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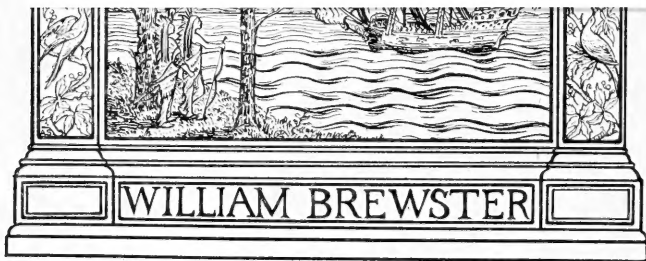
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VOL. III.

NO. I.

RANDOM NOTES

ON



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The New Check-List.

WE are glad to learn, through the receipt of a circular from the American Ornithologists' Union, that the *New Check List and Code of Nomenclature of North American Birds*, is about to be presented to the public. This work, which will be of the highest character, representing as it does the almost incessant labor for two years of an able committee appointed by the Ornithologists' Union, will not find a place on the shelves of the naturalist's library, but will be constantly lying on his work-table close at hand. The treatment seems to us to be admirable. The first part is given up to the exposition of the rules of nomenclature, and the second gives not only a classified list of all the North American birds, but is synoptic in its character, giving the names of the higher groups. After each specific name references are given by which its original description can be found, and also appended to each is a brief statement of its habitat. That no confusion will be experienced in referring to previous check-lists those of Baird, Coues, and Ridgway are given in full in the concordance. Though the price (\$3.00) may seem at first a little high, it should be remembered that a first-class work of such size and of limited sale, is of necessity expensive.

Work of the Government Entomological Division.

SINCE our last issue several yearly reports have been received, among which that of the United States Commissioner of

Agriculture, which embraces a general sketch of the work done by the department during the past year, and that proposed for the ensuing is especially interesting and valuable.

The work done by the Entomological Division includes the publication of several bulletins which contain the results of a vast amount of investigation. That the labors of the board are of the highest practical value is admirably set forth by the commissioner, who thus writes:

"The importance of the study of economic entomology becomes every year more and more apparent. Scarcely an agricultural or horticultural meeting takes place but that the subject of injurious insects and the best means of counteracting their ravages occupy a large share of attention. The losses occasioned by destructive insects to the farmers of the country aggregate an enormous sum, and there are few directions in which the department can do more good than in researches having for their object the prevention of a portion of these immense losses. The valuable results already obtained in the work of the Entomological Division under its present efficient management are a sufficient promise of good work yet to be done.

The work of this division has greatly increased during the year, several new lines of investigation which promise valuable results having been entered upon.

The appearance of the so-called "seventeen-year locust" or periodical cicada, in May and June, over a large extent of country, enabled the entomologist to make many interesting investigations in regard to it, and a bulletin (No. 8 of the present series) was prepared and issued, giving a full account of the habits and life-history of the species, and a revised edition is being prepared.

Two other bulletins have been issued, one (No. 5) treating of certain parasites of injurious insects, and the other (No. 6) of the imported elm-leaf beetle. This last is a practical treatise of an insect that has

of late years proved very injurious to the elms throughout the Eastern States, and shows clearly and plainly how it may be satisfactorily dealt with.

Destructive grasshoppers have been exceptionally abundant during the summer. One species (*Melanoplus destructor*), peculiar to the Pacific slope, has done much damage in California, and special study has been given to it on the spot.

Remembering the fearful devastation caused by the Rocky Mountain species between 1873 and 1877, the people of the West have felt very keen anxiety as to the future on account of the increased injury the present year. The entomologist has given this subject very careful attention, and, from the reports of special agents and a full consideration of the subject, he concludes that there is some danger of increase in the next two or three years should the weather prove favorable to the insect.

But as an encouraging offset to this rather gloomy prospect, he also considers that, under conditions the most favorable to grasshopper increase, the injury can never be as widespread as it has been in the past, owing to the advance and increase in settlement.

Other destructive insects have been very numerous, and a series of test experiments have been made by agents stationed in New Jersey, Indiana, and Iowa, with many insecticides which have been recommended but never thoroughly tested.

Another new field of investigation has been added to the division by the appropriation by the last Congress of \$5,000 to be devoted to the promotion of economic ornithology, or to the study of the interrelation of birds and agriculture, an investigation of the food, habits, and migration of birds in relation to both insects and plants. I have commissioned Dr. C. Hart Merriam, the chairman of the committee on migration of the Ornithologist's Union, to act with the entomologist in this matter, and circulars have been prepared and sent out, and the work is now progressing in such a way as to promise solid and valuable results."

In the work of the Ornithologists' Union many of the readers of *RANDOM NOTES* are personally interested, and all will look forward to its results as presenting prime factors in the consideration of scientific agriculture.

A Convenient Method for Finding the Specific Gravity of Minerals.

THE principal thing needed to determine the specific gravity of a mineral is an ordinary spiral spring; for quite large and heavy specimens a window-curtain spring will answer. The spring may be attached by a nail or wooden peg which has been driven in an upright piece of board of considerable length; care being taken to have the support long enough so that the mineral in hanging will not touch the board. The mineral is now fastened to the lower end of the spring by means of a string, a mark *a* having been previously made on the upright piece of board opposite to the lower end of the unstretched spring, the mineral is allowed to hang free and draw out the spring to its utmost. Now, on the upright, mark the position of the same portion of the spring as was before used in determining *a*, and call this second point *b*.

The distance from *a* to *b* will represent the weight of the object in air.

Now raise a vessel of water under the specimen so that it shall be wholly immersed and mark again on the upright the position of the lower end of the spring and mark it *c*.

The distance from *b* to *c* will represent the loss of weight in water.

Now we know that the specific gravity of a solid is equal to its weight in air divided by its loss of weight in water; therefore, the distance from *a* to *b* divided by the distance from *b* to *c* will give the specific gravity of the mineral in question.

Suppose, for example, we wish to find the specific gravity of a piece of Hematite. We first note the natural position of the spring, then attaching the specimen we note that the weight of the mineral has stretched the spring so that it extends five inches. Next, we bring up under the specimen a jar of water until the mineral is beneath the surface but not touching the sides or the bottom, and find that the spring has lost one inch of its length. Five, the weight in air, divided by one, the loss of weight in water, gives five as the specific gravity of Hematite.

If it is desired to operate with small fragments a more delicate spring must be used,

and instead of each time tying the specimen to the spring, a small scale pan may be permanently attached. Instead of marking the positions of the spring, a permanent scale can be made on the upright board. In the Jolly Balance, of which this is only a modification, the scale is cut on the surface of an upright mirror.

The determination of the specific gravity is especially valuable in distinguishing ores of iron, copper, lead, etc., and though it may be roughly approximated by balancing in the hand, the method here described is convenient, easily understood, and if properly carried out will give a result which will answer for all practical purposes.

H. F. WALKER.

A Collecting Trip in the Magdalens.

ON alighting from the cars at Pietou Landing we are met by the captain of the iron packet "Beaver." The freight is soon on board and with the order to "cast off the bowline," we realize that we are soon to see the land of the Puffins, Gannets, and Razor Bills.

Late in the afternoon we touch at Georgetown, Prince Edward's Island, and later at Souris, after which the course is shaped for the Magdalens.

On the following morning we see the mountains and high cliffs of red sandstone. As we approach nearer we are struck by the fantastic forms which the actions of the elements have given to the coast. Here is a vast cave into whose dark mouth flies a Black Guillemot with a small fish for her young. Yonder is a high hill looking like a huge divided sugar-loaf, the side towards the sea being perpendicular from base to summit, a distance of 400 feet or more; midway, upon a narrow shelf, is a bunch of sticks whose nature is betrayed by the harsh croaks of a pair of ravens. On the shore of a small cape at the base of this hill is the store, and near by several story-and-a-half houses. By far the best accommodations are offered to strangers at the house of Louis Boudreault, mayor, etc., etc., of Grindstone.

The afternoon was spent in "getting the lay of the land." The islands are extremely hilly, and the greater portion is covered

with a growth of stunted spruces, whose interwoven branches rival a chaparral thicket. In various parts of the islands are sloughs, which, although firm enough in appearance, would, to use my companion's description, "mire a web-footed ghost." In the midst of these sloughs the Rusty Grackle and Wilson's Snipe lay their eggs in safety. In the large slough on the east point of Grosse Isle Wild Geese are said to breed. Not a great variety of birds were to be found on Grindstone, so we determined to move to pastures new.

A visit to Shag Rock revealed the fact that nothing but Wilson's Terns and a few Black Guillemots are breeding there now. Mr. Maynard informs me that he once found Cormorants breeding there; but at that time the rock was almost inaccessible, though now it has been made easy of ascent by the action of the frost. We found that the waves had formed a large cave, the roof of which in a few years will fall in and again divide the island.

The natives told us, in answer to our inquiries concerning Bird Rocks, that the best thing to do was to go to Bryon Island and there wait a favorable day to go across to the noted rocks, about twelve miles distant. This we did; but the favorable day was not forthcoming. In the interval we thoroughly explored "the Bryon." This, in many respects peculiar island, has not a spring, and but a single well; rain-water is used for all purposes. The island is somewhat of a figure eight shape. On the east point a colony of Wilson's Terns have taken up their abode, and on the rocks around vast numbers of Kittiwakes sun themselves, contesting for their position with the Eider Ducks, which are in turn driven away by the seals.

On the northern side are colonies of Puffins and Razor Bills which deposit their eggs in natural clefts oftener than in holes of their own excavation; and in the debris which falls from the cliff are seen the nests of the Black Guillemot. The entrance to the nests is betrayed by the smoothness of the earth at the opening. In various parts of the island are found the burrows of the Leach's Petrel, and farther into the interior the Black Polled Warblers and Winter Wrens build. Several collectors, I am told, have taken nests of the Pigeon Hawk (*Falco Columbairus*) here. Numerous Red-Throated

Divers, Mergansers, and Surf Ducks were seen, also a pair of Harlequin Ducks, evidently having a nest on the island.

Having explored Bryon, our attention is directed to Bird Rocks. Many times did we turn our spy-glass there and plainly discern the white mantle of birds which covered them. It is very difficult to persuade a native to go to the rocks. Nothing will do it but an extravagant "insult" in the shape of hard cash. At last, angry and nettled by the delay, we determined "to go it alone." Securing an eighteen-year-old fisher boy, we start during a dead calm to row across. Arriving at the rock in the afternoon, we are cordially greeted by the light-keeper. The height of the rock has been much exaggerated by many writers. At its lowest point its height is 120 feet; the circumference is 700 yards; without a ladder the ascent of the larger rock would be well-nigh impossible, but the smaller rock, one-half mile distant, can be scaled by an expert climber.

The Gannets are probably the most interesting inhabitants. Wherever there was a shelf of sufficient width they were to be seen guarding their bunch of sea-weed, their single egg, or the naked young. The keeper said that he had collected the eggs from a particular shelf every day and that the Gannets there had ceased laying, but still guarded jealously their despoiled nests, if nests they might be called.

The Murres and Razor Bills are crowded upon the smaller ledges, and when they fly the eggs and young are pushed off. The young appear not to be injured by the fall, and some were noticed which fell fully 100 feet to the rocks beneath, to scamper to the water and swim out, only, however, to fall a prey to the voracious cod-fish which lie in wait for their prey with the persistency of sharks. In this instance the birds were about a week old.

The Kittiwakes build a neat nest under the overhanging crags, which is very difficult. The Puffins, now reduced to a small colony, occupy one corner of the top surface, making their burrows under the flat rocks, and sitting near the entrance gazing with curiosity at the intruder who comes to despoil their homes.

The birds are very tame and will allow a near approach.

The Murres' eggs are gathered by the light-keeper and placed in pickle for winter use. At that time he had thirteen barrels prepared and stowed away.

But darkness is overtaking us, and having gathered up the slain birds, we embark for the return, feeling well repaid for the aching muscles which the long row, together with five hours of climbing had caused, and with reckless indifference we stretched ourselves on the thwarts and surrendered to the embrace of Morpheus, and in our dreams the mournful cries of the Kittiwakes seemed to mingle. Suddenly, a loud "boat ahoy" breaks in rudely upon our slumbers, and we answer the hail of a fishing schooner drifting for salmon. Finding that a light breeze has risen we set the sail and arrive at Bryon about 3.30 A. M., the following morning.

As the mercenary result of our venture we had about seventy specimens of Murres, Gannets, Razor Bills, Puffins, Kittiwakes, and three half barrels of eggs (many of which however, contained embryos), while in our hearts we felt the satisfaction of an enterprise successfully accomplished.

G. W. F.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXIV.

SUB-CLASS PULMONATA.

THE animals of this third and last subclass of Gasteropoda, differ from all the previously described mollusca, principally in the fact that they are air-breathers. They have only the simplest form of a breathing apparatus lined with a net work of respiratory vessels. The sexes are united in each individual. Most of the species have a shell large enough to contain the animal, some have a shell only to cover a portion of the body, and a few have none. The Pulmonata are divided into two orders, viz.: Stylommatophora and Basommatophora. These are further sub-divided into sub-orders, groups, families, sub-families, genera, sub-genera, sections, sub-sections, species, and varieties. These finer sub-divisions are

of no particular importance, except as a convenient method of grouping and arranging a large collection, and only serve to confuse the student. They will be omitted in these papers. Those readers who wish to know all these finer sub-divisions are referred to *Tryon's Structural and Systematic Conchology*, published by the author at the Academy Natural Science, corner 19th and Race Streets, Philadelphia.

ORDER STYLOMMATOPHORA.

Terrestrial mollusks having four tentacles, the superior pair retractile, and having eyes at their extremities. This order contains nineteen families.

Family Testacellidæ, four genera and forty-five species, all absent from *North America*.

Family Oleacinidæ, four genera and over two hundred species, all absent from *New England*. A few species inhabit the *Southern United States*. Mostly found in *Tropical America, North and South Mexico and West Indies*.

Family Streptaxidæ, three genera, about two hundred species, all foreign.

Family Helicoidea, seven genera, seventy-five species, all foreign.

Family Vitrinidæ, sixteen genera, over two hundred species; of these two genera are represented in *America*, viz.: Vitrinonites, W. G. Binney, contains one species, *V. Lattissimus*, Lewis, *mountains of Western North Carolina and East Tennessee*, and Vitrina, Drap, eighty species, three of which inhabit *America*, one from *California to Utah southward to New Mexico*, one in *Greenland and Labrador*, and one in *Canada and from Maine to Michigan*.

Family Zonitidæ contains two genera, Zonites and Nanina. Nanina is divided into twenty-seven sub-genera and over five hundred species, inhabiting in tropical and sub-tropical regions of *Asia, Africa and Oceanica*. Zonites is divided into twenty-seven sub-genera, twelve of which inhabit the *United States*, and five are found in *Rhode Island*, viz.: Hyalinia, Conulus, Helicodiscus, Striatura, and Punctum.

76. ZONITES (HYALINIA) ARBOREA, SAY.

Syns:

Helix arborea, Say, Binn., Eatton, Gld., DeKay, Ad., Pfr., Chem., and C.

Hyalinia arborea, Morse, Tryon, W. G. Binney.

This shell was discovered by Thomas Say, and described in *Nichols' Encyclopædia*, 1816, as *Helix arboreus*: "Shell very thin, fragile, repressed, horn color, pellucid very little convex; whorls four, irregularly wrinkled across; aperture sub-lunated. lip thin, brittle, junction with the body whorl acute; umbilicus large and deep. Length one-tenth of an inch nearly." Either Mr. Say or the printer made a mistake. It measures one-quarter of an inch in diameter. Morse's description says, "umbilicus not large, whorls four to five."

This shell is not remarkable for its beauty, and is not of particular interest. It is extremely common, found about decaying stumps and old logs under the bark. It is very simple in structure, and would at once be recognized by any person who had ever seen it. Its range is very great, being found from Labrador to Florida; from Great Salt Lake to Texas; in California, Montana, Nevada and New Mexico. It is also said to have been found in Cuba and Guadalupe.

77. ZONITES (HYALINIA) BINNEYANA MORSE.

This shell was discovered in Maine, by Mr. E. S. Morse, and named by him *Helix Binneyana*. It was described in the journal of the Portland Society Natural History: "Shell minute, whorls four; spire slightly elevated, pellucid, nearly colorless; aperture well rounded; umbilicus open." It is quite a rare shell. It has been found in Maine, Massachusetts and at Tawas Bay, Mich. I have found a few in Rhode Island, but perhaps its range is greater than is now suspected and future observers may find it to inhabit a greater extent of territory than is now accredited to it. It resembles arborea a little, but is smaller (one-sixth of an inch in diameter) and differs in color, being of a greenish white tint.

78. ZONITES (HYALINIA) CELLARIA, MÜLER.

This shell is not a native of this country but has become naturalized by a residence of over fifty years. It is an European species, very common in Great Britain, France, and Germany. The following description

is taken from Reeve's *British Land and Fresh Water Mollusks*, page 47: "Shell rather narrowly, deeply umbilicated, depressly orbicular, greenish-yellow, pale, very glossy; spire convexly flattened; sutures linearly channelled; whorls six, narrow, increasing slowly, longitudinally obscurely plicately striate; aperture obliquely lunar." It was first noticed by Müller in 1774 and named by him *Helix cellaria*. Reeve calls it *Zonites cellarius*. It has been described by many other authors in Europe under twelve different names.

Mr. G. Ord, of Philadelphia, found the first specimen in America, and gave it to Mr. Say, who described it as a new species under the name of *Helix glaphyra*. It has since been found in old, damp cellars in Boston, Lynn, Salem, Marblehead, Portland, Halifax and other sea port towns, and was supposed to have been imported into this country on wine casks or other merchandise. On comparison with the English shells, they were found to be identical. I found them twenty years ago in two old cellars in Pawtucket, in the boat-house of Mr. G. L. Spencer, in Pawtucket, and in several cellars on Canal Street in Providence.

On Broadway, in this city, there is a large greenhouse, or rather several of them together, owned by Mr. Robert Hogg; in these greenhouses at all times of the year, can be collected quantities of these shells. In this warm and damp atmosphere these animals propagate and grow rapidly and unlike other snails do not hibernate six or seven months in the year. These snails are very destructive to the young plants and are regarded by Mr. Hogg as a nuisance. If any of our readers are anxious to collect this species under their best conditions, alive and of all sizes, I will guarantee that if they present themselves at Mr. Hogg's door and say they wish to get some snails, he will come up smiling every time and invite you to come in and pick up all you want, and if he has time will help to fill you up and rid his place of the nuisance.

Mr. Morse, in speaking of this species in the *American Naturalist*, says: "A lady in Portland, in whose cellar the writer collected many, stated that the snails annoyed her by crawling into her milk pans.

[To be continued.]

The Native Trees of Rhode Island.

No. IX.

BY L. W. RUSSELL.

Quercus ilicifolia—SCRUB OAK—BEAR OAK.

The common occurrence of the *Quercus ilicifolia*, scrub oak or bear oak, in Rhode Island, indicates a corresponding prevalence of poor soil. It will grow in mere sand or gravel, or wherever it can get a foothold among thinly-covered ledges of rock. While the primitive forests yet remained, this little oak chiefly grew, no doubt, as an undergrowth; and even now, in existing wood lots, hundreds of these shrubs may frequently be counted upon an acre of ground, ready to take full possession as soon as the larger wood is cut off. Their growth is particularly noticeable in pine woods and among the gray birches. The fact of the scrub oak following the pine when the latter is removed is often spoken of as though it were a strange thing, but this is easily accounted for. The squirrels have been the seed-planters. A careful observer will find these oaks plentifully scattered about among the pines, or other trees. The soil has become exhausted of the material essential to the larger growth. This hardy oak is ready to cover the ground as a kind of fallow crop. It springs up, and, in a few years, makes an almost impenetrable bush. Worthless as fuel, except where wood is scarce, it has its use. It prevents the winds from making sand-heaps of poor soils. These shrubs frequently, in a natural way, protect trees of tender growth until they get sufficiently established to take care of themselves. Man could do better with them, and, indeed, has successfully utilized them in this way: They have been planted in rows as nurses to other trees which needed protection, the latter being planted a few years later in the vacant places. Another way is suggested: Cut lanes, a few feet wide, in existing areas of this shrub, planting pine or other seeds in the spaces; the oaks would thus act as a protection from wind and weather until the seedlings were well started.

In the diluvial drift and ridges around

Providence and further down the bay, also in the southern part of the State, the scrub oak readily takes possession of the soil. With it, in some localities, is found the still smaller chinquapin oak, and, with both, oftentimes, the gray birch and pitch pine. I suppose that the only reason why we do not find it as the principal growth in better soils, is that trees of a larger growth overrun them, keeping them if they survive at all, as an almost unnoticeable undergrowth.

The general appearance of the scrub oak is very familiar. It is the smallest of the native "biennials," usually not growing more than eight feet high, but having several stems from a single root, giving it, where it has a chance to spread, a very bushy appearance. The main stems are of a dark, rich green, beautifully varied with light, pearly dots and patches, the whole being shiny, as though varnished, and often prettily adorned with lichens. The young branches are of a light ashen gray, gradually taking the greenish hue of the stem, the extreme ends being velvety. The branches are numerous and very scraggy, well adapting the shrub to hedging purposes, for which it is sometimes used.

The blossoms appear in May and are very pretty objects. The sterile ones come from the axils of the last year leaves and hang in jaunty clusters, changing to various colors from orange to red. The fertile flowers are in the axils of the new and leaves are nearly sessile and inconspicuous.

The average typical leaf is about two and one-half inches long, two-thirds as wide on petioles often very short, but sometimes three-fourths the length of the leaf.

The fruit is very abundant and of good size for a shrub. It is often beautifully striped longitudinally and set in a neat, closely imbricated cup, christening the last year's branches in such profusion they form a striking appearance. The kernel is of a deep orange as is the base of the acorn when it is attached to the cup. The name "bear" oak is due to the fact that bears are fond of the acorns. Swine also feed upon them.

There is a well marked variety of this oak in the state growing fifteen to twenty feet high and six inches in diameter.

(To be continued.)

Reptiles and Batrachians of Rhode Island.

BY HERMAN C. BUMPUS.

NUMBER XVI.

4. *Rana palustris* Le Conte. The Marsh or Pickerel Frog is perhaps our most abundant batrachian, being found in nearly every small body of water and not infrequently taking up its abode in springs and surface drains.

Le Conte, in giving the original description of this animal, applied the specific title of *palustris*, thus characterizing it as an inhabitant of the salt marshes. Though often found in this locality, and being indeed the only native batrachian which is known to voluntarily take to salt or brackish water, the Marsh Frog is by no means restricted in its distribution, nor is it limited to the coast alone. Specimens have been seen by Dr. Holbrook in the White Mountains while the National Museum contains types from Wisconsin and various localities along the Mississippi as far south as the Mexican Gulf.

Though at first glance the Marsh Frog resembles the following species, the resemblance is only superficial and it is remarkable that the animal's identity should not have been made out until the description of Le Conte. Not only does *Rana palustris* differ from *Rana halecina* in coloring, having the spots of the back of a rectangular outline, arranged in four rows and of a deep brownish or black shade, but it presents several structural peculiarities. The cuticular folds of the back are less prominent and the snout is less pointed. The animal, moreover, is said to have a strong and not altogether pleasing odor. The young are described as being of a yellowish gold color, though I have not noticed that the young differ materially from the adults.

This frog is most loath to retire on the approach of winter and can often be found after the other Ranidæ have retired. I have often, on warm days in winter, seen this species as it made its way over the dead leaves at the bottom of some spring, possibly looking for a warm niche into which it might retire on the return of cold weather.

Being our most abundant frog and obtainable at almost all seasons of the year, it

has come into good repute with the freshwater angler, and is often, as a whole or in parts, used as a bait for the omnivorous pickerel. It is thus often spoken of as the Pickerel Frog, an appellation which it has in common with its more elegant congener, *Rana halecina*. The Marsh Frog often grows to a considerable size, the body alone sometimes measuring three inches in length, while the legs often exceed four inches.

Vorticella, or the Bell Animalcule.

IN those who have interested themselves in observing the more minute creations of nature, few objects have awakened more admiration or wonder than a colony of these active Protozoans, or single-celled animals. Though a most familiar object, it is quite possible that there are not a few of the younger readers of RANDOM NOTES to whom a short description of the manner in which the animal may be captured, and a few words on its structure and habits will not be wholly lost.

If the weeds and stones of a spring or clear brook be scraped with a fine net, and the result be washed out in a jar of fresh water, in a few days there will be observed, on the sides of the vessel, several white, moss-like growths which sway back and forth as the water is disturbed, but which immediately disappear on being touched with some object, as the point of a pencil. If one of these growths be now examined with a hand lens, by looking through the side of the jar, there will be observed what strikingly resembles a bunch of toy balloons—a colony of vorticellæ. Now if the entire bunch be removed from its support, by passing a knife blade beneath it, and placed on a glass slide with a small quantity of water and covered with a thin cover glass, in such a way as to exclude any large air-bubbles, many important points can be made out.

There will first be noticed a main stem in which is a striated elastic cord, which, by contracting, draws the bunch of vorticellæ toward what was once its attachment. The distal end of this stem branches into numerous sub-divisions, each of which, in structure, resembles the main stem and bears at its extremity a bell-like expansion—the vorticella proper. By watching the con-

tractions of these stems and branches, it will be noticed that the power of volition seems to reside in each individual, for while one portion of the colony may contract on being irritated, another portion will remain expanded and active. On all being disturbed the main stem contracts, drawing the entire colony to the surface of the support on which it grows.

Each bell, in its extended condition, is seen to have a flaring margin which is lined with a row of cilia whose motion induces a fresh current of water to be constantly flowing by and among the animals, from which they seize the nutritive particles.

On viewing the object, a single individual bell, with a higher power, the ciliated margin is seen to be partially covered by a disk, the *epistome*, which is also along its rim provided with cilia. If the single individual be now more closely examined, it will be noticed that the disk is raised upon one side and that particles from the water are constantly entering and leaving the organism at this place, the *vestibule*, which thus functionizes as the mouth.

Particles once entering the vestibule can be followed as they are taken further and further into the body of the animal and finally, having all nutritive matter digested from them, they are thrown out from the same door which they entered.

If it is desired to further examine the digestive apparatus, a simple method is to induce the animal to accept as food some coloring matter, as powdered carmine. This, when being taken into the vestibule, will beautifully illustrate the action of the cilia, and as it fills up the digestive tract, will map out its outline in a most beautiful manner.

H. KAREY.

IMMACULATE EGGS OF SONG SPARROWS.—An item that interests me is the finding of a set of Song Sparrows $\frac{1}{2}$ in my garden, the eggs being almost entirely without any markings whatever—only one of the set being noticeably spotted; they closely resembled eggs of Blue Bird; pale bluish tint.—J. N. CLARK.

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<i>Chondropoma weinlandi</i> , Pfr., St. Do- mingo.....	10
<i>Chondropoma biforme</i> , Pfr., Gonave Islands.....	10 for 10
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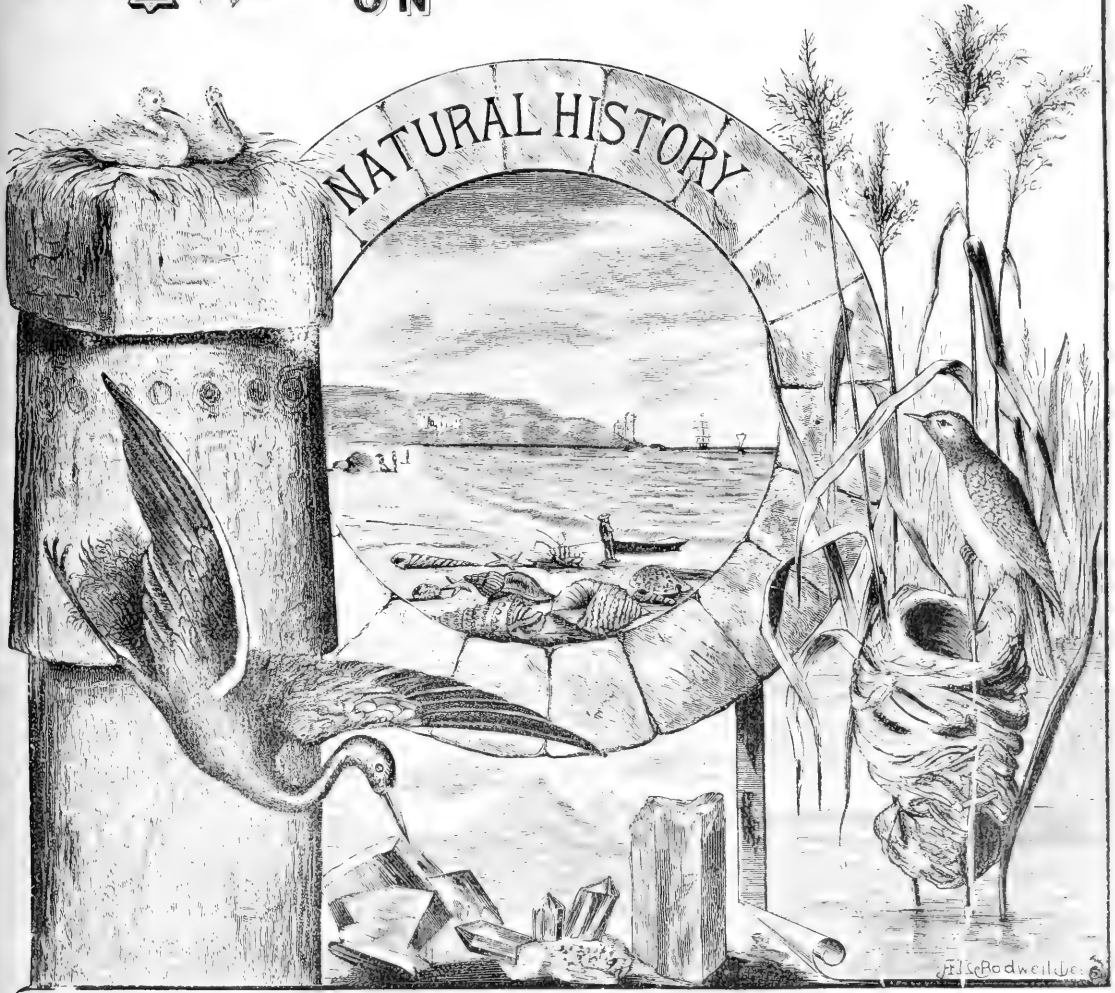
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Vol. III.

PROVIDENCE, FEBRUARY 1, 1886.

No. 2.

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

To a Friend at West Point.

"PROSE OR WORSE," BY W. W. BAILEY.

THE brave little Dutchmen
Are all in their place,
And safe in the care
Of my Wardian case,
Their "breeches" all packed
For the winter away
I hope to coax out
On some sunshiny day.
What will they imagine
When they shall awake
From their short winter nap,
With a yawn and a shake
To find themselves blooming
Down here by the shore,
In the city of Roger
With Yankees — *galore*
"In my minds eye, Horatio,"
The spot I recall,
Where they grow in the Highlands
By a wee water-fall,
That only in spring-time
Leaps over the rocks
Near the bend of "Flirtation"
At Battery Knox.
There often in childhood
I wandered to see,
The first of the season,
Myself, and the bee!
How lovely appeared then
Their foliage of lace,
And creamy white trousers,
Each one in its place;
And then I think, too,
And you know, I suppose,
Where, far down the cliff,
The dog violet grows.
I see the "herb Robert"
All dripping with dew,
And scent its rank fragrance
As I used to do.
Just here a path perilous
Led to an isle
Called "Duck" by the vulgar;
Methinks I should smile
To see myself scrambling
Once more down the way
That once was so easy
On half holiday.
"Backward, turn backward
O, time, in your flight,"
I seem to be dreaming
Of childhood to-night;
And many a picture
I gladly review
As I pen these poor verses
In answer to you.
West Point! what a word
To unravel the chain
Of lingering thoughts
I have stored in my brain.
I thread Stony Lonesome
Once more with my friend,

In beds of the walking fern
Pause to unbend,
Or sit 'neath the boulder
Where Drake's "Culprit Fay,"
Once wandered alone
With a fair mortal may.
But oftener I seem
In my fancy to roam
About the loved hills
That encircled my home.
And one there is always
Who walks by my side,
The genial, the gentle,
My father, my guide,
Who knew every plant
On those wonderful hills,
And read the sweet music
Of woods and of rills;
Who told the strange story
Of pebbles that rolled
From far away Shawangunk
In ice days of old;
Who led my young fancy
To seek and to know,
Whatever of beauty
The forests can show,
To him every trifle
Some lesson conveyed
And mysteries whispered
"Oh, be not afraid!
For the Mittella's star,
Or the green mantling scum
Of a pool, were still calling
Their lover to come."
Ah, who is there like him,
This friend of my youth,
Who prized above all things
The beauty of truth?
Bloom fair o'er his grave
Ye bright blossoms of May,
And breathe out your sweetness
For many a day,
And Crow's Nest, look down
On the lover who kened
Each blossom you own
As his personal friend.

WITH the exception of one week in January, the weather has been mild. The flocks of snow buntings that usually arrive along with our first heavy snows have not yet put in an appearance. We have not heard of the capture in Rhode Island of any Snow Owls, any uncommon species, or any unusual number of the commoner kinds, a marked contrast to the winters of 1883 and 1884, when Barred Owls, Pine Grosbeaks, and Brunnich's Guillemots abounded.

It is with much regret that we have to announce the recent death of Prof. Charles

E. Hamlin, who has for several years had charge of the conchological department in the Agassiz Museum of Comparative Anatomy at Cambridge. We hold in grateful memory the kind attentions we have received while making studies in his department.

WE are informed that the very fine collections of birds' eggs in the cabinet of the late John Snowdon Howland, of Newport, R. I., was bequeathed by him to New Haven, where it will be sent as soon as it can be properly packed for transportation.

Diamonds found in the United States.

WE are indebted to the author, Mr. George F. Kunz, for the pamphlet on precious stones, an abstract from the *Mineral Resources of the United States* containing much valuable and interesting material. From its pages we quote, regarding United States diamonds:

"About the first of the year 1855, a laborer in Manchester, Va., found a diamond in some earth he was digging up. It was put into a furnace for melting iron, at Richmond, where it remained at red heat for two hours and twenty minutes. It was then found to be uninjured and brighter than ever. It was valued in Richmond at \$4,000 and became the property of Capt. Samuel W. Dewey, who called it Oninoor, or "Sun of Light"; it was later cut by Mr. H. D. Morse, at an expense of \$1,500. The cutting reduced the weight from $23\frac{3}{4}$ carats to $11\frac{1}{8}$ carats. It is off color and imperfect, and is to-day worth not more than \$400.

