelican, pearly white.
 White Pelican, young, brown or dusky.
 Brown Pelican, white.
 Common Cormorant, green.
 Double-crested Cormorant, green.
 Florida Cormorant,
 Violet-green Cormorant,
 Snake Bird, carmine.
 American Swan, hazel.
 Common Puffin, brown.
 Sea-dove, or Dovekie, brown.
 Tufted Puffin, brownish yellow.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXI.

FAMILY 44. Ampullariidæ, large globular shells, living in fresh water lakes and rivers, retiring into the mud during the dry season.

The species are more than one hundred and fifty, divided among four genera, and four sub-genera, all inhabitants of tropical or semi-tropical parts of the world. A few species are represented in the southern parts of the United States.

FAMILY 45. Truncatellidæ. Animal amphibious, inhabiting margins of streams, salt marshes, etc. There are six genera, four sub-genera, and about one hundred or more species.

GENUS TRUNCATELLA, RISSO.

Of the six genera comprising the Truncatellidæ, this genus alone is represented in America. It is called the looping snail. It progresses by contracting the space between the foot and the lips like the geometric caterpillar. The type of the genus is the *Truncatella truncatula*, Drap., which also happens to be the one which inhabits Rhode Island. There are sixty-two species of this genus.

64. TRUNCATELLA TRUNCATULA, DRAP.

I have never seen a description of this species; have never seen a specimen of the shell; have never heard of its being found anywhere in the United States excepting at Newport, R. I., and all I know about it is the following quotation from A. E. Verrill's *Cat. Mar. Moll.*, p. 525, 1882:

"This species was found by the writer, living in considerable numbers, and of all ages, among the docks of Newport, R. I., July, 1880. It occurred among decaying seaweeds thrown up at high-water mark, both among the vegetable matter and on the under side of stones.

"Common on the coasts of Europe in similar localities. Perhaps introduced on this coast by shipping, but it may have been hitherto overlooked. It was associated with *Assiminea Grayana* and *Alexia myosotis*."

FAMILY 46. Cyclostomidæ. This is an immense family of operculated *land* shells, breathing air. It is divided into five sub-families, thirty-two genera, fifty sub-genera, and contains over twelve hundred species, not one of which inhabits New England. There is one species only in the United States, which inhabits Key West, Florida, but hundreds of species of these beautiful terrestrial mollusks cover the numerous islands of the West Indies.

FAMILY 47. Helicinidæ. This is also a large family of operculated land shells. It consists of nine genera, seventeen sub-genera, and over five hundred species, mostly confined to the West Indies. Four species inhabit the United States, one in Texas, one at Fort Dallas and Key Biscayne, Florida, one near New Orleans, and one from Texas to Georgia, and from Tennessee to Florida. None are found farther north.

It was stated in Chapter V., *RANDOM NOTES*, Vol. I., p. 9, 1884, that the sub-class Prosobranchiata is divided into four orders, viz.: Pectinibranchiata, Scutibranchiata, Polyplacophora, and Nucleobranchiata. We have now given descriptions of all the Rhode Island shells belonging to the first order of the sub-class Prosobranchiata. There is but little difference in the animals of the second order from those of the first; in fact, the description given in Chapter V., of Pectinibranchiata will very closely apply to the Scutibranchiata. The very latest authority recommends the suppression of this order and its sub-orders entirely, and the merging of its members in the previously described Pectinibranchiata. I shall therefore depart from the arrangement originally intended (in regard to this sub-class only), and drop the name of Scutibranchiata, and proceed to enumerate its families and genera as though a continuation of the Pectinibranchiata.

FAMILY 48. Neritidæ: four genera, seventeen sub-genera, and over three hundred and seventy species, all foreign to our fauna.

FAMILY 49. Liotiidæ: two genera, nine sub-genera, and twenty-five species; also foreign.

FAMILY 50. Rotellidæ: two recent and eight fossil genera, with twenty-eight recent species, all foreign.

FAMILY 51. Phasianellidæ: three genera, three sub-genera, and twenty-eight species, all foreign.

FAMILY 52. Turbinidæ; two recent genera, eighteen sub-genera, and about one hundred and thirty species, all foreign.

FAMILY 53. Trochidæ. This immense family contains over three hundred species, distributed among four genera and fifty-six sub-genera. Only one of these genera, *Margarita*, Leach, is represented on the Atlantic coast of the United States. The species of this genus are deep water in their distribution and are mostly obtained from the stomachs of fishes. They are also boreal and inhabit the cold waters of the Arctic and Antarctic poles. Of the nine species of this genus which are credited to the New England coast, but two might possibly be found in our waters. They never have been found here to my knowledge, but we will give them the benefit of the doubt.

65. MARGARITA HELICINA, FABRICUS.

Syns.:

Turbo helicina, Fabricus.

Turbo inflatus, Totten.

Paludina inflata, Menke.

Margarita arctica, Leach, Sly., DeKay, Gld.

Margarita helicoides, Beck.

Margarita helicina, Stimp. and modern authors.

Shell orbicular, depressed, thin, smooth and shining, of a bronze metallic tint and iridescent; whorls five, convex, the body whorl large with fine revolving lines on the base; suture well impressed; aperture round, expanded; lip sharp; umbilicus large and deep; operculum multispiral. Length one-fifth of an inch, breadth three tenths. Their habitat is on leaves of *Laminaria* in deep water, and are sometimes thrown up on ocean shores during a storm. They are found as far north as Greenland and in Baffin's Bay.

66. MARGARITA OBSCURA, COUTHOUY.

Shell conical, depressed, solid; spire dull reddish-brown; base ash; whorls five, convex, angulated in the middle by from one to three revolving ridges, and covered with numerous fine lines, those at the base almost microscopic; aperture round, pearly within; lip sharp; umbilicus large and deep, bounded by a sharp angular ridge; opercu-

lum horny, multispiral. Length one-half inch, breadth seven-twentieths. It is a beautiful little species, the surface being of a brilliant silvery lustre with crimson reflections, after the exterior epidermis is removed. It is found in the stomachs of fishes caught off Nahant, Mass., and Stonington, Conn. "Common in Massachusetts Bay, Casco Bay, and Bay of Fundy, from low water to 100 fathoms." (Verrill.)

FAMILY 54. Stomatellidæ, all foreign.

FAMILY 55. Pleurotomariidæ, all foreign.

FAMILY 56. Bellerophonitidæ. This family comprises a very large group of Palæozoic fossils. I believe there is not a single species of recent or living mollusca belonging to it.

FAMILY 57. Maclureidæ, contains twelve species of fossils belonging to the genus *Maclurea*, Lesueur.

FAMILY 58. Haliotidæ, one genus, four sub-genera, and seventy-five species, all foreign.

FAMILY 59. Fissurellidæ, six genera, and nearly two hundred species, all foreign.

(To be continued.)

Gift to Brown University.

Miss Anna A. Stout, of New York, announces her intention of bestowing upon Brown University the valuable herbarium of her brother, the late William Stout. The collection is especially rich in ferns, and is accompanied by a fern library of about twenty volumes. Miss Stout has already mounted over 1,800 sheets of ferns alone, and estimates that from 800 to 1,000 more will be needed. Probably Dr. Garber's Florida phænogams will require 350 more, and the Atkinson collection of Northern Himalayan ferns 560 to 570 sheets. Besides these there are many valuable duplicates of well-known collections, available for exchange. What is now sorely needed is a fund for the endowment of the botanical chair. A daily struggle for bread and butter is scarcely compatible with the best results either of teaching or research.

WHEN you are drowsy from reading or work, sleep until you are rested. Nature, by feelings of fatigue, calls for rest.

Phryganea.

THE old English word *Cadas* means a case for security. The word still lingers in tea-caddy. The case-worm or larva of *Phryganea* is a soft-bodied creature, but it has a firm head and strong jaws. It is supplied with six legs, well adapted for locomotion, and with two hooks at the end of the tail by which it secures itself in its case. It is a rapacious and pugnacious insect. It feeds upon fresh-water mollusks, larvæ, polyps, etc. As a builder it makes use of the materials at hand. The old Free Masons may have taken a lesson from it, and Longfellow might have had it in mind when he sang,—

“That is best which lieth nearest.
Shape from that thy work of art.”

Sometimes the case is made of sticks, sometimes of grains of sand, and, in Great Britain, sometimes of the shells of the small river-snail (*Planorbis*), even while their proper owners have them in occupation. The cases not only serve for protection but for anchorage also, and they are found to be the heaviest where the current is strongest—the creature having added materials to increase the weight.

If the caddis be deprived of his case, it will at once set to work to construct another; and, in confinement, it will build of materials supplied to it, such as small fragments of glass and coral and the broken teeth of combs. However rough the outside of the case may be, the inside is perfectly smooth, for it is lined with the same cement which binds the materials together, and which is exuded from the mouth of the creature.

It is interesting to watch the caddis shifting his ground, moving his habitation from one part of the river-bed to another. So much of the body as will allow the legs free motion is protruded, and the creature strains like a horse with a heavy load, whilst its dwelling moves forward more or less steadily accordingly as it presents a smooth or roughened surface.

Before the *pupa* change takes place the caddis draws itself entirely into its snug quarters, and spins a strong netted covering over the entrance to the case. Having thus “barred the door” against intrusion,

it dozes off into the long sleep, the waking from which shall be an introduction to a new life, in another element.

The Phryganidæ in their perfect state differ from others of the Neuroptera, in that they are covered with minute hairs. Hence Westwood and other English naturalists have classed them as a separate order, the Trichoptera (Gr. *θριξ*, hair; *πτερον*, a wing) or hairy-winged insects.

In dress the Phryganidæ are a sober people—browns, drabs and yellows are their favorite colors. Cross-venations give their wings a netted appearance. Their antennæ are long—in some instances very long, and the wings are carried longitudinally. The females deposit their egg-masses early in August on some surface projecting from the flood. Woodward tells us (*Int. to Mod. Class. of Ins.*, Vol. II., page 62) that occasionally they descend the stems of water-plants and lay them under water. The egg-mass resembles miniature frog-spawn. It is an accumulation of drops of gluten containing embryos in the form of minute green specks. The young larvæ burst forth in September, and proceed at once to construct their dwelling. They afterwards repeatedly “lengthen their cords and strengthen their stakes” according to their requirements.

“Our rivers abound with *fish* of various kinds, which at particular seasons derive a principal part of their food from insects, as the numerous species of the salmon and carp genus. These chiefly prey upon the various kinds of Trichoptera in their *larva* state called case or caddis-worms, and in their *imago*, May-flies.” (*Kirby and Spence, Int. to Ent.*, Letter IX.)

The adult salmon proper, *Salmo salar*, is believed by the best authorities, to eat little or nothing during its sojourn in fresh water. It leaves the ocean fat and returns to it emaciated. The above remark, therefore, does not apply to *Salmo salar*; but it does apply to others of the genus, and especially to the English *Salmo fario*, or common trout; and the Canadian *Salmo fontinalis*, the brook trout; and *Salmo najmacush*, the lunge. The lake shad (*Coregorius albus*), also is well known to have a keen relish for the Phryganidæ in their winged state.—*Report of Ontario Entomological Society.*

Educational Museums of Vertebrates.*

FROM what is known of man's present constitution and environment, and from what is commonly believed respecting his future form, condition, and associates, it seems to follow that all kinds and degrees of zoölogical instruction, whether anatomical, histological, physiological, pathological, psychological, or religious, should be based upon some knowledge of vertebrated animals. As aiding to make this knowledge real and lasting, every educational institution, of whatever grade, should have a vertebrate museum.