"The first diamond found in North Carolina was an octahedron valued at \$100, at the ford of Brindletown Creek, by Dr. F. M. Stephenson. Another was found in the same neighborhood; and a third, a distorted hexoctahedron, yellowish in color, at Twitty's Mine, Rutherford County. A fourth, greenish in color, was found by Dr. T. C. Hunter, near Cottage House, Lincoln County, in 1852. Another, said to be a perfect crystal of white color, was found at Todd's Branch, Mecklenburg County. Dr. Genth reports two diamonds from Portis Mine, Franklin County, and others weigh-

ing from one-half a carat to over two carats, are reported from J. C. Mill's Mines, in Burke County. These diamonds are usually associated with gold, monazite, zircon, octahedrite, etc., the débris of gneissoid rocks, in which graphite is always found.

"Several stones of fine quality have been found at the Horshaw placer gold mine, White County, Georgia."

Mr. C. G. Yale, furnishes the following notes on the California occurrences:

"For more than thirty years the placer miners have occasionally picked up small diamonds. The hydraulic washings at Cherokee, Butte County, have been the most prolific. The diamonds are usually found by the miners when cleaning up their sluices, or while washing off the bed rock, though in a few instances they have been picked up on the surface. As a general thing, the gravel in which they occur is mixed with lava, ashes, or other volcanic matter; zircon, platinum, iridium, magnetite, etc., being associated. While many of these stones have been of good color, brilliant and perfect, none weighing over $3\frac{1}{2}$ carats have been found in the state. So far as known, \$500 is the highest price for which any rough stone has been sold; large numbers have found purchasers at from \$10 to \$50, and not a few as high as \$100.

"The stones have been white, yellow, straw and rose, and many of good water. A few small diamonds have been found in the placer diggings of Idaho, of about the same quality, and occurring under the same conditions as in California.

"A stone weighing 15 carats was reported as found at Eagle, Waukesha County, Wis., having been thrown out at a depth of sixty feet while excavating a well. It is slightly off color and worth about \$300 as a diamond, but is held at \$1,000, owing to its being the first diamond found in Wisconsin; two small stones are also reported as found there, each weighing less than half a carat.

"In the latter part of 1883, a diamond was reported as found at Nelson Hill, near Blackfoot, Deer Lodge County, Mon. This was a colorless stone, in weight about 12 grains.

"Mr. J. D. Yerrington, of New York, reports a brown diamond, found near Philadelphia, Ariz. It weighed one carat, and when

cut yielded a gem of one-half carat. Two pieces of blue glass, that had been rolled so as to lose all form, were naturally supposed by the finder to be sapphires, being in the same locality with the diamond.

“One of the minerals most likely to be mistaken for the diamond, is a form of small quartz crystal, found principally at Santa Fé and Gallup, N. M., Fort Defiance, Ariz., Deadwood, Dak., and Shell Creek, Nev.

On the Breeding Habits of the Red-Shouldered Hawk.

THIS beautiful bird, familiarly known in southern New England as the Hen Hawk, is quite an abundant resident throughout the year. It is a very noisy bird, especially during the mating season, a favorite pastime then being to sail high up in the air in large circles, uttering its cry; I have seen a number of these birds so far up in the heavens that they looked as small as swallows, yet their cry could be heard very plainly.

Its food consists of small birds, rabbits, squirrels, etc., and occasionally chickens, the latter obtained from the poultry yard of some farm.

It breeds usually in deep, dark, swampy woods, and the naturalist might do considerable hunting and not be able to find its nest. One that I found April 16, 1884, was placed in the confluence of two main limbs of a maple tree in swampy woods; it was made of sticks, twigs, and sods; the cavity for the eggs was lined with cedar and grapevine bark and but slightly hollowed, the nest contained enough material to fill a bushel basket. As I approached the tree in which the nest was built, the setting bird silently left it, and sailing high up in the air, intently watched me as I climbed to the nest. Soon she was joined by her mate, who made his presence known by uttering his harsh ka-hee, ka-hee ka-hee.

I find, as a rule, that if the nest is inhabited, the ground near the bottom of the tree, and the bushes near by, will have a number of small feathers on and about them.

On a nest that I found April 25, this season, the bird staid until I began to ascend the tree; but usually she will leave before the tree in which the nest is placed is reached.

The nest, the description of which is given above, contained four fresh eggs; the dimensions are as follows: 2.15x1.63; 2.11x1.65; 2.09x1.62; 2.06x1.62 inches.

The eggs vary greatly both in size and color of markings. I have specimens, the ground color being light greenish white with scarcely any markings, others so thickly covered with dark brownish blotches as to nearly hide the surface color of the egg. The largest specimen I have, measures 2.23 x 1.75 inches; the smallest, 2 x 1.60 inches.

The Native Trees of Rhode Island.

No. X.

BY L. W. RUSSELL.

THE OAKS—*Quercus*.

THE following comprehensive view of the oaks of Rhode Island is presented as matter which may serve as convenient for reference and identification:

1. *The Annuals*.—Those which grow and mature their fruit during the first season.

Q. rubra—Red oak.

Q. tinctoria—Black oak. Yellow-bark.

Q. coccinea—Scarlet oak.

Q. palustris—Pin oak.

Q. illicifolia—Scrub oak. Bear oak.

2. *The Biennials*.—Those which do not mature their fruit until the second season, or eighteen months from blossoming.

a—*The White oak division*.

Q. alba—White oak.

Q. obtusiloba Post oak.

b—*The Chestnut oak division*.

Q.—*Prinus*.

Var. bicolor—Swamp chestnut oak.

Var. monticola—Rock chestnut oak.

Var. prinoides—Chinquipin oak.

Var. (not named).

The “annuals” are characterized not only by the ripening of the acorns during the first season, but, by the lobes of the leaves being terminated by a bristly point or *muero*. The lobes of the leaves of the “biennials” are rounded, and destitute of the bristly point. The leaves of the White oak division of the “biennials” have deep sinuses and correspondingly prominent lobes, while those of the Chestnut oak division have prominent teeth, resembling the

leaf of the chestnut tree. but the teeth being more rounded.

A few of the prominent characteristics of the several kinds of the above trees are arranged below :

Q. rubra. Red oak.—Large tree; massive trunk, bark smooth until old, wood porous, inferior; leaves oblong or lance shaped, not deeply cut, contracted at base, lobes five or six on a side, terminated by bristles; acorns large, in a broad shallow cup, covered with thin, close scales; grows rapidly, sprouts readily from the stump; rare in Rhode Island; comes to perfection farther north.

Q. tinctoria. Black oak. Yellow-bark.—Large, handsome tree; rough thick bark, yellow inside, very bitter; leaves on long footstalks, yellowish green, inversely egg-shaped, deeply cut on mature trees, very shining above, three or four lobes on each side, mucronate, rich russet yellow in the autumn; acorn small, rounded, finely striated by dark brown stripes, meat yellow, very bitter, in a deep cup, diminishing downwards, scales free at extremity, upper ones somewhat fringed, abundant; wood porous, inferior as fuel, fair timber in dry situations; very common in Rhode Island, beautiful as a shade tree.

Q. coccinea. Scarlet oak.—Fine symmetrical tree, large size, rather slender limbs; bark rough, numerous short clefts, reddish gray color; leaves very deeply cut, on long slender petioles, very shining on both sides, roundish or oblong in general outline, bristle pointed, rich scarlet or crimson in autumn acorn small, globose, in a deep cup, lengthened at base, abrupt at upper edge, kernel white, slightly bitter; wood very porous, inferior as fuel, handsome in cabinet work; tree common in Rhode Island, but less so than *Q. tinctoria* a fine shade tree.

Q. palustris. Pin oak.—A tree of middle size in Rhode Island, the northern limit of the species, limbs slender; most graceful of northern oaks; leaves small on slender footstalks, polished on both sides, cut almost to the midrib, thin, somewhat drooping; acorns very small, not abundant, cup covering half the fruit, close scales; tree grows by the side of streams or ponds; has somewhat of weeping habit over a stream; rare in Rhode Island.

Q. illicifolia. Scrub oak. Bear oak.—

A shrub, six to fifteen feet high, several stalks from a single root, scraggy branches; leaves small, on short footstalks, not deeply cut, two or three lobes with short bristly points; acorns small, beautifully striped, kernel deep yellow, same color where attached to the cup, very abundant; wood hard and tough; common upon the poor soils of Rhode Island.

Q. alba. White oak.—The most massive of native oaks, wide spreading, limbs low, large, and often crooked, lower ones horizontal, upper ones at sharp angles, bark gray or ash color, often in scales thick on old trees; leaves on short footstalks, four to six inches long, half as wide, upper surface lively green, lower surface pale, thick, leathery, deeply divided into lobes, three or four on a side, which are rounded or obtuse, and like all the "annuals," destitute of *mucros*; acorns long, average one inch, ovoid, in a shallow, flattened hemispherical cup, grayish, rough with roundish tubercles, on footstalks, single or in pairs, sweet and edible, not often abundant; wood tough, compact, elastic, very valuable for timber or fuel. The grandest tree of the New England forests; common in Rhode Island woods, although few finely developed specimens are seen.

Q. obtusiloba. Post oak.—Fine low-spreading tree in Rhode Island, branches numerous, very crooked and crowded near the trunk; foliage very dense, thick, leathery, shining above a deep sinus on each side, three broad divergent lobes above, and leaves arranged close together in stilted form; acorns on short footstalks, small, sweet, in a grayish, broad cup, smooth, close scales, often two, three, or four acorns together; wood valuable for posts, ship timber, etc.; tree very rare in Rhode Island.

Q. prinus var. *bicolor.* Swamp White oak.—A middle-sized tree, cylindrical head, scraggy branches, bark in long, loose scales, leaves obovate, narrowed at base into short footstalk, margin wavy, toothed, thirteen divisions, downy underneath, dark green above, six to seven inches long, half as broad, smaller leaves below the larger ones, fewer teeth; fruit large, roundish-ovate; acorns pointed, in deep hemispherical cups, rough outside, sometimes fringed on the margin, sweet, not abundant; heart-wood dark, sap-wood light in color, heavy, tough, strong, durable; a wet ground or

swamp tree found in various parts of the state, but usually scattered, extremely variable.

Var. monticola. Rock Chestnut oak.—Middle-sized tree, not common in Rhode Island, habitant of rocky hills, bark reddish gray, compact, divided by long clefts but not deep; leaves four to nine inches long, two to five wide, on short footstalks, margin round-toothed, six to thirteen divisions, parallel veins, the whole resembling a chestnut leaf; acorns large, sweet, not abundant; wood valuable for fuel or timber; a fine tree when well developed.

Var. chinquipin.—Shrub, ovate, four to six feet high, several stems form a single root; bark ashen gray, bitter, somewhat cleft, with a few thin scales, leaves small, obovate narrowed at base into a short petiole margin, wavy-toothed or nearly entire, polished above, fine downy beneath; fruit small, on half inch footstalks, from leaf axils, middle of new shoots, orbicular, in a neat tubercled cup; sandy plains, gravelly hills, and among ledges; not very common.

Var. unnamed. (See Art. No. IV., Vol. II., RANDOM NOTES)

NOTE. There are some variations of the oak family in this state, not specially alluded to in the above articles, but which may be treated of in future numbers. The oaks are seen to be abundant in Rhode Island, and really form the most important class of indigenous trees.

(To be continued.)

Reptiles and Batrachians of Rhode Island.

BY HERMAN C. BUMPUS.

NUMBER XVII.

5. *Rana halecina* Kalm. The Shad or Leopard Frog is at once the most beautiful as well as the most elegant native representative of the genus. Above it is of a green or yellowish metallic color and marked with two longitudinal rows of large, irregularly shaped, dark brown or black blotches which are bordered with a halo-like margin of a greenish shade. The arrangement into rows is often more or less broken up and the blotches may be small and numerous, or they may be of such a size as to extend from fold to fold of the skin.

Below, the animal is ordinarily of a pearly white shade, though yellowish or gray cloudings may appear, according to the temperament or surroundings of the animal. The cuticular folds are very prominent and of a bright yellow color.

This animal has always attracted more or less interest since its first mention by Catesby, though it was not specifically described until met with by the Swedish traveler Kalm, who noticed that it made its appearance along the Delaware at the same time as the shad, and he hence named it *Rana halecina* from *halec*, the Indian name of shad.

The Shad Frog prefers rather the moist meadow land to the sands and rocks and is often surprised by the naturalist as he wanders through the swamps or low open pastures. When thus startled the frog will excitedly jump about, not infrequently, in its bewilderment, approaching rather than fleeing from the object of its fright. These leaps, when compared with the length of the animal, are enormous. A Shad Frog measures about seven inches in length and often jumps a distance of eight feet. Were a man to leap a relative distance he would clear the widest street at a bound or lightly spring to the roof of any ordinary building.

In its geographical distribution *Rana halecina* is found from New Mexico to New Brunswick, and from Minnesota to Florida and is generally abundant, representing in America the *Rana esculenta* of Europe.

Of the breeding habits of this species it may be of interest to note that the time of oviposition is remarkably late, specimens being not infrequently found still interested in their domestic duties long after the other species have left the breeding ponds. Mr. J. A. Allen makes note of having found, on dissection, apparently immature eggs as late as April 23.

With the Shad Frog our treatment of the native Anurous Batrachians is concluded.

WE are having some cold weather here, but it is only for a day or two at a time. Prairie Dogs have not laid up at all this winter; they are to be seen every day. Meadow Larks and Red Shouldered Blackbirds stay in this locality every winter, as also Mallard Ducks and Canada Geese.

W. G. S.

LARIMER CO., COLORADO.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXV.

79. ZONITES (HYALINIA) ELECTRINA, GOULD.

THIS little shell was first found by Mr. T. J. Whittemore, on the borders of Fresh Pond, in Cambridge, Mass., and was described by Dr. A. A. Gould, in the *Jour. Bost. Soc. Nat. Hist.*, III., 1840, under the name of *Helix electrina*, viz.: "Shell small, depressed, pellucid, fragile, amber colored; whorls four, conspicuously wrinkled by the lines of growth; aperture rounded; lip simple; umbilicated."

The shell is *not* amber colored, as in Gould's description, but smoky horn color, and when the animal is living in it, the shell appears almost black. The three species, *arborea*, *electrina*, and *indentata*, can hardly be distinguished apart by a beginner in the science. At first, when collecting these species, I could never identify them, until, arriving at home, I could compare them with typical specimens. By a close examination of full grown specimens of the three species together, the following differences will be noticed: *electrina* has three and one-half whorls, *indentata* has four, and *arborea* has four and one-half to five. In *arborea*, the whorls increase slowly and regularly; in *electrina*, the last, or body whorl, enlarges rapidly in size, in which respect it resembles *indentata*; but the most apparent difference between *arborea* and *electrina* is in the color of the shell as well as of the animal, and its more shining appearance; its umbilicus too, is a little smaller and its habit is unlike either of the others, being found only in very moist places, under leaves, in fact, preferring low, swampy ground. The differences between this species and *indentata* will be given under the description of *indentata*.

It is found everywhere in the United States, east of the Mississippi River. F. A. Sampson quotes it from Pettis Co., Missouri, in the *Bulletin of the Sedalia Nat. Hist. Soc.*, August, 1885. Binney refers this species to *Helix viridula*, Menke, thus making it an European as well as an American shell. Many conchologists are

of this opinion, and the shell is called *viridula* full as often as it is *electrina*. *Helix viridula*, Menke, is one of the synonyms of *Zonites radiatulus*, Reeve, and as I have carefully examined and compared our shells with the English *radiatulus*, I am satisfied that they are not identical, and that *electrina*, Gld. is its proper specific name.

80. ZONITES (HYALINIA) INDENTATA, SAY.

THIS species was discovered by Say, and described in June, 1822, in the *Jour. Ac. Sci. Phila.*, II., 372: "Shell depressed, pellucid, highly polished; whorls four, with regular distinct impressed lines across, of which there are about twenty-eight to the body whorl, all extending to the base; aperture rather large; lip simple; umbilicus none, but the umbilical region is deeply indented." It inhabits the same range with *arborea*, and is found in company with it, under decaying leaves and also under stones. It is about the same size as *arborea*, but is distinguished from it by being lighter in color, in being polished, in having one whorl less, and in the rapid enlargement of the body whorl. It is distinguished from *electrina* by the absence of an umbilicus, by the color (*indentata* being whitish and sometimes tinged with pink, while *electrina* is smoky), and by the lines being remote, while they are crowded in the other species; and from all other shells of this genus, by the microscopic impressed lines radiating from the umbilical dent, which resemble water lines, or the lines on a gooseberry, while the interstices are perfectly smooth.

81. ZONITES (CONULUS) CHERSINA, SAY.

WE have here a shell, very different in shape from those heretofore described in these pages; instead of having, like them, the apex slightly raised above the body of the shell, we have one in which the thickness, or distance from the apex to the base, will measure as much as the diameter. It is round like a top, with the spire elevated like a cone. It was described by Say, in the *Jour. Ac. Sci. Phila.*, 1821: "Shell sub-globose, conic, pale yellowish-white, pellucid, convex beneath; volutions six; suture moderate; labrum simple; umbilicus none."

It cannot be mistaken for any other Rhode Island shell as there is only one other that

resembles it at all; this is *Strobila labyrinthica*, belonging to a different genus. They are of the same shape but *chersina* is the larger of the two; *chersina* is highly polished, *labyrinthica* is heavily striate; *labyrinthica* has a small umbilicus, *chersina* has none. In *chersina* the lip is simple and sharp, and the aperture open and free; in looking into the aperture of *labyrinthica*, a remarkable peculiarity is seen, which will be explained under that species. Its synonyms are

Helix chersina, Say, Gld., Ad., Reeve, DeKay, Morse, Binney.

Helix egna, Say, Chem., Rve., Pfr., etc.

Conulus chersina, Morse, Tryon.

Many conchologists, both in Europe and America, have labored to prove this species to be identical with *Helix fulva*, of Europe. I think they must have studied these two shells from poorly figured illustrations and ambiguous descriptions, for if they had compared good specimens of the two species together, they ought not to have made so great a mistake.

It is found everywhere in the United States, east of the Rocky Mountains, under leaves and on the under side of boards and fence rails in moist places. I once found a splendid specimen floating on a chip in Mashapaug Pond. Say found his first specimen in the Sea Islands of Georgia. Its height and breadth are about one-tenth of an inch.

82. ZONITES (HELICODISCUS) LINEATA, SAY.

Syns :

Planorbis parallelus, Say.

Helix lineata, Say, Binn., Gld., Ad., Fer., Desh., Chem., etc.

Helicodiscus lineata, Morse, Tryon.

This unique shell was discovered by Say, in upper Missouri, in company with a large number of fluviatile species in a dried up pond. The peculiar form of the shell, so unlike any other land shell in America, together with the circumstance of finding it in such a situation, led him to suppose it was fresh water species, and he accordingly described it as *planorbis*. Afterwards, having found other specimens near Philadelphia, under altogether different circumstances, he saw his error, and re-described it as *Helix lineata*.

It is not at all convex on the upper side, like all the other species of this genus, but is discoidal or planorboid shaped, that is, round like a wheel, and flat. It has four whorls, equally visible on both sides of the shell and has a series of raised lines revolving on the body whorl. It has a decided greenish color, is one eighth of an inch in diameter, and is very common in Rhode Island under leaves with *chersina* and *labyrinthica*, etc. It is not very common in the West, but quite so in New England, along country roadsides. Its aperture is narrow, semi-lunate; lip thin; within the aperture on the outer lip, are situated two small, conical, white teeth, and still farther within the aperture can be seen another pair of similar teeth, and in some specimens, a third pair is seen by breaking away a portion of the lip and whorl. The shape of the shell, its raised revolving lines, its green color, and the peculiar teeth within the aperture, distinguish it from any other species of shell known.

83. ZONITES (STRIATURA) MILIUM, MORSE.

This is the smallest shell yet brought to your notice; its diameter is one-twentieth of an inch. It was discovered by Mr. Edward S. Morse, in Maine, and described in the *Proc. Bost. Soc. Nat. Hist.*, VII., 28, 1859:

"Shell depressed, transparent, shining, white with a greenish tinge, marked with distinct and regular striae of growth and microscopic revolving lines; whorls three, rounded, rapidly increasing; suture deeply impressed; lip simple and sharp; aperture very oblique; umbilicus very wide and deep, showing all the volutions."

Thus far it has been found only in Maine, Massachusetts, and Rhode Island. Very little can be said of these smaller species; their habits cannot be studied very well, and they are only to be found by diligent search under the moist leaves of our thick, hard wood forests.

(To be continued.)

WE desire to call attention to the collection of shells offered for sale on the last page of this issue. They are exceptionally perfect, of full size, and few collections of its size contain so many rarities.

CHECK-LIST OF GENUS CLAUSILIA. I.

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- | | |
|---|---|
| <p><i>Clausilia</i> abrupta Küst.
 accedens Möll.
 acicula Küst.
 acridula Ziegler.
 aculus Benson.
 acuminata Mouss.
 adamsiana Pfr.
 adposita Strobel.
 advena Küst.
 agesilaus Martens.
 agnata Partsch.
 agnella Parr.
 alba Küst.
 albersi Charp.
 albicosta Boettger.
 albobincta Pfr.
 album Küst.
 almissana Küst.
 alpina Stab.
 alschingeri Küst.
 altecostata Zelebor.
 amalthea Westerlund.
 amiatae Martens.
 amena Küst.
 amorgia Boettger.
 anaphiensis Boettger.
 anatolica Roth.
 angiostoma Küst.
 anguina Parr.
 angustata Bielz.
 aperta Küst.
 approximans Ziegler.
 aquila Parr.
 arcadia Boettger.
 archilabris Kutsch.
 armata Kutsch.
 asaluensis G-Austen.
 asphaltina Ziegler.
 auriformis Mouss.
 austeni Bland.
 avia Parr.
 bacillum Benson.
 badia Ziegler.
 balsamoi Strobel.
 bargesi Bourg.
 basilensis Gredler.
 belloti Strobel.
 bensoni H. Adams.
 bergeri Mayer.
 bernandi Pfr.
 biasolettina Charp.</p> | <p><i>Clausilia</i> bicarinata Ziegler.
 bicristata Friw.
 bidens Linn.
 bidentata Strom.
 bielzi Pfr.
 bigibbosa Charp.
 bilabiata Wagner.
 binodata Ziegler.
 bipalatitis Martens.
 biplicata Mont.
 bitorquata Friw.
 blanci Martens.
 blanda Ziegler.
 blandiana Pfr.
 blaui Möll.
 boetica Küst.
 boettgeriana Paul.
 bogatensis Bielz.
 bohemica Clessin.
 boissieri Charp.
 bonelli Martens.
 bosniensis Zelebor.
 bourguignata Charp.
 brevicollis Pfr.
 brevior Martens.
 brevissima Benson.
 brunnea Ziegler.
 bulbus Benson.
 busehi Küst.
 byzantina Parr.
 caerulea Fer.
 calcaræ Phil.
 callifera Küst.
 callocincta Küst.
 cambodiensis Pfr.
 campylauchen Boettger.
 cana Helder.
 canaliculata Pfr.
 canalifera Rossm.
 candida Pfr.
 candidescens Ziegler.
 canescens Parr.
 capillacea Rossm.
 carinthiaca A. Schmidt.
 carissima Ziegler.
 carniolica F. J. Schmidt.
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 caucasica Parr.</p> |
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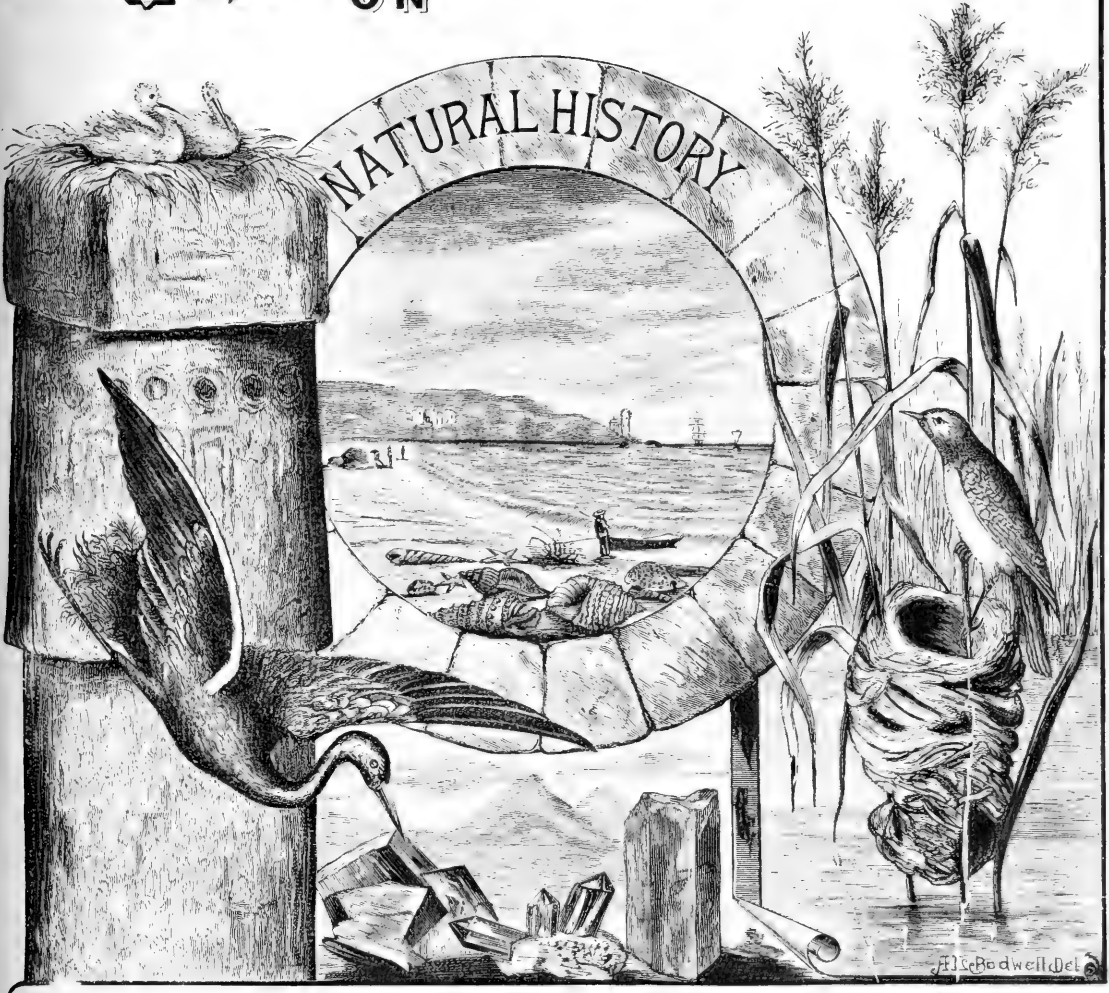
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THROUGH the politeness of the author we are in receipt of the *Bulletin of the United States National Museum*, 29. "Results of Ornithological Explorations in the Commander Islands and Kamtschatka." By Leonhard Stejneger.

We have never studied a similar report with more interest and satisfaction. As a collector and observer the author has been indefatigable, reporting with exactness, in the species described, the fresh colors of bills, irides and feet, about which the dried skins available to most of us can give no idea. Beside the absolutely scientific information, there is much of general interest. We have taken the liberty to reprint elsewhere a portion of the article on the Tufted Puffin, *Lunda cirrhata*.

WHILE collecting this last season in an old ravine almost impassable from fallen rocks and the wild rose, a Rock Wren, *Salpinctes obsoletus*, flew out of a hole in the bank which was nearly perpendicular. Upon scrambling up to it I discovered as beautiful a piece of bird architecture as it was ever my fortune to behold. The nest, which was in the hole, contained four young and one egg. On the outside the sand was levelled off so as to form a shelf about a foot in diameter. It was nicely levelled off and paved with small flat stones about the size of an old cent, laid to fit one another in a wonderfully artistic manner, reminding one of the map puzzle with which we were all familiar in our boyhood. I have discovered one nest before, and that was situated in a similar position, but had no such outside decorations.

WM. G. SMITH.

The Stone Chat. *Saxicola oenanthe*, No. 21 of the Ridgeway list, is the Wheatear of Europe, and not the Stone Chat, *Pratincola rubicola*.

The European Titlark, *Anthus pratensis*, No. 72, is the Meadow Pipit, and this name should be adopted here as they have another Titlark, the Tree Pipit.

The Yellow Wagtail, *Budytes flava*, No. 70, is their Grayheaded Wagtail.

F. T. J.

"Toporok" Tufted Puffin.

(LUNDA CIRRHATA) FALL.

From U. S. N. M. Bulletin, No. 29.

[Results of Ornithological Explorations in the Commander Islands, and Kamtschatka. By Leonhard Stejneger.]

THE "Toporok" (plur. "Toporki"), together with the "Are" (*Uria arra*), is the most numerous of the many species of the *Alcidae* on the islands, and as both are also the largest in size, they become of eminent importance to the natives as sources of fresh meat. This is especially the case on Copper Island, the area of which is more limited, and where the inhabitants have fewer facilities for preserving the meat of the fur-seals slaughtered during the short season of the summer. To them, the adults, young, and eggs are the most welcome additions to their bill of fare, and, indeed, I myself was very often gratified by a good meal of fried "Toporki," for the meat, although very dark, is by no means distasteful. I remember occasions when I thought I had never eaten anything better, when fur-seal-tongues and toporok-breasts were esteemed higher than deer-tongues and goose-breasts are to-day.

But it is not only for food that these birds are used. The skins are carefully flayed off, and made into wide and long, very warm and nice garments, the so-called "parka," with the feathers turned inside. About fifty skins are required for one "parka." In order to remove the fat from the skins, they are chewed over and over again by the

women and children until all the fatty matter has been chewed out, that being their method of tanning. These "parki" are rather easily torn, but are extremely warm and light, as I can testify from my own experience. Dressed in one I could go driving in a dog-sledge in the severest cold without feeling any inconvenience, and its lightness would allow me to keep it on when strolling about, away from the sledge, hunting ptarmigans or other ornithological and gastronomic objects.

The yellow feathers of the long ear-tufts are in great demand for decorative purposes. The seams of a fine "*Kamlejka*" (rain coat made of seal-guts) is often tastefully adorned with them.

With the beginning of May these birds commence making their appearance on the coasts of the islands, looking out for their old homes, but for a while they stay mostly on the water, not far from land, until the nests are taken possession of in earnest, which happens about the beginning of the second week of June.

The natives, heartily tired of their winter food, the salted seal meat, look forward to the arrival of the Toporki with great impatience, and as soon as a sufficient number are observed in the neighborhood of the old rookeries parties start off in order to catch a good supply for food and clothing, advantage being taken of the peculiar habits of the birds.

I shall in the following attempt a short description of such an excursion :

On a bright afternoon in May—and at that season really some fine, bright days occur, even on the Commander Islands—we started, a gay picnic party, consisting mostly of Aleuts and their wives or lady friends, for the small island Toporkoff, about three miles off from the village. During our passage out only few birds were seen, as it was no "land day," but I was assured that they would be in on the following morning. The Toporki and their allies show during this season, previous to the breeding, the peculiarity of appearing regularly, as it seems, in great abundance near shore on one day, while next day they have all disappeared, staying away on the high sea for two days, when they again take a "land day." The natives had calculated

that the following day would be such a regular land day.

The afternoon passed pleasantly; some were out fishing, the younger members of the party were playing ball, while I was busily engaged in securing specimens of *Troglodytes pallescens*, *Acanthis linaria*, etc., besides odds and ends of plants, insects, mollusks, and crustaceans.

Toporkoff, which has received its name on account of being a rookery of the "Toporki," is a small island consisting of a level plateau about 30 feet above the surface of the sea, rising abruptly from a 50 to 200 feet broad, sandy or rocky beach. The upper surface of the plateau is covered with a thick, hummocky sod, which in every direction is perforated by the numberless holes dug by the "Toporki" and used by them for dwellings to rear their young in.

Water birds were rather scarce near the island, though at a distance large flocks, like black patches, were seen resting on the sea. Now and then a solitary Torporok would cross overhead in its straight flight; a few cormorants (*Phalacrocorax pelagicus*) aired their wet wings on the outlying rocks, stretching their long necks in all directions; noisy gulls (*Larus glaucescens*) flew up and down, screaming and scolding at the intruder.

Evening set in, and the picnic party returned, leaving us men with the bajdarkas. Toporki crossed the island more frequently, but not in such numbers that it was thought worth while to try catching them. A camp-fire was started for the preparation of the tea, and soon the indispensable "samovar" was humming its cheerful tune. My Aleuts were unusually silent and dull, and we soon crept into the hull of the bajdarkas, a snug and rather comfortable bed, though smelling considerably from seal-oil, that peculiar smell which characterizes almost everything on the islands, and to which the outsider will have to adapt himself if he wants to feel comfortable during his sojourn on the seal islands.

The ornithological spectacle at daybreak the following morning was quite different from what it had been the foregoing day. Hundreds and thousands of *Lunda cirrhata* crossed and recrossed the island, coming from all directions, and disappearing on

the opposite side in order to return again and again. A wonderful sight! The black birds, with their conspicuous white face-mask, the long and floating yellow ear-tufts bent like the horns of a ram, and the large-green-and-red-colored beaks and red legs, looked more like fantastical creatures of the tropics than inhabitants of the less extravagant north. Their flight seemed to have no particular aim except to view and review the spot where they were going to take up their summer abode, for they flew singly upon their straight courses, no one taking notice of the others. Like black specks they rose from the horizon heading for the island; the nearer they came the bigger they grew, until they passed over us, disappearing as specks again on the other side, and when first started nothing seemed to be able to bring them out of their straight course. These clumsy looking, puffy birds possess, nevertheless, a very rapid flight, so that at the first acquaintance one is rather apt to shoot behind them, but they do not rise very high in the air, especially when passing over the upper plateau of the island.

The natives take advantage of these peculiarities, and their device for catching the Toporki is based upon the apparent difficulty of the bird to make a sudden turn in its straight flight.

A piece of wide-meshed net-work stretched on a hoop, about four feet in diameter, fixed to a light pole, 10 to 12 feet long, is the instrument used in catching the Toporki, by suddenly throwing it in the way of the bird, who flies directly into it, and thus falls to the ground and is captured.

When I turned out the Aleuts were already in their places waiting for the rush of the birds, which had not yet begun. They were scattered pretty evenly around the island, seated on the edge of the bluff. Their immovable figures, wrapped in the warm "parka," or the lighter "kamleika" were clearly visible against the gray western sky, and now with the dawning day we discern the net at their side, but what is more surprising, each one surrounded by a small flock of Toporki. These stretch their necks and point with their bills straight up in the air in quite an unaccountable manner, remaining so long in that rather unnatural position that we become suspicious. A

closer inspection reveals that these are only decoys, empty skins held in position by a stick protruding between the jaws and with the other end thrust into the ground.

Before long the sea and the horizon become lively with birds, and soon the sky above us literally swarmed with these red-and-green-beaked, white-masked, yellow-horned masses. It was "land-day" indeed! I only wondered that they did not suffer collision with each other during their airy sailing, for they were thick as May-flies round an electric light, and flew both straight and rapid.

When a Toporok crosses overhead of an Aleut he suddenly raises his net; the bird, unable to turn aside, runs into it with a clash, falls to the ground, and in a twinkling is added to the heap of other unfortunates with broken necks.

When full day has set in this sport is at an end, as then the birds fly higher, and now comes the moment for me and my gun.

To the accompaniment of the buzzing breakfast-"samovar," I wrote down my memoranda on fresh colors, individual variation, moulting, etc., surrounded by hundreds of specimens, selecting desirable objects for skinning, and preparing colored sketches of the fresh colors of bills, eyes, etc., before they fade away and dry up.

The eggs are white, without gloss, usually with faint lilac spots, which are more numerous in a wreath around the blunt end. Owing to the location of the nests in holes dug in the soil, the eggs are always more or less stained.

THE turkey buzzard has been supposed to be a silent bird. Mr. Burroughs mentions a roosting place at Red Rock near Washington, D. C., where great numbers perch for the night. Their actions are much like those of our domestic turkey. Perching upon the limb, they walk along, and when a suitable place is found they make a peculiar noise, like that of a cow blowing through her nose on lying down; this is the only noise he has observed from this bird.

A few years ago, in early spring, as one of these birds was flying about fifteen feet above my head, I heard it make a noise exactly like the cluck of the domestic turkey-hen.

JOHN H. STEELE,
Pottstown, Penn.

The Forest Trees of Rhode Island.

BY L. W. RUSSELL.

No. XII.

Castanea — THE CHESTNUT.

THE common chestnut tree, *Castanea vesca*, is closely allied to the oaks, *Quercus*. It is abundant in Rhode Island. Many of the rocky hills and ridges in Providence and Kent counties, are still growing large lots of chestnut trees. They sprout readily from the stumps of felled trees, and grow very rapidly. A growth of twenty-five years will give two or three cuts large enough for railroad ties. There are numerous lots in the state which have been cut several times and the latest growth is still vigorous. The soil of the state, in general, is well adapted for producing this tree. It will flourish well in light sandy, or gravelly soils, but does better upon rocky hills where the roots can penetrate the crevices, or anchor themselves among the stones. It is a stately tree when fully grown. Sixty to eighty feet is not an uncommon height in the forest, where it grows without limbs, except a few short ones at the top. In open grounds it spreads widely, growing in favored situations to large size. Observers of trees will call to mind single specimens now standing, having bodies from fifteen to twenty feet in circumference, near the ground, and from fifty to eighty feet in height. The spread is often as great as its height. At the distance of an eighth of a mile or more, the tree has a peculiarly sturdy appearance. The limbs are large and stiff, the whole top appearing as though it had been under the gardener's shears. This characteristic alone will enable one to identify the tree at a long distance.

The bark of this tree is thick and firm, on young trees smooth, brown in color, with a greenish tinge; but from ten or twelve years of age, dividing by long furrows, growing deeper and wider with age. On old open, grown trees, the bark is very rough and thick.

The leaf of the chestnut is conspicuous for its large size, its prominent parallel veins ending in long bent points, separated by large curved indentations. The leaves are of a lively polished green above, paler beneath, turning to orange or buff color in autumn. The foliage is abundant and

noticeable for the radiated tufts of leaves near the ends of the branches.

The male or sterile flowers are in bunches of stiff catkins, long as the leaves, very conspicuous, emitting a profuse, and to most people a disagreeable odor. The flowers are arranged in groups along the stalk of the catkin. The fertile flowers are in little bunches in the axils of the upper leaves, afterwards developing into burrs containing the fruit. They are seen single, or two or more near each other. The fruit is too familiar to need description.

The fruit as grown in Rhode Island, is generally smaller and inferior to that grown farther from the sea-coast, although it is sometimes abundant.

The wood, although containing only about one-half the heating power of hickory, is valuable for charcoal, and makes excellent kindlings. For timber, as applied to various uses, it is of great value. The grain is handsome in furniture, it is very durable and is sufficiently tough and elastic for many uses. But few native trees will grow to a size fit for use so quickly. A natural chestnut forest ground is a valuable piece of property. The crop is sure of growth, certain of sale; and many now sterile, utterly profitless tracts of New England land might be planted with chestnuts with certainty of good pay for the labor.

It may be mentioned that the Spanish Chestnut, so called, is not regarded as a different species from our own, although the fruit is much larger, and also greatly inferior in quality to ours. The Spanish Chestnut is largely cultivated in southern and central Europe, the fruit forming an important article of diet for the poorer classes of people.

The dwarf chestnut of the central and southern states of our own country, is a mere shrub, there being but a single oval nut in a burr, which is very sweet.

The writer would suggest that orchards of our native chestnut trees, planted from the best varieties (and they differ much in size and quality of fruit) might prove as profitable an investment as orchards of some other fruit trees.

PROVIDENCE will soon celebrate, at considerable expense, its two hundred and fiftieth anniversary. Still we have not a public museum or art gallery.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XVIII.

2. ORDER URODELA. We now come to the tailed Batrachians, the so-called salamanders, newts, efts, and tritons. These animals differ from the frogs in possessing, through life, a well-developed tail, which often exceeds the body in length. It will be remembered that the frogs had a tail at a certain period of their lives, though this became resorbed as the animal changed from young to adult. The salamander, then, represents the more imperfectly developed frog, and is hence regarded by evolutionists as holding an inferior position. To this branch but little attention has been given by the naturalists of the state, and there is consequently but little material collected on which to work out the native forms. The writer trusts, however, that a brief description of the more common representatives, will result in interesting those who have opportunities for working out more definitely what we ought to know about all.

1. *Diemyctylus miniatus Rafinesque*. The common Salamander or Newt is one of those forms which presents so great a variety of form and color, that naturalists have often mistaken specimens of odd appearance for representatives of new species, resulting in a most confused state as regards the animal's real name. *Salamandra stellio* and *S. symmetrica* have given place to the name adopted above; while a form long considered to be a different species, *Diemyctylus viridescens*, has lately been shown to be only an extreme variety.

The common Salamander is abundantly found in all parts of the state, and is the most common representative of the order. In length it is about three inches, and is generally dull olive-red above, and yellowish red below; the whole body being more or less covered with small black dots. Along each side is a row of red spots which are very characteristic. The tail is provided with a fin of considerable size, the upper part of which is developed in the males at certain periods of the year into a high crest. The bright colors, attractive habits, and the ease with which it can be domesticated, render this form one of the most popular pets, and is often to be

seen in the aquarium of the amateur naturalist.

The time for this animal's appearance is now almost here, though it can be secured at almost any time of the year. That it can well endure the cold is apparent, for specimens are often captured late into December, and the writer has several times observed them, as they crawled about on the decaying sedges of some muddy pond, long after ice had covered them over. When thus moving about they were evidently in search of food, possibly for some small fresh water mollusks or larval beetles. In the warmer weather, they are often to be seen in numbers, under culverts and in slow running streams, and not infrequently some adventuresome one crawls away from the water to forage on the abundant insect life, which is to be found among the bits of decaying twigs and leaves of our damp forests. When thus surprised it seldom makes any effort to escape, and on being handled only continues to gulp down air, as though in that lay its only hope of salvation. Early in the spring the males, adorned with far gayer colors than usual, and with a most remarkable expansion of the tail, begin their courtship. The eggs of the female are much like those of the frogs, being deposited in clusters, attached to twigs or to grass. Each egg is surrounded by a mass of glairy substance, which expands in coming in contact with the water, and both serves to protect the eggs from external injury, and is devoured by the young as food.

After the mating season is over with, we are told by Col. Nicholas Pike, that "both sexes leave the water and hide, without feeding, under stones and tussocks. The young of the second year sometimes leave the water for months together and secrete themselves in damp places. When droughts occur and the ponds dry up I have often dug them out, all huddled together, more than a foot below the surface, and where the clayey ground has been so parched that they are unable to burrow they are often seen several together, dead or dried up."

MR. A. H. JAMRACH, prominent in London, Eng., as a dealer in specimens of natural history, died Nov. 14, 1885, aged forty-four years.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXVI.

84. ZONITES (PUNCTUM) MINUTISSIMUM, LEA.

SHELL broadly umbilicated, sub-globose, reddish horn color, shining, marked with strong transverse striæ and microscopic revolving lines; whorls four, convex; aperture sub-circular, oblique; lip simple, acute.

This species was first found in Cincinnati, O., and described by Mr. Isaac Lea in *Trans. Am. Phil. Soc.* ix., 17, 1841. It has since been found in Maine, Massachusetts, Rhode Island, and New York. It is the smallest land shell in America, perhaps the smallest in the world, its diameter being only four one-hundredths of an inch.

Mr. E. S. Morse proposed a new genus, *Punctum*, for this species, in 1864, as the buccal plate differs from all other species of *Zonites*. The jaw of all the others consists of one solid plate, while that of this species consists of sixteen distinct pieces. *P. minutissimum* is the only species of the genus. Tryon in his *Structural and Systematic Conchology*, III., 25, 1884, places it under *Zonites* as a sub-genus.

Family Helicidæ. An enormous family of land snails containing a great number of genera and several thousands of species. The following description, however, applies to all its members. Shell external, usually well developed, and capable of containing the entire animal; aperture closed by a layer of hardened mucus, (minutely perforated opposite the respiratory orifice), during hibernation, which takes place in cold regions in winter, and in hot countries in summer. The principal genus of this family is called *Helix*, meaning a coil. The original *Helix* of Linné included all sorts of land and fresh water shells and has been restricted more and more by every author who has written on the subject since his time, until after dropping off genus after genus, making new ones out of the species of the old *helix*, and even whole new families, there were still some thousands of species left in 1834, when Gray separated the genus *Nanina*. The latest authority,

after leaving out more than five hundred species of *Nanina*, and many more of *Zonites*, gives the number of species of *Helix* as thirty-four hundred, which he divides up into forty-seven sub-genera, each with numerous sections or groups. I think the use of the term *helix* should be abandoned altogether. Many conchologists are in the habit of using the sub-generic names in a generic sense, and even the sectional or group names in the same manner. I propose in these papers, and also in a work on the genera of shells which I am now engaged in writing for publication, to drop the term *helix* altogether and to use the larger groups, such as *Mesodon*, *Patula*, *Polygyra*, *Stenotrema*, etc., in a generic sense, and the others as sub-genera. Of the above thirty-four hundred species, only about one hundred and twenty-five inhabit the *United States*, and only eight are known to inhabit *Rhode Island*.

GENUS MESODON RAF., 1831.

Shell large, sub-globose or orbicularly depressed; aperture rounded lunar; peristome white lipped, sometimes dentate on the parietal wall, and sometimes on the basal margin, whorls five or six, regular; umbilicus partly or wholly covered by the expansion of the lip. Generally of a uniform pale horn color.

This genus is found only in the *United States*. There are twenty species, two of which inhabit *Rhode Island*.

85. MESODON ALBOLABRIS, SAY.

This species, the largest in size of any of our Rhode Island land shells, is found everywhere in dark, hard wood forests from *Canada to South Carolina*, and westward to *Nebraska*. It is universally distributed within the above named limits, and is a very handsome, well proportioned shell.

It was first noticed by Mr. Thomas Say, the first and greatest naturalist of America, and described by him as *Helix albolabris*, in the American edition of *Nicholson's British Encyclopedia of Arts and Science* published in Philadelphia, 1816, in the following words:

"Shell thin, fragile, convex, imperforated with six volutions, whorls obtusely wrinkled across, and spirally striated, with very fine impressed lines, a little waved by passing over the wrinkles, both becoming extinct

toward the apex, which is perfectly smooth; aperture lunate, not angulated at the base of the column, but obtusely curved; lip contracting the mouth abruptly, widely reflected, flat, and white. Breadth one inch."

The animal deposits its eggs in May or June according to locality, in the light mould by the side of logs and rocks. If these eggs are taken and kept in a warm room, we can raise them, and thereby obtain more delicate and symmetrical shells than those found in the woods. The eggs hatch in from twenty to thirty days, the young snail being provided at birth with a shell of one and a half whorls. They make their first repast on the pellicles of the eggs from which they have just emerged. They will eat a mixture of flour or meal and water and are very fond of young cabbage or lettuce leaves. Care must be taken to keep the full light of the sun from them and to give them plenty of air and moisture. They attain their growth in two years, or much sooner if a little powdered chalk or other preparation of lime is mixed with their food. When about half grown they can scarcely be distinguished from the next species, the umbilicus being open, and the lip sharp and thin. When they have arrived at maturity, the lip thickens and is reflected over the umbilicus, which it completely covers.

Like all other land snails in temperate climates, they cease to feed in October, and select a place under some log or stone, and fix themselves mouth upwards. They then withdraw their bodies within the shell, and having secreted a thin transparent membrane with which they cover the mouth of the shell, thereby excluding the rain and cold, they lie dormant until the next spring, when, as Gould says, "they break down this barrier and enter upon a new campaign of duty and pleasure."

In watching these animals in captivity, I have noticed that whenever the earth in the bottom of the dish in which they were kept, became dry, they would always retire into their shells, and having stretched across the aperture their thin glistening membrane, they would lie dormant until supplied with the necessary moisture. This they would do at any and all times of the year; although being kept in a warm room all winter, they did not hibernate as they do in the

woods. Probably they do the same in summer in their native haunts, for the best time to find them is just after a rain.

Though timid and evidently frightened when first taken, they soon become accustomed to being handled, and love to be bathed and fed with fresh leaves; and while feeding so transparent is the body of the animal, each particle of food can be seen passing from the mouth, over the top of the head between the tentacles, to the stomach. While eating, a peculiar nipping, rasping sound is heard, caused by the tentacles or teeth of the snail tearing its food in pieces. The teeth of all mollusks are situated on their tongues. They are very numerous, and are placed in rows; they are pointed and recurved, or turned backwards. The tongues of the molusca are very interesting to microscopists. By leaving the animal in a weak solution of potash for a few days the body will completely dissolve, leaving only the tongue, which is about one quarter of an inch long and one-eighth of an inch wide in this species. The number, size, and shape of the teeth differ in each species. In *Mesodon albolabris*, or the white lipped snail, the number is about ten thousand.

There is a variety of this species found sparingly in some of the states, called *dentata*, which develops a small tooth, or rather a calosity (for it never attains the size of a respectable tooth) on the parietal wall. I found only four specimens of this variety in Rhode Island, all of which were obtained in Cumberland, near Beacon Pole Hill.

(To be continued.)

NOTICE.

MR. OLIVER DAVIE has met with trouble and disappointment in the destruction, by fire, of the plates prepared for his forthcoming *Egg Check List*.

The work will necessarily be delayed a few weeks longer, but I shall have plenty of them as soon as issued.

Two Sea Doves, *Alle nigricans*, were shot near Warwick, during a storm, about the middle of February.

CHECK-LIST OF GENUS CLAUSILIA. II.

J. RITCHIE, JR.

- Clausilia* cecillei Phil.
 ceylanica Benson.
 charpentieri Pfr.
 chia Boettger.
 cinerascens Küst.
 circumdata Friw.
 clandestina Parr.
 clathrata Friw.
 closta Boettger.
 coarctica Mouss.
 cochinchinensis Pfr.
 cognata Boettger.
 colbeauiana Parr.
 colorata Küst.
 comensis Shuttl.
 commutata Rossm.
 comparata Parr.
 compressa Pfr.
 concilians A. Schmidt.
 conemenosi Boettger.
 confinis Parr.
 conjuncta Parr.
 connectens Westerlund.
 conspersa Parr.
 conspureata Janin.
 contaminata Ziegler.
 constricta Kutsch.
 coreyrensis Mouss.
 corpulenta Friw.
 corticina v. d. B.
 corynodes Helder.
 costata Ziegler.
 costulata Janin.
 costulifera Möll.
 courquiniana Bourg.
 crassicosata Benoit.
 crassilabris Küst.
 crenulata Ziegler.
 cretacea Küst.
 cretensis Mühlf.
 crispa Lowe.
 cristatella Küst.
 cristicollis Westerlund.
 cruciata Studer.
 cumingiana Pfr.
 curta Rossm.
 cusmichi Kutsch.
 cyclostoma Pfr.
 cylindrelliformis Bourg.
 cylindrica Gray.
 cylindricollis Küst.
 dacica Friw.
 dalmatina Partsch.
 davidiana Bourg.
 decipiens Rossm.
 decolor Küst.
 decorata Küst.
 deltostoma Lowe.
 densestriata Ziegler.
 denticulata Olivier.
 derasa Mouss.
 detersa Ziegler.
 dextrorsa Boettger.
 diaphana Küst.
 diminuta Parr.
 dimorpha Küst.
 diodon Studer.
 dipolauchen Boettger.
 discolor Pfr.
 disjuncta Mortill.
 dissipata Boettger.
 distans Pfr.
 distinguenda Möll.
 divergens Kleciach.
 dohrni Pfr.
 dolosa Parr.
 dominicensis Pfr.
 dotzaueri Küst.
 draparnaldi Beck.
 dubia Drap.
 duboisi Charp.
 dunkeri Pfr.
 dutaillyana Bourg.
 eburnea Pfr.
 ehrenbergi Roth.
 elata Ziegler.
 elegans Bielz.
 elisabethi Möll.
 eris A. Schmidt.
 erivanensis Issel.
 erjavecii Boettger.
 eugeniae Küst.
 exarata Ziegler.
 excellens Pfr.
 exigua Lowe.
 exima Möll.
 exoptata A. Schmidt.
 expansilabris Boettger.
 extensa Pfr.
 fallaciosa Küst.
 fallax Rossm.
 fauciatata Parr.



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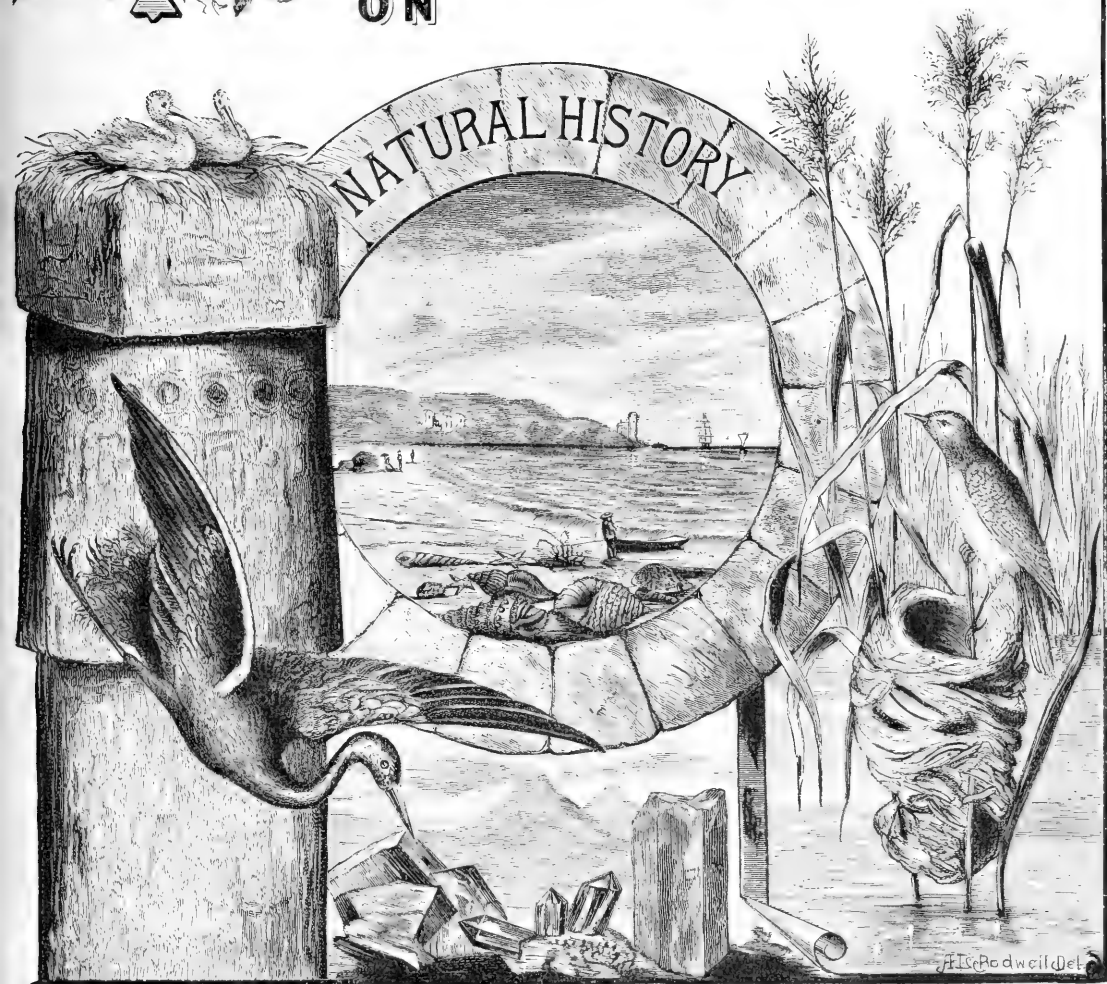
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Vol. III.

PROVIDENCE, APRIL 1, 1886.

No. 4.

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I HAVE just finished a much too hasty perusal of the new book, *Two Years in the Jungle*, by William T. Hornaday, now chief taxidermist in the United States National Museum. Its five hundred pages, descriptive of travel in the wilds of India, Borneo, and the Malay Peninsula, are full of reliable descriptions of the native animals, practical advice regarding their capture and preparation for scientific purposes, with abundant exciting adventures experienced in their pursuit, withal an intensely interesting work. I have taken the liberty to reprint the description of his first tiger hunt.

RECIPT FOR CEMENT FOR GUMMING LABELS TO MINERALS AND SHELLS. — Pulverized gum Arabic, 4 ounces; pulverized white sugar, 2 ounces; starch, 4 drachms.

Dissolve all separately in as little water as convenient. Dissolve starch in cold water, then stir it into sugar water, and then that mixture into the gum water. Boil with great care, as burning will spoil the whole. It is well to use a tin vessel raised from the bottom of another vessel containing water.

After the starch ceases to make the mixture look milky it is cooked, but at least an hour's time will be required.

Keep in large mouthed, tightly corked bottles, or when done pour into a tray covered with strong paper, spreading it evenly over the paper, allow to dry; when dry enough, moisten back of paper and remove it from the gum, dry again thoroughly, break into fragments and preserve for use in wide mouth stoppered jar.

As far as I can ascertain I am the only individual who has discovered nests and eggs of Townsend's Flycatcher, *Myiadestes Townsendi*. On the 17th of June, 1884, I discovered a nest with two eggs. The old female was sitting on them, so there could be no mistake as to the identity. The nest was placed in the end of an old hollow pine tree that had fallen in a horizontal position. The nest was a very rough structure, composed of twigs and needles of the pine, lined with a few dead leaves. The eggs were about one inch in length by five-eighths. The ground color a very light blue, splashed throughout with brick red spots, and a few purple spots at the larger end where the ground color was nearly obscured. The above nest and eggs I sent with the female bird to the Smithsonian Institution. About two weeks later I discovered another nest situated in a similar position in an old pine that had broken off about six feet from the ground, the top portion still leaning against the old stump, and in the latter the nest was placed. It contained four eggs; they were just like the first. The old female which I reluctantly had to shoot, was on the nest. I discovered a few days after that the rodents had been at the eggs and confiscated three of them; the fourth I have yet. Both nests I took in Jefferson County, Col., at about six thousand feet elevation.

Some time ago I took a nest of seven eggs of the Rocky Mountain chickadee, *Parus Montanus*. They were very far advanced. I took out three young birds which I placed in alcohol together with the eggs, and forwarded them to Professor Coes. He wrote me that they were the first that he had ever seen, and was very much surprised to find them pure white, as the whole of the family lay spotted eggs. The nest was placed in an old hollow pine about two feet below the entrance hole, and composed entirely of the hair of the common gray rabbit. I took the above in Jefferson County, Col., at 6,000 feet elevation.

WM. G. SMITH.

My First Capture of a Tiger.

FROM "TWO YEARS IN THE JUNGLE."

BY WILLIAM T. HORNADAY.

"We strolled through the Government Forest until nearly noon, when, just as we were about returning to camp, we heard a fearful growling and roaring a few hundred yards in advance which set us instantly on the *qui-vive*. We hurried in the direction of the sound, which continued at intervals for some minutes. I said: 'Tiger, Vera?' and he replied: 'No, sahib, panther, shall we go for it?' 'Of course' and on we went.

"Presently we heard trumpeting and branch breaking half a mile beyond us, and then Vera said the low roaring, or growling noise had been made by the elephants. On our way toward the elephants to have a quiet look at them, we came to a little nullah,* and there in the level sandy bed of the stream was the trail of a large tiger.

"The men carefully examined the huge tracks in the wet sand, compared notes a moment and declared the trail was fresh. Then I examined it for myself, looked wise and said, 'Oh, yes, it is very fresh indeed.' Vera looked anxiously about a moment, examined the bore of my rifle doubtfully, tried to measure it with the end of his little finger, and finally asked me very seriously whether I would dare to fire at a big tiger with that small rifle. I said 'Yes, certainly; just show me one and see.' I did not for a moment allow myself to hope for such good luck as a meeting with the animal that made those huge tracks and a shot at him, but without a moment's delay we started to follow up the trail.

"The little creek ran through perfectly level and very open forest. Its bed was about eight feet below the level, forty feet wide, and almost dry. The tiger had gone loafing leisurely along down the bed of the stream, walking in the shallow water every now and then, crossing from side to side, and occasionally sticking his claws into the

bank as if to keep them in practice. Vera led the way, as usual, I followed close at his heels, and we stole along as silently as shadows.

"We had followed the trail about a mile, when we came to a clump of bamboos growing in a sharp bend in the stream. Vera stopped short, grasped me by the arm, and pointed through the clump. He had the habit of grasping my arm with one hand, and pointing with the other whenever he discovered any game, and I could always tell the size and ferocity of the animal by the strength of his grasp. This time he gave my arm such a fierce grip I knew he must have found a tiger.

"Sure enough, there was Old Stripes in all his glory, and only thirty yards away! The midday sun shone full upon him, and a more splendid object I never saw in a forest. His long, jet black stripes seemed to stand out in relief like bands of black velvet, while the black and white markings upon his head were most beautiful. In size and height he seemed perfectly immense, and my first thought was, 'Great Caesar! he is as big as an ox!'

"When we first saw him he was walking from us, going across the bed of the stream. Knowing precisely what I wanted to do, I took a spare cartridge between my teeth, raised my rifle and waited. He reached the other bank, sniffed it a moment, then turned and paced slowly back. Just as he reached the middle of the stream he scented us, stopped short, raised his head and looked in our direction with a suspicious angry snarl. Now was my time to fire. Taking a steady, careful aim at his left eye, I blazed away and without stopping to see the effect of my shot, reloaded my rifle with all haste. I half expected to see the great brute come bounding round that clump of bamboos and upon one of us; but I thought it might not be I he would attack, and before he could kill one of my men I could send a bullet into his brain.

"Vera kept an eye upon him every moment, and when I was again ready I asked him with my eyebrow 'Where is he?' He quickly nodded, 'He's there still.' I looked again and sure enough he was in the same spot, but turning slowly around and around, with his head held to one side as if there was something the matter with his left

*"Nullah is an Indian term of the most comprehensive signification used in speaking of any channel or water-course, and applied alike to a small river or deep ravine, to the sandy bed of a dried up stream, or a wet gutter."—A. C. McMASTER.

eye! When he came around and presented his neck fairly, I fired again, aiming to hit his neck bone. At that shot he instantly dropped upon the sand. I quickly shoved in a fresh cartridge, and with rifle at full cock and the tiger carefully covered we went toward him slowly and respectfully. We were not sure but that he would even then get up and come at us. But he was done for, and lay there gasping, kicking, and foaming at the mouth, and in three minutes more my first tiger lay dead at our feet. He died without making a sound.

“To a hunter the moment of triumph is when he first lays his hand upon his game. What exquisite and indescribable pleasure it is to handle the cruel teeth and knife-like claws which were so dangerous but one brief moment before; to pull open the heavy eyelid; to examine the glazing eye which so lately glared fiercely and fearlessly upon every foe; to stroke the powerful limbs and glossy sides while they are still warm, and to handle the feet which made the huge tracks that you have been following in doubt and danger.

“How shall I express the pride I felt at that moment! Such a feeling can come but once in a hunter’s life, and when it does come it makes up for oceans of ill luck. The conditions were all exactly right. I was almost alone and entirely unsupported, and had not even one ‘proper’ weapon for tiger hunting. We met the tiger fairly on foot, and in four minutes from the time we first saw him, he was ours. Furthermore, he was the first tiger I ever saw loose in the jungle, and we had outwitted him. I admired my men quite as much as I did myself. They were totally unarmed, and they had seen me miss spotted deer at sixty yards; but instead of bolting as I should have done had I been in their place, they stood right at my elbow like plucky men as they were. What if they had been of the timid sort? They would never have consented to follow the trail of that dangerous beast.

“I paced the distance from where we stood to the dead tiger, and found it to be just thirty yards. My first was a dead centre shot, striking him exactly in the left eye, scarcely nicking the edge of the lid. I had intended that that bullet should enter his brain, but owing to the narrowness of

the brain cavity it only fractured the left side of the cranium. However, it rendered him quite powerless either to fight or run away, and he would have died very soon from such a terrible wound. In fact, I now think my second shot was really unnecessary. Owing to the position of his head I could not possibly have placed a bullet in his forehead so that it would have reached the brain, but had I been using a regulation ‘No. 8 bore rifle’ throwing a two ounce ball, I could have blown the whole top of his head off very neatly (!) and utterly ruined him as a specimen. My second shot struck one of his neck vertebrae and cut his spinal cord, killing him instantly, a favorite shot with me when I can catch an animal at rest.

“He was a splendid specimen every way, just in the prime of tigerhood, fat, sleek, and glossy. Up to that time, I could not make myself believe that a tiger can pick up a man in his mouth and run away with him as easily as a terrier does with a rat. But when I measured that great brute I saw and realized just how it was done. Before touching him with a knife we measured him carefully twice, and recorded the figures in my note book.

FELIS TIGRIS.

Animallai Hills, Sept. 27, 1877.

Length from tip of nose to end of tail vertebrae.....	9 ft. 8½ in.
Length of tail alone.....	3 “ 6 “
Vertical height at shoulders.....	3 “ 7 “
Girth.....	4 “ 2 “
Circumference of neck.....	2 “ 8 “
Circumference of head around the jaws.....	5 “ 0 “
Circumference of forearm.....	1 “ 8 “
Width of fore paw.....	6¼ “
Weight (by standard American scales).....	495 lbs.

MR. THOMAS MORGAN, of Somerville, N. J., reports Bluebirds singing in his garden, Feb. 8th and 10th, 1886.

In the vicinity of Providence, February 10th and 13th, Bluebirds, Robins, and Chickadees. March 11th, Song Sparrows. March 13th, red and buff shouldered Blackbirds, white-bellied Nuthatch, Downy Woodpeckers, with Bluebirds and Shore Larks abundant.

Destroying Caterpillars.

DURING the past year or two many interesting experiments have been made and valuable results obtained in the way of artificially introducing disease among communities of caterpillars, a sort of caterpillar plague or pestilence which carries them off by thousands. There is a very fatal disease which appears from time to time among silk worms, the larvæ of *Bombyx mori* when bred for the production of silk, a disease which spreads so rapidly that it frequently destroys entire broods of caterpillars within a few days. So destructive has it been that it is estimated that the silk crop in Europe is damaged by it to the extent of many millions of dollars annually. During the past ten years it is believed to have reduced the income of silk breeders some twenty-five per cent., and in 1879 was said to be the main cause in the great falling off in the silk crop of that year, which was only about one-fourth of the amount ordinarily produced. The celebrated Pasteur investigated this disease, and found it to proceed from the presence of an exceedingly minute form of bacteria, so excessively small that it has been estimated that it would require eight millions of them to cover the head of an ordinary pin. When water containing these minute organisms is sprinkled on the leaves on which the silk worms are fed, they are found to be rapidly infected and capable of communicating this pestilential disease to others with which they are associated. The bacteria may be preserved in a torpid condition without loss of effectiveness for at least a year, probably for several years, and that without any particular care, and when required for use can be rapidly propagated in a suitable fluid.

Throughout most of the State of Illinois and in some parts of Michigan, it was observed last autumn that a large proportion of the cabbage worms sickened and died. Hundreds of their bodies were to be seen rotting on the cabbage leaves or shrunken and dried to a blackened fragment. This was soon brought under the notice of the State Entomologist of Illinois, Prof. S. A. Forbes, a most careful and indefatigable observer, who at once proceeded to investigate the cause of this caterpillar plague. He found the disease at first to be very

unevenly distributed, some isolated fields showing no trace of it, while others not far distant were fairly reeking with death and decay, but as the season advanced it spread in every direction until in some districts almost every worm perished. He says, "We can conceive something of the significance of this disease if we imagine the terror and dread which would seize mankind if such a plague should suddenly assail human life. There would be no escape for any, because the contagion would be conveyed by the very food and drink by which life was sustained."

By dissecting specimens of the dead caterpillars, the microscope showed their intestines to be full of undigested food and swarming with a species of micrococcus, which appeared in the form of excessively minute spheres about one twenty-five thousandth of an inch in diameter, sometimes single, sometimes in pairs, and occasionally in strings of from four to eight. He found that these minute organisms could be readily cultivated in beef broth, and that a single drop of fluid from a diseased worm introduced into a vessel of such broth, would in two or three days render the whole contents milky with myriads upon myriads of these microscopic organisms precisely the same as those taken from the diseased larvæ. He also found by experiment that the disease could be communicated to other species of caterpillars. Experiments continued during the present year have shown that by propagating this form of bacteria in the manner described, and mixing a pint of a well-charged culture with a barrel of water and syringing cabbages with this fluid, the disease may be introduced, thus furnishing us with another means of defense against some of these injurious insects.

WM. SAUNDERS, *Canadian Entomologist*.
DECEMBER, 1885.

MICA IN CANADA.—During the past two years muscovite has been discovered in Canada in marketable sizes and paying quantity. The Villeneuve Mine in the county of Ottawa, has been worked continuously the past year, and has produced many thousands of pounds of mica, perfect in quality, in sizes varying from sheets for stoves up to plates 14 x 12 inches.—*Canadian Mining Review*.

The Forest Trees of Rhode Island.

BY L. W. RUSSELL.

No. XIII.

Fagus—BEACH.

ALTHOUGH the beach, *Fagus Jerruginia*, is to be found in various localities about the state, it is by no means a common tree of the woods. It occurs most frequently in cool situations, especially by the banks of streams and ponds. It is probable that neither the soil nor the climate of this region is favorable to the production of this tree in large numbers. Still, there are some fine specimens of this species now growing and the excellent qualities of the tree make it a desirable one for preservation and cultivation. There are few better shade trees than a well developed beach in open ground. It has a wide spread, orbicular in shape, and a very dense foliage which is always clean and free from insects. In open ground its limbs low, six to eight feet from the base, sending out numerous long, somewhat irregular arms, dividing into lithe branches and fine spray, at sharp angles towards the ends, but starting from the massive trunk at wide angles, the lower ones becoming nearly horizontal as the tree becomes well-grown.