From many vertebrate collections the average visitor carries away, besides the sense of fatigue, certain impressions which are inadequate or erroneous, or if correct, uncomplimentary.

The following plans and methods are followed in a preliminary re-arrangement of the vertebrate collections at Cornell University: The exhibition-cases should contain only specimens which can instruct or interest the visitor. Not only should facts be displayed, but fundamental principles should be illustrated. Quality is more important than quantity, and arrangement is usually more needed than acquisition. True economy consists in paying liberally for what is wanted, rather than in taking what is not wanted as a gift. The usefulness of a specimen, and thus its real value, is to be measured, not by its rarity or cost, but by the degree in which it exemplifies important facts or ideas. Many specimens should not only be labeled, but also accompanied by figures and explanations.

In addition to, or more often in place of the three great series—physiological, taxonomic, and geographical—which are commonly attempted in museums, but which it is rarely possible to complete, specimens representing an equal amount of time or money would have a higher educational value if divided among a considerable number of special series, each illustrating some morphological or teleological principle.

Some of these series are strictly artificial, yet useful; as, *e. g.*, animals exterminated by man; those which supply us with food,

medicine, weapons, clothing, or materials for habitation; fabulous, mythical, and sacred animals; and those which are mentioned by Shakespeare, and in the Scriptures.

Instead of vainly attempting to obtain and exhibit all the species of all the groups, most educational museums would attain more satisfactory results by selecting the more interesting or instructive forms from all classes, and limiting their efforts to complete groups for a few, upon which, as well as upon a larger number, may be illustrated the principles of classification, and of individual and geographical variation.

Among special series other than systematic, are *analogous forms and structures* which are sometimes mistaken for one another, but more readily discriminated when brought together. Such series are the rostrated animals, spinous forms, and those which have parachutes. *Physiological series* would contain the hibernating animals, those which are blind or nearly so, and such as are provided with scent-glands, tusks, and all poisonous vertebrates.

A *local collection* should embrace all the animals of the vicinity, and will benefit the student, both as an example for him to follow or improve upon, and as exemplifying the laws of geographical distribution and the influence of environment. The local collection need not contain anatomical preparations, but should exhibit both sexes, and all stages of growth of each species,—its mode of life, friends and foes,—so as to interest also the children, farmers, fishermen, hunters, and other residents of the neighborhood.

Although more than a quarter of a century has passed since the modern scientific doctrines respecting the methods of creation began to be accepted; although opposition to the general idea of organic evolution is now nearly confined to the stubborn and ill-informed; and although its substantial truth is tacitly admitted, or openly claimed, in nine out of ten higher educational institutions in this country,—I have yet to learn that any considerable part of a college museum has been specifically devoted to the exhibition of the facts which are described or figured in most zoölogical manuals, and in many works upon popular science.

*Taken from the abstract, in *Science*, of the address of Dr. Burt G. Wilder, before the American Association for the Advancement of Science, 1885.

CHECK-LIST OF BRITISH LAND SHELLS.

J. RITCHIE, JR.

- Arion* ater Linn.
 flavus Müller.
 hortensis Fer.
Geomalacus maculosus Allman.
Limax agrestis Linn.
 arborum Chant.
 flavus Linn.
 gagates Drap.
 levis Müller.
 marginatus Müller.
 maximus Linn.
 tenellus Müller.
Testacella haliotidea Drap.
 maugei Fer.
Vitrina pellucida Müller.
Zonites alliaris Müller.
 cellarius Müller.
 crystallinus Müller.
 excavatus Bean.
 fulvus Drap.
 glaber Studer.
 nitidulus Drap.
 nitidus Müller.
 purus Alder.
 radiatulus Alder.
Patula aculeata Müller.
 pygmæa Drap.
 rotundata Müller.
 rupestris Studer.
Helix arbustorum Linn.
 aspersa Müller.
 cantiana Montagu.
 caperata Montagu.
 carthusiana Müller.
 concinna Jeffreys.
 ericetorum Müller.
 fusca Montagu.
 hispida Linn.
 lamellata Jeffreys.
 lapicida Linn.
 nemoralis Linn.
 obvolvata Müller.
 pisana Müller.
- Helix* pomatia Linn.
 pulchella Müller.
 revelata Fer.
 rufescens Pennant.
 sericea Müller.
 variabilis Drap.
 villosa Drap.
Buliminus acutus Müller.
 montanus Drap.
 obscurus Müller.
Cionella acicula Müller.
 lubrica Müller.
Agraulina tridens Pulteney.
Pupa marginata Drap.
 ringens Jeffreys.
 secale Drap.
 umbilicata Drap.
Vertigo alpestris Alder.
 angustior Jeffreys.
 antivertigo Drap.
 edentula Drap.
 lillieborgi Westl
 minutissima Hartmann.
 moulinsiana Dupuy.
 pusilla Müller.
 pygmæa Drap.
 substriata Jeffreys.
Balia perversa Linn.
Clausilia biplicata Montagu.
 laminata Montagu.
 parvula Studer.
 rolphii Leach.
 rugosa Drap.
 solida Drap.
Succinea elegans Risso.
 oblonga Drap.
 putris Linn.
Alexia bidentatus Montagu.
 denticulatus Montagu.
 myosotis Drap.
Carychium minimum Müller.
Cylostoma elegans Müller.
Acme lineata Drap.

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“ multilineatus, Say, Fla.....	5
“ sepulchralis, Poey, Bahamas..	10
Orthalicus gallina sultana, Chem., Brazil.....	15 to 25
Cerithidea iostoma, Pfr., Raritan Islands.....	3 for 25
Cerithium septemstriatum, Hayti....	10 for 10
“ (Pyrazus) sulcatus, Born. . .	5
“ atratum, Brug., Hayti.....	5
Chondropoma weinlandi, Pfr., St. Domingo.....	10
Chondropoma biforme, Pfr., Gonave Islands....	10 for 10
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“ indica, Gmelin.....	25 to 50
“ spadicia, Swain, California ..	50 to 75
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“ cruenta, Gme., South Pacific..	15 to 40
“ limacina, Lam., Ind. Ocean...	15 to 30
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“ Milleri, Pfr., W. I.....	3 for 25
“ Troscheli, Pfr., Bahamas.....	3 for 25
“ provisaria, Bahamas.....	2 for 10
“ sagamon, Beck., Cuba.....	25
Terebra hastata, Kien., Bahamas....	10
Planoxis pyramidalis, Gme., E. I.....	15
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8	06	50	02	12	35
9	07	60	02	14	40
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12	12	100	04	20	50
13	12	100	04	22	89
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17	20	190	07	50	190
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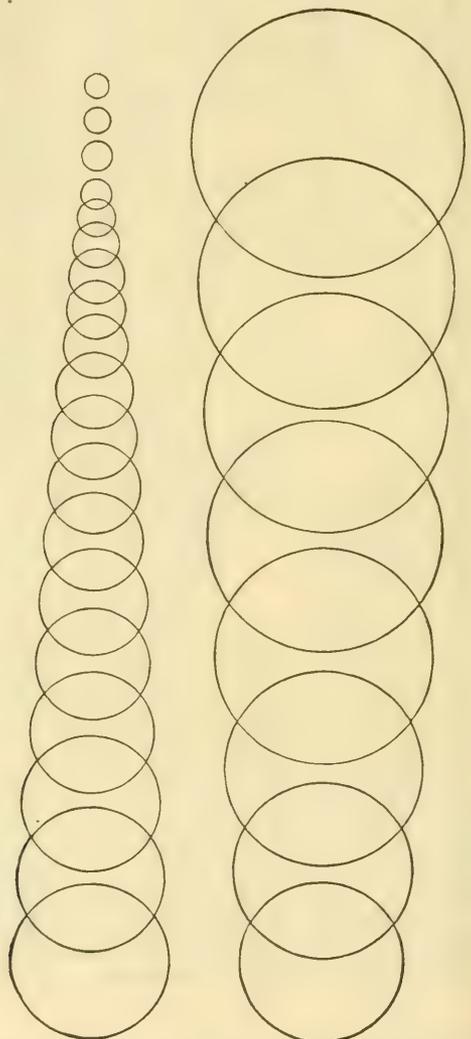
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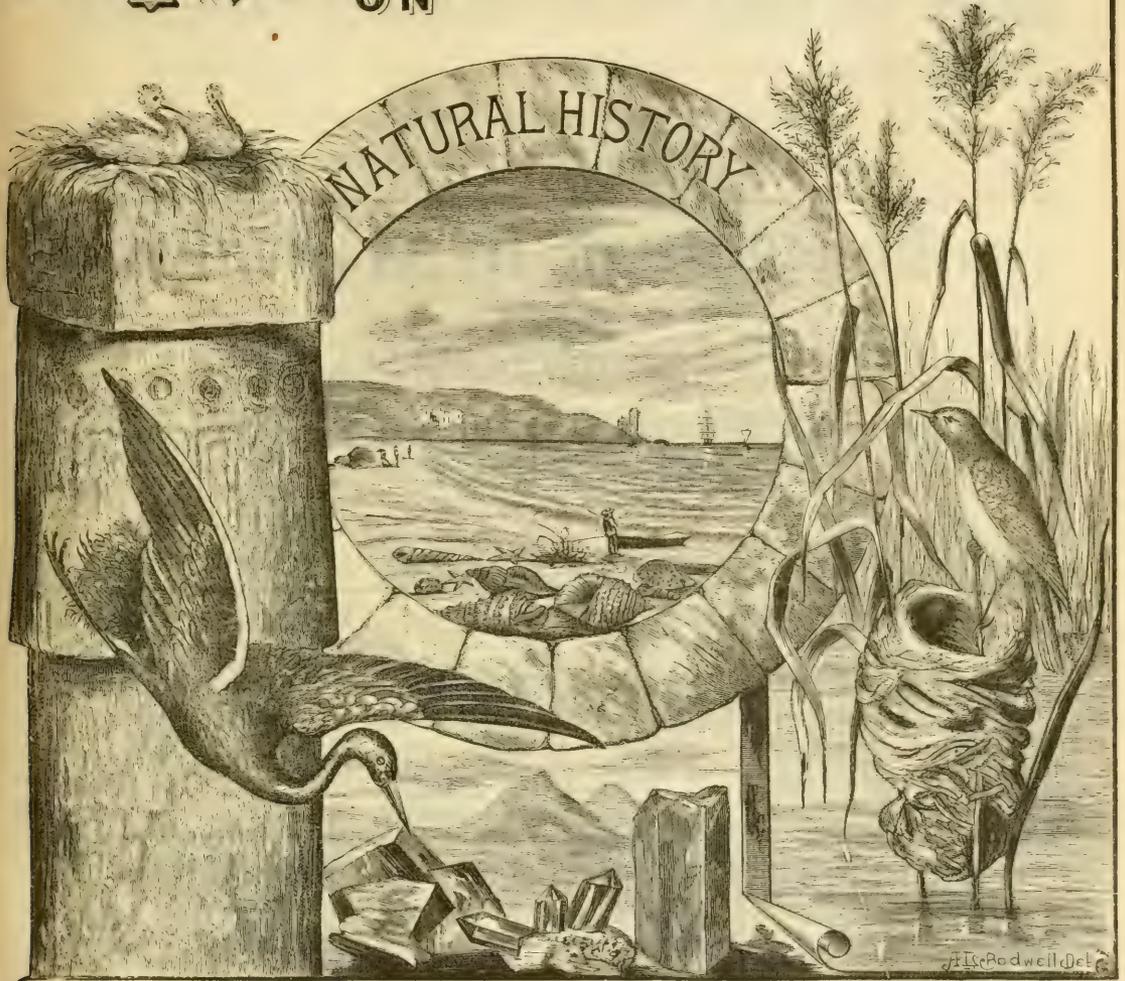


VOL. II.