The trunk gradually shapes itself from a circular combination of prominent roots, which may frequently be traced in fluted ridges up to the limbs. The roots keep near the surface of the ground, often in sight, never striking deep. For this reason shrubs rarely grow under the trees, and herbage is scant.

The bark is thin and smooth until upon old trees it becomes spotted, or wholly covered with variously-hued lichens. Its color upon young trees is that of lead or ashes. The buds are noticeable for their long spindle shape, being composed of delicate ribbon-like scales. When the buds open, they reveal a number of delicate leaves from the midst of which roundish tassels of beautiful flowers soon develop. The fruit forms during the summer months, and is peculiar from the shape of its angular three-sided nuts inclosed in a four-valved burr covered with fringed scales. The leaves, when young, have a pinkish tinge and a not unpleasant acid taste. As the leaves become full-grown, they are of a deep-green, shining above, with prominent midrib, from which come numerous parallel veins, ending in a sharp

tooth. The leaves come late and are more persistent than any other native forest tree, often remaining on low trees until they are pushed off by a new growth. In autumn the leaves turn to various shades of orange and brown. The wood is compact, with a fine silver grain making it desirable for cabinet work. It is much used for chair legs and frames, and for various tools; also, is a valuable fuel. There is a marked difference in the "heart" and the "sap" wood, the latter being the tougher. The terms "red" beach and "white" beach are given by lumbermen in accordance with the predominance of one of the two kinds of wood in the different trees.

The beach is a desirable shade-tree. A pasture beach is always a favorite with cattle in hot weather. Its wide spread branches dense, clean foliage, and general beauty, make it, also, well adapted for a wide lawn or rustic shade. Like most nut-bearing trees it is difficult to transplant it successfully, unless it is grown in a nursery. There may occasionally be seen fine spreading beach trees in Rhode Island. There is a model tree of this kind upon the farm of Engineer Herbert Shedd, in North Kingstown. The tree will flourish in any good soil of average moisture in this region. Its range of growth is extensive, it being found as the principal forest tree upon large areas in the north temperate zone of both hemispheres. In the forest it is a remarkably beautiful tree, tall and straight, the bole tapering very gradually, reaching sixty to eighty feet in height with only here and there a small branch, having branches at the top which adapt themselves to the space given. One can walk in a forest of beaches, upon a soft carpet of leaf mold, and hardly meet a shrub, and only a few characteristic herbaceous plants. Some of the finest forests of beach in this country may still be seen in western Massachusetts among the Berkshire Hills.

The "copper leaf" beach is a "sport" originally from Germany, making a most beautiful ornamental tree. The "weeping" beach also originated in Europe, and, like all "sports," is only obtained by grafting or budding. The "fern-leaf" beach is the most beautiful and graceful of all, obtained only by grafting, and with difficulty. One of the finest trees of this kind in this country is in the grounds of the Redwood Library, Newport.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXVII.

86. MESODON THYROIDES, SAY.

THIS species was also discovered by Thomas Say, and described in October, 1817, in the *Journal of the Academy of Natural Sciences*, Philadelphia, as *Helix thyroides*. It is the *Anchistoma thyroides* of H. and A. Adams. The following is the original description by Say: "Shell thin, fragile, convex, umbilicate; whorls five, obtusely wrinkled, or rather with equi-distant, gradually elevated obtuse lines, and spirally striate, with minute impressed lines; lips widely reflected, white and flat before, partially concealing the umbilicus; pillar lip furnished with a very oblique tooth. Breadth four-fifths to nine-tenths of an inch." It is found over nearly the same extent of territory as *Mesodon albolabris*, but is rare in New England. The only locality where I have been able to find it in Rhode Island, is in the deep woods back of the so-called copperas mine in Cumberland, between Cumberland Hill and Diamond Hill. This species somewhat resembles *albolabris*, but is distinguished from it by its partly open umbilicus and its oblique white tooth. The outer lip is thinner and more delicate, the aperture is more oblique, and the shell is more globose, and smaller in size. Western specimens attain a diameter of one inch and the tooth on the inner lip is strong and solid. Rhode Island specimens are never over three quarters of an inch in diameter; they have a delicate tinge of pink on the reflected outer lip, which is not seen on the solid white lip of the western ones, and the tooth is only slightly developed. Although considered the same as the typical *thyroides* of Say, our shells resemble in general appearance the *Mesodon bucculenta* of Gould more than any other American shell. *M. bucculenta* is southern in distribution and has not been found north of Pennsylvania. I am very much inclined to believe our shells are *bucculenta*, or rather, that the species called by that name are only local varieties of *thyroides*. The land shells of

Rhode Island, compared with the same species from other parts of the country, are dwarfs. This remark does not apply to the fresh water or marine species, as *they* are as large and sometimes larger than those found elsewhere. The reason is that our soil, composed mostly of granite, is deficient in the lime necessary for the snails to produce exuberant shells. I think if the eggs of our *M. thyroides* or other species should be taken to Ohio and raised there, they would develop just as large and solid shells as the natives, and *vice versa*.

GENUS PATULA, HELD., 1837.

"Shell perspectively umbilicated, discoidal or turbinated, depressed, rugose or striated; whorls gradually enlarging; aperture rounded, unarmed by teeth; lip simple, sharp."

This genus is divided into twenty-four sub-genera and three hundred and twenty-seven species, distributed all over the world. Three of these sub-genera are represented in Rhode Island, and two more in other parts of New England.

87. PATULA (ANGUISPIRA) ALTERNATA, SAY. *Syns.:*

Helix alternata, Say.

"scabra, Lam., Desh., Chem.

"infecta, Pfr., Parr., Reeve.

"strongyloides, Pfr. Reeve.

"mordax, Shutt., Gould, Pfr., Bld.

"dubia, Sheppard.

Anguispira alternata, Morse, Tryon.

This shell, rejoicing in so many appellations, was also discovered, and described by Thomas Say in *Nicholson's Encyclopædia*, 1817, as follows:

"Shell somewhat convex, fuscous, varied or alternating with pale rays; whorls five, striated across with raised, equi-distant, acute lines, forming grooves between them. Aperture thin and brittle, lip regularly curved, within glossed with pearly, and when placed before the light the fuscous lines appear sanguineous. Umbilicus large, exhibiting all the volutions. Three-fourths of an inch wide. Inhabits the Middle States." Since Say's time it has been found in every state east of the Rocky Mountains.

Morse's description of the New England specimens in the *American Naturalist*, June, 1867, differs somewhat from Say's: "Shell flattened, heavily striate, light horn

color, with dark brown bands arranged obliquely across the whorls. Aperture when viewed from below nearly circular, lip simple and sharp, whorls six. The base of the shell is lighter in color than the upper surface. Diameter one inch."

These shells are found all over our state on decaying stumps and logs, but never of size given by Morse. Even at Lime Rock in Smithfield, where we find them crawling over the broken masses of limestone, they never exceed three quarters of an inch and rarely attain that size. The difference in size of our alternatas and those from the west is even more striking than in the case of *Mesodon albolabris*. The shells of this species are carinate while young, that is, they have a sharp line running around the centre of the shell, dividing the upper from the lower surface. This line disappears at maturity, forming a well rounded surface and a circular aperture. Generally several specimens are found together, thus differing in their habits from the preceding species, which are usually solitary.

88. *PATULA (DISCUS) STRIATELLA, ANTH.*
Syns.:

Helix striatella, Anth., Gld., Binn., Ad., Chem., Pfr., Reeve, Morse.

Helix rudrata, Adams, non Studer.

Anguispira striatella, Tryon.

Patula striatella, Morse.

In 1817 Mr. Say described a shell which he named *Helix perspectiva*. The species now under consideration was for many years confounded with Say's *perspectiva*.

Several gentlemen in Ohio, where both species abound, had observed the difference in the two shells sometime previous to 1840, when Mr. John G. Anthony published a description of the new species under the name of *Helix striatella*, in the *Journ. Bost. Soc. Nat. Hist.*, III., 278. *Helix perspectiva* is not found in New England, but *striatella* is very common here and throughout the United States north of Virginia, extending into Canada and British America.

It is about one quarter of an inch in diameter, of a uniform reddish horn color, depressed, convex, almost discoidal; whorls four, flattened above and rounded below, with sharp elevated lines of growth, not parallel with the whorls as in *lineata*, but across them; suture distinct; lip simple and thin; umbilicus broad and deep, ren-

dering the base of the shell cup shaped. It is found about old stumps and under the bark of decaying logs; also under leaves near the margins of ponds.

89. *PATULA (PSEUDOHYALINA) EXIGUA, STIMP.*

Syns.:

Helix exigua, Stimp., Gld., Binn., Morse.

" *annulata*, Case., Pfr.

" *striatella junior*, Gld.

Pseudohyalina exigua, Morse, Tryon.

This shell was described by Dr. William Stimpson, as *Helix exigua*, in the *Proc. Bost. Soc. Nat. Hist.*, III., 175, 1850. The genus *Pseudohyalina* was founded by Morse in 1864. In papers on the "Conchology of Rhode Island" prepared for the Providence Franklin Society in 1871, by the writer, it was described as a sub-genus of *Hyalina*. Tryon in *Structural and Systematic Conchology*, 1884, places it under *Patula* as a sub-genus of *Helix*. Tryon's *Manual of Conchology*, 1886, classifies it thus: Family *Zonitidae*, Genus *Zonites*, Montfort, 1810. Sub-genus *Striatura*, Morse, 1864. Section *Pseudohyalina*, Morse, 1864.

"Shell broadly umbilicated, depressed, pellucid, greenish horn color, marked with delicate revolving lines, and distant, longitudinal ribs, obliquely decussating the incremental striae; whorls three and a half, aperture oblique, transversely rounded; lip simple, acute."

It is quite common in Maine and in Canada; more sparingly in the other northern tier of states to Wisconsin, and may be considered as a rare shell in Rhode Island. Its umbilicus is wide but shallow, showing all the volutions. Diameter one-tenth of an inch. Under the microscope with a one inch objective, it is a most beautiful object; in fact, the longitudinal ribs and the delicate revolving lines between them cannot be seen unless the shell be magnified somewhat; a common pocket lens, however, will bring out the characteristic marks which distinguish this species from any other of our land shells.

(To be continued.)

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CHECK-LIST OF GENUS CLAUSILIA. III.

J. RITCHIE, JR.

Clausilia fausta Friw.
 ferruginea Blanford.
 filicostata Stolickza.
 filocostulata Lubow.
 filograna Ziegler.
 filosa Mouss.
 filumna Parr.
 fimbriata Mühlfd.
 fiammula Pfr.
 flava Küst.
 foliacea Fir.
 forbesiana Pfr.
 formosa Ziegler.
 formosensis Adams.
 fortunei Pfr.
 fovecollis Parr.
 frauenfeldi Zelebor.
 fraudigera Parr.
 friwaldskyana Rossm.
 fulcrata Ziegler.
 funiculum Mouss.
 fusiformis Blanford.
 fusorium Mouss.
 galeata Parr.
 gallinæ Bielz.
 gastrolepta Ziegler.
 gaudryi Bourg.
 gemmulata Küst.
 genezarethana Tristram.
 gerlachi Möll.
 gibbula Ziegler.
 gigas Beck.
 glabella Pfr.
 glabricolis Parr.
 glauca Bielz.
 glorifica Parr.
 gobanzi Parr.
 goldi Kutsch.
 goniostoma Küst.
 gospiciensis Zelebor.
 gouldiana Pfr.
 gracilicosta Ziegler.
 græca Pfr.
 grayana Pfr.
 grimmeri Parr.
 grisea Deshayes.
 griseo-fusca Mouss.
 grohmanniana Partsch.
 grossa Ziegler.
 guicciardi Helder.
 gulo Rossm.
 gustavi Boettger.

Clausilia hanleyana Pfr.
 hasta Küst.
 haueri Bielz.
 hectica Küst.
 hedenborgi Pfr.
 helenæ Kleciach.
 hellenica Küst.
 helvola Küst.
 hepatica Küst.
 hetera Friw.
 heudeana Möll.
 hiatula Küst.
 hierosolymitana Bourg.
 homalorhaphé Pfr.
 hübneri Rossm.
 hueti Mortill.
 hyperolia Martens.
 iberica Roth.
 idæa Pfr.
 impura Küst.
 incerta Benoit.
 incisa Küst.
 incommoda Boettger.
 inconstans Mouss.
 index Mouss.
 indigena Parr.
 inflata Olivier.
 insignis Gould.
 inspersa Parr.
 intermedia F. J. Schmidt.
 interrupta Ziegler.
 isabellina Pfr.
 istriana F. J. Schmidt.
 itala Martens.
 itylensis Boettger.
 janinensis Mouss.
 japonica Cross.
 javanica Bourg.
 jonica Parr.
 jos Benson.
 josephinae Boettger.
 judaica Bourg.
 jucunda Küst.
 jugularis Bielz.
 karsteniana Shutt.
 kephissæ Roth.
 kleciachi Küst.
 kobeltiana Küst.
 kondourana Blanc.
 kreglingeri Zelebor.
 krüperi Zelebor.
 küsteri Rossm.

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“ var cinerea.....	10
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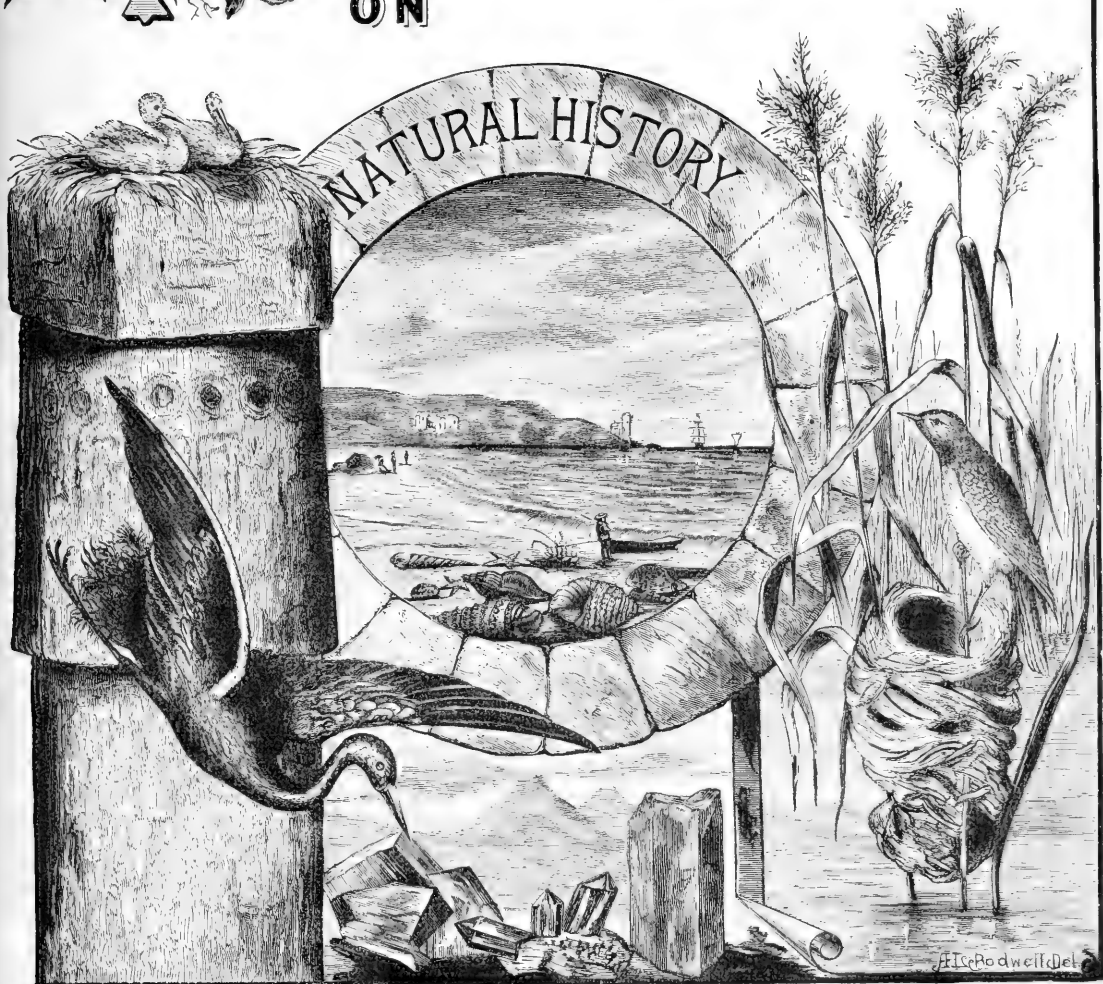
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VOL. III.

NO. V.

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ON



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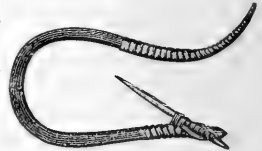


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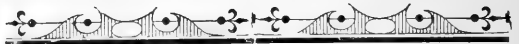
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Random Notes on Natural History.

Vol. III.

PROVIDENCE, MAY 1, 1886.

No. 5.

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

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Yelping a Gobbler.

EARLY in March, before the turkeys began to gobble, we had taken several by lying in wait at their roosts. But about the third week in March the gobblers were beginning to make the woods ring; and one day, at dinner, my hunting companion, Ben H— remarked to me “I reckon we might yelp up a gobbler this evenin’, if you want to. I heerd one a gobblin’ right smart this mornin’ over on Brushy.” Now Ben was a native “West Texican,” born and bred in the woods, a skillful and enthusiastic hunter; and you may be sure his proposition was eagerly accepted.

Setting out about four o’clock, a two-mile walk across a rocky ridge brought us to the little dry creek, whose banks of dense chaparral and cedar brake had gained for it the name of “Brushy.” A favorable location was soon secured in a thicket, in front of which and toward the neighboring mountain was an opening some fifty yards across. We lay down at full length, propped up on our elbows, behind the screen of bushes. Ben laid his gun by his side, but cautioned me to keep mine in readiness, and when I heard a gobbler at once to bring it to bear in that direction, that there might be no stir when the turkey appeared. Then he took from his pocket and put to his lips a common, slender cigar-holder, cupped his hands about the end and sounded a wonderfully perfect imitation of the turkey hen’s plaintive call. At first it brought no response; then came from away off at the

foot of the mountain an answering gobble. The bird was apparently a half mile away. Again the call sounded and again the gobble. This was repeated several times, the answer coming nearer and nearer, then abruptly ceasing. Ben motioned to me to be ready, then sounded the call again. Straining eyes and ears, soon we could hear the *click-thrrrr* of wings as the turkey “strutted”; and in a few moments more he advanced from behind a thicket on the opposite side of the opening—tail spread, wings dropped and head drawn proudly back as he looked about for his expected inamorata. The sunbeams glanced and flashed from his feathers; and, in my admiration, I entirely forgot our purpose in summoning him. Presence of mind was suddenly recalled by an impatient “Humph!” from Ben as he caught up his Winchester. With a sharp “*Pit*,” the old gobbler had wheeled and started to rise; but my Remington dropped into position just in time, and a charge of “B” sent him flopping on to his back.

He was a splendid, huge old fellow, and, though by no means the first we had taken, yet we could not resist the impulse to sit down and gloat over him; smooth his ruffled plumage and pull his long “beard.”

Ben asked if we should not go up the creek and try for another. I thought we ought to be satisfied; so we picked up our bird and started for home. And we were fully satisfied before the ranch was reached, for I verily thought that turkey could not weigh an ounce less than fifty pounds. But the scales refused to go beyond twenty-four and three-fourths; and, after all, that isn’t so bad for a turkey!

B.

STRANGE BEHAVIOR OF A BLUE JAY. — In RANDOM NOTES, Vol. II., No. 1, is an article about a Jay which pounced upon an English Sparrow and flew away with it. The writer asks, “did he want the sparrow for food?” I am not well acquainted with the habits of our birds, but from what I have seen of the

Blue Jay I should say he wanted the sparrow for food.

A number of years since my attention was called to a young chicken about ten days old; it was said to have been killed by one of these birds. I left the chick and a few minutes after a Blue Jay lit on it, pecked and tore at it, and soon flew with a piece of it to its nest of young not far away. The next day at noon I heard a chick making quite a noise, and on going out to see what was the matter I saw one of these birds pecking away at the head of a chick which would soon have been killed had I not come to the rescue; as it was, it died three or four days afterwards. Since then I have known of Jays attacking young chickens several times. I have noticed in every instance that the bird had young ones about ready to leave the nest.

A. A. HINKLEY.

Du Bois, Ill.

BOHEMIAN WAXWINGS.—Among several flocks of Bohemian Waxwings at an altitude of 10,500 feet, I secured four good specimens March 23. One specimen had a very fine brown hair, eight and a half inches long, growing from each corner of the mouth. The books to which I have access make no mention of such appendages. Are they rare, or have they been unnoted before?

COLORADO.

DEAN W. PARK.

Some Early Wild Flowers.

At this season, when the buds give promise of warmer days, every one turns with longing to the woods. Even those who, in August, are indifferent to floral beauty, and whose eyes are at times closed to everything that is not practical, become quite inspired by a spray of alder or a bud of arbutus. In every one there is an instinct, however staled by custom or choked by indolence, which leads him to the forest or the meadow. One man takes to fishing, and another to hunting, not so much for the sport often, as for the wild surroundings and the utter freedom.

Our country is so vast in its extent that the flora of one region often differs essentially from that of another. The early flowers of Colorado, most elegant of their kind, are, as a rule, quite unlike those of Rhode Island.

So, in any sketch like the present, one must restrict himself to his immediate surroundings. With us the earliest flowers are those tasseled clusters which droop from alders or hazels, or the silky spikes, beloved of children, which protrude from willows. Pussy willows! we can never say too much of them. Is it because they are associated with our own or the second childhood, that they are so dear? The reader will recall how lovingly Thoreau always mentions them—his “little vegetable redeemers.”

Following these almost immediately, say anywhere from the 21st of March onward, comes New England's favorite, the Mayflower, or as science calls it, the *Epigœa*. An arbutus proper it is not, but what's in a name? In this familiar sermon we shall not be precise in terminology, though striving to be accurate. Just about the city the localities of this fragrant and most lovely flower are fast vanishing. To see it in full size it is necessary to make a somewhat extended trip. But such a journey pays, when somewhere under oaks or pines, remote from gas, dust, and all city abominations, the tourist reposes on a bed of odorous blossoms.

To us, a flower that appeals more tenderly to our sympathies, and sooner kindles the spark of delight, is the hepatica or liverwort. In Rhode Island it is local, but usually abundant enough when one finds it. Perhaps for her sins, Providence is denied the immediate approach of this blue-eyed beauty. It especially loves rocky, wooded slopes. In such situations one will often find a whole troop of the laughing blossoms playing bo-peep among the leaves. It is nonsense to say that they do not enjoy the fun. Why, just see their bonny faces, dimpling with sheer merriment. To our mind's eye comes back even in mid-winter that old familiar boulder, cloaked with costly emerald velvet under which, time out of mind, we have every year sat and joyed in the liverworts. And those friends who share our pleasure, who are like them among the sons of men! Herein is one of the delights of natural science, that kindred spirits may meet and revel together.

A very lovely spring flower, and we can, in our limited space, name but a few, is the columbine. Many a people know it, as they do some dozen other things which are not, under the name of honeysuckle. Its long spurs, as every boy knows, contains honey—

but this does not warrant a misnomer. Nothing in our vernal landscape is more attractive than a craggy ridge, from the crevices of which droop the red blossoms of columbine. The foliage is delicate and clearly cut, and each flower is posed as by an artist. The plants do extremely well in cultivation, increasing in size and number of blossoms.

Among the loveliest of the spring flowers is the *Houstonia cœrulea*. It has many common names, as bluets, innocence, Quaker ladies, and Star of Bethlehem. The last title it shares with many other plants; it is only necessary for a flower to have a resemblance to a star for somebody to apply an old name to it. There is nothing like our English dearth of nomenclature. In this particular we have no fertility of resource.

Every one; in Rhode Island, certainly, knows the dainty bluets. They come about the middle of April. First, we note a few struggling blossoms on grassy slopes or in sunny meadows, soon to be followed by hundreds of others, till finally each field seems to be drifted full of snow. White these little flowers appear at a distance. A nearer inspection shows them to be of a lavender blue and with a yellow eye. Many, indeed, are white, but enough are tinged to countenance the name. They are Quaker ladies, we suppose, from their lavender bonnets. The plants are only a few inches in height, delicate and graceful. Before opening the flowers droop on their pedals. As they expand, each salvaform corolla is upraised. We find groups of the bluets at slight intervals apart, each group having the peculiarity of a particular form of the flower. The next group may be quite different. Indeed, the bluet, like most of the madder family, to which it belongs, is dimorphic. The stamens and pistils are of differing length in the two forms, and each form is the complement of the other. Insects are the agents for the transmission of the pollen.

We have heard of portions of the country where our *Houstonia* is not found. It must be a tame and humdrum spring that omits their cheerful faces. As well might one banish the robin, the bluebird and the tryza. Always we would find ourselves longing for the New England woods. Far more distinctive of our region is the *Houstonia* than even the trailing arbutus.

MARCH 29, 1886.

W. W. BAILEY.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XIX.

Plethodon cinereus erythronotus, Cope, (*Plethodon erythronotus*, Baird, *Salamandra erythronota*, Green). The red-backed or chestnut-backed salamander is abundantly found in our damp forests, under decaying logs and among the fallen leaves of moist slopes. The body is much smaller than that of the previous genus, and more slender. The long cylindrical tail equals in length the body from snout to the hind limbs; the entire animal sometimes measuring three and one-half inches. Sixteen to nineteen folds can be counted between the fore and hind limbs which represent as many vertebræ. The general color is dark reddish brown, more or less mottled below, and with a characteristic broad, median dorsal stripe of a chestnut color, which extends from the back of the head to the tip of the tail. The inner toes are rudimentary. When discovered in its hiding-place this animal makes little effort to escape, though it may break off its brittle tail, a member which is soon again supplied. Professor Cope considers it to be nocturnal in its habits, though it is often to be seen on cloudy days, slowly wandering over the mossy carpeting of our less frequented woods. He moreover gives to it the habit of ascending slender vegetable growths, as ferns and grasses, coiling itself often at quite an elevation in such a way that on being disturbed, by a sudden spring it leaves its perch and soon is hid away under some sheltering rock. It is also able to climb the smooth surface of a pane of glass being assisted in this by its moist abdomen.

The eggs are often to be met with by one knowing the place in which they are deposited. The cavities in decaying logs are usually selected, and the eggs to the number of a dozen suspended in a grape-like cluster. The geographical distribution of this species is less general than that of the previous form, being restricted to the more eastern portions of our country. Several varieties have been demonstrated.

Native Forest Trees of Rhode Island.

No. XIV.

BY L. W. RUSSELL.

The Hickory.—*Carya*—*Carya alba*.

THE hickories, genus *Carya*, are represented in Rhode Island by four species: *C. alba*, *C. tomentosa*, *C. porcina*, and *C. amara*. The first, *C. alba*, commonly known as the shagbark or shellbark, is found in various localities in most sections of the state, but rarely in such bodies as to form a woods of the trees as is frequently seen of the chestnuts and some kinds of oak. The tree flourishes well here and is highly prized, as it ought to be, for its wood and its fruit. It is readily distinguished from the other hickories by its bark, fruit, and leaves. Its form, also, as seen in the grouping of its limbs, is, to an experienced eye, another means of recognition. The hickories are frequently seen by walls in neglected corners and out-of-the-way places where squirrels have planted the nuts. Farmers often leave them when cutting other trees for further growth for timber, or for their fruit. When grown from a seedling where there was room for a natural spread, a shellbark is usually a picturesque object. Without any apparent cause, the limbs divide into several groups, separated by vacant spaces, giving that freedom from stiffness in shape which is the delight of landscape artists. With a general cylindrical head they are tall,—often seventy to eighty feet,—erect, and firm. The body is not large, two feet in diameter being the average for a full grown tree, but in the forest it retains its size to many feet in height.

The outer bark is a characteristic feature. Upon old trees it exfoliates and hangs often by a single attachment, in long, loose scales of an iron gray, or dark ashen color. On young trees the bark is smooth. The branches are small but exceedingly tough. The leaves which spring from beautiful flower-like scales, appear late in the season and expand to a length of eighteen or twenty inches, there being usually five leaflets obovate in shape, the odd very prominent. In autumn these turn to shades of orange, falling early. The male flowers are in long

slender catkins, pendulous, three on each stalk, the middle one about twice the length of the others. The fertile flowers, which are inconspicuous, are on the ends of the recent shoots, two to four in group. The fruit is globose in shape, varying much in size and quality upon different trees, and is contained in a thick, spongy shell, which opens by four depressed seams. The nuts are yellowish white, and marked by four distinct angles. The nuts vary considerably in shape, size, and thickness of shell; some are considerably flattened, and others prolonged at the end into a prominent tip made by four angular ridges. The kernel is the best of any of our native nuts. The fruit is undoubtedly capable of great improvement by selection and cultivation. The English walnut is naturally a small, poor, thick-shelled nut, but has been wonderfully improved by cultivation. It seems reasonable to believe that the cultivation of this tree for its nuts, might be in Rhode Island a source of sure profit to persons who intelligently pursued it. Besides this, its growth for wood and timber would be sure for a high money value. The wood stands at the head for its heating value; and its agreeable odor and freedom from snapping, with its bright livid coals, render it the most desirable of all woods for an open fire. Its uses in the making of tool handles, agricultural implements, in mill work, for carriage work, etc., are such as to make a demand for the timber which is never fully supplied except at high prices. With its excellencies of toughness, elasticity, strength, and compactness should be mentioned two defects,—liability to warp and twist, and to decay readily when exposed to moisture.

This species of hickory, as well as the others named, rarely occurs north of Central New England, but is found south to the Carolinas, and frequently west to the Rocky Mountains. The hickories do not occur at all in the countries of Europe, the walnut taking the place of them there. The hickories flourish finely in Rhode Island, with the exception of localities too sandy or swampy.

The difficulties of raising plantations of this tree lie in their slow growth when young, their need of protection from cold winds until large enough to shield each other, and the impatience of farmers in waiting for a score and a half of years for a

money return. But in four or five years a plantation could be thinned out for walking-sticks, always in demand, in eight years for hoop poles, for which the supply is always short, and later for numerous other uses, leaving finally the "standards" for fruit and timber.

Exit Helix, Enter—What?

[WRITTEN FOR RANDOM NOTES]

THE Academy of Natural Sciences, of Philadelphia, contains one of the largest collections of shells in the world. Figures or specimens of every known species are displayed therein in such a manner as to be readily seen and easily studied; the whole collection being artistically as well as scientifically arranged in its respective classes, orders, families, and groups. Many of the genera have also been divided and subdivided. Nevertheless, it has been deemed advisable to retain their older standard names as well as those of more recent coinage.

These later divisions are shown by printed cards placed in certain parts of the cases, following which are the special varieties of the genus to which they are supposed to refer. As a rule, however, the standard generic names or their initials are applied to all. Among *Cypræa* for instance, one division may read "*Aricia*," another "*Luponia*," another "*Epona*," and so on, but upon every card on which specimens of each group or sub-genus are glued, the original name *Cypræa* or its initial is written, as *Cypræa Arabica*, *C. caurica*, *C. cicercula*, etc. So, in the division of *Helices* a group card may read *Mesodon*, *Stenotrema*, or any one of the thousand other names given, yet upon every specimen label may be seen the old generic word *Helix* or its initial.

This is the system established by Mr. George W. Tryon, Jr., conservator of the collection, who is, without doubt, one of the most practical and best informed conchologists living. For the pleasure and perhaps profit of a few experts, it may have been advisable to break up the various well-known genera into a dozen or more varieties, each laden with some stupendous name scarcely worth the ink with which it is written, but for the mass of students the leading generic

name is quite sufficient, saving, as it does, a deal of confusion if not an unnecessary cramming of the memory also. Perhaps not one conchologist in a dozen would be able to recall, if asked to do so, the characters of *Aricia Arabica*, or *Stenotrema Leaii*, though they all would probably describe them readily if referred to as *Cypræa Arabica* or *Helix Leaii*. Complications in this as in all other branches of science should therefore be studiously avoided. But few men can remember the names of even the three or four hundred standard genera alluded to. What folly then to suppose that they can acquire an inkling of the thousands of divisional terms suggested by recent writers.

Were I a Verrill or a Dall I might be more chary about airing my opinions, perhaps. As it is, I hardly dare to hint that a large percentage of these innovations seem to smack more of the gratification of personal vanity than of a desire to benefit science.

In the light of these premises, I was not a little surprised to notice in the March number of *RANDOM NOTES*, that my good friend, Mr. Carpenter, had decided to exclude the name *Helix* from his forthcoming catalogue of Rhode Island Land shells, preferring, instead, such equivocal names as *Polygyra*, *Stenotrema*, and scores of others similar in character.

Though knowing Mr. Carpenter to be a most thorough conchologist, I could not help thinking that for once his judgment had betrayed him.

Otherwise it seems impossible to believe that he would attempt the annihilation of one of the most familiar names known to science; much less that he should suppose such a result could be attained.

A sorrowful day it will be when a hundred ambiguous terms replace the word which now embraces them all.

And then, when some importunate student shall ask the meaning of each, how sad it will be to hear my friend repeat the only possible answer, "Simply a variety of *Helix*." JOHN FORD.

PHILADELPHIA, March 18, 1886.

SEASONABLE NOTES.—The first shad of the season taken in Warren River, Monday, April 12. Brown Thrushes arrived in the vicinity of Providence, April 14. White-bellied Swallows, April 9.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXVIII.

90. PATULA (PSEUDOHYALINA) MINUSCULA, BINNEY.

Syns.:

- Helix minuscula*, Binn., Ad., Reeve, Chem., Morse.
 “ *minutalis*, Morelet.
 “ *apex*, Ad., Reeve.
 “ *lavelleana*, D’Orb.
 “ *mauriniana*, “

Pseudohyalina, minuscula, Tryon, Morse.

Shell depressed-convex; epidermis whitish; whorls four, convex, not increasing rapidly in diameter, with microscopic wrinkles; suture distinct; lip simple; aperture circular; umbilicus large and deep, showing the volutions. Diameter one-tenth of an inch, height one twenty-fifth.

It inhabits from the Red River of the North to Texas and Florida, in all the states east of the Rocky Mountains. It has been quoted from California, Bermuda, Cuba, Jamaica, and Porto Rico. I have collected all the land shells of Bermuda, but never saw this species there, and do not believe that it exists in any of the islands mentioned. It is not at all common in Rhode Island, but is found in great quantities in the West. In Cincinnati it is very common in the grass and in gardens. It was described by Binney in *Jour. Bost. Soc. Nat. Hist.*, III., 453, 1840.

GENUS VALLONIA RISSO, 1826.

Shell depressed, diaphanous, umbilicated, whorls three and a half to four; aperture oblique, sub-circular; outer lip white, thickened, reflected. There are but three or four species, all minute, and are distributed all over the northern portions of Europe, Asia, and America.