NO. XI.

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First Meeting of the Franklin Society Sept.—1885.

BY PROF. W. WHITMAN BAILEY.

THEY come from the hills, and the bright sunny fountains,

They come from the rivers, the plains, and the mountains,

From sea-side and summit our savants return,
While we of the laity anxiously yearn

To scrape up the bits which by accident fall
From the table they spread in their banqueting-hall.

How ruddy and brown, too, our travelers look,
From lengthened perusal of Nature's own book:

'Tis surely salubrious diet they found
Wherever they 'stablished their fair hunting-ground.

Oh! could we but into their diaries peep,
Perhaps we would find what might well murder sleep,

So great would the interest be in the notes
Of fossils upturned and of dredging from boats,

How the devil fish reared his extensible arm,
How the catamount yelped, how the hare gave alarm,

How the screech owl in agony hooted until
The timid supposed him the prophet of ill,

How the loon o'er the lake like a lost spirit moaned,
And how with rheumatics a bed-fellow groaned;

Could we see in their boxes, a wealth we'd behold—
Fine crystals of quartz and pyrites like gold,

Orthoceras shells, and perhaps ammonites,
Pterodactyls and mammoths and small trilobites;

Here bits of stone pestles and arrows and bones,
And here see the rubbish, a mass of loose stones.

Now into port-folios we venture to gaze,
For this is the botanist's province always,

And from the rare weeds and the flowers they press,
The region they traveled perhaps we can guess.

But suppose these *thesauri* are hid from our view
By our churlish companions, what are we to do?

We must wait till they turn on their river's of talk,
Or give thought expression by pencil or chalk.

But for one, we must own our impatience is great—
Mr. President, start them; we really can't wait.

SINCE the writing of the following article on the Hoary Bat a fine specimen has been shot in East Providence, R. I., and is now in the possession of Mr. G. W. Field.

Hoary Bat.

ATALAPHA CINEREA (BEAUVOIS) PETERS.

Dr. C. Harte Merriam says the capture of a specimen of the Hoary Bat must for some time to come be regarded as an event worthy of congratulation and record.

We cannot boast of having captured one, but have just been so fortunate as to receive one alive from West Freetown, Mass., It has since become the property of Brown University.

As we have never before seen a living specimen, and no capture has been recorded for Rhode Island, we can do no better than to quote liberally from a most interesting article by Dr. Merriam in the *Transactions of the Linnean Society*, Vol. II., p. 77:

"The Hoary Bat can be recognized, even in the dusk of evening, by its great size, its long and pointed wings, and the swiftness and irregularity of its flight. It does not start out so early as our other bats, and is consequently more difficult to shoot. The borders of woods, water-courses, and roadways through the forest are among its favorite resorts, and its nightly range is vastly greater than any of its associates.

"Imagine for a moment, sympathetic reader, that you are an enthusiastic bat-hunter, and have chanced to visit some northern forest where this handsome species occurs. The early evening finds you, gun in hand, near the border of a lonely wood. The small bats soon begin to fly, and in the course of fifteen or twenty minutes you may have killed several, all of which prove to be the silver-haired species (*Vesperugo noctivagans*). The twilight is fast fading into night, and your eyes fairly ache from the constant effort of searching into obscurity, when suddenly a large bat is seen approaching, perhaps high above the tree-tops, and has scarcely entered the limited field of vision when, in swooping for an insect, he cuts the line of the distant horizon and disappears in darkness below. In breathless suspense you wait for him to rise.

crouching low that his form may be sooner outlined against the dim light that still lingers in the northwest, when suddenly he shoots by, seemingly as big as an owl, within a few feet of your very eyes. Turning quickly you fire, but too late! He has vanished in the darkness. For more than a week each evening is thus spent, when, perhaps, on a clear cold night, just as the darkness is becoming too intense to permit you to shoot with accuracy, and you are on the point of turning away, something appears above the horizon that sends a thrill of excitement through your whole frame. There is no mistaking the species—the size, the sharp, narrow wings, and the swift flight serve instantly to distinguish it from its nocturnal comrades. On he comes, but just before arriving within gun-shot, he makes one of his characteristic zig-zag side-shoots, and you tremble as he momentarily vanishes from view. Suddenly he reappears, his flight becomes more steady, and now he sweeps swiftly toward you. No time is to be lost, and it is already too dark to aim, so you bring your gun quickly to your shoulder and fire. With a piercing, stridulus cry, he falls to earth. In an instant you stoop to pick him up, but the sharp grating screams, uttered with a tone of intense anger, admonish you to observe discretion. With delight you cautiously take him in your hand, and hurry to the light to feast your eyes upon his rich and handsome markings. He who can gaze upon a freshly killed example without feelings of admiration, is not worthy to be called a naturalist.

“The Hoary Bat occurs about the Red River settlement in British America, and Dr. Richardson obtained it at the Cumberland House on the Saskatchewan, in lat. 54° N. Robert Kennicott procured it in the Hudson Bay Company's territory, further north than any other species of bat has been taken. It is a summer resident of high latitudes. In the West it has been taken in Arizona and New Mexico, but only, so far as I am aware, at considerable altitudes. In fall and winter, isolated individuals have been procured from localities so far to the southward of its usual habitat, that I am constrained to believe it a migratory species. Nothing appears to be known about the breeding habits of the Hoary Bat. On the evening of the 30th of June, 1883. Dr. A.

K. Fisher shot a large female (measuring 422 mm. in spread of wings) at my home in Lewis County. It had already given birth to its young, and each of its four mammae bore evidence of having recently been nursed.

“That the species ruts about the first of August there can be no reasonable doubt, for I saw more of them from the 30th of July till the 6th of August than I have ever seen in all, before or since, and twelve adult specimens killed during that brief period were all males. They were not feeding, but were rushing wildly about, evidently in search of females. Many flew so high as to be out of range, though directly over head. The only young one I have ever seen was shot here August 6, 1883, by Walter H. Merriam. It was nearly full grown (measuring 400 mm. in extent) and different from the adults chiefly in being lighter colored.”

John Snowdon Howland.

J. S. HOWLAND, better known as Snowdon Howland, died at his home, Newport, R. I., September 19, 1885. He was a cripple from hip disease, caused by bathing too frequently in the salt water when a boy. Though a great sufferer, and for many months at a time confined to his bed, he was ever cheerful.

He was one of our best oölogists, and the collection he leaves is second to none in quality and very few exceed it in size. The taste with which it was arranged in his cabinets was such as to make it attractive even to those not interested in such things.

We can all appreciate the pleasure of making a collection, but probably few of us can realize the satisfaction it gave him, or how much it alleviated his years of suffering.

While we miss one whom we have so respected and honored, we cannot feel sad when we think that his sufferings have ended.

F. T. J.

The new *Check List of North American Birds, and Code of Nomenclature*, adopted by the American Ornithologists Union, will be issued during the coming December. It will be an octavo volume of about 300 pages.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. VII.

Quercus coccinea — SCARLET OAK.

Q. coccinea, or the scarlet oak, is frequently met with in Rhode Island. It grows in company with the black oak, *Q. tinctoria*, to which it is closely related. Indeed, in a grove of the two kinds, they pass into each other by such fine gradations that it is only by a few points of distinction that they can be distinguished from each other.

It is one of the handsomest of our native oaks, more noticeable for its graceful, shapely growth than for the strength and sturdiness which characterize most of the oaks.

Upon open grounds it forms a somewhat stately, orbicular head. The limbs are numerous, long, and, for an oak, rather slender, dividing into fine branchlets, which give an airy lightness to the aspect of the tree. The trunk is usually straight and covered with a bluish gray bark, divided, but not deeply, by short clefts. The bark is not as thick as that of the black oak, not so dark, nor so deeply cleft. The inner portion of the bark is of a pink or reddish tinge, while that of the black oak is yellow. The buds are conical, obtusely pointed, and smaller than those of the black oak. The leaves are smaller, more deeply cleft, and thinner than those of the black oak. In the autumn, they are of a brilliant scarlet and form one of the most attractive beauties of the woods.

The acorn is small, nearly globose, but somewhat lengthened, deeply set in the cup, which has large, close scales, that terminate abruptly, without fringe. The kernel is white and much less bitter than that of the black oak. The wood is inferior, both as fuel and timber, to that of the black oak, with which it is commonly confounded, except by close observers.

Although not the most stately of our oaks, it is a rapid grower; and on account of its beauty at all seasons, and especially in the autumn, it is deserving of cultivation as a shade and ornamental tree.

This tree reaches a high degree of perfection in Rhode Island. In its distribution,

it occupies the same regions as the black oak, the latter being regarded by recent botanists as simply a variety of the scarlet oak.

There are a number of fine scarlet oaks, of well-marked characteristics, by the roadside leading from Olneyville to Dyer's nursery; and in the grove opposite to the entrance to the grounds may be found some specimens of interesting varieties of the black and scarlet oaks. It may be here properly mentioned that the groves and river banks in the vicinity of Mr. Dyer's residence offer a noteworthy variety of finely-developed native forest trees.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XIV.

2. *Rana catesbiana* Shaw. (*Rana pipiens* Linn. The Bull Frog is the largest anurous Batrachian of North America, specimens having been known which measured twenty-one inches in length. Though the larger representatives of the succeeding species are often confused with this animal, a full-grown Bull Frog, with all its independence, thoughtful air, and perfect composure, is never to be mistaken. Lest, however, the more immature representatives be mistaken for their more plebeian associates, a few characteristic points, which will determine their identity, will perhaps be acceptable to the novice.

The most striking difference is in the so-called cuticular folds: a pair of ridges passing posteriorly from the back of the eye, over the tympanic membrane. These folds in the Green Frog continue as far as the last vertebra, outlining in their course the position of the distal ends of the transverse processes of the several vertebræ. In the Bull Frog these folds stop soon after passing the large drumhead-like areas behind the eyes — the tympanic membranes. The Bull Frog is also without the underlying metallic tint generally characteristic of the Green Frog. Other differences in color are misleading and cannot be relied upon for specific determination. The color and even the marking being likely to vary in either species.

I have captured specimens of the Bull

Frog when they were of the most beautiful pale emerald, and marked with spots and blotches of the lightest brown. A few hours of confinement have sufficed to render them of a deep brown color, the green almost entirely disappearing, and the maculation only appearing on the closest scrutiny.

Though familiar to every one, the Bull Frog is not the most abundant species of the genus. It is often seen by those rowing on our ponds and rivers, as it sits on some warm bank, ready to plunge into the water on being too closely observed. It will generally, however, allow one to approach near enough to drop a small grapple, decorated with some bright-colored worsted, before its capacious mouth, and, judging the value of its food from its appearance only, the fastidious patriarch soon finds himself in the angler's fish-basket, from which he will only emerge in piecemeal to lure the equally omnivorous pickerel, or to garnish the table of the epicure.

As to the voracious nature of this animal Mr. J. A. Allen writes:

"I have taken from its stomach young specimens of *Chrysemys picta* an inch and a half in length. And woe be to the hapless young frog that hops into a pool where sits one of these greedy monsters! When collecting birds I have on several occasions had specimens, which fell into the edge of the pond when shot, stolen by them. In one instance a medium-sized Bull Frog seized and attempted to swallow a cedar bird (*Ampelis cedrorum*) that had fallen near him; he succeeded to his apparent satisfaction, although the tips of the wings and tail of the specimen projected from his mouth, while he sat composedly waiting for the other end to digest. On another occasion a more active fellow gobbled up a rare Warbler that chanced to drop near the water, and, to my great disgust, swam off with it beyond my reach. Many farmers have learned by sad experience of their ability to swallow small ducklings."

The geographical distribution of the Bull Frog is extended, it being found from Quebec to California, and from the great lakes to the Mexican Gulf; in these limits, however, it is most abundant in the northeastern portions.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXII.

FAMILY 60. Patellidæ. The shells comprising this extensive family are called limpets. They are not spiral like most of the gasteropods, but dish-shaped, more or less conical; the aperture comprises the entire under side, and of course they have no operculum; they adhere to stones and are not easily detached unless we come upon them unawares. The family is divided into three sub-families, Lepetinae, Acmaeinæ and Patellinae, the second of which only is represented in Rhode Island.

Sub-family Acmaeinæ contains four genera and about thirty species. The only species inhabiting our state belongs to the genus *Acmaea*, Esch., sub-genus *Collisella*, Dall.

67. *ACMÆA (COLLISELLA) TESTUDINALIS*, MÜLLER, 1766.

Syns.:

Patella testudinalis, Müll., Fabr., Dill., Wood., Lam.

Patella clealandii, Sly., Flem.

Patella amœna, Say.

Patelloidea amœna, Carth.

Patelloidea testudinalis, Lea, DeKay.

Lottia testudinalis, Gould.

Lottia antillarum, Sly.

Patella clypeus, Brown.

Tectura testudinalis, Stimp., Dall., Perkins.

Collisella testudinalis, Dall., 1870.

The above list of synonyms are but a few of the many names which have been given to this species. It is a very common species in the boreal regions of Europe, Asia, and America. It extends southward in Europe to England and France; to Japan in the North Pacific; inhabits Greenland to Cape Cod, but rare south of it. It has been quoted from Watch Hill, R. I., but I have never heard of any author speaking of it except as an ocean species, that is, found on ocean shores, but it is found in our bay at Warwick Neck light-house, and as far up as Rocky Point, at least fifteen miles from the ocean. Our specimens are small, from one-half to three-

quarters inch in length, but in Maine they are an inch, and in Europe one and a half inches long. They are very abundant in Norway, Scotland, and Ireland, where they are used for bait, and in times of scarcity, for food.

A description of this species is difficult, as the individuals vary so widely. Shell oblong-oval, elevated; apex behind the centre, pointed and turned towards the head of the animal; color greenish-white, with brown stripes; within, the centre is generally dark brown, and the margin checkered with brown and white spots. It resembles in form, though on a larger scale, our common fresh-water limpet, *Ancylus fuscus*. Its habitat is on stones from low-water mark to twenty fathoms or more.

There is a variety of this species whose habitat is only on the narrow leaves of *Zostera marina* (eel grass). Whether this is only a variety of *testudinalis* or a distinct species, I am not prepared to say; many authors consider it distinct, and it certainly differs as much in appearance, and more so than some species which are universally acknowledged to be distinct. If the normal *testudinalis* resembles *Ancylus fuscus*, Ad., this variety still more resembles our other fresh-water limpet, *Ancylus parallelus*, Hald. The specimens do not vary as much as the *testudinalis*, but are very uniform. The shell is long and narrow, only three-tenths of an inch broad by one-half inch or more in length; the sides compressed, thin and fragile; ends obtusely rounded; color reddish-brown, checkered with yellow oval or circular spots; the interior showing the exterior markings. This species is called *Alveus*, Conrad, var., or, by those who consider it distinct, *Acmæa* (*Collisella*) *alveus*, Con. I am disposed to think it a distinct species by itself.

ORDER POLYPLACOPHORA, GRAY.

FAMILY 61. Chitonidæ, Guilding. The order Polyplacophora differs from the other orders of the sub-class Prosobranchiata in both animal and shell. In this order the sexes are united in each individual, while the shell is multivalve, or composed of eight separate transverse plates, inserted in a coriaceous mantle, forming an extended margin around them. There is but one family, as above, and two genera, *Chiton* and *Chitonellus*.

GENUS CHITON, LINNÆUS, 1758.

The earlier naturalists considered these unique shells to belong to the Malentozozoa of Blainville, or articulated mollusks, and included them among the Barnacles or Crustacæ; they also called them multivalves. They were deceived by the appearance of the shell, which consists of eight arched plates, but are not valves, as were supposed, nor articulated in any way, but arranged like shingles on a roof, and let into the tough mantle of the animal, at the ends, by the sharp, smooth edges. These plates are more or less sculptured, and the margins either bare or covered with hairs, spines, or other ornamentation. They are found in all parts of the world, but unlike most shells, the finest species are not tropical, but inhabit the colder shores of North and South America. There are more than 250 species, divided among about fifty sub-genera. Seven species are credited to New England, of which two are known to inhabit Rhode Island. Possibly some of the others may yet be found here. The two species known to inhabit our bay are as follows:

68. CHITON (*CHÆTOPLEURA*) *APICULATUS*, SAY.

Shell oblong-oval, color grayish; anterior plate a crescent, with three or four concentric lines and numerous dots arranged in regular lines along the margin; the next six plates have on their dorsal triangles, twenty to thirty longitudinal series of beads, or pointed, elevated dots; on the lateral triangles, which are elevated above the dorsal ones, are scattered dots like those on the anterior plate; posterior plate, with the series of dots like those on the dorsal triangles of the six central plates, a central tubercle, and the remainder with scattered dots like those on the anterior plate. Margin coriaceous, with alternate stripes of white and dusky pubescence. Length one inch, breadth three-fifths. It inhabits from South Carolina to Cape Cod, and is found on stones in dredging and on dead shells of *Busycon*, *Natica*, etc.

69. CHITON (*TRACHYDERMON*) *RUBER*, LOWE.

Shell small, oval, elevated, carinated; plates smooth and shining, even under the lens; color light red, sometimes with flashes

of crimson across one or two plates; the keel at the centre is sometimes striped with crimson spots; interior rose-red, paler at the margins. Length one-half inch, breadth three-tenths.

Found in the maws of fishes and on stones dredged from deep water. Habitat from Connecticut to Greenland, Iceland, Norway, and Great Britain.

All Chitons when disturbed roll themselves up into a ball, and on this account are sometimes called sea-woodlice. In collecting the smaller kinds it is better not to try to separate them from the shell or stone to which they may be attached, but take home shell and stone together. If the animal is killed when rolled up in a ball, the shell cannot be straightened again without breaking it; the only way is to place the Chiton between two boards after it has straightened itself, and kill it with hot water, and let it remain between the boards until the shell stiffens in this position, otherwise its tendency is to roll up, even when the animal is dead.

ORDER NUCLEBRANCHIATA.

These are pelagic animals, swimming by means of fin-like lobes of the foot; some have a transparent, glassy shell, others have no shell at all. There are three families, five genera and about fifty species, all absent from our fauna.

This chapter completes the description of all the species of mollusca which inhabit Rhode Island, belonging to the first subclass of Gasteropoda.

(To be continued.)

An Uncommon Fish.

SINCE the last issue of RANDOM NOTES, there has been secured, from a seine in Greenwich Bay, a specimen of *Selene comer*, or, as it is more popularly called, the Moon Fish or Horse Head. The latter name is particularly applicable, as the face bears a striking resemblance to those seen on ancient coins representing the Roman charger, a resemblance carried still further by the mane-like disposition of the dorsal fins. In the general outline the Horse Head is of an irregular pentagonal form, nearly as deep as it is long, and so compressed, that the greatest distance from

side to side measures no more than the diameter of the eye.

The most striking features, however, are the elongated portions of the dorsal and ventral fins. By actual measurement the dorsal filaments are in length more than twice the depth of the fish. These filaments are remarkably like the waxed-ends of a shoemaker. The Cobbler Fish is the nearest relative to the Horse Head.

Though the present species is immature, measuring only three inches in length, specimens from other localities have been found of nearly twice this size.

In its geographical distribution this animal is found in the warmer seas of both the Atlantic and Pacific, its northern limit being, heretofore, Long Island Sound.—H. C. BUMPUS.

The Click Beetle, Skip Jack, or Spring Beetle.

BY H. H. VEITCH.

THERE are many different kinds of beetles in Worcester County, known under the above names, and all belong to one family, the *Elateridæ*. It is of the genus *Agriotes* that I would write in particular. The different species of this genus are the parents of the wire-worms that abound in most gardens, and are considered by farmers so injurious to vegetation.

These beetles may be found in the field or garden from June to September among piles of rubbish or rotten sods. They lay their eggs in July and August, attaching them to the roots of vegetables, such as potatoes, corn, beans, peas, etc., in little clusters containing forty or more. These hatch out in September and October, and the young larvæ find sufficient food to last until spring in the decomposing roots to which the eggs are attached.

In cultivating my garden in May I have often turned over clusters of these wire-worms adhering to the roots upon which the eggs were deposited the previous summer. At this stage of their development they are about an eighth of an inch in length, and not exceeding a horse-hair in thickness. They now separate, and in future it is each one for itself.

When a year old, they acquire the shin-

ing mahogany brown color characteristic of the larvæ of the *Elateridæ*. The second year finds them the common wire-worms. In June and July of the third year, they complete their growth.

The larva now swells, the skin becomes greatly distended; at length it ruptures longitudinally and the perfect insect issues. I would state for the benefit of farmers that fall plowing will not destroy these pests. I have this winter subjected the tiny larvæ to a cold of fifteen degrees below zero, without the slightest injurious effect.—*Worcester County Naturalist*.

The Tragopans, or Horned Pheasants

(*Ceriornis*),

Have a powerful body, moderate-sized wing, and short, broad tail, composed of eighteen feathers. The bill is very short and rather weak, while the strong, flat foot is furnished with a spur. Two small, fleshy, horn-like appendages are situated behind the bare patch around the eye, and the naked skin on the throat is prolonged so as to form a pair of pendant lappets. The rich plumage of the male lengthens into a crest at the crown of the head, and is most beautiful both in its hues and markings, whilst that of the female is comparatively of sombre tint.

THE SIKKIM HORNED PHEASANT.

The SIKKIM HORNED PHEASANT (*Ceriornis Satyra*) is of a bright carmine-red on the brow, crown of the head, nape, and shoulders; a broad band, that passes from the temples to the back of the head, and a narrow line around the lappet at the throat, are also of the same glowing hue; the upper back, breast and belly are red, enlivened with white spots edged with black; the mantle and upper tail-covers are brown, but each feather is delicately striped with black, and has a black spot at its extremity; some of the feathers on the upper wing-covers are also dotted with red, the dark-brown quills are bordered and streaked with dull yellow; the tail-feathers are black, striped with dark brownish-yellow.

The eye is deep brown, and the foot yellowish-brown; the fleshy appendages and lappets are blue, spotted here and there with orange-yellow. The male is twenty-

seven inches long, the wing measures eleven inches and a half, and the tail eleven inches. The plumage of the female is principally brown, darkest on the back, and enlivened by numerous black and red spots and streaks, as well as by the white shafts and dots of the feathers. Her length is only twenty-four inches, and that of her tail ten inches.