This genus has received other names, as follows: *Amplexus*, Brown, 1827; *Chilostoma*, Fitz., 1833; *Circinaria*, Beck., 1837; *Corneola*, Held., 1837; *Glaphyra*, Albers., 1850; *Lucena*, Moq-Tan., 1855, etc.

91. VALLONIA MINUTA, SAY.

Syns.:

- Helix pulchella*, Müll., Pfr., Binn., Ad. Gld., etc.
 “ *costata*, var., Müll.
 “ *minuta*, Say, Binn., DeKay, Morse.

Vallonia minuta, Morse, Tryon, and others.

It is difficult to say whether the specific name of this shell should be *minuta* or *pulchella*. If the American shell is identical with the European species, *pulchella* has the precedence, as Müller named it in 1774 and Say in 1817. It does not seem possible that it could have been accidentally introduced from Europe, and spread all over the United States in so short a time as this country has been known to commerce, and it seems equally improbable that the same species should have been created in both hemispheres, with a wide ocean between on both sides. It is a fact that the shells from both countries look precisely alike, but as Professor Morse has examined the tongues of many specimens of both species, and always finds a difference in the lingual dentition, and as it is probable that other differences may be observed in them, I prefer to call our American shell by Say’s name. It is found under stones, on old walls, in gardens and in grass growing on the banks of rivers. I find it in Rhode Island more commonly on the under side of boards and rails in damp places than in any other situation. Dr. Perkins says it is common about the roots of elms on the college grounds at Yale. They are gregarious in their habits. I found once, about twenty clustered together under an old log and as many more on a board lying in the grass at Lime Rock, in Smithfield. In both instances the locality was very damp and must be under water a good portion of the year.

The shell is one-tenth of an inch in diameter, white or nearly colorless, translucent, with four whorls, the last spreading at the aperture like a trumpet; the lip is white, thick, and reflected; umbilicus large, showing the volutions. A strongly ribbed variety has been found in Kansas, at Cincinnati, Philadelphia, and other places. I have never seen any of this variety in Rhode Island, and have none in my collection, and should be pleased to receive specimens

from any generous reader of RANDOM NOTES, who has them to spare.

GENUS STROBILA, MORSE, 1864.

Shell umbilicated, globose, conic, or depressed, obliquely and coarsely striated, smoother below; aperture lunately rounded; peristome thickened and reflected; the parietal wall and base of the last whorl each with two or more revolving lamellæ. Distribution, four species, United States, Mexico, West Indies. Set apart from *Helix* as a new genus, by Prof. Edward S. Morse, in *Jour. Portland Soc. Nat. Hist.*, 1, 26, 1864.

92. STROBILA LABYRINTHICA, SAY.

This shell was described by Say in May, 1817, in the *Journ. Acad. Nat. Soc. Phila.*, Vol. I., p. 15. His description is not exactly correct in several particulars.

It belongs to a genus containing but four species, two of which are represented in the United States: one found only in one county of Texas, and the one under consideration, which inhabits all of eastern North America.

It is of the same size (one-tenth of an inch in height and breadth) and general appearance as *Conulus chersina*, described in the February number of RANDOM NOTES; a globose conic shell with six volutions. It differs from that species in having a small umbilicus, in having oblique lines or ribs at regular distances, distributed over its surface, instead of being smooth and polished as in *chersina*; the outer lip is thickened and reflected, and in fresh specimens has a beautiful rose tint; within the aperture on the inner lip, are seen two parallel lamellar teeth, running far back into the interior of the aperture, and resembling a miniature railroad track; farther within the aperture is a third line, only slightly raised, between the other two. Under the microscope, these three lamellar teeth are seen to be surmounted with numerous sharp spines pointing toward the aperture. It is extremely common in Rhode Island under leaves and is also found on the under side of chips in damp places.

All the other genera of this immense family of land shells, including among others *Bulimus*, 323 species, *Bulimulus*, 545 species, *Buliminus*, 350 species, are absent from our fauna.

Family Orthalicidæ, thirty-two species, inhabit the West Indies and tropical America.

Family Achatinidæ, sixteen genera and over five hundred species is represented in Rhode Island by the

GENUS ZUA, LEACH, 1820.

“Shell ovate-oblong, imperforate, smooth, pellucid, glistening, dark horn color; whorls rather convex; aperture less than half the total length of the shell, ovate; columella more or less truncated; peristome blunt, its margins joined by a callus.”

Woodward's *Manual of the Mollusca* gives the number of species of *Zua* as six; Tyron recognizes nine; Morse two, and Binney but one, which inhabits all the northern portions of Europe, Asia, and America. This species was named *Helix subcylindrica* by Linné in 1767, and is described in European works on conchology under fifteen different specific names.

Morse observes a great difference in the lingual dentition between the American and European specimens, and considers our shell to be a distinct species. I have collected in Rhode Island, and also in the grounds of the Crystal Palace at Sydenham, Eng., and I can certainly see a difference in the appearance of the two shells. Our species is called

93. ZUA LUBRICOIDES, STIMP.

It is a beautifully transparent, highly polished, cylindrical shell, the size of a grain of wheat, one-third of an inch long, smoky horn color; whorls six, rounded; aperture oval; lip thickened and of a claret tint when fresh. It is so highly polished that when one attempts to pick one up, it slips out of the fingers. It is very plenty in some places, though extremely local. Say found it on the shores and islands of Lake Winnepeg and the Lake of the Woods. Gould found it at Oak Island at Chelsea, Mass., in incalculable numbers. It inhabits New England, New York, Michigan, Nebraska, Canada, and British America. I find it only in one locality in Rhode Island, under a thick bed of leaves, on the east side of a stone wall, near the *Mesodon thyroides* locality in Cumberland.

(To be continued.)

CHECK-LIST OF GENUS CLAUSILIA. III.

J. RITCHIE, JR.

Clausilia kutschigi Küst.
 laconiae Mouss.
 lævicollis Parr.
 levissima Ziegler.
 lamellata Ziegler.
 lamellosa Wagner.
 laminata Mont.
 lampedusæ Cale.
 lanceolata Boettger.
 latestriata Bielz.
 laxa A. Schmidt.
 lederi Boettger.
 lepida Westerlund.
 lerosiensis Fer.
 lesinensis Kutsch.
 leucophryne Parr.
 leucoraphe Blanc.
 leucopleura Brus.
 leucostemma Küst.
 leucostigma Ziegler.
 leucostoma Küst.
 liebetruti Charp.
 lineolata Helder.
 lishkeana Parr.
 litotes Parr.
 livida Menke.
 longicollis Küst.
 lorraini Menke.
 lowei Albers.
 loxostoma Benson.
 lucensis Gentil.
 lunellaris Pfr.
 lusitanica Bourg.
 macarana Ziegler.
 macedonia Rossm.
 macrostoma Küst.
 maculata Ziegler.
 maculosa Deshayes.
 madensis Fuss.
 magnilabris Zelebor.
 magniventris Küst.
 mamotica Gulia.
 maranhonensis Albers.
 marcki Zelebor.
 orsiniana Villa.
 orthostoma Menke.
 oscarri Thies.
 oscitans Fer.
 osculans Martens.
 ossetica A. Schmidt.
 ovata Blanford.
 oystoma Rossm.

Clausilia pachychila Ziegler.
 pachystoma Küst.
 pæstana Phil.
 pagana Ziegler.
 pancici Zelebor.
 parolina Betta.
 parreyssi Ziegler.
 parthenia Küst.
 parvula Studer.
 pauli Mabill.
 pellucida Pfr.
 penangensis Stolicka.
 penchinata Bourg.
 perarata Martens.
 perlucens Boettger.
 perplana Boettger.
 peruana Troschel.
 perversa Linn.
 petrina Parr.
 petrosa Parr.
 pfeifferi Küst.
 phæniciaca Bourg.
 philippiana Pfr.
 piceata Ziegler.
 picta Pfr.
 pikermiana Roth.
 pirostoma Boettger.
 planilabris Rossm.
 platydera Martens.
 plicatula Drap.
 plumbea Rossm.
 pluviatilis Benson.
 polita Parr.
 pomatias Pfr.
 porphyria Möll.
 porrecta Friw.
 porroi Pfr.
 portensis Silva.
 præclara Pfr.
 proba A. Adams.
 proboscidea Küst.
 procera Bielz.
 profuga Charp.
 prophetarium Bourg.
 proxima Waldf.
 pruneri Ziegler.
 puella Pfr.
 pulchella Pfr.
 pumila Ziegler.
 pumiliformis Boettger.
 punctulata Küst.
 pustulata Küst.

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- VII. La., Tex., Ark., I. T., N. M.
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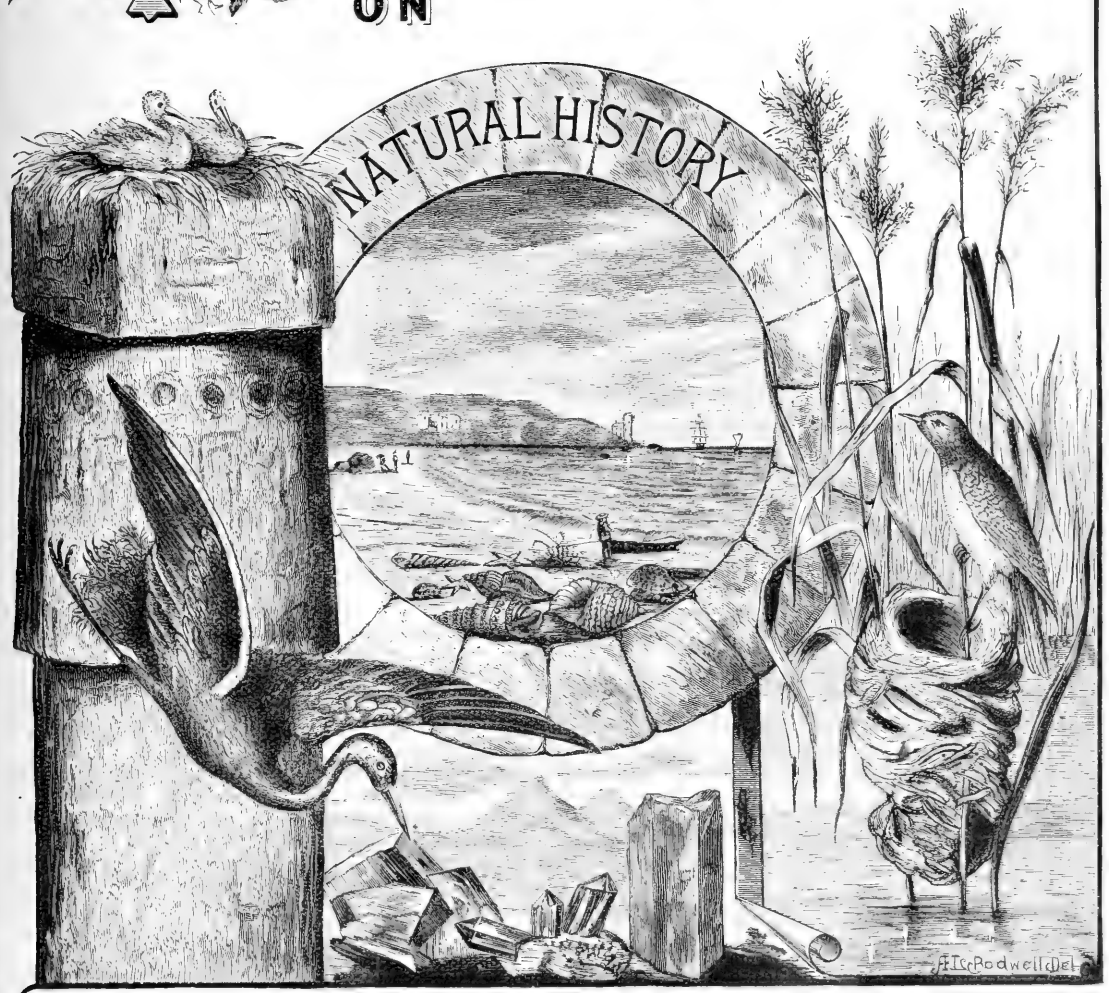
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NO. VI.

RANDOM NOTES

ON



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Random Notes on Natural History.

Vol. III.

PROVIDENCE, JUNE 1, 1886.

No. 6.

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UNDER date of July, 1885, the United States Department of Agriculture issued a list of questions on "Economic Ornithology." As to whether the presence of certain species of birds were of benefit to the agriculturist, and the effect of population upon bird life.

A recent perusal of this list has led to the following random notes:

The evidence as to whether crows steal eggs so far as our personal experience goes, seems circumstantially to indicate that they do, such as observing crows about the neighborhood, and finding nests rifled afterwards. On the farm of Mr. G. M. Gray, Warren, R. I., a hen stole a nest in a piece of woods not far from the house. This was followed by an especial congregating of crows in that neighborhood, but out of regard for the hen and a financial interest in her brood, the crows were raided and frightened away several times. At another time Mr. Gray was the happy possessor of a tame crow. A brood of young chicks was confined within the circle of the rim of a cheese-box, this placed on the ground and covered with a strong netting proved a capital nursery, until these conditions were discovered by the crow, who excavated under the edge of the box, and as a luckless chick making the circuit of his prison-house fell into the pit he was seized by the legs, drawn forth, and devoured. On account of this proof of a calculating mind the crow was killed, he having previously proved his ability at stealing hens' eggs. Though I have no absolute data at hand, I am satisfied that at certain seasons crows confer some benefit on the Rhode Island farmers by eating from

the fields and newly plowed land beetles and insect larvæ. A little later, after the corn is planted or has sprouted to a length of about two inches, these same birds together with the crow blackbirds or purple grackles, levy toll by pulling it up. To prevent this many of the Rhode Island farmers moist their seed with thin tar, mixing it with flour or something to overcome the stickiness. In other cases strings are stretched across the fields and hung with white rags, and now and then a dead crow. The first remedy is said to be quite efficacious, the second seems to meet with varied success. In the fall, when the corn is ripe, the grackles light in considerable numbers on the stalks and quickly husk out the ears doing considerable damage after a time.

In Rhode Island we have an abundance of salt water shore with muddy flats, as well as fresh ponds and rivers. The crows are there enabled to obtain many mollusks which are palatable to them, and perhaps the abundance of this food is of much advantage, their appetite being satisfied with less need of the farmers' grain.

The common report seems to be that the English sparrow drives away bluebirds, martins, indigo buntings, &c. Certainly on and about my own premises they have multiplied seriously, and the more interesting species have appeared less frequently for the past two or three years. We have an occasional robin, vireo, and chipping sparrow, but the foreigners are in the large majority with their incessant unmusical chip; their perpetual quarrels, their unsightly nests, and the dirty evidences of their presence. I have this spring observed them pecking vigorously at the buds of my sapsou apple tree, but as I did not shoot any for dissection I cannot positively say but what they found insects there.

Robins, cat-birds, and brown-thrashers, do certainly eat small fruits. At Mr. Gray's farm a nice strawberry patch is very convenient to a grape arbor, and in the shade of this arbor the filled boxes of berries were

usually set away for a time as the picking went on. So sure as a box was left open, one or all three of the aforementioned would sneak in, pick out the best fruit, and even scatter it about, working well down into the box in search of choicer morsels; but for their generally good behavior and the sweet songs of the cat-birds and thrushes they were very seldom molested.

That beautiful bird the cedar waxwing eats some cherries; he also eats the canker worms; few of the birds molest the hairy larvae, like tent caterpillars, but I have several times seen the yellow-billed cuckoo, with his whole head thrust into one of their nests doing apparently rapid execution. Mr. Charles Snow, of Taunton, is my authority for the fact that potato-beetles are eaten by the night-hawk.

The effect of settlement in Rhode Island *i. e.*, manufacturing villages principally, is certainly tending to drive away many birds, especially on account of the cutting away of the wood-land, and, in general, the abundance of enterprising boys and cats. Perhaps it is unfortunate for the birds that excellent shot-guns can be purchased at so low a figure. It is true that we have here a law (full too much of it) to protect the birds. It is, however, a dead letter, and never enforced. A little secrecy is maintained about shooting game out of season, but so soon as the closed season is over the gentleman sportsman goes forth and shoots without mercy, frequently for the gratification of killing, with no consideration of his appetite or intention of eating one-half his game. Witness the quantities of mergansers and other tough and unpalatable ducks slaughtered by hundreds, and never even picked up from where they fall. The same is true of gulls, terns, loons, grebe, and herons, never allowed to pass without trying a wing shot. I believe as many nice birds have been thus shot and thrown away as have been collected for business purposes.

MR. JAMES M. SOUTHWICK.

DEAR SIR: Referring to Mr. William G. Smith's article on *Myiadestes Townsendi*, in April *RANDOM NOTES ON NATURAL HISTORY*, I will say that he is mistaken regarding the first capture. The nest and *eggs* of this bird were first taken in 1874, I think.

I have an account of it somewhere in my papers, but cannot find it now. In 1882 and '83, I collected twelve sets of the same species in Colorado. The bluebirds arrived here March 15. About ten days ago a pair of them excavated a hole in a dead cherry limb. To-day they have commenced carrying in material for their nest. They arrived ten days, and began nesting seven days earlier than in 1885.

Respectfully yours,

D. D. STONE.

OSWEGO, N. Y., April 13, 1886.

Seasonable Notes.

EARLY morning rambles a few miles to the north of Providence, have led to observations of new arrivals as follows: April 20, a Pine Creeping Warbler; April 26, Towhee Buntings; April 29, Black and White Creepers. (May 1, Spotted Sandpipers, at Bristol, R. I.); May 3, Nashville Warblers and Chipping Sparrows; May 4, Whippoorwill, Wood Thrushes and Golden Crown Thrush, or Oven Bird; May 5, Cat-birds; May 6, Yellow Warbler, Rose-breasted Grosbeak, Chestnut-sided and Prairie Warblers, Wilson's Thrush, Swamp Sparrows and Maryland Yellow-throats; May 7, Yellow-breasted Chats, Least Flycatchers, Redstarts, Yellow-throated Vireo, Baltimore Orioles and Tanagers; May 10, Ruby-throated Humming-bird; May 12, Great Crested Flycatcher; May 17, Indigo Buntings.

From Attleboro, Mass., a set of Red-shouldered Hawk's eggs reported April 8. April 10, a nest with two young and two eggs of Barred Owl, and on the 14th a nest with two fresh eggs; May 6, two young of the Great Horned Owl nearly ready to fly were brought to me from Scituate, R. I.; May 13, a set of Song Sparrows observed; May 18, a nest of Golden-crown Thrush not quite completed.

NEWPORT NATURAL HISTORY SOCIETY.—

At the annual meeting of this society held at Newport, R. I., 6th May last, there were some remarks in the curator's report as to the immense superiority of complete or even incomplete series of specimens above strange and abnormal forms which are too

often presented by well-meaning donors. The importance of these remarks leads us to quote that portion of Mr. A. O'D. Taylor's report, which embodies them. They are worthy of note for all local museums wherever contemplated. The report says: "During the twelve months under review various donations have been received, and have been regularly acknowledged in the public newspapers, so that a detailed list of donors and contributions need not be recapitulated. Objects have been presented from the various departments of mineralogy, conchology, botany, and zoölogy, while articles of ethnological and archæological interest have occasionally made their appearance. Isolated specimens, however, when selected and presented, as they often are, because of their deviation from the normal type, do not—however interesting in their peculiarities—convey the knowledge derivable from complete series of specimens which would fairly represent the links of development in groups of organic life, and the various gradations in inorganic structures. Such typical series or sets of collections are still wanted. In order that our collections should become of real value and of practical aid in the study of natural history, we must have different series of connected and related specimens; if not completed, at any rate becoming intelligently shaped towards completion. We must emerge from the rudimentary stage indicated by a random assemblage of curiosities, and aim at procuring representative series illustrative of our local fauna and flora, and of the geological formation and minerals of our neighborhood. Even at the risk of repeating the leading thought behind the suggestions of my first report, I take the liberty of urging this essential on the consideration of our members and friends."

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XX.

Plethodon glutinosus, Baird, (*Salamandra glutinosus*, Green). The Slimy, or Blue spotted Salamander was originally described by Professor Green from a specimen captured at Pittsburg, Penn., and later on received the attention of Dr. Storer, who received a specimen from Andover, Mass.

As we have never captured the form in Rhode Island we can do no better than give the description from this latter naturalist: "Length, six inches. Whole upper part of the body of a very dark brown, thickly sprinkled with distinct light blue spots. Sides appearing quite light colored from the blue spots having become confluent. Abdomen lighter colored than the back, exhibiting the spots more numerous and distinct than the back. Head, three-quarters of an inch long; nearly half an inch wide, flattened above. Eyes very prominent; of a deep black color, widely separated from each other. Nostrils rather small. Legs, co or of the body, and spotted like it. Anterior feet, four-toed; posterior, five-toed, and unusually long. Tail, length of the body; much compressed throughout its whole extent, save the extremities, the anterior of which is circular, the posterior pointed."

The description given above agrees well with that given by later herpetologists, except that attention has been drawn to the fact that the tail becomes much compressed in alcoholic specimens, giving to it a prominent keel above and below. Indeed, so much does alcohol change the form and coloring of these soft bodied animals, that unless one is familiar with the live specimens, gross mistakes will occur in the study of those preserved.

Dr. Holbrook mentions the Blue Spotted as the most abundant salamander of North America, often several individuals being captured under the decaying bark of some prostrate log. With us it is sure'y an uncommon animal, and the same may be said of its distribution in Massachusetts. It is not reported from Maine, though Professor Packard assures me he has met with it in Labrador. Farther south and west it is quite abundant, and specimens have been captured in Texas and Wisconsin, showing it to be a well distributed form. Of the animal's breeding habits nothing is known.

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*.

Native Forest Trees of Rhode Island.

No. XV.

BY L. W. RUSSELL.

CARYA TOMENTOSA.—MOCKER-NUT HICKORY.

C. tomentosa, commonly known as the mocker-nut, is frequently seen in certain localities in Rhode Island. There are some finely developed trees of this species upon the rocky ridges in the vicinity of Diamond Hill. This tree, when well developed, is a more stately and graceful object than the shell-bark hickory. Its trunk is erect and tall, its head pyramidal in general outline, yet varying enough to avoid stiffness. The branches are of moderate size, forming sharp angles with the main stem. The bark differs from that of the shell-bark in not having long, loose scales, and being arranged in ridges made by close, deep furrows. The recent shoots are stout, terminated by large, round buds, covered with prominent downy scales: The male flowers appear upon catkins grouped in threes, three to six inches long, the middle one being the longest. The fertile flowers are small and are composed of a four-parted calyx, from which spring two ragged stamens. The leaves are conspicuously large, often twenty inches in length, and composed of seven to nine obovate, slightly serrated leaflets, downy underneath. The fruit is large, thick shelled, varying much in shape, sometimes four-angled, giving rise to the name "square-nut." The kernel is small compared with the whole fruit, and although edible is far inferior to that of the shell-bark. A characteristic of the leaves, of service in identifying the tree, is their strong resinous odor, particularly when they are young. The wood has the prominent characteristics of the genus but is not easily cleft, and is not quite as tough as that of one or two other species of the genus. It is difficult to distinguish the woods of the different hickories, but the buds, leaves, fruit, and bark of the different species show characteristics sufficient for easy identification.

CARYA GLABRA.—PIG-NUT HICKORY.

C. glabra, or the pig-nut hickory, is commonly diffused in Rhode Island. It is a beautiful tree, with a shapely, cylindrical

head, having a bright, glossy green foliage, erect and stately, making a fine landscape adornment. It grows in company with *C. alba* and *C. tomentosa*, but to most observers is a more attractive tree than the others. The bark is of a lighter grey than that of those described. On young trees it is broken into small ridged masses, but, generally speaking the bark is smooth. It is not uncommon to find patches of yellowish lichens upon the trunks of old trees and sometimes plates of loose bark appear as with the shell-bark. The branches are small, lower ones but slightly curved upwards; the buds small, egg-shaped and pointed. The leaves are small compared with those of the two preceding species, smooth on both sides, five to seven leaflets, sessile and narrow, tapering at both ends. The terminal one is obovate and upon a short footstalk. In autumn the leaves turn to a rich orange. Those of the shell-bark drop early and without coloring. The fruit of the *C. glabra* is fig-shaped. Wilson Flagg in his *Woods and By-Ways of New England*, says that the original name of the fruit was "fig-nut," and that "pig-nut" is a corruption of the former. He thereby recommends a restoration of the name "fig-nut." It should be observed that the nuts vary much in size and shape upon different trees; but they are usually thick-shelled and smooth, and of bluish grey color. The meat is scant, difficult to get out and scarcely edible when obtained. It grows singly, or in bunches of two to four, and is very abundant. The tree grows to a large size and from the compactness, toughness, and elasticity of its wood it is highly valued as a timber tree. As fuel the wood is scarcely inferior to that of the shell-bark. There are many beautiful specimens of this tree in the vicinity of Providence and in other parts of the state.

The Topographical Survey.

"THE finance committee of the House has given a hearing upon the matter of the proposed topographical survey of the state. The plan proposed is the same as at present adopted in Massachusetts, where a survey is being made in connection with the Government." That such a survey be made is eminently desirable.

The Block Island Cod and Haddock Fishery.

FRESH cod and haddock from the Block Island fishing-grounds have arrived in Providence in large quantities in the past two weeks. During last week alone the amount landed here was over 40,000 pounds, and the receipts will probably continue quite large for two or three weeks to come, as the present season will last through the month of May. This kind of fish is caught about twenty or thirty miles southeast of Block Island, whence it is brought here and sold off the boats at the dock for four cents per pound. The fish have been of good size, have arrived here in good condition, and have sold quite readily. There are two seasons for fresh cod and haddock,—the present one, which, as before stated, will last through the month of May, and the fall season, which begins with the month of November, and continues until about the middle of December. The fish are caught in trawls. A trawl consists of a string of line that will reach from 600 to 1,000 yards. To this string lines are attached about six feet apart. On the end of each of these lines is a hook, baited with clams, fresh herring, or flounders. On each end of the long string to which the lines are attached, is an anchor, which keeps the trawl in position. A line reaches from the anchor to the top of the water, with a buoy attached to it, for the purpose of locating the trawl. A trawl 1,000 yards long usually has from 1,500 to 2,000 hooks. When two-thirds of these hooks secure a fish, the catch is considered an excellent one, and when half of them are filled it is a very good one. The fisherman after he has dropped his anchor, rows off and strings his line along with its baited hooks until he comes to the "end of his rope," when he drops another anchor with the buoy attached, and the trawl is set. It is allowed to remain in the water from four to twenty-four hours. The fishermen then go to the buoy, pull up the anchor, and haul in the line, taking the fish off as the hooks come to the surface of the water. While they take off the fish the line is allowed to go over the other side of the boat into the water, so that when they have reached the other end of the string and the last hook is hauled up, the remainder of the string of lines is already set for a new catch. This

is a busy season for the Block Island fishermen, and a great many are now engaged in that kind of fishing.—*From the Sunday Journal, May 2, 1886.*

About Cleaning Oily Specimens of Lepidoptera, etc.

BY PH. FISCHER, BUFFALO, N. Y.

If a specimen becomes oily, it is generally believed that its beauty can never again be restored; but with a trifling cost and a little labor any specimen will in a short time have again its former lustre, without injury to the insect. This remedy has been tried on the most tender Diurnals, as well as on Sphingids and Noctuids. It can be used on every insect. Should a specimen be oily throughout, body and wings, it may be put in the following fluid: One part of sulphuric ether to two parts of the strongest alcohol, and left therein for about twenty-four hours. Should the specimen be very oily, another bath may have to be applied.

Should this second bath, after removing the insect, be only slightly discolored, the insect may be put in the last bath, which consists of pure sulphuric ether, in which it is left a few hours only. After being taken out and partly dried, it is put on the spreading-board.

Another way of cleaning specimens, where only the wings are oily, is this: The specimen is put on the spreading-board, under side up, without fastening it in any way, and the purest spirits of turpentine poured on it to fully soak the wings, after which finely-powdered pipe clay is strewn thickly over the affected parts, and this left to dry. Should the clay, after being dry, be yellow, the oil is not all out of the wings, and the above has to be renewed. Should the clay be perfectly white after drying, it can be relied upon that every particle of the fatty matter is drawn out of the wings. To remove the clay it need a little experience, though any one can do it with a little care. Hold your specimen on the upper part of the pin, and give the pin a little jerk near the point, and the clay, being brittle, will easily fall off. After it is all removed the specimen may be brushed off with a fine camel hair-brush until clean. A specimen treated in the above ways will never again become oily.—*The Canadian Entomologist, April, 1886.*

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXIX.

SINCE writing the last chapter for the May number of RANDOM NOTES, I have received from Mr. John H. Thomson, of New Bedford, Mass., a pamphlet published by him, entitled *The Land Mollusca of Bristol County, Mass.* The portion of the county explored by him comprises the city of New Bedford, the towns of Dartmouth and Westport, together with the adjoining town of Tiverton, R. I. The climate of Tiverton, Newport, and the other towns of Southern Rhode Island, differs from that of Cumberland, Smithfield, etc., although only forty miles apart, more than many sections of the country separated by hundreds of miles. The flora, too, is very different and it is not surprising that the fauna should differ as well. In fact, Mr. Thomson has discovered in the dense woods of Tiverton, several species of land shells not before known to inhabit this state. I am sorry not to have seen this pamphlet before, as I should then have given Mr. Thomson credit for these species, and described them in their proper places. I will therefore describe those species which have been omitted up to this point in the classification, and then proceed as usual, giving him proper credit for the remaining species.

94. ZONITES (HYALINIA) NITIDA, MÜLL. *Syns.:*

Helix nitida, Müller, 1774, non Gme.
nor Drap.

“ *succinea*, Studer, 1789, non Müll.

“ *lucida*, Drap., 1805.

Helicella nitida, Risso., 1826.

Oxychilus lucidus, Fitz., 1833.

Polita lucida, Held., 1837.

Zonites lucidus, Gray, 1840.

Aplostoma nitidus, Moq-Tan., 1855.

Hyalina nitida, Tryon, 1866. W. G.
Binney, 1869.

Shell depressed, moderately convex above, and concave below, brownish horn color, whorls four and a half; umbilicus moderate but deep; aperture rounded. More conical and a little larger than *H. arborea*, Say. Inhabits Central and South-

ern Europe, Great Britain, and British America.

It was first discovered in the United States by Dr. Ingalls at Greenwich, N. Y., who called it *Helix hygrophila*. It was afterward found to be one of the few European species common to both continents. It is known to English gardeners from its habit of infesting pine beds and orchid houses. It has until now been quoted only from Ohio and New York in this country. I have collected it at Sandusky City on the shore of Lake Erie. Mr. Thomson finds it in Tiverton, R. I., on the rocky heights west of Stafford Lake.

95. ZONITES (GASTRODONTA) MULTIDENTATA, BINNEY.

Shell depressed, yellowish horn color, thin, smooth, and pellucid; whorls six; aperture transverse, narrow; from two to four rows of five or six minute, white teeth; each are seen through the shell, radiating from the umbilicus; teeth situated far within, and the last row not visible from the aperture. Diameter one-eighth of an inch, height one-sixteenth.

Quoted from Maine, Vermont, New York, and Ohio. Mr. Thomson finds it on high ridges in Tiverton and Westport. “Very rare.”

96. ZONITES (STRIATURA) FERREA, MORSE.

Shell depressed, not shining, steel gray; whorls three, rapidly enlarging; aperture large, rounded; umbilicus small and abrupt, showing all the volutions; surface minutely marked with fine revolving lines. Diameter one-tenth of an inch, height one-twentieth.

This species was discovered by Prof. E. S. Morse in Maine, and was described by him in *Proc. Portland Soc. Nat. Hist.*, 1., 17, 1864. It has been found in Maine, Massachusetts, and New York. Mr. Thomson finds it on Tiverton “rocky ridge.” “Very rare.”

97. PATULA (PLANOGYRA) ASTERISCUS, MORSE.

Shell light brown; whorls four, banded by from twenty-five to thirty thin, transparent, prominent ribs; spire flat; suture deep; lip sharp; umbilicus large. Diameter one-sixteenth of an inch.

Discovered by Professor Morse in Maine; described in *Proc. Boston Nat. Hist.*, vi., 128, 1857. Quoted from Gaspe, C. E., Lake Superior, Hudson River, N. Y., Salem, Mass., and near Portland, Me. Morse says: "It is a rare shell, and seems confined to wet and boggy ground where spruce and pine is intermingled with alder." Mr. Thomson says: "Westport. Very rare; under dead maple leaves near swampy places."

98. *PATULA (ACANTHINULA) HARPA*, SAY.
Syns.:

Helix harpa, Say, 1824.

Pupa costulata, Mighels, 1844.

Bulimus harpa, Pfr., Chem., Reeve, Binney.

Zoögenetes harpa, Morse, 1864.

Zoögenetes, Morse, 1864, is a synonym of *Acanthinula*, Beck., 1846.

Shell ovate-conic, light horn color, thin and elastic; whorls four, the last two marked by thin prominent ribs; suture distinct; aperture nearly round; lip sharp. Length one-eighth of an inch.

This species is one of the very few exceptions among land snails in which the young are brought forth alive. They are hatched from eggs, but the eggs are retained within the parent when this takes place.

It was first discovered in the Northwest Territory, by Thomas Say, on the expedition to St. Peter's River. L. L. Thaxter has found it at Ascutney, Vt. Morse found it in various parts of Maine and it is quite common near Portland in hard wood groves. Tryon quotes it from Maine to Iowa. It is said to inhabit British America, Norway, Sweden, and Lapland. Mr. Thomson finds it in Westport and Tiverton in groves of maples among leaves and moss.

Patula (Anguispira) alternata, Say, described in the April number of *RANDOM NOTES*, is subject to much variety in both color and outline. A coarsely striated form, with a well-developed carina is called var. *mordax*, Shuttleworth, and a perfectly colorless variety called *alba*, Tryon, has been found by Morse in Maine, and by Currier in Michigan, while another form, smooth and never carinated, with a shining translucent epidermis, has been found in New York and called var. *fergusonii*, Bland. This variety has also been found by Mr.

Thomson in Westport, Mass., and in Tiverton, R. I.

99. *STENOTREMA MONODON*, RACKETT, 1822.

Shell light russet; whorls five to six; aperture flattened; lip narrow and turned back. On the inner lip is a white tooth. The shell is covered with minute hairs which give the surface a velvety appearance. In the typical species the whorls revolve around the axis at such a distance as to leave a wide and deep umbilicus, while in a variety called *fraterna*, Say, they revolve close together and the reflected peristome covers the umbilicus, which in this variety is a mere perforation. It is said to inhabit the whole country east of the Rocky Mountains. Mr. Thomson finds both the typical *monodon* and the var. *fraterna* in Tiverton, R. I., in old orchards and pastures.

100. *MESODON SAYII*, BINNEY.