This species, which was the first known to naturalists, inhabits the Nepal and Sikkim Himalayas, being more abundant in the former. "I have," says Jerdon, "seen it in spring at an elevation of about 9,000 feet above the level of the sea; and in winter it descends to between 7,000 and 8,000 feet in the vicinity of Darjeeling, and perhaps lower in the interior. It is frequently snared by the Bhootees and other Hill-men, and brought alive for sale at Darjeeling. Its call, which I have heard in spring, is a low, deep, bellowing cry, sounding like "waa-ung-waa-ung." Its general habits are no doubt similar to those of the *C. melanocephala*, which have been more accurately described."

THE JEWAR, OR WESTERN HORNED PHEASANT.

The JEWAR, OR WESTERN HORNED PHEASANT (*Ceriornis melanocephala*), differs from the species last mentioned principally in the predominance of black in the coloration of the under side. In the male the feathers on the top of the head are black, with red tips; the nape, upper part of the throat, and shoulder are scarlet; the feathers on the mantle dark brown, ornamented with very delicate black lines, and, towards their extremities, with small black-edged white spots. The feathers on the breast and belly are black, spotted with white, and slightly shaded with red; the quills are pale black, spotted and edged with brown; the tail is black, striped with brown and white at the ends of the feathers. The eye is nut-brown, the bare patch that surrounds it bright red, while the fleshy horns are pale blue; the lappets on the throat are purple, dotted with light blue at the sides, and bordered with flesh-pink; the beak is horn-grey, and the foot reddish. The male is from twenty-seven to twenty-eight inches long, and from thirty-five to thirty-six broad; the wing measures ten inches and a half; and the tail ten inches. The plumage of the female

is varied with different shades of brown and black on the upper parts of the body, and with greyish brown, black and white on the under side; the back is enlivened by pale yellow markings, and the under side by irregular white spots. The length of the female is twenty-three inches, the breadth thirty-one inches and a half; the wing measures nine inches and a half, and the tail eight inches and a half.

These birds are found from the western borders of Nepaul to the extreme North-west Himalayas; they are not very common near Simla and Mussooree, but are more plentiful near Almora.

"Their usual haunts," says "Mountain-eer," "are high up, not far from the snows, in dense and gloomy forests, where they live either alone or in small scattered parties. In winter they descend the hills, and then their favorite haunts are in the thickest parts of the forests of oak, chestnut, and morenda pine, where the box-tree is abundant, and where under the forest trees a luxuriant growth of 'ringalt' or the hill bamboo forms an underwood in some places almost impenetrable. They keep in companies of from two or three to ten or a dozen or more, not in compact flocks, but scattered widely over a considerable space of forest, so that many at times get quite separated, and are found alone." Jerdon tells us, "that if undisturbed they generally remain pretty close together, and appear to return year after year to the same spot, even though the ground be covered with snow, for they find their living then upon the trees. If driven away from the forest by an unusually severe storm or any other cause, they may be found at this season in small clumps of trees, wooded ravines, or patches of low brushwood.

"At this season, with the exception of its cry of alarm when disturbed, the Jewar is altogether mute, and is never heard of its own accord to utter a call or note of any kind; unlike the rest of our pheasants, all of which occasionally crow or call at all seasons. When alarmed it utters a succession of wailing cries, not unlike those of a lamb or kid, like the syllables 'waa, waa, waa,' each syllable uttered slowly and distinctly at first, and more rapidly as the bird is hard pressed and about to take wing. Where not repeatedly disturbed it is not

particularly shy, and seldom takes alarm till a person is in its immediate vicinity, when it creeps slowly through the underwood, or flies up into a tree; in the former case continuing its call till again stationary, and in the latter till it has concealed itself among the branches. If several are together all begin to call at once, and run off in different directions, some running into the trees, others running along the ground. When first put up they often alight in one of the nearest trees; but if again flushed the second flight is generally to some distance, and almost always down-hill. Their flight is rapid, and the whirr produced by the wings peculiar, so that even when the bird is not seen it may be distinguished from any other species. Where their haunts are often visited, either by the sportsmen or the villagers, they are more wary, and if such visits are of regular occurrence and continue for any length of time, they become alert in a very high degree; so much so that it is impossible to conceive a forest bird more shy or cunning. They then, as soon as aware of the presence of any one in the forest, after calling once or twice, or without doing so at all, fly up into the trees, which near their haunts are almost always evergreens of the densest foliage, and conceal themselves so artfully among the tangled leaves and branches that unless one has been seen to fly into a particular tree, and it has been well marked down, it is almost impossible to find them. In spring, as the snow begins to melt on the higher parts of the hills, they entirely leave their winter resorts, and gradually separate and spread themselves through the more remote and distant woods, up to the region of birch and white rhododendron, and almost to the extreme limits of forest. Early in April they begin to pair, and the males are then more generally met with than at any other period; they seem to wander about a great deal, are almost always found alone, and often call, at intervals, all day long. When thus calling, the bird is generally perched on the thick branch of a tree, or the trunk of one which has fallen to the ground, or on a large stone; the call is similar to the one they utter when disturbed, but it is much louder and only one single note at a time—a loud energetic 'waa,' not unlike the bleating of a lost goat—and

can be heard for upwards of a mile. It is uttered at various intervals, sometimes every five or ten minutes for hours together, and sometimes not more than two or three times during the day; its purport most probably is to invite the females to the place. When the business of incubation is over, the broods, with the parent birds, keep collected together about one spot and descend towards their winter resorts as the season advances; but the forests are so densely crowded with long weeds and grass that they are seldom seen till about November, when these have partially decayed, so as to admit of a view through the wood."

The Jewar feeds chiefly on the leaves of trees and shrubs; of the former the box and oak are the principal ones; of the latter, *thugall* and a shrub something like privet. It also eats roots, flowers, grubs, insects, acorns, seeds, and berries of various kinds, but in small proportion as compared with leaves; in captivity it will eat almost any kind of grain. Though the most solitary of our pheasants, and in its native forests perhaps the shyest, it is the most easily reconciled to confinement; even when caught old it soon loses its timidity, eating readily out of the hand, and little difficulty is experienced in rearing it.

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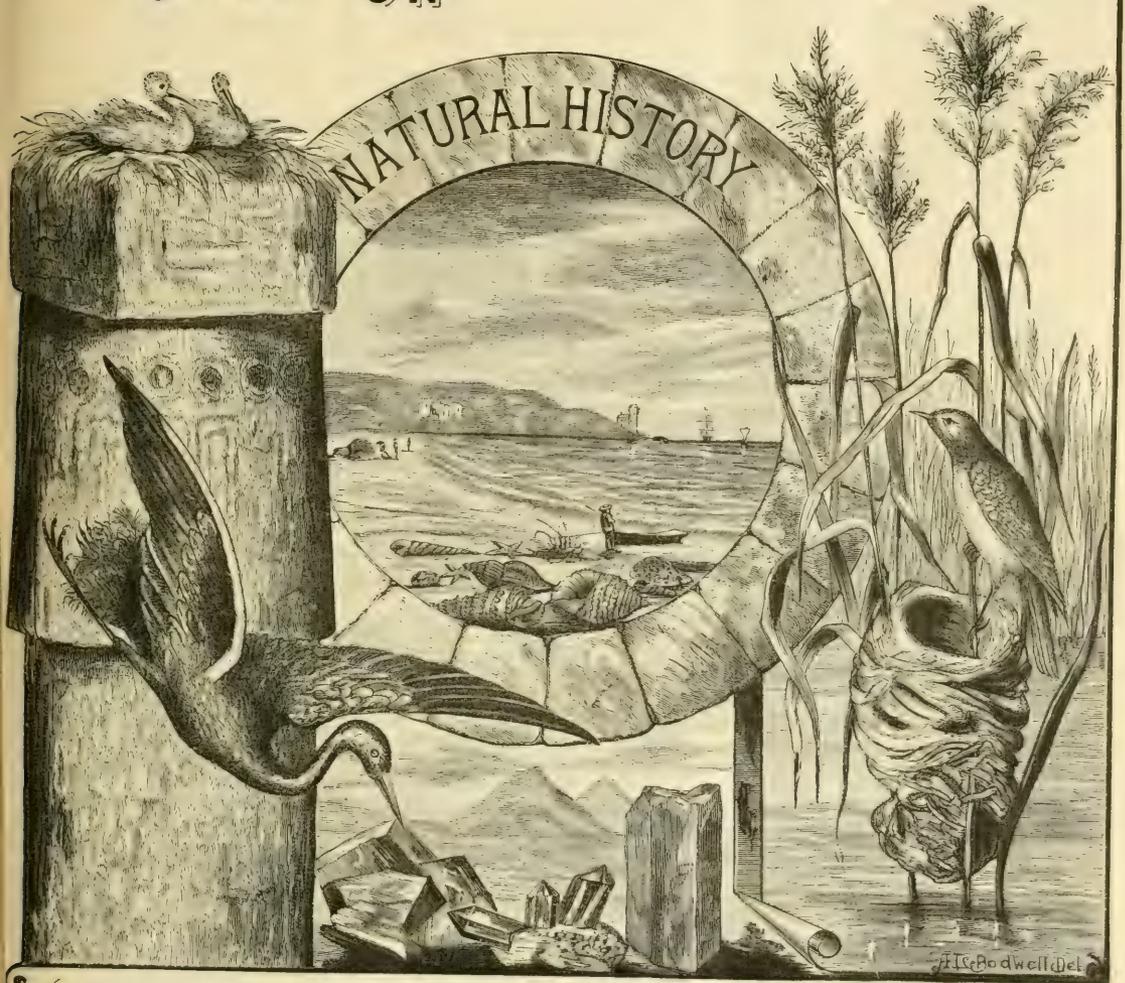
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Random Notes on Natural History.

Vol. II.

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Random Notes on Natural History.

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FRED. T. JENCKS.

Harbor Seal.

PHOCA VITULINA, LINN.

THIS animal, the only representative of the family commonly found on the eastern coast of the United States, presenting so great variety in size and color, is known in different localities by different names. From its abundance in bays and harbors it is often called the Bay or Harbor Seal, and being not infrequently found in fresh water, it is known, especially further north, as the River Seal.

The geographical distribution of this animal is extended. In America it is found along the Atlantic coast from Greenland to the Carolinas, and along the Pacific from Behring Strait to Southern California. It is not restricted to the New World, however, but is along the Scandinavian peninsula the commonest species, and extends its range further south, being occasionally met with in the Mediterranean. It is an animal that not infrequently ascends rivers, and is even found up the St. Lawrence as far as the Great Lakes, and has been taken in

Lake Champlain. On the New England coast seals are commonly observed on the low islands, at the mouths of rivers or in sheltered bays, where they can sometimes be counted by the score as they lie basking in the sun, or quarelling with one another. On surprising such a colony, with a splash, all have disappeared, though their heads can soon be seen as they come to the surface for air, or to examine more closely the object of their fright. They now often utter a quick bark or guttural whine, which, together with their canine-like head, has given rise to the name which is sometimes applied to them, Sea Dog.

In our bay the seal is found throughout the year, though more abundantly seen during the winter months. About two years since a specimen was killed at Riverside, the skeleton being now deposited in the museum of Brown University. A mounted specimen, also captured in the bay, is to be seen in the cabinet of the Franklin Society.

Few mammals present greater variation in color than the present. Specimens range from a uniform yellowish-brown to uniform dark brown, and sometimes nearly black, and are spotted with blotches lighter or darker than the underlying shade. The more common coloring, however, is brownish-yellow with darker spots and patches, the lips and eye-lids being lighter rusty yellow. The males, which exceed the females in size, sometimes measure six feet in length. The young at birth are a uniform soiled or yellowish-white, changing to the ordinary darker shades at the first molt, this occurring before, or within three or four days.

An interesting account is given of one which was born in the gardens of the Zoölogical Society of London. Immediately after its birth it, by rolling and turning about, completely divested itself of its outer covering of *fur* and *hair*, which formed a mat upon which it rested for several hours.

The rutting season is supposed, from reports made by the Newfoundland fishermen, to be in September, the young one from

each mother being born the following May. In these northern seas the skins of this animal, called the Hair Seal, are regarded as being of considerable value on account of the beautiful markings which they present, and are used for coats, caps, gloves, women's underwear, and to cover trunks, boxes and canoes. The flesh is also of value, being considered the most palatable of seal-beef, though this, to the uninitiated, is saying but little. In capturing fish they are very active, destroying large numbers, and not infrequently taking them from the net of the fisherman, even while he is at work.

In domestication the Harbor Seal becomes very docile, and soon learns to perform many odd tricks, though they are often troubled, while in artificial reservoirs of water, by their eyes becoming sore and inflamed.

The first description of this animal was made by Linne in 1754, since which time, as a result of its extended geographical range and wide range of variation in color and size, the animal has received over a score of synonyms by those who have had insufficient material for proper identification. It is more robust than most seals; has a large head, broad nose, and short limbs. The heavy dentition is very characteristic, the molars being broad and thick, and set obliquely in the jaw.

Victoria Regia.

WHILE collecting on the Amazon in the vicinity of Santarem, a small town situated at the mouth of the Tapajos River, I was fortunate enough to find a group of those immense water-lilies known by the name of the *Victoria Regia*. They were growing near the head of a lagoon among the tall grass which, in the wet season, floats and grows on the surface of the water. There were about a hundred leaves, and six or more blossoms.

The leaves were from four to seven feet in diameter, and the edge of the largest one I measured was nine inches above that portion of the leaf which rests on the water. The under side of the leaf is cellular, and resembles honeycombed tripe in everything but its color, and is covered with spines. The stem, which was an inch in diameter, was also covered with spines.

The bud was six inches from base to apex, and about four inches at the widest. The blossom when fully expanded measured over a foot across. When the bud first opens the flower is pure white. It then commences to turn pink, and the color deepens until the flower wilts, so that when a number of plants grow together one may find all shades of color from pure white to dark pink.

Each seed-pod contains about half-a-pint of seeds, and if the seeds when fresh are placed over a brisk fire they will pop, and can be used for food, tasting much like an inferior quality of pop-corn. The leaves as they float will sustain for a short time a considerable weight, but owing to their being full of holes, they cannot support more than a few pounds without eventually sinking.

On one of the leaves I found a nest of the jacana (*Parra jacana*). It was made of a small heap of grass and rubbish, and contained two strangely marked eggs.

The peculiar formation of the under side of the leaf gives considerable stiffness to it, and the formidable array of spines that cover this surface and the stem, no doubt, serves to preserve them from the attacks of animals. I could not make out whether the holes in the leaves were the work of insects, or of nature. Certain it is that if there were no holes the heavy rains of the wet season would fill the leaves and sink them. I gathered a large number of the seed-pods, and sent a quart or more of the seeds to a gentleman in Para, who sent them to England, where, I have since learned, they created considerable interest as the plants raised from them in hot-houses proved to be of a new variety. W. H. W.

I CLIP the following from J. V. R. Swan, acting Consul General's report at St. Petersburg, Russia. It contains some new facts, that will be of interest to your readers no doubt.

"In one of the villages in the government of Toula the peasants are interested in the breeding of canaries. Eighty homesteads thus find profitable occupation. The breedings are sold in Moscow and the neighborhood. In the huts engaged in this undertaking from five to ten breeding-cages are the average. This industry is also partly

developed in other villages in the neighborhood of Toula. The breeding of canaries is also largely carried on in the government of Kalouga.

"In many villages of the Temnikoff district (government of Tamboff) pigeons are bred as domestic animals and their skins sold as peltries to the furriers and others, mostly Jews, who visit the weekly bazaars and fairs to make such purchases. This dealing in pigeon skins is a decided innovation of later times, and cruelly dispels the illusion of travelers and writers as to this bird's sanctity amongst the commonalty."

The skinning of pigeons to sell their pelts in commerce is something I do not understand unless they are intended for export to be used as hat trimmings.

Yours truly, JAS. M. WADE.

Our Friends the Spiders.

BY REV. FOREST F. EMMERSON.

[From the proceedings of the Newport Natural History Society.]

WE come now to the true web-builders, the spinners and weavers of nets. I shall endeavor to describe three classes of webs:

First. There is the regular geometric web of the common garden spider, though it is doubtful whether there is ever found a true geometric web. In a geometric web, truly such, the concentric circles would meet. But this is not the fact in the common spider's web. Instead of meeting the circles pass by each other as they come around to the point of starting, and thus form, not a geometric circle but a spiral. In the construction of this so-called geometric web, the guys and stays are first attached to surrounding objects; then the radii are made, running from a common centre to the circumference. The guys, stays and radii are made of a firm, dry, inelastic silk. When this preliminary framework is done, the spider weaves on the concentric circles, attaching each circle to each one of the radii by the direct application of the spinners so as to make them adhere. These circles, not only with this spider but with all spiders, are made of an elastic silk, covered with a viscid gum, which, after the line passes into the air, gathers on the thread in globules so numerous and so minute that it is estimated that on a web

sixteen inches in diameter there are 100,000 of them.

Second. The eccentric web. The Charleston spider is known in the scientific books as *Nephila plumipes*, meaning the feather-footed golden fleece, so-called from the fact that there are bunches of feathery growth on the joints of its legs, while one pair of spinners produces a silk of very fine quality and of the color of gold. It was discovered during the war on the islands in Charleston harbor by an officer of our army who is a naturalist. It builds an eccentric web. The focus of this web is near the top where the spider takes position head downwards, waiting for prey. The radii, guys and stays of this web are made of inelastic threads of silvery color, while the circular lines are of elastic, viscid silk of golden color. Though usually making one thread of all the spinners, it is believed that spiders may use one or all of the spinners at will. But why the golden spinners should produce silk ordinarily dry when reeled from the body, and viscid when used for the concentric circles of the web is not as yet understood. It may be that the same spinner sends out the line and at the same time covers it with the viscid gum, or one spinner produces a filament while another covers it with the gum. At all events with three pairs of spinners the Charleston spider spins four kinds of silk; the golden dry, the golden viscid and elastic, the silver dry, and the pale blue.

As I have before intimated the circles of the web are not concentric, or spiral, as in the regular web of the common spider. They do not pass completely round a common centre, but are cast over the upper radii in loops and brought back upon themselves in an opposite direction, never passing a point above the focus. In this web some of the circles (and this is a peculiarity of this spider) as well as the radii, guys, and stays, are made of the dry silk.

Third. The triangular web. Professor Wilder, of Cornell University, found a spider a few years ago near Ithaca, N. Y., which does not seem to have fallen under the notice of observers elsewhere. He calls it the "triangular" spider, from the fact that it builds a web, not geometric or eccentric, but triangular in shape, and this triangular shape is proof of a purpose which

shows almost human intelligence. A base line as a stay or support of the web is attached vertically to the trunk of a tree adhering only at the two ends. From this four lines, always this number and no more, start at equal distances from each other and converge to an apex, or acute angle, and then extend as a single line to some fixed point. These four lines correspond to the radii in the ordinary web, and the transverse elastic lines correspond to the concentric circles of the same. The web when finished is considerably longer than the distance between the two points of attachment, and this slack line is for a purpose which is the most striking evidence of the intelligence of this spider. The spider takes up the slack herself; and wonderful as is the piece of work which she has accomplished, her management of this web in taking her prey is still more wonderful. Although in spinning the ten transverse lines she is believed to make 9,000 movements with her hinder feet, yet, without a moment's rest, she takes her place when the web is finished, on the single line between the apex and the point of attachment behind her. Hauling the single line taut behind her with her hinder feet, she draws in the web and makes it taut with her first and second pairs of feet, precisely as a man would haul a sagging hammock by pulling at the single line at the end. The third pair of feet when desired may lightly hold the slack rope.

She is now ready for business. For hours, if necessary, she holds her place, pulling taut the line and keeping the web firm in position. When the unlucky insect comes in contact with her web, she suddenly lets go with her fore feet all the slack line, and the web being lower and heavier, the apex line is drawn taut, the net falls outward and downward upon itself in a kind of collapse, the transverse elastic and gummy lines are brought nearer together, and thus the entanglement of the prey is insured. The spider then creeps cautiously out on one of the radii, and if she is not sure of her game runs back, draws everything taut as before, and if the insect is still in the toils again lets go with a snap; she has been known to repeat this six times in succession before venturing a personal encounter with her victim.

But furthermore, and still more wonderful, she has another method of using her web. Contrary to the popular belief that animals have but one way of doing things, they often have several, conforming their action to circumstances. For sometimes this spider, instead of simply letting go the slack line, takes more desperate measures. Fastening a new line to the tree behind her for her support, and reeling from her body as she advances, keeping thus a line of possible retreat in the rear, she cuts the apex line with her jaws, still holding to the line in front of the cut she has made, and supported in the rear by the new line attached behind; she then again advances and grasps all the radii where they meet and cuts them with her jaws; advances again, rapidly, and bites off more still, holding by what remains with her fore feet; at each successive cut, as she advances, the web slackens, recoils and falls into collapse, just as it did in the former case when she simply let go the slack line, until, finally, spreading her feet far apart she gathers up the radii once more and with a quick movement throws the whole of the web like a blanket over her prey. Then grasping the whole mass she transfers it to the third pair of feet which roll it over and over, while she holds on to the ruin of the web alone with her fore feet, and with the hinder feet she draws out from her spinners broad bands of new silk, winding it around and around the struggling insect, now hardly visible. Having reduced insect, web, and all, to a rounded mass, she seizes the whole mass, the insect in his silken shroud, more dead than alive, and mounts with it to the recent scene of her waiting patience and there devours her prey. This spider thus completely sacrifices its web, the product of so much toil and skill, and the capture of a single insect involves the ruin of the cunning machine elaborately built to accomplish it.

As to webs in general, it may be said that as the radii are generally covered with the viscid gum, the web is very elastic, yielding to the struggles of insects without breaking, and withstanding the force of the wind. If the wind is strong, however, the spider shows her intelligence by loading the web with sticks and small pebbles to hold it firmly in place.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XV.

2. *Rana clamitans* Merrem. (*Rana fontinalis* Le Conte.) The Screaming, Green or Spring Frog is with us a most abundant animal, to be found at all periods of the year in those open brooks and springs which are not covered with ice, and inhabiting every ditch, small pool, or muddy brook during the spring and summer months. The young of this species are very abundant in the shallow valleys of our oak and chestnut woods, where they congregate in pools left by the melted snow, and, during the warmer portions of the day, scramble over the half submerged branches, or quietly bask in the sun's rays.

As a person wanders through the woods on a spring day, he is startled by suddenly surprising one of these happy colonies, the individuals of which, in their efforts to find concealment, splash into the water with screams of fright, there to immediately find no suitable hiding-place, however, but in a moment to let their uneasiness give way to curiosity as they allow themselves to come to the surface and eye the object of their confusion.

On observing one of the little fellows as he rests on the water, one is impressed with the singular example of protective resemblance which he exhibits. The general form presents no points contrasting with the surrounding twigs and irregularly curved leaves. The color is remarkably like that of the algæ, banded with dark stripes of a shade of rotten bark and maculated with spots of minute patches of fungus.