Shell depressed and thin, color shining russet; whorls five or six; aperture rounded, bordered by a narrow white lip, with a slight protecting tooth near the umbilicus. The umbilicus is open, showing all the volutions. On the inner lip is a strong white tooth. Diameter nearly one inch. It is quite a rare shell, but inhabits from Maine to Illinois and southwards to Pennsylvania, and prefers hill sides and mountains. Mr. Thomson finds it in Westport and Tiverton. Very rare, only near streams of water.

101. *MESODON WHEATLEYI*, BLAND.

Shell conoidally globose, thin, hirsute; whorls five and a half; aperture obliquely lunate, the parietal wall armed with a tooth; umbilical region excavated, but imperforate. Reddish horn colored, the lip rose colored. Diameter fourteen, height seven millimeters. The only localities known heretofore are the mountains in Cherokee County, N. C. Mr. Thomson finds it rare at Tiverton "rocky ridge," with *Striatura ferrea*, Morse, a thousand miles north of its only known locality.

(To be continued.)

THE new *Egg Checking-List*, and description of birds' nests and eggs, by Mr. Oliver Davie, unavoidably delayed for several months, is now issued. See adv. page xxiii.

CHECK-LIST OF GENUS CLAUSILIA. V.

J. RITCHIE, JR.

Clausilia pygmaea Möll.
 quadriplicata Parr.
 raddei Siev.
 raricosta Boettger.
 raymondi Bourg.
 reeviana Pfr.
 regalis Parr.
 regularis Parr.
 retusa Olivier.
 robusta Küst.
 rolphi Leach.
 rothi Zelebor.
 rotundata Parr.
 rubicunda Küst.
 rudis Pfr.
 rufocincta Küst.
 rufospira Parr.
 rugicollis Ziegler.
 rugilabris Mouss.
 rugosa Drap.
 rugulosa Küst.
 rufila Küst.
 saccata Küst.
 sacrificata Benoit.
 sancta Bourg.
 sandbergeri Rossm.
 sandrii Küst.
 satura Ziegler.
 saxatilis Parr.
 saxicola Parr.
 scalaris Pfr.
 schmidti Pfr.
 schuchi Voith.
 schwerenbachii Parr.
 scolopax Küst.
 scopulosa Parr.
 sebenicensis Vidov.
 sejuncta Westerlund.
 semicincta Boettger.
 semicostata Küst.
 semidenticulata Pfr.
 semilabiata Kutsch.
 semilamellata Mouss.
 semirugata Ziegler.
 senilis Ziegler.
 septemplicata Phil.
 serbica Möll.
 sericata Pfr.
 serrulata Middend.
 shanghaiensis Pfr.
 sheridani Pfr.
 sieboldi Pfr.

Clausilia sieversi Mouss.
 silesiaca A. Schmidt.
 sirkii Parr.
 slosarski Lubow.
 solida Drap.
 solidula Pfr.
 soluta Küst.
 somechetica Pfr.
 sores Küst.
 soror Küst.
 sororia Parr.
 sowerbyana Pfr.
 splendens Charp.
 spratti Pfr.
 stabilis Ziegler.
 stenzi Rossm.
 stigmatica Ziegler.
 stimpsoni A. Adams.
 stossichi Boettger.
 straminea Parr.
 straminicollis Parr.
 strangulata Fer.
 trauchi Boettger.
 striata Pfr.
 strigata Pfr.
 strigillata Mühlf.
 strigosa Kleciach.
 striolata Parr.
 strobili Porro.
 strumosa Friw.
 sturmi Küst.
 styriaca A. Schmidt.
 suberistata Küst.
 subcylindrica Ziegler.
 substricta Parr.
 subtilis Parr.
 subulata Pfr.
 subuliformis Küst.
 succineata Ziegler.
 sulcosa Wagner.
 sumatrana Martens.
 suturalis Küst.
 swinhoei Pfr.
 syracusana Phil.
 taczanowski Lubow.
 tau Boettger.
 taurica Kryn.
 tenella Parr.
 tenedricosa Küst.
 tenuicostata Pfr.
 tenuilabris Rossm.
 terebra Pfr.

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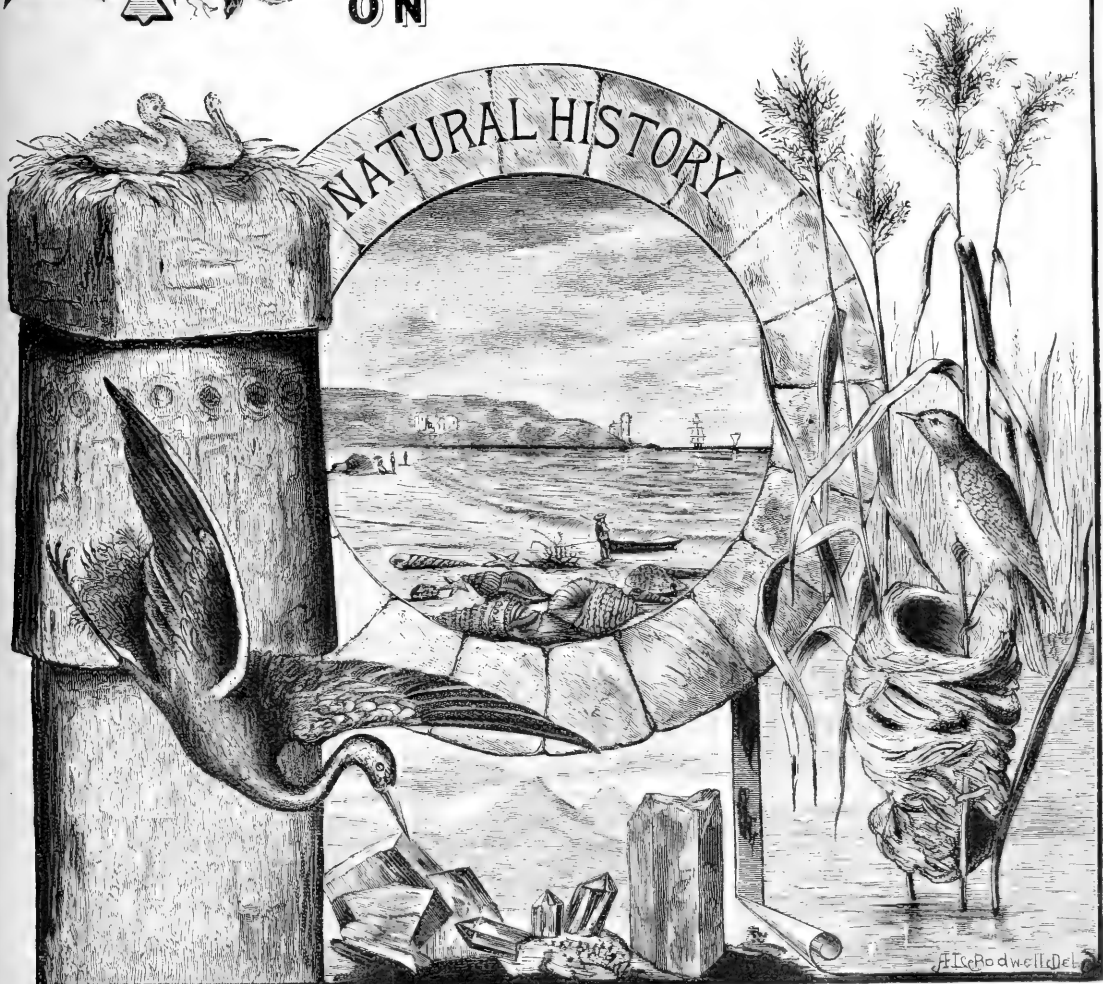
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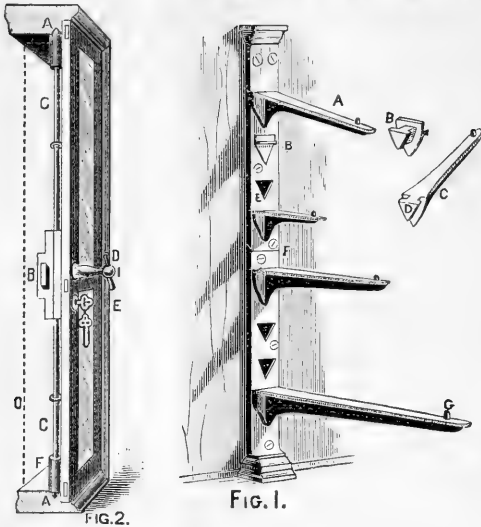
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A Visit to the Wolf Rocks.

THIS romantic and curious glen with its piles of gigantic boulders, called the Wolf Rocks, because they formerly, with little doubt, sheltered the wolf and other wild beasts, is situated partly in Kingston and partly in Exeter. The glen forms a deep ravine, which runs northwest and southeast, cutting across a long ridge or hill, forming one of the highest elevations in the town of Kingston. Leaving the Kingston railroad station a drive of two miles over a romantic road leads to a wood road or path to the rocks. The ravine is about fifty feet deep, the sides, especially on the north, quite deep and covered with enormous boulders, some of them ten or twelve feet in diameter. The glen is about an eighth of a mile long, and before reaching the eastern end the path makes a turn to the left and opens somewhat abruptly into an amphitheatre. Here the scene is most impressive, the side towards the northwest rising steeply some fifty or sixty feet at least, and paved with huge boulders as if cast down by Cyclopean hands. The Wolf Rocks may find their analogues in the White Mountains, but for Rhode Island presents a scene of unusual interest.

The boulders are large, not much rounded, and evidently had not traveled far from the parent rock. Some are of coarse granite, with a flesh-colored feldspar, like that quarried at Westerly; in others the feldspar is whitish, while many of the boulders are of a dark gneiss, and there is a large boulder of white quartz some four feet in diameter.

To explain the origin of the Wolf Rocks we shall have to go back to the glacial period, a time which had such a potent influence in shaping the scenery of New England.

At the beginning of the ice age the land stood so high above the sea that Long Island Sound and Narraganset Bay were dry land. Rhode Island, as well as southern New England, out to the Elizabeth, Block, and Long Islands, was mantled in ice, a sheet some three to five hundred feet in thickness. This sheet moved slowly from a little east of north, southward, as proved by the ice marks on Mount Pleasant in Providence, and on either side of the bay south of the city. The highest elevations were worn smooth and somewhat ground down, and the huge pile of debris formed a part of the great terminal moraine of the New England portion of the continental glacier.

If from the hasty examination made under the guidance of I. G. Peckham, Esq., and the Rev. Mr. Wells, of Kingston, our impressions are correct, the ravine or gorge containing the Wolf Rocks was formed before the ice sheet. The latter moving southward, pushing before it and also, perhaps, carrying on its broad back a load of boulders broken off from the ledges to the northward, dumped some of them into the ravine, partly filling it up, while others fell in as the ice melted. Such seems to be the story of these boulders. None of them appear to have been great travelers, and it would be a pleasant task for the local geologists or summer boarders in the pleasant village of Kingston to track them to their original birthplace. At all events, they are resting in a romantic glen, one of the wildest and most picturesque spots in the state.

P.

BROWN UNIVERSITY.

—*Providence Journal.*

Mr. I. M. THRASHER reports a Yellow-crowned Night Heron shot near Tiverton, R. I., about May 1st.

Silver Gar.

Tylosurus longirostris.

ABOUT June 2d several specimens of this fish were taken in the Barney River. One was brought for my examination. It measured twenty-three and one-half inches extreme length, and a cross section of the body was an egg shaped oval, one and seven-eighths inches across the longest measure.

The name "Gar" is said to be derived from a Saxon word meaning "needle," and in the Gulf of Mexico they are called "needle fish"; the form is strongly suggestive of the name, for the jaws extend into a narrow beak, set around with sharp conical teeth, the lower jaw was three-eighths of an inch longer than the upper and measured five and one-fourth inches. This inequality is said to occur only in matured specimens.

The general color above was a dark mottled and somewhat changeable green, lighter toward the sides, and all the under parts silvery; the skin very smooth and without scales; while from a median line drawn the length of the side, fine lines or indentations pointed diagonally backward. The dorsal fin, short and small, and nearly opposite of the ventral fin.

Mr. Newton Dexter informs me that he has captured this species in the Seekonk River, and he does not consider them at all rare in Rhode Island. The general habitat is from Massachusetts Bay to the Gulf of Mexico, northern Central America and in the West Indies.*

Observers state that the Gars swim rapidly with undulatory motion near the surface of the water, and seize upon such smaller fishes as associate in shoals.

The bones are green in color, which has a tendency to make the fish unpopular for food, but the flesh is said to be of fine flavor, and on the south coast of England a kindred species is taken in large quantities and esteemed a delicacy. There are three other North American species, one of these common in Southern California.

* *Natural History of Aquatic Animals*, Government Publication, page 458. U. S. Commissioner of Fish and Fisheries.

WHILE collecting, about one hundred miles north of Lawrence City, Wyoming Territory, I came across an old hollow pine, which had the appearance, by having some feathers around a hole about ten feet from the ground, of being inhabited. My friend climbed up and looked in, exclaiming, "Owls or snakes, but here goes," at the same time thrusting in his arm and pulling out by the head a duck, which proved to be a female, Barrows Golden Eye (*Bucephala islandica*). She was sitting on eight eggs, green in color, of uniform shape, and measuring two and one-half by one and five-eighths, which were far advanced in incubation. Two of them had the appearance of being frozen, as the shells were cracked and the contents protruding.

The next morning, June 3d, I had to break the ice on a pond near by to procure water for our camp. That day it snowed from daylight until dark; such weather was enough to chill a china egg, and I don't wonder at an unprotected duck's egg getting nipped.

W. C. SMITH.

A Florida 'Possum Hunt.

My friend and I were recently from the North, and our Southern neighbors had promised to take us on a 'possum hunt; so one clear December evening, just after sundown, we started. There were six of us, and four dogs. We were well, but variously armed. One had a spade, another an axe, a third a hoe, a fourth a heavy cudgel, my friend his double-barrel, and I brought up the rear with a lantern, which proved to be as useless as the formidable armature.

Having filled our pockets with oranges from a neighboring grove, we struck off into the "hammock," a term applied to the dense hard-wood forests as distinguished from pine land. The Southerners were disposed to regard my lantern as a superfluity, and I heard covert sneers at the "Yankee notion." To pay them I took care to hold it so that they should be as much as possible in the shadow as we stumbled through the underbrush in a long, irregular line. I secretly hoped, too, that one of them would step on a snake in the darkness, when I would come to the rescue with the light. But no such contingency occurred, and the moon rising, soon clouded my hopes.

After we had fairly got into the "hammock," the dogs were let loose, and we could hear them far away, their cries growing fainter and fainter, till, to my uneducated ears they were no longer audible. One dog showed a disposition to chase rabbits, which brought down many curses upon his head from our cracker guide. A halt was called when we reached an open space, and we were told, as our guide expressed it, that we were "gwine ter wait till the dogs done treed a 'possum."

I selected a log a little removed from the others, and with a Northerner's caution in regard to scorpions and centipedes, carefully inspected the log before trusting myself to it.

The hammocks of Florida are full of interest to a naturalist. Their fauna and flora are wonderfully varied. In the white moonlight, the trees, draped with winding sheets of "Florida Moss," looked ghostly enough to satisfy the cravings of the most supernatural. How different from our Northern forests—there, in the moonlight, every outline is clear cut, every leaf shows its shape, and the dark shadows suggest no thought of concealment,—here every decided outline is smothered by the long, gray twiners of the moss, and a shadow, as though of a unrepented sin hangs over the wood. I was gliding towards the reverie into which I am invariably drawn when in the presence of Mother Nature, when I was roughly awakened by a voice, shouting, "They've got him!" Every one was up in an instant, and then followed a wild rush of nearly a mile through the thick growth, over prostrate logs, and around "sinks," to where the dogs were yelling like mad at the foot of an immense oak—by far the largest tree in the neighborhood. A council of war was held—was it a 'possum or a 'coon; and how to get it down? It seemed to be popular opinion that if it was a 'coon, the game wasn't worth the candle, but as nothing could be seen in the thick branches, it was, of course, impossible to decide between *Didelphys* and *Procyon*.

Suddenly our guide, who had maintained a wise countenance when questioned concerning his opinion, exclaimed, "I see him!" There was a stampede to where he was standing, and six pairs of eyes greedily gazed at the tree-top. "I see him," he con-

tinued, "right onto thet fust big limb, and I reck'n its a 'possum." That settled the matter, though a young fellow did dare to remark *sotto voce*, "Derned if I reck'n its a 'possum. Never yit seed a 'possum take sich a big tree." The *ipse dixit* of the guide seemed to settle matters with the others, and the opinion of the "Northers" was, of course, not asked.

After some deliberation, and considerable "cursing" of the 'possum for choosing so big a tree, it was proposed to cut it down. After two rounds it became evident that, at the rate we were working, the tree would fall some time the next afternoon. A halt was called, and more deliberation. Finally a stout young fellow offered to climb the tree. This was something of an undertaking for the trunk was without a limb for over forty feet, and was, moreover, about twenty feet in circumference at the base. However, we felled a small oak near by against the larger, and by means of considerable "boosting," he at last reached the branches. The moon just then was obscured by clouds, so we could hardly see him, but we could hear him wondering where the "derned thing" was.

Suddenly a pistol shot from the tree-top broke the silence, then another, and another. "Got him?" No answer. Then another shot. "Got him?" Still no answer. The moon, breaking through the clouds at that instant, showed a heavy body clinging despairingly to the lowest limb. Another shot, and the body loosed its hold, and fell swiftly into the mass of excited dogs, where it would have been torn to pieces, had not the guide rushed in, and driven them off with heavy blows, and held up to our interested gaze—a 'coon!

The countenance of all dropped. I heard some one behind me exclaim, no longer *sotto voce*, "Derned if I reckon'd 'twas a 'possum. Never yit seed a 'possum take sich a big tree!"

We voted to give up the hunt that night, and turned homewards. The enterprising fellow who had worked so hard for his "'possum," slung the 'coon over his shoulder with rather a disappointed air. The last thing I heard as I turned in at our gate was, "Derned if I didn't reck'n that warn't no 'possum!"

HENRY A. KELLY.

BELLEVEU, FLA.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXI.

Amblystoma punctatum Linn., (*Salamandra venenosa* Barton, *Salamandra sub-violacea*, Harlan). The violet colored, or spotted Salamander, though not particularly abundant, has nevertheless been many times observed by those interested in nature, attracting attention because of its considerable size and brilliant markings of yellow on an apparently black field. More specifically, the entire upper parts are of a bluish black, fading to black on the jaws and sides of the head. A violet or purple tint appears below, and extends from the chin to the top of the tail. The bright yellow or orange spots are large and oval, and are variously distributed in different individuals. Generally the head bears four or five, which appear at the back of each orbit and behind the temples, while those of the body are arranged along each side in a more or less obvious row, to extend on the tail. The limbs often bear one or two smaller spots.

In size, the Spotted Salamander is larger and more bulky than those hitherto treated. It often measures five inches in length, and I have seen a specimen that exceeded seven inches. The feet are of considerable size, and are of use in walking only, being unprovided with webs. The posterior pair are the larger, and of the five toes the third and fourth are largest. Other structural though generic peculiarities are the ossified tarsus, and caspus or ankle and wrist joints, the fish-like vertebrae, these having their centre hollowed out anteriorly and posteriorly, and the large thick tongue, attached at its base and free only along the margin. The tongue is more or less folded, the folds starting from a posteriorly placed centre, and radiating anteriorly. The lateral folds of the body are eleven in number.

This species was probably first described by an American naturalist in 1803, when Dr. Barton exhibited a living specimen before the Am. Phil. Soc., though no definite description was then drawn up. Later on it seems that some person gave an account of the animal to Rafinesque, who sent a description to Daudin, who published it in his work under the name *S. venenosa*

imposed by Barton. Barton finally published his description of the animal, calling it *S. sub-violacea*, a name acknowledged by Harlan. Long before this, however, Linné had, in the Old World, described the form, and his name is that now adopted by right of priority. We thus see the confusion that may arise from the too hasty description of supposed new forms.

In its habits the present species is nocturnal, being found during the day-time hid away under rocks and decaying trees. Not unfrequently it is found in some post-hole or well, into which it has fallen, and is unable to make good its escape. If exposed to the rays of the sun it soon shrivels up and dies; indeed, so necessary is moisture to this animal, that it seems to be provided with a special series of glands from which exude, through pores in the skin, a milky fluid. These are quite readily seen in a healthy individual, on the head there being several clusters.

Crocodile — Alligator.

THE distinction between Crocodiles and Alligators is based on the shape of the head, which in the crocodile is long, tapering to a narrow snout, in the alligator flat and broad; but particularly on the fact that the long canine teeth in the lower jaw of the alligator fit into well-defined pits in the upper jaw. These are represented in the crocodile simply as notches. Our most common species is Alligator mississippiensis, and is restricted, I am informed, to the southeastern portions of the United States, while several species occur southward to South America, and a new species is lately reported from China. Crocodiles also occur in Florida, and their many representatives are found in the West Indies, South America, all over Africa, in India, and the East India Islands.

Among crocodiles in general there is a separation between the plates of the head and back, but in the Gavial found in India, and which is said to grow to be nineteen or twenty feet long, the plates are uninterrupted, and in the old males there occurs a prominent and curious swelling at the end of the nose. The prominent species in South America is called a Cayman.

Native Forest Trees of Rhode Island.

No. XVI.

BY L. W. RUSSELL.

Carya amara.—The bitternut Hickory.

C. amara, or the bitternut hickory, is not common in Rhode Island. There are specimens in the groves in the vicinity of Saylesville, but few which are well developed. As an ornamental tree, it is the finest of the hickories. In the open grounds favorable to its growth, it attains the height of sixty or seventy feet, with a semi-orbicular head, sometimes assuming the columnar form, stately and noble in its proportions. The limbs are lithe and slender, starting from a central stem, which tapers gradually from the roots to the top. The spray is fine, and the leaves are on stems correspondingly small. The leaflets vary from seven to eleven, and are small, narrow, unequalateral and smooth on both sides. The characteristics named give the tree an airy gracefulness, which renders it highly attractive. In the autumn the tree is still more beautiful from the rich tints of orange which appear on the foliage.

The buds show characteristics by which the tree may be readily identified. They are small, the terminal ones flattened, curved, and considerably lengthened, while the axillary ones are short and rounded.

The fruit furnishes the easiest means of identification. It is small, thin shelled, and noticeable for the winged edges of the seams. The nuts can easily be crushed in the fingers, while the meat is so bitter as to be inedible, squirrels and boys alike refusing them.

The bark is usually smooth with an occasional loose flake upon old trees. It dyes a permanent yellow, and was much used by the Indians in coloring. The wood contains the excellent qualities of the other hickories, from which it is not usually distinguished. The hickories are distinctly American, their place being taken in Europe by the walnuts.

THE BUTTERNUT.—*Juglans cinerea*.

This stately tree is closely allied to the

hickories. It is a native of Rhode Island, but not common. There are a few fine native specimens in the vicinity of Stump Hill. They are also seen in the yards, or in the vicinity of old farm houses, where they have been planted for their nuts and shade. The tree does not grow nearly as dense a head as the hickories, and lacks the grace which belongs to some of them. Still, in spots where there is ample room for its wide spread, it is a very desirable tree to plant.

No one is liable to mistake the butternut for any other tree, unless it be for the black walnut, *J. nigra*. The body grows to a large size, frequently four feet in diameter. The limbs are few and stout, the branchlets being stiff to the ends. The limbs are long, the lower ones nearly horizontal. The bark is gray, smooth on young trees, somewhat ridged on old trunks. It has long been used for coloring shades of brown.

The sterile flowers are seen in May in large green catkins, six or seven inches long. The fertile flowers are upon terminal downy stalks, two to seven in a bunch. The well-known fruit ripens in October. If properly dried, it yields a sweet, edible meat, but too oily for healthfulness. The wood is light, slightly tinged with pink. It works very smooth in finishing, and is coming into high repute for cabinet work and nice inside work for dwellings. As the tree grows very rapidly, the planting of it for timber is worthy of consideration.

“THE WOODCHUCK.—Woodchucks is a very curious animal. It is made of hair and eyes and has two front teeth, and can see a man with a gun when his eyes are shut and bolted. I have seen a dog shake a woodchuck till both were black in the face. A woodchuck can snivel up his nose, show his teeth and look as homely as I can without trying. They sit on one end and eat with the other. A woodchuck can get home faster than a gun can shoot. He is round all over, except his feet which are black. When eaten they retain the flavor of their nests, and seem to be cooked without being pared. A fat woodchuck, when eat properly is no laughin' matter. They come under the head of “domestic animals,” and think their ain't no place like home when a dog goes for 'em.”

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXX.

FAMILY Achatinellidæ, three genera, fourteen sub-genera, and about three hundred and fifty species of beautifully colored shells, confined almost exclusively to the Sandwich Islands.

Family Cylindrellidæ, four genera, seventeen sub-genera, and over two hundred species, inhabits the West Indies and Tropical America.

Family Pupidæ, consists of eight genera, the largest of which, *Clausilia*, has seven hundred species, none of which inhabit the United States; the next largest, *Pupa*, with about four hundred species, distributed among twenty sub-genera, is represented in Rhode Island by two sub-genera, and the genus *Vertigo*, with one hundred species, by seven species in North America, six of which are found in or near Rhode Island.

GENUS PUPA, LAM., 1801.

Shell small, cylindrical or ovate-oblong; umbilicus slight; plicate, striate or costellate, brown horn-color; lip reflected, dentate or plicate within; columella the same, the extremities usually joined by a raised callus.

The genus is divided into nineteen sub-genera, only two of which are represented in the United States. They are *Leucochila*, with eight species, and *Pupilla*, with seventy-seven. Both of these sub-genera contain species which inhabit Rhode Island.

102. PUPA (LEUCOCHILA) ARMIFERA, SAY.

Shell cylindrical-oblong; apex obtuse; whorls six or seven, smooth, convex; aperture small; lip reflected, much thickened within; teeth four to five, the largest being bifid, starting from the body whorl, at the superior margin of the aperture; umbilicus perforated. Length, one-sixth of an inch; breadth, one-eighth.

This is the largest species of the sub-genus found in this country, and is easily distinguished by its waxy white color, and its peculiar bifid tooth. It has been quoted as abundant in the Middle and Western States, extending as far east as Vermont,

where it has been found on the shores of Lake Champlain. Mr. Thomson has found it in Tiverton, R. I., near the shore of Stafford Lake. "Rare."

103. PUPA (LEUCOCHILA) CONTRACTA, SAY.

A widely distributed species, inhabiting from Maine to Florida, and westward to Iowa and Texas. It is not a very common shell in New England, but is found under the bark of decaying logs and stumps. Morse says: "Found in beech groves under bits of rotten bark." It has been found on piles of old bricks. It has six whorls, gradually tapering to a not very obtuse apex. It is of a whitish color, translucent and distinctly umbilicated. The lip is broadly reflected, and the aperture is nearly closed by four strong teeth, one of which, situated on the columella, is spoon shaped, and contracts the mouth so that it resembles a horse shoe in shape. The mouth is so filled up by these teeth that it seems strange how the animal can protrude its body at all through the irregular and minute spaces between. Its length is one-tenth of an inch, and its breadth one-twentieth.

104. PUPA (LEUCOCHILA) CORTICARICA, SAY.

Shell cylindrical, white, shining; apex obtuse; whorls five, convex with well impressed sutures; aperture small, sub-orbicular; lip reflected, white; umbilicus minute. Length, one-tenth of an inch; breadth, one-twenty-fifth. Distribution, Maine to South Carolina, and from Wisconsin to Mississippi.

Described by Say in 1817 as *Odostomia corticarica*, changed in 1819 to *Pupa*. The character of the mouth of this species varies in different individuals. Usually the lip has a single tooth on the parietal wall, near the centre, and a tooth-like enlargement near the umbilical termination of the peristome; sometimes there are two teeth on the parietal wall; in other specimens there is a tooth, not in the centre, but a little one side, and again some individuals have no teeth at all. It is found under the bark of dead trees near the ground. Mr. George Hunt of this city found quite a number of specimens in the crotch of a dead oak tree some eight or ten feet from the ground.

105. PUPA (LEUCOCHILA) FALLAX, SAY.

A pretty, turreted shell, gradually tapering to a somewhat pointed apex; whorls six, shining, color dusty brown; aperture less than one-third the length of the shell; lip white, expanded but not reflected; umbilicus minute; mouth destitute of teeth. Length one-fifth of an inch; breadth one-tenth.

It is very abundant in the Western States, and in some places it is a great nuisance in gardens, especially in strawberry beds. It eats both leaves and fruit. A collector in Cincinnati once picked forty specimens on one strawberry leaf. It inhabits from Nebraska to Texas, and the Middle States southward to South Carolina. It may be considered a rare shell in New England, and when found is extremely local. Adams speaks of its being found in Vermont, and Mr. Thaxter has found dead specimens in Woburn, Mass. It has been found on Martha's Vineyard, and Mr. Thomson finds it rare on the rocky ridge in Tiverton, R. I., among oak trees. I once found it in Cranston, near Providence, under somewhat peculiar circumstances. One day after a long tramp, I sat down on the grass under a *juniper* tree on the border of Cunliff's Pond; after a short time I happened to look down, and saw several objects crawling on the legs of my pants, I picked off one of them and examined it, and found it to be a specimen of *L. fallax*. I looked carefully among the grass around the roots of the tree but could find nothing. After quite a search in vain, I reseeded myself in the same place, and in a little while commenced picking off the shells from my pants' legs, until I had secured a half-ounce bottle full. I have never seen the species in any other locality in Rhode Island.

106. PUPA (LEUCOCHILA) RUPICOLA, SAY.

Shell cylindrical, elongated; epidermis brownish horn color; whorls six; apex obtuse; aperture oval; lip thickened within, and widely reflected; teeth five, umbilicus minute. Length one-tenth of an inch; breadth one-twenty-fifth.

It was first discovered by Thomas Say in East Florida and described in *Jour. Acad. Nat. Sci. Phila.*, II., 163, 1821, and is said to inhabit all the states east of the Mississippi River. It has not yet been found in Rhode Island to my knowledge.

107. PUPA (PUPILLA) BADIA, ADAMS.

Shell oblong, cylindrical; whorls six to seven, rounded; color light brown, faintly striated; aperture nearly circular; lip thickened; umbilicus perforate. Length one-eighth of an inch; breadth one-sixteenth.

This species was found by Professor Adams near Lake Champlain, and described by him in *Bost. Jour. Nat. Hist.*, III., 331. Mr. C. B. Fuller first discovered the species in Maine. It is very abundant in places near Portland. Mr. W. C. Cleveland has found it on Oak Island, Chelsea, Mass. It inhabits the islands in the Gulf of St. Lawrence, and is quoted from New York. Mr. Thomson finds it in Westport and Dartmouth near the salt water, in old dead trees and stumps. This species has been confounded with *P. muscorum*, Linn., an European species, but is a larger shell, with a less thickened lip. Some specimens have a tooth on the parietal wall. Mr. Thomson says, not one in fifty of those collected by him has it.

108. PUPA (PUPILLA) PENTODON, SAY.

This is a minute shell of a spermaceti white color, though when found is generally incrustated with dirt. It is found in wet places under boards and bits of wood. Mr. Thomson finds it at the foot of trees in moss and under leaves near water holes. Although not mentioned in books as being found in such places, I have found it under piles of round stones by roadsides in the country, closely adhering to the stones. It is only one-fifteenth of an inch in length by one-fortieth in breadth, but notwithstanding its small size, it has five whorls, and an aperture armed with from four to nine teeth according to its age. The largest tooth, situated on the middle of the parietal wall, is curved to the left; at the front, nearly opposite the large tooth, is another, also slightly curved to the left. The other teeth are nearly straight.

It was described by Say in 1822, but his description is incorrect in several particulars. It inhabits from British America to Georgia, and westward to the Rocky Mountains. Common in New England.

(To be continued.)