Though now of small size the Green Frog can be distinguished from the Bull Frog by the characteristic features given in the previous number.

The young Green Frogs are not always, however, allowed to thus live in peace and happiness, for not unfrequently there is concealed in some dark recess of their nursery a gigantic Bull Frog who makes a daily meal of one of their number, or, worse still, they are presided over by a pair of their own kind, possibly their own parents, who do not hesitate to make away with large numbers of the aspiring youth.

Like many other animals of wide geographical range, the present species, presenting in different localities different varieties, has been described under several different names. So eminent a naturalist as Holbrook considered the more northern representatives to be of a distinct species, following the description of Le Conte, describing them under the name of *Rana fontinalis*, a name, by the way, which is well chosen as illustrating the habits of the animal.

Though during the day the Green Frog remains so near the water that a few jumps will enable him to reach the element of comparative safety, in rainy weather when the grass is wet, and during the damp nights, he not infrequently wanders away from water in search of insect life or new fields of plunder. While on these excursions he may be surprised by the Night Heron, or picked up by the larger owls.

Rana clamitans is, with us, only exceeded in size by the Bull Frog. Specimens measuring over eight inches in length, from the snout to the tips of the toes, are not uncommon.

Successful Rearing of some Young Dusky Ducks.

I HAVE known of the experiment being tried more than once before without success, and have heard it emphatically asserted that the species was untamable; but my neighbor has exploded that theory and now has three of the birds among his flock of domestic Pekins, where they eat their share of the meal and assert their rights among the flock as eagerly as if they were to the manor born. This clutch of eggs was found by a boy and set under a hen, who brought out seven ducklings. Some escaped early from their pen and were seen no more. A neighbor's cat further despoiled the flock, when the remaining three were taken by my neighbor and attached to his flock of young Pekins with whom they at once affiliated and became ring-leaders in mischief and wandering where the old mother duck could not follow for the cord that tied her up. A roomy yard now detains them all, where they are developing in good shape, already over three months old.—J. N. CLARK.

The Native Trees of Rhode Island.

BY L. W. RUSSELL.

No. VIII.

Quercus palustris — PIN OAK.

THE *Quercus palustris* or pin oak is not a common tree in Rhode Island. It grows only in the southern part of the state, and sparingly there. It is found in the great Kingston swamp, occasionally on the banks of the Pawcatuck River, and, probably, by the banks of streams leading into it. This is probably about on the line of the northern limit of this interesting tree. It grows more plentifully in the Central states of the Atlantic coast, where it attains the size of a large tree. In Central Park there is a magnificent specimen of this tree, seventy or more feet in height. It prefers a position where it can overhang a stream or pool, but will grow finely on dry ground. Near the Stonington railroad bridge, which spans the Pawcatuck near Wood River Junction, may be seen some well-developed specimens of this tree. Several old trees of this species overhang the stream just below the bridge, and others, young and thrifty, grow in the gravel embankment near by. The largest specimen I have seen is in Ashaway village, by a pool of water, north of the Baptist church.

This is the most graceful of our native oaks. The limbs divide into lithe, waving branchlets, which, especially near streams, have a weeping habit. The leaves are bright, with almost a metallic sheen, deeply cut, and on slender stalks. They are smaller than those of the other biennials.

Quercus illicifolia — SCRUB OAK.

Quercus illicifolia or scrub oak, sometimes called "bear" oak, is common upon the sterile grounds of Rhode Island. Many acres are occupied by it, almost to the exclusion of other tree or shrub growth. Its worthlessness is its protection. It is too small for timber or even fuel, in most localities, and the cost of clearing land occupied by it is usually greater than the land is worth when cleared, unless near the city or populous villages.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXIII.

SUB-CLASS OPISTHBRANCHIATA.

THIS, the second sub-class of Gasteropoda, is composed of mollusks in which the sexes are united in each individual, while in the first sub-class Prosobranchiata, the sexes are separate. The animals of Opisthobranchiata are called sea-slugs, because the shells are small and thin, and either partially or wholly concealed by the animal. Some have an internal, others an external shell, while many are without any shell at all. There are two orders, Tectibranchiata and Nudibranchiata.

ORDER TECTIBRANCHIATA.

FAMILY 62. Philinidæ. This family consists of nine genera, two of which, Philine and Scaphander, inhabit the Atlantic coasts of the United States. Three species of Philine inhabit New England, north of Cape Cod, and one, a new species, *Philine amabilis*, Verrill, was dredged 100 miles south of Newport in 120 fathoms. Verrill also reports four other species of Philine from Martha's Vineyard to Cape Sable, Nova Scotia. Two species of Scaphander are quoted, one from Casco Bay, Me., (*S. puncto-striata*), and a new species, *S. nobilis*, Verrill, off Martha's Vineyard, in 1,000 to 1,300 fathoms. These nine genera contain about forty-five species, none of which are found in Rhode Island.

FAMILY 63. Tornatellidæ, composed of two sub-families, four recent and several fossil genera, is represented in Rhode Island by a single species.

70. TORNATELLA PUNCTO-STRIATA,
ADAMS.

Syns.:

Actæon puncto-striata, Stimpson.

Shell small, white, elongated-oval; whorls five, the body whorl large, three-fourths the length of the shell; the surface of the upper whorls, and of the body whorl above the aperture, smooth; the lower half of the shell encircled by ten to fifteen revolving, deeply-cut lines, which are indented by

minute punctures at regular distances; each whorl is flattened at the suture, which is deep and channeled; aperture narrow, two-thirds the length of the body whorl; outer lip sharp and regularly curved; inner lip thickened, with a distinct fold on the columella; umbilicus depressed, open in young specimens. Length one-tenth, breadth three-fortieths of an inch.

It was first discovered by Prof. C. B. Adams, in mud dredged in New Bedford Harbor, and described by him in *Journ. Bost. Soc. Nat. Hist.*, III., 323, 1840. Of the twenty-two species of Tornatella, known to us, our shell is the smallest yet found. I have taken a few specimens alive in dredging, and find recently living shells washed up on sandy shores, in shell sand and in heaps of seaweed thrown up beyond ordinary high tide. Inhabits from Cape Cod to South Carolina.

FAMILY 64. Cylichnidae, contains three genera, all of which are represented in Rhode Island.

GENUS CYLICHNA, LOVEN.

This genus inhabits deep water generally, and its distribution is world-wide. There are forty species, two of which inhabit Rhode Island.

71. CYLICHNA ALBA, BROWN.

Syns.:

Volvaria alba, Brown, 1827.

Bulla triticea, Couth., 1838.

Bulla corticata, Möll., 1842.

Cylichna alba, Stimp., Dall., Tryon, etc.

Shell cylindrical, solid, smooth, of a dull white color, covered by a thin, rusty epidermis; surface with minute revolving lines and delicate lines of growth; spire none; in place of it is a circular pit, from the margin of which the lip takes its origin, rising a little, then passing downwards in a straight line, forming a long, narrow aperture; inner lip curved at the base, making the aperture at this point double its ordinary width. Length one-third, breadth one-tenth inch. Found in the maws of fishes caught in Massachusetts Bay (Gould); Maine (Mighels); Greenland (Mörch); Great Britain (Brown); from Block Island to the Arctic Ocean; northern coasts of Europe; northwest coast of America, south

to Silka (Verrill). I have found one specimen in Narragansett Bay.

72. CYLICHNA ORYZA, TOTTEN.

Shell minute, white, glossy, largest in the middle and tapering at each end; spire depressed to a shallow pit; body whorl enveloping all the others; surface smooth; at each end are a few microscopical revolving lines; aperture long and narrow, wider at the base; resembles the previous species very much, except that it is shorter in proportion to its breadth. Length one-fifth, breadth one-tenth inch. It was first discovered by Colonel Totten, in Newport Harbor, and described by him in *Silliman's Journal*, XXVIII., p. 350. Afterwards found by Professor Adams in New Bedford Harbor in mud. Inhabits from Cape Cod to South Carolina. Not uncommon in Greenwich Bay at Apponaug in shell sand.

GENUS UTRICULUS, BROWN.

73. UTRICULUS CANALICULATUS, SAY.

Syns.:

Volvaria canaliculatus, Say, 1826.

Bullina canaliculata, Say, 1832.

Bulla canaliculata, Gould and DeKay.

Bulla obstricta, " "

Utriculus canaliculatus, Stimp., Dall.

Shell cylindrical, white, shining, covered with faint lines of growth; spire a little elevated, with a minute but prominent apex; whorls five, the summit of each having a shallow rounded groove; outer lip arching forward; inner lip enameled, with a small tooth on fold near the base. Length one-eighth, breadth one-tenth inch. Massachusetts Bay to South Carolina. We find it in Rhode Island on sandy beaches.

Another species. *U. Gouldii*, Couth., inhabits from Massachusetts Bay to Grand Manan.

GENUS DIAPHANA, BROWN, 1833.

Syns.:

Amphisphyra, Loven.

74. DIAPHANA DEBILIS, GOULD.

Shell small, obliquely-ovate, tumid, thin and brittle, greenish white; whorls four, all terminating on a level; body whorl the

whole length of the shell, including all the others, and partially detached from them above; surface smooth; aperture the entire length of the shell, narrow at the spire and constantly widening to the base; outer lip slightly waved; inner lip covered with a thin coat of enamel, partly covering an umbilicus. Length one-tenth, breadth a little less. Cape Cod to the Arctic Ocean; northern coasts of Europe (Verrill). Stonington, Conn. (Linsley). Very rare south of Cape Cod. I have never seen one in our bay.

FAMILY 65. Bullidæ, contains three genera, one of which is represented in Rhode Island.

GENUS BULLA, LINNÆUS, 1759.

There are fifty species of Bulla, distributed all over the world, inhabiting sandy mud flats, slimy banks of river mouths, and brackish places. They are carnivorous, feeding on bivalves, and serving in their turn as food for fishes. There are three species in New England, but only one in Rhode Island.

75. BULLA SOLITARIA, SAY, 1822.

Syns.:

Bulla insculpta, Totten, 1835.

Shell oval, bluish white, fragile, the body whorl enveloping all the others and covered with numerous revolving minute and regular lines; spire depressed, invisible, sometimes opening in a small pit; aperture narrow at the top and broader at the base; outer lip sharp, thickened a little at the base, forming a slight fold at the umbilical region. Length one-third, breadth one-fourth inch. Say described this shell in the *Journ. Acad. Nat. Sc., Phila.*, II., 245, from a solitary specimen found on the coast of Maryland, and supposed by him to be very rare. Col. J. G. Totten afterwards found shells at Newport, R. I., which he described in *Silliman's Journal*, XXVIII., p. 350, as *Bulla insculpta*. Gould and DeKay adopted his name in their works, but in Binney's Gould, second edition, Say's name was restored. The two species are now considered identical. Massachusetts Bay to South Carolina. Common in the muddy lagoons and salt

ponds along the shores of Vineyard Sound, Buzzard's Bay, and Long Island Sound, (Verrill). I have dredged alive a few half-grown specimens in our bay. Over twenty years ago I found quite a number of dead, full-grown shells on the sand at Mark Rock, but have never been able to get any more since that time at that locality or elsewhere, until last summer (1885). One day last August I was informed that there were quantities of these shells on the shore at Camp White. I started the next day for the locality and, sure enough, there were thousands of them there, full-grown, but dead, and all cleaned out beautifully, and showing by their appearance to be very recently living. I gathered several hundreds of them, and the next day an unusually high tide swept away every trace of them from the shore, and since then not one has been seen. They inhabit mud flats covered with eel-grass, facing sandy shores, in one or two fathoms water. They are extremely fragile shells, and are seldom seen in cabinets in a perfect condition.

- FAMILY 66. Aplustridæ.
- “ 67. Lophocercidæ.
- “ 68. Aplysiidæ.
- “ 69. Pleurobranchidæ.
- “ 70. Umbrellidæ, all absent

from our fauna.

Order Nudibranchiata contains seven families, eleven sub-families, 108 genera, and over 600 species. These animals are all destitute of a shell, except in the embryo state, and although many species may inhabit our waters, on this account they are excluded from the shell-bearing mollusca of Rhode Island.

(To be continued.)

Color of Birds' Eyes.

- Color of eyes of adult. Red-tailed Hawk, (observed in two living specimens), Straw.
- Sharp-shinned Hawk, adult, red.
- Sharp-shinned Hawk, young, straw.
- American Golden Eye Duck, straw.
- Pileated Woodpecker, straw.

DICKEY & ALLEN.

ON account of change in our business and pressure of work, this number is unavoidably delayed.

TABLE OF CONTENTS, VOL. II.

- Aplocerus Montanus**, 67.
Atalphia cinerea, 81.
- Bailey, W. Whitman**, Buttercups, 61.
 First Meeting of Franklin Society, 81.
 Lines read at Field Meeting of Prov. Franklin Soc., 65.
 Our R. I. Violets, 51.
- Bat**, Hoary, 81.
- Batrachians, Reptiles and**, of R. I., H. C. Bumpus, 5, 13, 20, 28, 37, 44, 52, 59, 68, 75, 83, 92.
- Beetle Click**, Spring, H. H. Veitch, 86.
- Birds**, Check-list of N. A., 82.
 Breeding-places of Sea Fowl, 53.
 Egg Check-list, 17.
 Eyes, color of, 23, 56, 64, 75, 96.
 Food of Raptorial, Charles Dury, 57.
 Migration of, 18.
 Wingless, 49.
 Winter, 15, 18, 23.
- Blue Jay**, Strange Behavior of, 5.
- Brown University**, Gift to, 77.
- Buhach**, 47.
- Bumpus, Hermon C.**, Reptiles and Batrachians of R. I., 5, 13, 20, 28, 37, 44, 52, 59, 68, 75, 83, 92.
- Buttercups**, W. W. Bailey, 61.
- Cape Cod**, Collecting trip to, 25, 34.
- Carpenter, Horace F.**, Shell-bearing Mollusca of R. I., 6, 14, 22, 30, 38, 46, 54, 62, 70, 76, 84.
- Cerionis**, 87.
- Cermatia forceps**, F. E. Gray, 1.
- Check-lists**, British F. W. Shells, J. Ritchie, Jr., 72.
 British Land Shells, J. Ritchie, Jr., 80.
 Conchological, J. Ritchie, Jr., 8, 16, 24, 32, 40.
 N. A. Birds, 82.
- Collecting trip to Cape Cod**, 25.
- Color of Birds' Eyes**, 23, 56, 64, 75, 96.
- Coot's Eggs**, 51.
- Conchologists**, Hint to, 64.
- Cormorants in R. I.**, 34.
- Cryolate**, Reactions of, 19, 25.
- Duck**, Mergsander Gooseander Fish, 35.
- Ducks**, rearing young dusky, 93.
- Dury, Charles**, food of Raptorial Birds, 57.
- Embryology of Fulgur carica**, 21.
- Emmerson, F. F.**, Our Friends the Spiders, 91.
- Eyes**, Color of Birds, 23, 56, 64, 75, 96.
- Ferns**, Distribution of, 7.
- Fewkes, J. W.**, Genera of Pteropoda from Narragansett Bay, 3.
- Fish**, an uncommon, Selene vorner, 86.
- Franklin Society**, 1st meeting, W. W. Bailey, 81.
- Fulgur carica**, Embryology of, 21.
- Goat**, Rocky Mountain, 67.
- Gray, F. E.**, Cermatia Forceps, 1.
- Hawk Owls**, 34.
- Heron**, Night, S. F. Denton, 9.
- Howland**, John Snowdon, 82.
- Insects**, April, 26.
 June, 47.
 May, 34.
 Collecting of, F. E. Gray, 27.
- King Rail**, 60.
- Mammal Skins**, 73.
- Mastodon Americanus**, Shrewsbury, Mass., 2.
- Migration of Birds**, 18.
- Mineral Cabinet**, a novel, 2.
- Mollusca**, Shell-bearing of R. I., H. F. Carpenter, 6, 14, 22, 30, 38, 46, 54, 62, 70, 76, 84.
- Museums**, Educational, of Vertebrates, 79.
- Mylacris Packardi**, 64.
- Narragansett Bay**, Soundings in, D. W. Hoyt, 36.
- Nest**, Double, 61.
- Newport**, N. H. Society, 41.
- N. O. Exhibition**, R. I., at the, 3, x.
- Nuthatch**, White-breasted, J. H. Steele, 26.
- Opal**, 3.
- Ostriches**, 49.
- Owl**, Hawk, 34.
- Snowy**, 35.
- Ozocerite**, Franklin S. Smith, 19.
- Pheasants**, Horned, 87.
- Phoca vitulina**, 89.
- Phryganea**, 78.
- Proliferation of Rose**, 61.
- Providence Franklin Soc.**, Lines read at Field Meeting, W. W. Bailey, 66.
- Pteropoda**, Genera of, from Narragansett Bay, J. W. Fewkes, 3.
- Reptiles and Batrachians of R. I.**, H. C. Bumpus, 5, 13, 20, 28, 37, 44, 52, 59, 68, 75, 83, 92.
- Rhode Island**, Buttercups, W. W. Bailey, 61.
- Clambake**, 65.
- Comorants in**, 34.
- Entomological Society**, 11.
- Ipswich Sparrows in**, 17.
- Native Trees of**, L. W. Russell, 29, 36, 45, 55, 58, 69, 74, 83, 94.
- Newport**, N. H. Society, 41.
- Reptiles and Batrachians of**, H. C. Bumpus, 5, 13, 20, 28, 37, 44, 52, 59, 68, 75, 83, 92.
- Rodentia of**, 12, 35, 42, 60.
- Shell-bearing Mollusca of**, H. F. Carpenter, 6, 14, 22, 30, 38, 46, 54, 62, 70, 76, 84.
- Violets**, W. W. Bailey, 51.
- Ritchie, John Jr.**, Check-list British F. W. Shells, 72.
 Check-list British Land Shells, 80.
 Conchological Check-lists, 8, 16, 24, 32, 40.
- Robin**, Albino, 34.
- Rocky Mountain Goat**, 67.
- Rodentia of R. I.**, 12, 35, 42, 60.
- Rose**, Proliferation of, 61.
- Russell, L. W.**, Native Trees of R. I., 29, 36, 45, 55, 58, 69, 74, 83, 94.
- Seal**, Harbor, 89.
- Selene Vorner**, 86.
- Shad Fishery**, 48.
- Shells**, Cleaning, 30.
- Sitta Carolinensis**, J. H. Steele, 26.
- Sparrow**, Ipswich, in R. I., 17.
- Spiders**, Our Friends the, F. F. Emerson, 91.

Taxidermy, 18. Pickle for Skins, 51. To turn mounted bird into skin, Brewster, 1.	Ventilation, 43, 47. Vertebrates, Educational Museums of, 79. Victoria regia, 90. Violets, R. I., W. W. Bailey, 51.	Warbler, Yellow-rumped, 67. White-cheeked, in Conn., 43. West Medford Depot, 2.
--	---	--

INDEX TO ADVERTISEMENTS.

The figures refer to the issue of RANDOM NOTES, the letters to the page.

Audobon's Birds of N. A., 5, xix. Auk, The, 3, xii.	Hoosier Naturalist, 10, xxxviii; 11, xlii; 12, xlvi. Horsford's Acid Phosphate, 1, ii; 2, vi; 3, x; 4, xiv; 5, xviii; 6, xxii; 7, xxvi; 8, xxx.	Seeds, 6, xxiv; 7, xxviii. School Collection of Birds, 4, xv; 8, xxxii. Minerals, 4, xv; 8, xxxii.
Birds' Eggs, 1, iv; 4, xvi; 6, xxiii; 7, xxvi; 8, xxxi, 9, xxxv; 10, xxxix; 11, xliii; 12, 1. Alaskan, 4, xvi. And Nests Wanted, 6, xxiv. Exchange, 2, viii. School Collection of, 4, xv; 8, xxxii.	Linnæan Society Transactions, 1, ii.	Science Observer, 9, xxxiv. Shells, 1, iii; 2, vi; 7, xxviii; 10, xxxix; 12, 1.
Bird Skins, 1, iv; 6, xxii; 7, xxviii; 8, xxxi; 10, xxxix; 11, xliii. Exchange, 2, viii. Wanted, 2, vii.	Mammals, 4, xv; 7, xxxviii; 8, xxxii. Mammals, Mounting, 5, xix; 8, xxx1.	Southwick & Jencks, 1, iii, iv; 2, vi, vii, viii; 3, xi; 4, xv, xvi; 5, xviii; 6, xxiii, xxiv; 7, xxvi, xxvii, xxviii; 8, xxx, xxx1, xxxii, 9, xxxiv; 10, xxxviii, xxxix, xl; 11, xlii, xliii, xlv; 12, xlvi, xlix, 1.
Birds of N. A., Audobon, 5, xix. Birds, Young, in the Down, 7, xxviii.	Mica Sand, 9, xxxv. Minerals, 1, iii; 7, xxviii; 9, xxxv; 12, xviii. Amateurs' Collection, 4, xv; 8, xxxii. School Collection, 4, xv; 8, xxxii. Wanted, 1, iii. Wanted in exchange, 1, iii.	Southwick & Jencks' Catalogues, 2, viii; 3, xii; 4, xiv; 5, xviii; 6, xxii; 7, xxvi; 8, xxx; 9, xxxiv; 10, xxxviii; 11, xlii; 12, xlvi.
Calder, Herman L., Printer, 6, xxii; 7, xxvi.	Newport N. H. Soc., Proceedings, 8, xxx; 9, xxxiv; 10, xxxviii; 11, xlii; 12, xlvi.	Sponges, 6, xxiv. Starfish, 6, xxiv.
Catalogues, see Southwick & Jencks.	Ostrich Eggs, 12, 1.	Supplies, Naturalists', 11, xlv; 12, xlvii.
Conchological Manual, G. B. Sowerby, 11, xlii.	Philadelphia, Conchological Pub- lications of Academy of Nat- ural Science, 9, xxxv; 10, xxxviii.	Taxidermists' Tools, 7, xxvi; 8, xxx1; 9, xxxiv; 12, xlvi; 12, xlix.
Coral, 6, xxiv; 7, xxviii.	Patmigan, 3, xii.	Trays, 4, xiv; 5, xviii; 6, xxii; 7, xxvi; 8, xxx; 9, xxxiv; 10, xxxviii; 11, xlii; 12, xlvi.
Davies' Egg Check-list, 3, xii.; 4, xiv; 5, xviii.	Ross, J. A. & Co., 48.	Turtles, 4, xv; 8, xxxii.
Echinoderms, 6, xxiv. Eyes, Glass, 1, iii; 2, viii.		Voluta vexillum wanted, 5, xix.
Glass Eyes, 3, xii; 4, xiv; 5, xviii; 5, xx; 6, xxii; 7, xxvi; 8, xxx; 9, xxxiv, xxxvi; 10, xxxviii, xl; 11, xlii; 12, xlvi.		

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