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" 9,	<i>errones</i> Linn.....	2	" 62,	<i>arabacula</i> Lam.....	2
" 11,	<i>caput-serpentis</i> Linn.....	5	" 65,	<i>tabescens</i> Sol.....	1
" 14,	<i>Lamarkii</i> Gray.....	2	" 67,	<i>stercoraria</i> Linn. var. <i>rattus</i> , Linn... 2	
" 15,	<i>erosa</i> Linn.....	3	" 69,	<i>pantherina</i> Sol.....	2
" 16,	<i>argus</i> Linn.....	2	" 71,	<i>diluculum</i> Reeve.....	5
" 17,	<i>talpa</i> Linn.....	3	" 73,	<i>testudinaria</i> Linn.....	1
" 18,	<i>clandestina</i> Linn.....	4	" 74,	<i>poraria</i> Linn.....	4
" 19,	<i>albuginosa</i> Gray.....	2	" 75,	<i>capensis</i> Gray.....	1
" 21,	<i>quadrimaculata</i> Gray.....	1	" 76,	<i>lynx</i> Linn.....	6
" 22,	<i>irrorata</i> Sol.....	3	" 77,	<i>cruentata</i> Gmel.....	2
" 23,	<i>comptoni</i> Gray.....	1	" 77a,	var. <i>variolaria</i>	2
" 24,	<i>algoensis</i> Gray.....	1	" 78,	<i>scottii</i> Brod.....	1
" 25,	<i>felina</i> Gmel.....	2	" 80,	<i>onyx</i> Linn.....	2
" 27,	<i>pyrum</i> Gmel.....	2	" 84,	<i>punctulata</i> Gray.....	2
" 31,	<i>vitellus</i> Linn.....	4	" 86,	<i>helvola</i> Linn.....	5
" 30,	<i>polita</i> Roberts.....	1	" 88,	<i>lurida</i> Linn.....	2
" 32,	<i>hirundo</i> Linn.....	2	" 89,	<i>thersites</i> Gray.....	1
" 33,	<i>neglecta</i> Sow.....	3	" 90,	<i>sowerbyi</i> Kien.....	2
" 34,	<i>eburnea</i> Barn.....	1	" 95,	<i>turdus</i> Lam.....	2
" 35,	<i>cribraria</i> Linn.....	2	" 96,	<i>umbilicata</i> Sow.....	1
" 36,	<i>miliaris</i> Gmel.....	2	" 97,	<i>reticulata</i> Mart.....	2
" 39,	<i>ursellus</i> Gmel.....	4	" 98,	var. <i>histrio</i> Gm.....	1
" 40,	<i>aurantium</i> Mart.....	1	" 99,	<i>arabica</i> , Linn.....	3
" 41,	<i>ventriculus</i> Lam.....	2	" 101,	var. <i>intermedia</i> Kien.....	3
" 42,	<i>arenosa</i> Gray.....	3	" 104,	<i>interrupta</i> Gray.....	3
" 43,	<i>ziezac</i> Linn.....	2	" 105,	<i>tigris</i> Linn.....	3
" 44,	<i>ocellata</i> Linn.....	4	" 108,	<i>fimbriata</i> Gmel.....	3
" 45,	<i>caurica</i> Linn.....	5	" 109,	<i>stolida</i> Linn.....	1
" 46,	<i>mus</i> Linn.....	2	" 111,	<i>sulcidentata</i> Gray.....	1
" 48,	<i>carneola</i> Linn.....	5	" 113,	<i>nigropunctata</i> Gray.....	1
" 49,	<i>pulchella</i> Sw.....	2	" 114,	<i>esontropia</i> Ducl.....	1
" 51,	<i>gangrenosa</i> Dillw.....	4	" 119,	<i>melanostoma</i> Leath.....	1
" 52,	<i>scurra</i> Chemu.....	3	" 128,	<i>mappa</i> Linn.....	1
" 53,	<i>pieta</i> Gray.....	1	" 130,	<i>angustata</i> Gmel.....	1
" 54,	<i>annulus</i> Linn.....	5			

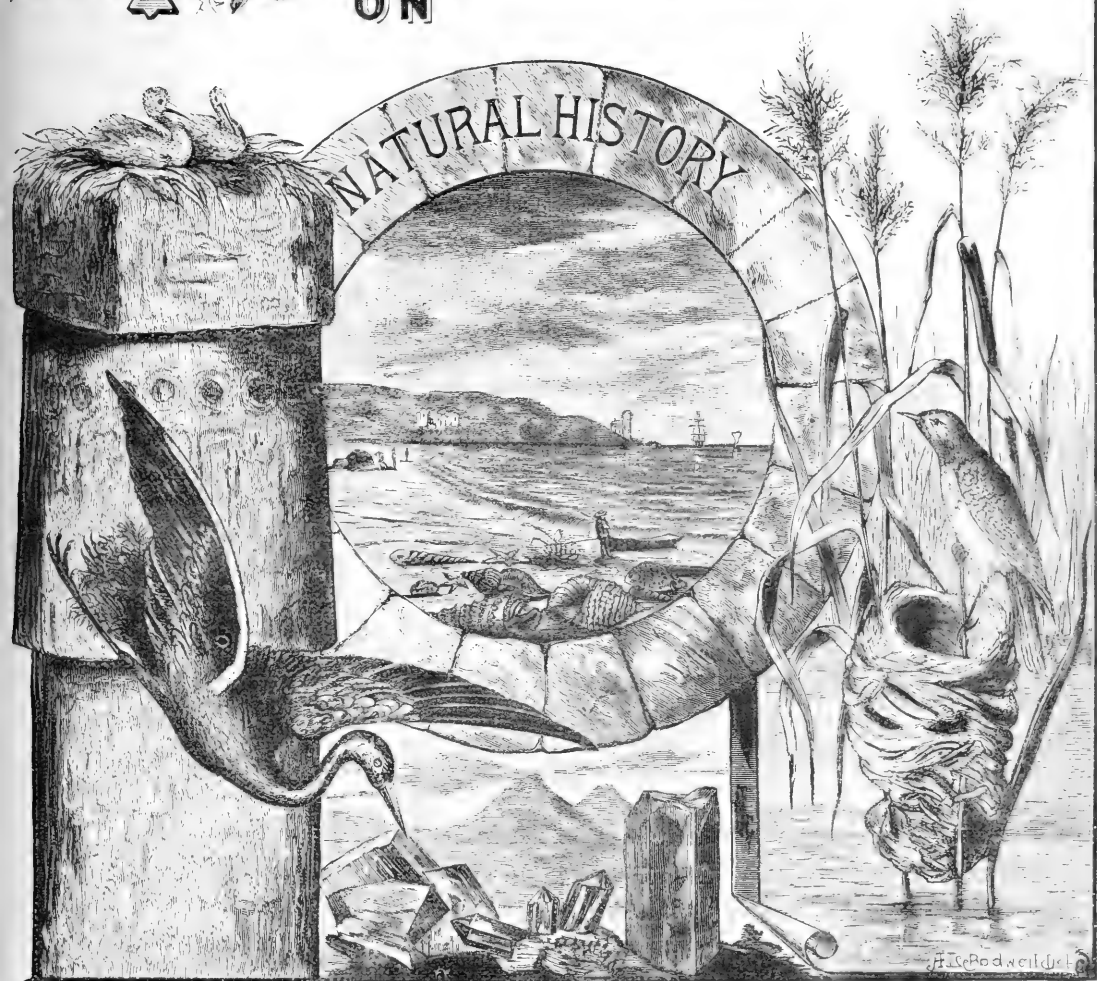
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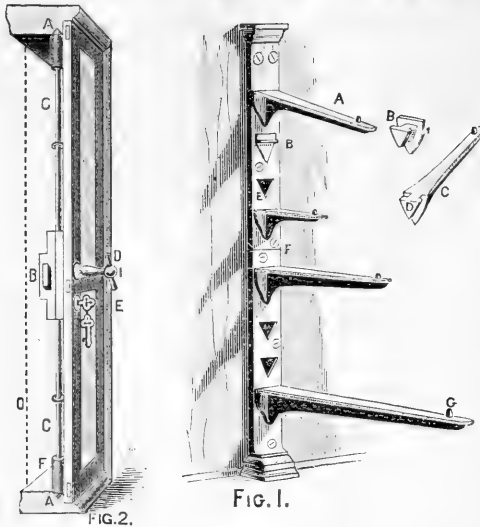
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What's in a Name?

The following from the *Pawtucket Valley Gleaner*, will serve to show how much "Patsy" knew about the "Night Hawk."

TOM-CAT WILL NOT YOWL TO-NIGHT; OR, THE NIGHT-HAWK'S LAST ADVENTURE.

Maple Valley's sun was setting,
O'er the hill tops far away,
Flooding all the land with beauty,
At the close of one bright day;
And the last rays kissed the feathers
Of a bird so free and high,
Sailing o'er the fields and woodlands,
With his wild, discordant cry.

As he sailed so slow and stately,
In the air so cool and free,
Far below he saw the chickens
Roosting on an apple tree.

"Oh," he said, "I want my supper,"
As he winged his airy flight;
"But I cannot catch a chicken
If the tom-cat yowls to-night."

"I," he said, "am called the night-hawk,
And a lofty name I bear;
But it makes me awful hungry,
Sailing in this keen, cool air.
I am longing for my supper,
But I shall not get a bite
If the chickens are kept wakeful
By the tom-cat's yowls to-night."

"On the ground I see you prowling,
Looking for a mouse or rat,
And I'd gladly make a supper
Off you, Maple Valley cat,
If I only had the courage,
But I fear your scratch and bite.
If I dared to, I would fix you
So you would not yowl to-night."

"Ah! at last I see you're sleeping
Underneath the apple tree
Where the tender chicks are roosting,
But my victim you shall be;
Nevermore you'll squall at evening,
And the chickens put to flight,
For I'm going to devour you,
And you will not yowl to-night."

Down he flew upon the green-sward,
Where the cat a bed had found,
When the sly cat pounced upon him
And bore him down to the ground.
"Ah" the night-hawk cried, "you've tricked
me,
Now I'm in a pretty plight!
I had thought to dine upon you,
So you would not yowl to-night!"

With bright hues the east was glowing,
And the moon hung in the west,
When the tom-cat ceased his labors,
And stretched on the grass to rest.
He had found the bony night-hawk
Tough to tear and hard to bite;
And oft in his sleep he murmured:
"Tom-cat will not yowl to-night."

PATSY.

Another Enemy in the Poultry Yard.

FOR several seasons, I have been using in my poultry yards kept for domestic use, the Plymouth Rock, and found it in every way a most satisfactory variety. But it is not my present object to "write up" any fowl of the earth or air except one which the reader must presently admit can not be painted in color of too black intensity. The spring laying season had opened and the attendant of the poultry had been very much elated by the richness of his egg harvest, when I found him one day quite dejected by the loss of his finest pullet. He said that she had been struck by a hawk some days before, and had just died from the effects of the wound. The next day he reported another case of the same kind, and the experience was repeated daily until it became both monotonous and inconvenient. Six of the best hens had been wounded and most of them were dead. The hawk theory was exploded but none more satisfactory had been suggested. We would have suspected hogs which frequented the woods adjoining the poultry yard, but the wounds were always inflicted upon only one part of the body of the hen and no corresponding impression of another set of teeth could be found. The destruction of the fowls still continued and its cause still baffled our efforts at comprehension, until one day a boy working on the farm happened to pass the fowls ranging in the

woods near their yard, and discovered the enemies. The hens were running with loud screams from a flock of crows pursuing them. One crow was perched upon a large hen's back at which he was pounding and tearing with his beak in order to pluck out the feathers. When he succeeded he flew off to "feather his nest," leaving his victim with a large wound in her back, from which she was to die in a few days. The crafty wretches had insidiously obtained the confidence of their daily companions, the hens, by walking about with them in the woods and pretending to be very sociable, while in reality they were plotting their base designs of a "forced levy." Have they not proved themselves eminently worthy of the appellation "black rascals," and has such an experience ever been reported before? To me the latter was both novel and *painfully* instructive.

P. S. HUNTER.

The Poultry Monthly.

To Prepare Turtles for Skins or Mounting.

THE under shell of a turtle is called the plastron, and is joined to the upper shell on each side for a little distance which varies in the different species; therefore, a fine sharp saw is the first requisite, with which to divide as neatly as possible both of these connecting pieces of shell, then with scissors cut through the skin all around the hinder part of the plastron, as close to the plastron as possible, and yet leave an edge of skin to sew to, when making up or mounting the creature. The plastron may then be turned back like the cover to a box, the legs disjointed and skinned, as with any animal, and all the bones left in; skin the tail and take out the bone, disjoint the neck, and skin as far as possible, which will be just back of the eyes; remove the brain and the flesh back of the eyes, and the muscle in the hinder portion of the jaw. The eyes must be removed from the outside and with great care to prevent cutting the lids. It is sometimes desirable to cut through the skin on the under side of the tail for about half its length, and also through the soles of the feet or flippers, as it facilitates the turning of these members. Poison all parts thoroughly with arsenic and alum, or arsenical soap. In mounting make

an internal skeleton of wire as for a mammal, and stuff with sawdust or chopped tow.

I HAVE received from Col. N. S. Goss his revised catalogue of the birds of Kansas, allowing to that state three hundred and thirty-five species, and describing with care and exactness, the eggs and the building habits of such as are positively known to breed in that state. An addition to ornithological literature of much value and interest.

Colonel Goss has followed in his arrangement and nomenclature, the A. O. U. Check-List.

Sword-fish *Xiphias Gladius*.

JUST at present (July 10) that little piece of Rhode Island, New Shoreham or Block Island, anchored ten miles out at sea is having high jinks over the annual appearance of sword-fish. They appear to our islanders about July 1, attracted by the usual abundance of food, which is largely mackerel, menhaden, and squid, and in fact any small fish that come in schools. The best fishing ground lies on the shoals, to the south and southeast of the island, and the sport affords a decided revenue. Many sportsmen are attracted to the island and the steamer "Ocean View" is frequently chartered by them for a day's fishing. The success is various. A report to the *Providence Journal*, July 15, states:

"Sword-fish seem to be running heavier than usual of late, most of them weighing in the neighborhood of three hundred pounds. The three taken by the 'Ocean View' Monday weighed 981 pounds dressed, and the five of Tuesday 1,395 pounds."

Another report says: "One party brought in thirteen sword-fish weighing about two hundred and fifty pounds each; while the next day fifteen were captured."

A correspondent of the *Hartford Times* writes from the island:

"This exciting fun is now at its full tide. It is splendid sport."

"The vessel is fitted with a little standing place called 'the pulpit,' down in front of the bows, outside, among the bowsprit and anchor chains. On this a harpooner stands

with harpoon in hand. To this murderous iron a long, light, strong line is fastened, and to the other end of this rope is fastened an empty barrel.

"Now the sword-fish is a 'queer critter.' Whether he weighs 200 or 700 pounds, he is the same sly, ferocious, aggressive fellow, the most terrific foe a man can meet in the water, unless it is a man-eater shark, and probably the sword-fish can give even him some 'p'int.' He is actually malicious, wantonly ugly. His sword is a bony prolongation of his snout, often three feet long, and used as he can use it, it is a terrible weapon. He can not only attack, and even kill a whale, but will always attack a man, if he can get at him, and will not seldom attack a ship — burying his sword deep in the planking and breaking it off.

"Well, our harpooner on the little 'Ocean View' being duly warned by a shout from the lookout, who has discovered a swordfish off on the weather bow, gets ready to throw his lance. The fish after filling up with mackerel — on which he feeds — floats near the surface motionless, his sharp, sickle-shaped dorsal fin alone sticking out above the water and serving to betray his position. If the boat approaches 'across his bows,' so to speak, or 'head on,' he will lie perfectly still, let it almost go over him; but you can't follow him from behind; he is suspicious of that situation, and is off. He can dart like a flash of lightning. No other fish has such power of force and swiftness in darting. It is this that makes his otherwise not strong and rather harmless sword such a formidable weapon. The harpooner throws his lance, burying it deeply in the fish; perhaps throws it almost clear through his vitals; at any rate, the strong barbed iron 'holds.' The instant the harpoon is hurled over goes the barrel, too, thrown by a person who is watching for that exact moment — for the wounded fish darts off at an incredible rate, and makes the foam and spray rise well up over the barrel. This barrel reveals his course as well as hampering him and wearying him; and one of the crew now lowers a boat and goes after him to 'play' him, draw him in, and try to exhaust him. If he can only once get a loop around the slender bottom of that widely forked mackerel tail, he is sure of landing his prey and not till then.

"One of their fish proved to be a sly coon. The man in the boat had followed him a mile or so out from the little steamer, and was 'playing' him, in the way of wearying him out, when he was puzzled at the queer conduct of the fish. The latter seemed to be limp and spiritless — the line had ceased to be 'taut,' and the interviewer thought the fish must be giving up the whole business, when like a shot from a rifled cannon, crash! came the ugly sword right through the boat's bottom. It penetrated the bottom, then passed through the tin bailing dipper that lay in a hollow reserved for that utensil, near the boat's stern, then through the plank cover, that fitted over that little cupboard in the floor, to make it flush with the rest, and striking the man on the heel, knocked him head first to the other end of the boat. His boot heel saved him from being cut. The wounded fish that performed this exploit then succeeded in drawing out his sword, leaving only some pieces of its broken edges near the end, as mementoes of the adventure. The hole thus made in the boat gave its startled occupant all he could do to 'bail out' fast enough to keep afloat; but he made signals for help, which were seen and answered by the little steamer, and, eventually, both man and swordfish were secured.

"One of these ugly swordfish last Friday, stuck his sword into the mackerel schooner 'Volunteer,' one of a fleet of mackerelmen who are fishing here, from Gloucester, Cape Ann. That fish wasn't so fortunate; his weapon proved to be firmly imbedded in the ship's bottom, and in his frantic plunging he not only broke it off, but tore out with it some of his head. He was soon after found dead; but he had given the schooner such a blow that it felt to those on board as if she had struck something that jarred her all over; and on going down into the hold to look at the bottom, there was found the sword — it had gone clear through."

The general history of the swordfish as taken from the *Natural History of Useful Aquatic Animals*, by George Brown Goode, affirms that the range is from Jamaica, latitude 18° north, to Cape Breton, latitude 47° and along the coasts of Western Europe, entering the Baltic and Mediterranean seas. The various names for the fish in different languages are simply variations on the one

given it by Aristotle, the father of zoölogy, twenty-three hundred years ago, and retained until now.

“The ancient city of Siena, secluded and almost forgotten among the hills of Northern Italy, should have a peculiar interest for Americans. Here Christopher Columbus was educated, and here, in the height of his triumphs as a discoverer, he chose to deposit a memento of his first voyage across the seas. His votive offering hangs over the portal of the old collegiate church, closed for many years, and rarely visited save by some American tourists. It consists of a helmet and armor worn by the discoverer when he first planted his feet on the New World earth, his weapons, and the weapon of a warrior killed by his party when approaching the American coast — the sword of a swordfish.”

There seems to be no record of this fish entering the rivers of America, though they are said to do so in Europe.

There seems to be an absence of the ordinary habits of breeding season with us. None of the fish are ever taken with eggs, and they do not associate together. Captain Ashby says they are always distant from each other at least thirty or forty feet.

Young fish are taken in the Mediterranean in the winter, that will weigh from one-half to twelve pounds, but the smallest reported from this locality are four feet long, including the sword, and weigh from thirty to forty pounds; the largest eight and one-half feet long, with sword, and weigh three hundred pounds gross. These fish are a light plumbeous hue, darker on the back and white on the belly.

Mitchell and DeKay state that in 1791 a specimen sixteen feet long was exhibited in New York.

The fish disappear with the month of August, and where they pass the winter is a matter of conjecture.

The sword-fish is infested with many species of invertebrate parasites, the gills, stomach, intestines, and the flesh are all subject to attack; while among the vertebrates the shark is his worst enemy.

THE great mass of mankind can only gaze and wonder; if they undertake to think, they grow listless, and soon tire out. — *Uncle Esek.*

Wild Flowers of Warwick.

THE earls of our Rhode Island Warwick, if in our coming peerage there are ever such, will we think, assume the *Rudbeckia* for their floral emblem. It is certainly a knightly if not regal ornament. And it abounds throughout the Warwick region where we spend the summer. Perhaps the less pedantic know it better by its common name of “cone flower,” or better yet by the title yellow daisy. The latter is a pretty fair name for it, as popular names go. But nomenclature aside, what a magnificent creature is this weed! The centre is a chocolate-colored cone — around which radiate the long strap-shaped, orange-colored marginal flowers. Occasionally they are large enough to be mistaken for sunflowers — and in structure are finer. To us they always suggest something oriental, but as a matter of fact they are essentially western. Most of our weeds come hither from Europe; this from our own prairies. It may be that our now incessant communication with the newer states will bring us annually more and more of their indigenous plants.

The question of what constitutes a weed is of constant recurrence. The answer depends largely upon the stand-point of the observer. Whatever is troublesome is a weed, but the same thing transposed to another location may be prized as an elegant flower. In the bright little book, *On the Wing*, by Mrs. Blake, we have just read how in California they try to cultivate our too common white daisy or ox-eye. With us it is a beautiful nuisance. In return we grow in our garden the universal California poppy, (*Eschscholtzia*) for the value of its glorious yellow flowers.

On these Buttonwood plains we have often remarked there is always a preponderating yellow. The progressive series is something like this, St. John's wort in June and early July, followed by wild indigo, golden-top Aster (*Crysoopsis*), sensitive plants, and in August and September a variety of golden rods. The most splendid of the latter has, in this state, almost a restricted location near Old Buttonwoods Hotel, but there it is very common. It is the *Solidago rigida* of science. The heads are larger and fuller than in any other species,

and are disposed in a flat corymb of intense yellow. The plant blooms in September, and always tempts us back to our summer repose.

It is surprising what these apparently sandy plains will yield in the way of flowers. Beside the golden daisies, before referred to, there is at present a glorious display of lilies. Everywhere one finds the hand-like spike of a pale blue lobelia. A singular plant which is here very common is the colie root (*Aletris farinosa*). It has a rosette of radical leaves, oblong in shape, and straight nerved. From the centre of these rises a tall scape bearing a lot of white mealy-looking flowers. The meadow beauties are now very abundant, forming brilliant patches of rose purple. The calyx is a dark red, and is urn-shaped. The stamens have long yellow, singular-looking anthers hanging forward and opening at the top. By pressure the pollen is projected from the apical pores. This genus (*Rhexia*) is the sole representative at the North of a vast family of tropical plants, many of them large and gorgeous. They are distinctive of South America. We have found stray specimens of the ragged orchis, and of the hinged loose stripe, *Lythrum alatum*, which according to the books is here far out of range.

Two species of *polygala* are quite frequent, and one of them extremely pretty. The young student will find them hard to describe. There is a small yellow-flowered flax, the delicate blue *Linaria*, the daisy fleabane, and the white top aster. If we step aside into moister soil we will find many other things. Among these, the most showy are the calopozons and gozonias, both of them members of the beautiful orchis family. All of this lineage are with us terrestrial, but in the tropics they are largely air plants, gorgeous in hue and extraordinary in form. Their color and shapes are correlated with the visits of insects. As Gray says, "free lunches are never provided without a hope of recompense." The treat is the nectar or honey, the removal the transference of pollen from flower to flower.

Another little plant, forever associated with Darwin, which we here find commonly along the remains of the old horse railroad to Apponaug, is the sun dew. It is now in

flower, and is perhaps, the best known of the carnivorous plants.

We see so many persons wandering aimlessly among these wild flowers, and often seeking their names in vain, that we are led to pen these few notes to aid their steps if possible. To us the process of accumulation has been a long one. Let no one suppose either that it has been easy. If there is any art worth knowing that can be so characterized, we have not met it. Botany at its best calls to-day for a large mental equipment. One should be a good classical scholar, (hence we have no quarrel, but only love, for good old Latin and Greek,) should be a good chemist and physicist, and it would be of advantage if he knows entomology. But above all he must be an observer and reasoner, seeing all things, judging all things, and open to argument and proof.

W. W. B.

BUTTONWOODS, July 13.

The Growth of *Unio Complanatus*, Lea.

I HAD never before been able to learn how long a time it took a *Unio* to mature. There is a brook on our place, that I have dredged from one end to the other and never could find any shells but *Anodonta subcylindracea*, Lea, *A. undulata*, Say, *A. fluviatilis*, Lea, *Sphærium striatinum*, Lam, *Physa heterostropha*, Say, *Plaporbella campanulatus*, Say. Now the brook runs into the Raritan River, about one and one-half miles from our place, and besides we made a small pond; the dam is three feet in height, so that no *Unio* could get into the pond and brook above. Oct. 30, 1881, I planted eighteen specimens of *U. complanatus*; they were one and one-half inches in length when I planted them. On April 29, 1883, as I was dredging this pond, to my surprise I found five *Unio complanatus*, and they measured over four inches in length: hardly any variation in all five. Now the brook is quite full of them, and in an hour I can get one hundred or more. As they were growing about eighteen months, they must have grown over one and one-half inches in a year.

I should like to hear if any one has observed the same development before, or knows the facts of their growth.

THOMAS MORGAN.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXI.

GENUS VERTIGO, MÜLLER, 1774.

Shell minute, rimate, oval, frequently sinistral; apex obtuse; whorls five or six; aperture, irregular, multi-dentate; lip white, expanded.

There are about one hundred species of Vertigo distributed between four sub-genera, of which *Alæa*, Jeff., contains eighty-five. This is the only sub-genus represented in America. The American species are eight in number and of these, six inhabit New England. They resemble each other so closely that it is only by the teeth that they can be distinguished apart until after a long experience in working up these species. The teeth are scarcely visible to the naked eye, and require a microscope to determine their character.

Very little indeed, can be said about these minute shells. Their habits and appearance are very similar, and a scientific description of one will apply to all, excepting as regards the number of teeth, their position, etc.

109. VERTIGO (*ALÆA*) *BOLLESIANA*, MORSE.

This species was discovered in Maine and described by Prof. E. S. Morse, *Ann. N. Y. Lyc.*, VIII., 209, 1865. It was named after the Rev. E. C. Bolles, an enthusiastic conchologist, formerly curator of the department of mollusca at the Peabody Academy of Science, at Salem, Mass.

It is a very rare shell and extremely local. It has been quoted from Maine, New Hampshire, Massachusetts, New York, Norfolk, Va., and Tiverton, R. I. I have never seen it in our state, but in Rehoboth about three miles over the line in Massachusetts, I have found it on stones and leaves abundantly under a butternut tree by the side of the road. About half a mile from this locality I found others under precisely the same circumstances, but know of no other spot where they can be obtained, save under those two butternuts. The shell has four whorls, amber colored, sub-translucent; apex obtuse; within the mouth are five teeth,

one prominent and a little curved, on the parietal wall; two similar ones on the columella margin, and two lamelliform, elevated teeth at the base, within the aperture. Size of shell sixty-five by thirty-five one-thousandths of an inch.

110. VERTIGO (*ALÆA*) *GOULDII*, BINNEY.

Described by Binney in *Proc. Bost. Soc. Nat. His.*, I., 105, 1843. It is of a light chestnut color, with four and a half whorls and five teeth resembling those of *Bollesiana* excepting that the two on the base are not lamelliform and within the aperture, but spring up from the labial margin and are shaped like the other teeth. This species is found under leaves in the woods and is found throughout New England and the Middle States. Length one thirty-second, breadth one sixty-fourth inch.

111. VERTIGO (*ALÆA*) *MILIUM*, GOULD.

Described by Dr. A. A. Gould (for whom the previous species was named) in *Jour., Bost. Soc. Nat. Hist.*, III., 401, 1840. It was first discovered at Oak Island, Chelsea, Mass., in November, 1839, after a warm rain. It is distributed from New England to Texas, but is seldom observed on account of its extreme minuteness, being even smaller than *Carychium exiguum*. It has six teeth, two on the parietal wall, one on the middle of the left lip, one on the base of the aperture, and two on the outer lip within the mouth. It has a large and deep umbilicus, but four whorls, dark amber colored, and is the smallest species of the genus. "It is four one-hundredths of an inch in length, three one-hundredths in breadth, and weighs five one-thousandths of a grain; and this tiny shell incloses a pulsating heart, a lung, stomach, liver, and all the organs we find in the larger snails" (Morse). Found under decaying leaves in woods, and sometimes under stones in pastures. Mr. Thomson has found them in green moss hanging from white oak trees.

112. VERTIGO (*ALÆA*) *OVATA*, SAY.

Described by Thomas Say in *Jour. Acad. Nat. Sci. Phila.*, II., 375, 1822. Thin, amber colored and highly polished; whorls five; aperture semi-oval with from four to eight teeth. There are generally two and sometimes three on the parietal wall and

the others are distributed around on the margin of the lip.

Vertigo ovata, or *Pupa modesta* as it was formerly called, is the largest of our species of this genus, being three-fortieths by one twenty-fifth of an inch. It is found only in wet places, under chips, leaves, stones, etc. I found once a large number of them at Pawtucket, in a ledge of rotten slate. By breaking off pieces of the slate, the shells were seen between the layers of the stone. It was close to a small pond and the stones and shells were quite wet.

113. *VERTIGO (ALÆA) SIMPLEX*, GOULD.

Described by Dr. A. A. Gould at the same time with *V. milium* as above. It is a smooth, light chestnut colored shell, more cylindrical in shape than the other species of the genus; apex blunt; whorls five; length one-fifteenth of an inch, breadth one-thirtieth. Its distinguishing character is its circular aperture, destitute of teeth, and its sharp lip. It is found in the woods under leaves in Canada, New England, and New York. Mr. Thomson finds it in damp places in interstices of old logs in company with *H. electrica*.

114. *VERTIGO (ALÆA) VENTRICOSA*, MORSE.

Described by E. S. Morse, *Ann. N. Y. Lyc.*, VIII., 1, 1865. Found in Maine, New Hampshire, Massachusetts, Rhode Island, and New York.

Shell umbilicate, ovate-conic, light colored, polished, apex obtuse; suture deep; whorls four; lip widely reflected, the right margin flexuose, within thickened and colored. Length seven one-hundredths, breadth forty-five one-thousandths of an inch.

Family *Limacidae*. Shell rudimentary a calcareous plate, not spiral, concealed under the mantle, and covering the respiratory cavity.

Family *Tebennophoridae*. Animal a slug with neither external nor internal shell.

Family *Arionidae*. Animal naked, with mantle concealing a few calcareous grains representing a shell plate.

These three families all contain species which inhabit Rhode Island, but are not included in the shell-bearing mollusca.

Family *Succineidae*, six genera, six subgenera and more than two hundred species, is represented in America by the genus *Succinea*; this is divided into five sub-

genera, of which two inhabit the United States. These are, *Succinea* restricted, to which Studer, 1830, gave the name of *Tapada*, and *Brachyspira*, Pfr., 1855. There are about forty species in this country, four of which inhabit Rhode Island.

115. *SUCCINEA (TAPADA) AVARA*, SAY.

This species was described by Say in the appendix to Long's second expedition to the St. Peter's River, 1822, as follows:

"Shell sub-oval, pale reddish yellow, sub-diaphanous, fragile, covered with an earthy crust; whorls three, minutely wrinkled; body whorl very large; spire small; aperture sub-ovate, large, two-thirds the length of the shell. Length three-twentieths of an inch. Inhabits the Northwest Territory."

Succinea avara is now catalogued from nearly every state in the Union, east of the Rocky Mountains. It is found about the margins of muddy streams, and sheltered under loose objects in moist places, but is also found in Rhode Island, under leaves in the woods far away from any water.

The young shells have a large rounded aperture, and scarcely any spire; they are always covered with a coating of dirt. Under the glass they prove to be covered with fine hairs which collect the dirt. As they grow larger this peculiarity disappears and the shells have a deep straw color. Mr. Say's specimens evidently were not full grown, as the size of the adults is seven-twentieths of an inch, the aperture is one-half the length of the shell and the spire is quite long.

SUCCINEA (TAPADA) OBLIQUA, SAY.

This is a large, in fact, the largest American species of *Succinea*, being one inch in length, by three-quarters in breadth. It has never been quoted from New England by any author, but Mr. Thomson in his *Land Mollusca of Bristol County*, says: "*S. obliqua*, Say, Tiverton, R. I. Very variable, but generally the typical form is found in swaley places on hillsides; very nearly allied to *S. ovalis*, Gld." *S. obliqua* does not resemble *S. ovalis*, Gld., and I am inclined to think Mr. Thomson has mistaken some large specimens of *S. Totteniana*, Lea for the *obliqua* of Say. The next chapter will contain descriptions of *S. ovalis*, Gould, and of *S. Totteniana*, Lea.

(To be continued.)

Chemically Pure Gold.

MR. H. F. CARPENTER, gold and silver refiner, at 29 and 31 Page Street, in this city, has succeeded in producing, by a process known only to himself, a chemically pure gold for the use of photographers who wish to make their own chloride. The term "chemically pure" means a good deal. It is almost impossible to obtain anything absolutely pure in the strict meaning of the term. Fine gold, as sold by refiners and used in the manufacturing of jewelry, is not perfectly pure; it contains a trace, and sometimes a good deal more than a trace, of silver, copper, and other base metals. Its intrinsic value is \$1.03 per dwt., and is sold at that price and allowed for in sweep and other waste at the same price, there being no profit whatever in selling this metal. The chemically pure gold, $\frac{1}{10000}$ fine, Mr. Carpenter sells for \$1.10 per dwt., and the article is worth its difference in price to those who desire it perfectly pure. Mr. Carpenter is a graduate of Brown University, and was the first person in the United States to refine photographic wastes. While studying chemistry at the university (in 1860), at that time a youth of eighteen, he conceived the idea of utilizing the waste from photographers, which was being thrown away, as jewelers' sweepings were some years previous. He has had a longer experience than any other person in this line (twenty-five years), and is doing business for pho-

tographers all over the country, as well as his regular business of gold and silver refining in general. He manufactures besides the chemically pure gold, a chemically pure nitrate of silver, and chloride of gold for photographic use.—*The Jeweler*, Providence, R. I.

Literary Note.

MESSRS. J. B. LIPPINCOTT & Co. have in press a *Manual of North American Birds*, by the eminent ornithologist, Prof. Robert Ridgway, curator department of birds, Smithsonian Institution, Washington, D. C.

The author has had unrivalled advantages for the preparation of a treatise of this character, arising from his own field experience, as well as his connection with the National Museum, and the free access which has been granted him to various other public and private collections of birds, both in this country and Europe.

The work is to contain some four hundred and twenty-five illustrations suitably executed, and will conform to the geographical limits, classification, numeration, and nomenclature adopted by the American Ornithological Union.

We doubt not it will be one of the most important and original contributions to the literature of the subject which has ever appeared, and presume that naturalist and sportsman alike will find in it an invaluable aid.

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149.	Logger-head Shrike.....	10	522.	Wilson's Plover.....	25
149a.	White-rumped Shrike.....	05	552.	Willet.....	35
242.	Cardinal Grosbeak.....	08	555.	Bartram's Sandpiper.....	40
244.	Rose-breasted Grosbeak.....	15	557.	Spotted Sandpiper.....	10
249.	Lazuli Bunting.....	20	571.	Clapper Rail.....	10
286.	Black-bill Magpie.....	25	578.	Purple Gallinule.....	50
301.	Scissor-tailed Flycatcher.....	15	579.	Florida Gallinule.....	10
317.	Black Pewee.....	15	580.	American Coot.....	10
324.	Acadian Flycatcher.....	15	585.	American Flamingo.....	75
325a.	Trail's Flycatcher.....	15	602.	Black Mallard.....	40
369.	Yellow-bellied Woodpecker.....	50	605.	Pintail Duck.....	40
372.	Red-bellied Woodpecker.....	30	609.	Blue-winged Teal.....	20
375.	Red-headed Woodpecker.....	08	610.	Cinnamon Teal.....	40
385.	Road-runner.....	30	618.	Redhead.....	20
387.	Yellow-bill Cuckoo.....	20	627a.	American Eider Duck.....	20
388.	Black-bill Cuckoo.....	15	634.	Ruddy Duck.....	1 00
390.	Groove-bill Crotophaga.....	2 00	640.	American White Pelican.....	50
394.	American Barn Owl.....	50	641.	Brown Pelican.....	20
395.	American Long-eared Owl.....	50	642.	Common Cormorant.....	35
402.	Little Screech Owl.....	40	643.	Double-crested Cormorant.....	35
408.	Burrowing Owl.....	30	643a.	Florida Cormorant.....	25
423.	Caracara Owl.....	1 50	645.	Brandt's Cormorant.....	50
430.	Marsh Hawk.....	35	649.	Snakebird.....	35
431.	Cooper's Hawk.....	30	650.	Gannet.....	20
432.	Sharp-shinned Hawk.....	50	656.	Black-skimmer.....	15
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436.	Red-tailed Hawk.....	50	664.	Western Gull.....	40
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480a.	Florida Quail.....	15	729.	Western Grebe.....	75
480b.	Texan Quail.....	10	736.	Loon.....	1 25
482.	California Quail.....	10	742.	Razor-bill Auk.....	20
489.	American Egret.....	25	743.	Common Puffin.....	20
490.	Snowy Heron.....	15	745.	Tufted Puffin.....	1 75
491.	Reddish Egret.....	30	760.	Black Guillemot.....	20
492.	Louisiana Heron.....	10	763.	Common Guillemot.....	20
493.	Little Blue Heron.....	10	764.	Thick-billed Guillemot.....	20
496.	White-crown Night Heron.....	35	764a.	Brunnich's Guillemot.....	20
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" 3, <i>exanthema</i> Linn.....	1	" 57, <i>spurea</i> Linn.....	3
" 5, <i>asellus</i> Linn.....	5	" 58, <i>mauritiana</i> Linn.....	3
" 8, <i>isabella</i> Linn.....	4	" 60, <i>cinerea</i> Gmel.....	3
" 9, <i>errones</i> Linn.....	2	" 62, <i>arabica</i> Lam.....	2
" 11, <i>caput-serpentis</i> Linn.....	5	" 65, <i>tabescens</i> Sol.....	1
" 14, <i>Lamarkii</i> Gray.....	2	" 67, <i>stercoraria</i> Linn. var. <i>rattus</i> , Linn.....	2
" 15, <i>erosa</i> Linn.....	3	" 69, <i>pautherina</i> Sol.....	2
" 16, <i>argus</i> Linn.....	2	" 71, <i>diluculum</i> Reeve.....	5
" 17, <i>talpa</i> Linn.....	3	" 73, <i>testudinaria</i> Linn.....	1
" 18, <i>clandestina</i> Linn.....	4	" 74, <i>poraria</i> Linn.....	4
" 19, <i>albuginosa</i> Gray.....	2	" 75, <i>capensis</i> Gray.....	1
" 21, <i>quadrinaculata</i> Gray.....	1	" 76, <i>lynx</i> Linn.....	6
" 22, <i>irrorata</i> Sol.....	3	" 77, <i>cruentata</i> Gmel.....	2
" 23, <i>comptoni</i> Gray.....	1	" 77a, var. <i>variolaria</i>	2
" 24, <i>algoensis</i> Gray.....	1	" 78, <i>scottii</i> Brod.....	1
" 25, <i>felina</i> Gmel.....	2	" 80, <i>onyx</i> Linn.....	2
" 27, <i>pyrum</i> Gmel.....	2	" 81, <i>punctulata</i> Gray.....	2
" 31, <i>vitellus</i> Linn.....	4	" 86, <i>helyvola</i> Linn.....	5
" 30, <i>polita</i> Roberts.....	1	" 88, <i>lurida</i> Linn.....	2
" 32, <i>hirundo</i> Linn.....	2	" 89, <i>thersites</i> Gray.....	1
" 33, <i>neglecta</i> Sow.....	3	" 90, <i>sowerbyi</i> Kien.....	2
" 34, <i>eburnea</i> Barn.....	1	" 95, <i>turdus</i> Lam.....	2
" 35, <i>cribraria</i> Linn.....	2	" 96, <i>umblicata</i> Sow.....	1
" 36, <i>miliaris</i> Gmel.....	2	" 97, <i>reticulata</i> Mart.....	2
" 39, <i>ursellus</i> Gmel.....	4	" 98, " var. <i>histrion</i> Gm.....	1
" 40, <i>aurantium</i> Mart.....	1	" 99, <i>arabica</i> Linn.....	3
" 41, <i>ventriculus</i> Lam.....	2	" 101, " var. <i>intermedia</i> Kien.....	3
" 42, <i>arenosa</i> Gray.....	3	" 104, <i>interrupta</i> Gray.....	3
" 43, <i>ziczac</i> Linn.....	2	" 105, <i>tigris</i> Linn.....	3
" 44, <i>ocellata</i> Linn.....	4	" 108, <i>fimbriata</i> Gmel.....	3
" 45, <i>caurica</i> Linn.....	5	" 109, <i>stolida</i> Linn.....	1
" 46, <i>mus</i> Linn.....	2	" 111, <i>sulcidentata</i> Gray.....	1
" 48, <i>carneola</i> Linn.....	5	" 113, <i>nigropunctata</i> Gray.....	1
" 49, <i>pulchella</i> Sw.....	2	" 114, <i>esontropia</i> Ducl.....	1
" 51, <i>gangrenosa</i> Dillw.....	4	" 119, <i>melanostoma</i> Leath.....	1
" 52, <i>scurra</i> Chemu.....	3	" 128, <i>mappa</i> Linn.....	1
" 53, <i>picta</i> Gray.....	1	" 130, <i>angustata</i> Gmel.....	1
" 54, <i>annulus</i> Linn.....	5		

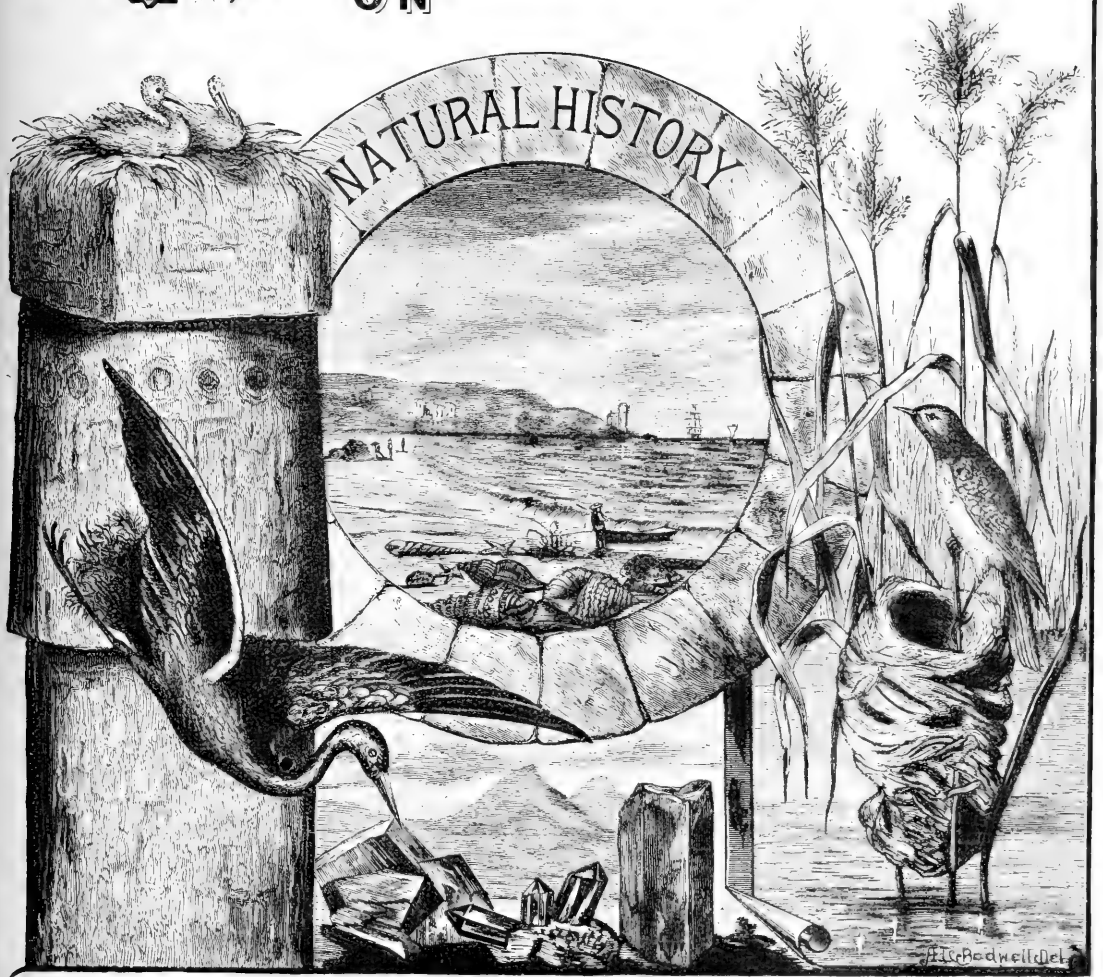
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RANDOM NOTES

ON



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AN article has appeared in the *Ornithologist and Oölogist*, Vol. II., No. 8, touching upon American taxidermists, and some opinions adverse to their work, expressed by Montague Browne, F. L. S.

We are all obliged to see things from our stand-point, and I must quote my own experience, which is that, while I always order the best, I can (with a few notable exceptions,) seldom obtain European skins that average as fine as those made by my American collectors; perhaps the best are kept at home, and the seconds sent to the American market.

I freely admit that there are collectors in America who make unsightly bird and mammal skins, but the standard of quality has very much improved during the past six years, and I can produce a score of *Yankees* whose work in that direction cannot be surpassed the world over.

It has been my experience to find collectors who, from motives of economy, preferred to take the chances of ordering their supply from the cheapest possible source, or to follow the still more questionable policy of exchanges, unloading frequently the poorest stock they had to strangers, whose ability as preparators was entirely unknown. Surely such persons must not expect to obtain for themselves the best commodities.

My last and recent order from an English dealer was for a number of American skins; they were all selected from my lowest quoted price, and a dealer's discount expected beside. My best skins cannot go to Europe on such terms.

THERE are some queer problems connected with the present movement for the protection of American birds.

I note the fact that women who, from motives of utility, economy, or beauty, are inclined to wear plumes, wings, and birds upon their costumes, are especially condemned; and properly enough an appeal is made to their emotions and their gentle sympathy, to discard such ornaments. Perhaps, however, it is not commonly known that for the manufacture of a very large portion of those ornaments, the plumage of domestic fowls (dyed in colors) is freely used; also the heads, wings, etc., of domestic pigeons and game birds, otherwise waste products of our markets.

I have patiently waited for some one to appeal to the men. Audubon is said to have regretted it after he had killed a bird. It is to be doubted if some of our modern sportsmen ever regret (though they do hold stoutly and honestly to the observing of legal seasons), if they did they would be ashamed to report so frequently through well-known channels, strings of fish and bunches of birds, killed certainly for the pleasure of the slaughter, since, by a little mathematical calculation, it would seem that the requirements of the camp, the family, or family and friends, must be greatly over-supplied.

The statement has been made that the negroes of the South are killing for food, every thing they can find, mocking birds sharing the fate of other songsters, large and small. If this is true, it is most unfortunate. Yet it is possible that the food is needed in many cases. The favored residents of our cities do not need game for their sustenance, and the usual high price places it beyond the reach of the poor.

I have knowledge of hundreds of ducks, (shot in the season), and left to flutter on the water, dying and dead, because they were not fit to eat, not worth picking up, and of marsh birds killed and brought home, smelling terribly; they certainly were not eaten, and could only be used to prove that

the owner had a good gun, steady nerves, and good luck.

Men will not cease to go shooting; but cannot some one with the ability to write popularly, so work upon their sensibilities that they will cease destruction within a reasonable limit; and if legitimate game is scarce, so control themselves as to husband their cartridges for another trip?

Surely the women are not alone to blame.

LOVELAND, COL., July 20, 1886.

As probably but a small percentage of your readers ever had an opportunity to scale the Old Rockies, perhaps a brief account of a trip that I have just undertaken will be of interest to some of the real lovers of nature.

On the 6th of July we hired a man and team to haul us and our outfit as far as Willow Park, which is about eight miles west of Estes Park, which lies at the foot of Long's Peak; that is as far as we could travel by wagon. The rest of the journey must be accomplished either mounted on a bronco, or on foot. I preferred the latter, as I feel safer on *terra firma*. We reached there about noon the next day, discharged our teamster, and pitched our tent, killed a few ground squirrels for supper which we disposed of with a vengeance, and soon turned in. The next morning we started out on a collecting trip. We found many species of birds but they were all in poor plumage and entirely useless for specimens. We found Williamson's red naped, Lewis', Harris', and red shafted woodpeckers, Steller's jays, black-billed magpies, robins, Arctic blue birds, turtle doves, plumbeous vireos, Parkman's wrens, and a few others, and they all appeared to be breeding. We also found jack rabbits and cotton tails, woodchucks, four-striped and thirteen-striped chipmunks, and one old female dusky grouse, and a brood of about ten young. They were about as large as the eastern quail.

The next morning we started on foot to try to reach timber line, (that is the line beyond which no timber grows), which the settlers claimed to be about five miles, but they admitted they had never footed it. I thought it was nearer twenty by the time we reached it, which was accomplished in about

four hours. We followed what is called the Big Thompson or old Indian trail that passes clear over the divide. I have no doubt that it was a better road when they used it than it is now, as it is almost impassable at places because of fallen logs. Within a few years there have been extensive forest fires through that section, which was a very heavily timbered tract, and the trees have fallen in all directions; this makes bad traveling. The settlers of to-day are either too indolent or have not the time the red skins had to clear, so the poor bronco had to face the music; but we had one advantage, if we could not climb over we could crawl under. The clouds looked very threatening, the thunder rolled in the distance, and by the time we reached timber line the rain commenced in good earnest. This is where, at this time of the year, you can experience a good thunder-storm at noon, almost every day. I think we have not had above six fine days in six weeks; but the storms are mostly confined to the mountains, although sometimes they get off on a tear. One man in this vicinity lost two hundred and three sheep by hail one day last week, and at least three-fifths of all the wheat crop in this county has been destroyed by the same enemy. When the storm had abated, it was time to start back to camp, so we had no opportunity to collect at all that day, although we saw several varieties of Lepidoptera new to me. The next day we started out again, and a third party accompanied us as guide, as we intended to reach the divide if possible. We packed one horse with our camping outfit, and our guide rode a second horse with guns and rifle; we had no use for the latter but then it was good company. Once in a while a fellow will meet a grizzly or a hungry mountain lion, but they won't wake up the camp if they can steal your grub without it.

We footed it, as before. The storm again set in before we had gone far, and sent us hunting for a friendly rock. It delayed us some, but we made timber line in time to put in about two hours collecting. The only birds we found were American tit-larks, broad-tailed hummers, intermediate white-crowned sparrows, and one pair of Townsend's flycatchers. The rocks around where we camped were swarming

with coneys, a little animal rather smaller than a prairie dog, that kept up an incessant chattering until dark. We were camped close to the only spring near there, and that might have been the cause of their discomfiture. The pines grow stunted in this region, and as many of them were loosened from the rocks we rolled them together and built a roaring fire to keep off the inevitable mosquitoes, which were numerous and hungry, and also any hungry carnivora that might be prowling around, although they mostly exist in the imagination. We cooked and ate our supper, and turned in, and slept as only hunters can sleep. We had no opportunity to dry our bedding so we had to roll into them wet. Although we had snow banks above, below, and all around us, the air was quite mild. We were up and finished our bite before sunrise and struck for the range, leaving our horses where we camped. We traveled several miles over snow banks and grassy slopes. Where the snow had gone off, flowers of the most beautiful tints and fantastical shapes were blooming in profusion, and the whole air was enriched with their fragrance. What a contrast, to gather a beautiful bouquet with one hand and snow with other at the same time! We found one pair of old ptarmigans with a brood of five young. They all scrambled into the rocks and hid on our approach, but the poor little fellows had to hand over their mite as a contribution to science, which they did reluctantly. We also found one single male adult, and one male dusky grouse.

We collected some fine specimens of Lepidoptera on the road and they obliged us to retrace our steps, and kept our legs and insect nets busy until we reached camp. Everything was there but the horses, but we found them within a mile; soon had them packed, and started down the hill, reaching the bottom, tired and hungry, about sun-down.

At the foot of the trail there is a pile of rocks covering about a quarter of an acre, and rising nearly perpendicular about fifteen feet. It stands on an almost level piece of ground surrounded with heavy timber on three sides. The man that owns the ground called my attention to it. He said it was an old fort, and although he had lived there several years he had but recently discovered it as such. I started to look it

over, expecting to find another Cardiff giant or Silver Lake serpent got up for the job. But I found it had been a stronghold of no mean proportions; whether it had been fortified by whites or red skins I cannot answer. On the top of the fort all around the outer edge, heavy stones were placed in courses to about three feet in height, forming a very formidable breast-work, with port holes either for arrows or rifles. Large pitch pine trees were also laid horizontally, and heavy stones placed on them, but the trees have gone to decay and ceased to hold the stones in the place where they were formerly. I searched, without avail, for several hours to discover some trace or relic of its former occupants, but on descending I found a cave on a level with the ground where there had been a fire, as the walls were thickly covered with soot and grease. There were a great many remnants of charred bone lying around, but with my small knowledge of osteology I could not decide to what class of mammalia they belonged, with the exception of the half of a lower jaw bone with all the teeth intact, which was decidedly human. I think that probably some early pioneers, closely driven by Indians, had fortified themselves there, perhaps to be starved or murdered, and their remains burnt to hide the crime; but I hope some of your readers will be able to throw more light on this dark subject.

WM. G. SMITH.

Wild Flowers of Warwick.—II.

THE very kindly reception given to our recent article upon the Warwick flowers, tempts us once again to take up the subject. From accident, rather than design, we omitted many interesting plants from our former list. There are many things attractive to the botanist alone, and in the economic sense, good for nothing. Yet one never knows when the most despised of natural products is to become useful. Even the microscopic diatoms have found their value. So, in the pursuit of pure science, the investigator often alights upon a truth. Then a chorus of surprise comes up from the private box of the critics, and a shout of "Didn't I tell you so?"

But all this is apart from the proper mat-

ter of this essay. Our "cursed spite" does not lead us, as it did the Prince of Denmark, to making straight the crooked paths, or to reforming abuses.

How did we happen to omit the wild carrot from our former article? It is among the most striking of the plants now in bloom. It will be recognized at once by its broad umbels of pure white flowers, often with a single central flower of a maroon color. These clusters as they ripen, become depressed until in the fruiting condition there results a very pretty bird's nest. Very like fine lace are the flowers of the carrot. Is its root good eating? Well, we should say, as a rule, avoid all *umbelliferae* in a wild state. The parsnip is often dangerous. Moreover, the plaguey things all have so great a family resemblance that they may deceive the very elect. It would be a serious mistake to eat either of the hemlocks under an impression that it was a garden vegetable.

We now find on the Buttonwoods plains the smallest of the milk weeds (*Asclepias verticillata*). It is usually a foot or less in height, with narrow, whorled leaves and an umbel of small flowers, succeeded by long pods. These contain, by-and-by, the well known winged seeds of all milk weeds. Our region is rich in *asclepias*. We have, often along the shore, the tall common species, and in moist places everywhere the red *Asclepias iniarista*. On the sandy plains we will find, besides, the crumple-leaved *Asclepias obtusifolia*. But the really handsome one is the orange-colored butterfly weed (*Asclepias tuberosa*), very frequent along the railroad near Hill's Grove and Apponaug. It is possible that in the future the charming silk-like coma of these plants may become a commercial product. At present it serves to bear away the seeds like tiny parachutes, or to ornament parlors, or to aid Mr. Gibson as a model in some of his matchless drawings.

The first of the golden rods (*Solidago arguta*) has put in an appearance. It is a tall species with a branching wand, each portion of which is bent over and bears the heads on one side. In dry places, everywhere, the *Solidago nemoralis* will be in bloom in a few days. It is a smaller plant, with a bluish green aspect to the foliage; indeed, it has rather a dusty look. The

heads are minute and not nearly so brilliant as in many other species. We notice the smaller evening primrose (*Enothera pumila*) everywhere. The large and showy one, beloved of the big mother, grows mostly near the shore. Every one knows its lemon-yellow, fragrant flowers. Let young people notice whether the stamens or the pistils are first functional. We give them this as a pretty problem.

We have spoken already of the meadow beauty (*Rhexia*) now so very conspicuous about here. From its dainty name and its habit and its proud connection we ought to like it. As a matter of fact, it is always a trial to endure a magenta shade, something of which nature is rather fond.

Related to the evening primrose is the rattle-box (*Ludwigia attenuifolia*), which one will find on the old horse railroad to Apponaug, wherever it is moist. It has yellow petals — if you are up early to catch them. They are readily deciduous, but then the persistent calyx, coherent to the pod, is as lovely as a flower. It often assumes very brilliant tints of red. Perhaps it goes without saying that the popular name (which, by the way, is not distinctive), is given on account of the rattling of the seeds in the capsule.

Bindweeds have always been our admiration, and they grow very finely near the shore. Their large pink perillions are more beautiful than most morning glories. The name of this plant is *Convolvulus sepium*. The parasitic dodders, looking like coils of copper wire, are its run-down or degraded cousin. So are we in the habit of speaking of parasites in politics or in plants. By the way, do they ever *have* such in politics? The two *Spiraeas* will be met with. The pink one is known the Yankee-land over as hard-hack. The white or pinkish-white one has the name of "meadow-sweet." Both are charming in a bouquet.

But, with a long vista still before us, we are exceeding our limits and tiring our readers. Better a few herbs served judiciously as *entrees* than a whole repast of vegetables. This, then, is our excuse for the peculiar character of the shore dinner here offered, as well as for the spices and condiments intermixed.

W. W. B.

BUTTONWOODS, R. I., July 23, 1886.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXII.

5. *Amblystoma opacum* Baird, (*Salamandra opacum* Gravenhorst, *Salamandra fasciata* Green).

The Marbled or Opaque Salamander strongly resembles in outward appearance its larger congener, the Violet Colored Salamander. The two species, though the ground color of each is black, need never be confused, since the present form has the limbs comparatively feeble, allowing the animal to crawl but slowly; the head is less expanded laterally, and the body is well rounded, cylindrical, and terminated by a short tapering tail. The markings are also quite characteristic, being of a pale brown or greenish-blue shade, and appearing not as rounded spots but as transverse bands. These are often of considerable width as they leave the flanks, but become narrower as they reach the dorsal line. The eleven costal folds, the peculiar plaited tongue, and the ossified tarsus and fish-like vertebræ obtain of course in this species, as in the previous, being generic peculiarities.

The Marbled Salamander is often to be met with in wells, several specimens in the museum of Brown University having been found in drinking water. It is probable, however, that the animals were thus captured through accident, since the short, rounded tail and small, unwebbed feet do not well indicate an aquatic life. Their motions, moreover, when in the water, are slow and awkward, it apparently being an effort to keep the body right side up. It is probable that, while crawling on the damp and moss-grown stones of the curb, the unfortunate animals not infrequently lose their hold and only reach *terra firma* by making the passage of the pump.

In confinement they make perhaps a more strange than interesting pet. A box partly filled with some damp moss, such as grows in cranberry swamps, *Sphagnum*, will well please them, and so long as small insects and moisture is supplied, they will thrive. The length of five inches is seldom exceeded.

It is quite possible that in the wanderings

of some person interested in herpetology there may be found within the limits of our state, the so-called Tiger Salamander or *Amblystoma tigrinum*; though Mr. Allen says that there is no positive evidence of its capture east of New York, Holbrook considered the evidence sufficient to include Massachusetts in its habitat. It is probable, however, that confusion has arisen from the strong though superficial resemblance that the present species bears to *A. punctatum*. Confusion ought not to arise, however, since the species are quite distinct. The ground color of *A. tigrinum* is above, brown rather than black, below cinereous, the yellow spots are more numerous and smaller, and the size is often much more than that of either of the species hitherto mentioned, the length at times being over ten inches. The animal is said to like best the decaying logs of damp woods.

Pleurocera neglectum, Anthony.

FOR RANDOM NOTES.

WHILE collecting recently in the Little Muddy Creek, I found some shells of interest, that I consider to be the above specimens. When taken from the water they are covered with a ferruginous deposit, which being removed shows a polished and bright banded surface that is pleasing to the eye.

They do not agree with Mr. Anthony's description in regard to the bands. He says: "Sometimes the last whorl is encircled by two dark brown bands, of which the uppermost is also visible throughout the upper whorls."

These usually have three distinct bands on the last whorl, and two are visible on the next three or four preceding whorls; they vary from narrow and faint lines to broad and dark ones; some specimens are without bands, and the apex is eroded on nearly every shell. The species is abundant at the above locality, but not common in this vicinity. A. A. HINKLEY.

DU BOIS, ILL.

[The specimens received with the above article were *Pleurocera neglectum*, Anthony. ED.]

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXII.

116. SUCCINEA (TAPADA) TOTTENIANA, LEA.

This species is found only in New England, New York, and in Canada. It was first described by Mr. Isaac Lea in the *Proceedings of the Philosophical Society*, 1841, and named after Colonel Totten, of U. S. Army, who, while stationed at Newport, R. I., discovered several new species of mollusca, in dredging in Newport Harbor. We sometimes find it in woods, but more commonly in fields, or rather in low, wet meadows, on the margins of ditches. I have found it in quite large numbers under pieces of broken limestone, at the quarries in Smithfield. The shell is obliquely ovate, of a greenish yellow color, thin and shining; whorls three; the body whorl very large, spire not prominent; suture impressed, but not so deeply as in *S. avara*. The size of full grown specimens is three-quarters of an inch; the size of the aperture is three-quarters the length of the shell, oval, oblique, and so open that the animal can be seen, even when contracted within the shell as much as possible. The animal is of a salmon color, and the shell is so translucent as to enable one to see the color of the viscera within.

117. SUCCINEA (BRACHYSPIRA) OVALIS, GLD.

Succinea ovalis, Gould, non Say., Ad., Bin., Pfr., Morse, Tryon.

Succinea DeCampii, Tryon.

Brachyspira ovalis, Tryon.

Thomas Say, in 1817, described a shell which he called *Succinea ovalis*, and in 1824 he described *S. obliqua*, (a western species much resembling *S. totteniana*,) which he afterwards proved to be identical with his *S. ovalis*. Dr. A. A. Gould discovered and described in the first edition of *Gould's Invertebrata of Massachusetts*, 1841, a new shell, which he called *S. ovalis*. As *S. ovalis*, Say, and *S. obliqua*, Say, are synonymous, and as authors are agreed to call it *S. obliqua*, the name of *S. ovalis*, Gld., is retained.

The shell is very delicate, fragile, highly polished, quite elastic, and so transparent

as to allow all the organs of the animal to be seen through it. It is of a pale horn color, and is longer and narrower in proportion than the other species. The length of the shell is one-half an inch; of the aperture more than three-quarters the length of the shell; whorls three, the body whorl compressed; spire short but elevated and acute. Animal amber colored mottled with black dots. Inhabits the Northern and Middle States to Wisconsin.

They are generally found in wet grass, near the margins of ponds, but I have found them in Valley Pond, crawling on the stems and leaves of aquatic plants, a foot or more from the surface of the water, and several feet from the shore, rendering it necessary to wade out to them in order to collect them. How came they in such a position, when they can neither swim, nor direct their way in any manner in the water?

Family Veronicellidæ, one genus, no shell.

Family Vaginulidæ, two genera, no shell.

Family Onchididæ, four genera, no shell.

ORDER BASOMMATOPHORA.

Shell not operculated, few whorled, usually covered with a horny epidermis; animal having flattened, triangular or sub-cylindrical tentacles, contractile but *not* invertible, with eyes at their bases, sessile. There are six families of this order, two of which are represented in New England.

Family Auriculidæ contains fifteen genera, ten sub-genera, and about three-hundred and seventy species. Three of these genera, viz.: *Alexia*, with twenty-one species, *Carychium*, with fifteen, and *Melampus*, with one hundred and twenty species, are represented in Rhode Island by one species only.

118. ALEXIA MYOSOTIS, DRAP.

Auricula myosotis, Drap., 1801.

Carychium myosotis, Ferr., Moq.-Tan.

Auricella myosotis, Jurine.

Pythia myosotis, Beck.

Conovulus myosotis, Reeve.

Conovulus denticulatus, Forbes and Hanly.

Auricula denticulatus, Gld, DeKay.

Melampus borealis, Conrad.

Alexia Myosotis, Pfr., Morse, Tryon, W. G. Binn., etc.

Shell oval-elongated, thin, smooth, and shining; apex acute, suture distinct; whorls seven or eight, the body whorl three-fourths the length of the entire shell; aperture long and narrow; lip simple, with two or three white teeth on the inner margin. Length one-third, breadth one-eighth of an inch.

This is probably not a native species, although found in most of the sea-ports from New York to Nova Scotia. It inhabits Central and Southern Europe and the south and southwest of England, and may have been imported into this country, clinging to the sides of ships. It is quite common in Boston on old wooden wharves, where it follows the tide as it ebbs and flows.

Lieutenant Brown found it at Newport, R. I., and his specimens were described under the name of *Melampus borealis*, in *Silliman's Journal*, XXIII., 345, 1833. In some places it is found on isolated stones, which are submerged at high tide. It is never seen away from the vicinity of salt-water, and being an air breather, it must take in a supply of air sufficient to last during an hour or more, in which it is completely under water. It will live several days away from salt water, but becomes benumbed and dies on immersion in *fresh* water. Although common at Newport, I have never been able to find any around the wharves in Providence. Probably the water here is not clean enough for them. It is a mystery how anything can live in it or near it.

119. CARYCHIMUM EXIGUUM, SAY.

Syns.:

Pupa exigua, Say, Gld., DeKay, Adams, Binney.

Bulmimus exiguus, Binn.

Carychium exile, H. C. Lea, Troschel.

Carychium exiguum, all modern authors.

The genus *Carychium* is widely distributed over the north temperate portions of the earth; they are found from Siberia and Lapland as far south as Spain and Italy. One species is found in India on the shady side of mountains at an elevation of 5,000 to 9,000 feet. *C. exiguum*, Say, is the only species of the genus in America, and has been found in almost every state in the Union. It is a beautiful little shell, white, translucent and shining, tapering gradually to a rather obtuse apex; whorls fine, con-

vex, very oblique, with transverse striae; aperture obliquely oval, white; lip thickened, with a slight projection on the outer margin, and another, more prominent tooth on the parietal wall. Length, one-sixteenth, breadth, one-fortieth of an inch. When the animal is moving along over the leaves the shell is carried in a horizontal position.

Binney says: "Around Boston it is found at or below the surface in swamps, growing among mosses." Morse says: "Lives in very wet and boggy places in woods." Its habitat in Rhode Island seems to be very different. On the 4th of July, 1866, the first carychium exiguum was found in Rhode Island. Twenty years ago the little village of Albion was out in the country, and over on the Cumberland side of the Blackstone, were deep thick woods. High up on the hill in the shadow of the dark woods was a stone wall running north and south; on the east side of this wall were piled heaps of dead leaves, two or three feet deep, apparently having been undisturbed for years. It was among these leaves I found more than a hundred specimens of this tiny species. The next year I again visited the spot, and obtained about twenty more. Since then the woods have been cut down, several houses built near, and the locality destroyed by hens, which have scratched the leaves all over, and probably devoured the few remaining mollusks living under them. From that time until last summer I never found another specimen, and thought no new locality would ever be discovered; but a new one has been found, and a better one than the first. In the town of Johnston, just beyond Neutaconkaut Hill, over in the woods on the left side of the road, are some ancient lime-pits, where two hundred years ago or more, somebody excavated for lime in these hills. The holes are partly full of water in winter and spring, but are dry or nearly so, and filled with dead leaves in summer, and that is the time to go and the place to find enough *C. exiguum* to satisfy even a collector for exchanges. (To be continued.)

A MAN who lived in the swamp daily prayed to Jupiter for health. "Pray from the hill-top, and your prayer will be granted," answered Jupiter.—*H. C. Fulton*.

The Leather-Backed Turtle.

(SPHARGIS CORIACEA.)

ABOUT the 30th of July, two schooners sailing for sword-fish in the vicinity of South-east Point, Block Island, captured, as the correspondent of the Providence *Journal* has it, "Two large sea animals, of a variety which no one at the island has ever seen before."

That anything marine could be brought to that port and not find a name, led to some rather wild conjectures, such as the possibility of a hybrid between a seal and a turtle, a new variety of aquatic life, or even an unknown species, and the new arrivals were visited by many experts who named them everything from a gopher to a box-tortoise. The very good general description given by the *Journal* correspondent, which I take the liberty to reprint, stamped them at once as, "Luths," "Trunk Turtles," or "Leather-backed Turtles." "At length the prize was hoisted upon the deck of the schooner, where he made frantic efforts to escape and pounded heavily with his huge flukes. As he lay he measured five feet ten inches in length with his head drawn back as far as possible, with a spread of six feet eleven inches to the forward flukes or flippers, and of three feet ten inches to those next the short, blunt tail. From back to breast his body is twenty inches in diameter, and two feet six inches from side to side. His head, which resembles that of a seal in shape, with similar nostrils, skin, and weeping eyes, but lacking hairs, is nine inches wide and eight inches deep or thick just back of the eyes. The head cannot be drawn within the shell, as in the case of turtles. The upper jaw resembles that of a turtle in shape, but is cartilaginous. The lower jaw is like that of a turtle in shape, but is not hard. The neck is very full and muscular. He inflates his throat like a frog, and then expels the air after from half a minute to two or three minutes with a puffing, blowing sound. His shoulders, strong, round, and full, are twelve inches in diameter. His forward flukes are two feet six inches long, eleven inches wide, and from one-half of an inch to three inches thick. He moves them much as a bird moves its

wings; indeed, the captain says he moved in the water like a bird flying rather than like a fish swimming. His strength may be judged from the fact that once, as he turned, a fluke struck a bundle of 250 shingles and sent it sliding as if it had been a feather. Instead of a shell under the body there is a kind of plate or rather strong cartilage. The shield which covers the back is suggestive of that of a turtle, but differs in two respects. It is not so hard, seeming like very hard rubber. This creature has no scales, but has its covering arranged like planks, six in number, each six inches wide, with the rear ends narrowed to conform to the shape of the animal. Instead of cracks depressed between the planks, there are ridges raised above between the longitudinal sections of the shield. There are six sections and seven ridges. The shape is almost exactly that of the shield on which the Goddess of Liberty leans on coins. His skin is mottled, a mixture of yellow, pink, and dark blue black, the last the predominant color. A few barnacles were on the neck and back. The expression of the face is mild, and he seems to be gentle in disposition, making no effort to injure those around him, but trying rather to get away."

The museum of Brown University of Providence has a specimen, taken some years since in Rhode Island waters, one has been captured near Portland, Me., and one taken in 1880 near Cape Ann, is reported to have made soup equal to that of the green turtle. Specimens will frequently weigh one thousand pounds, and their capture is reported from the temperate and tropical waters of all oceans and the Mediterranean Sea.

The creature represents in the at present accepted arrangement of zoological specimens, a family, a genus, and a species combined, which goes to make a good specimen a very desirable adjunct to any museum, the quoted price for such, being about \$175.

They are, however, very difficult to preserve properly. In this connection it is unfortunate that these creatures, having died, were sunk in deep water, only one plastron (or back) a very useless part being retained. If it was necessary to be rid of disagreeable odors they might have been anchored just beyond low tide, for a little time, or at least the head preserved.

DESIDERATA IN GENUS CYPRÆA.

barcalyi Reeve.
bicallosa Gray.
brageriana Crosse.
broderipii Gray.
candida Pease.
castanea Higgins.
chrysalis Kiener.
chrysostoma Kiener.
clara Gaskoin.
coffea Gray.
compta Pease.
contaminata Gray.

crossei Marie.
fusco-maculata Pease.
gemmula Wkf.
goodalii Gray.
gracilis Gaskoin.
guttata Rumph.
helenæ Roberts.
jenningsiana Perry.
lentiginosa Gray.
leucodon Brod.
leucostoma Gray.
marginata Gaskoin.

menkeana Desh.
notata Gill.
pardalina Dunker.
paroula Philippi.
peasei Gaskoin.
petitiana Crosse et Fisher.
reevei Gray.
sauliæ Gaskoin.
semiplota Mighels.
thomasi Crosse.
valentia Perry.

I wish to acquire as many of the above species as possible, and will treat with museums or collectors possessing duplicates on a basis of sale or exchange.

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158-626 Spotted Sandpiper.
315-459 *Passenger Pigeon*.
412-378 Flicker.
423-351 Chimney Swift.
446-305 Couch's Kingbird.
451-310 Sulphur-bellied Flycatcher.
455a Olivaceous " "
460-319 Coues's " "
470-329 Fulvous " "
470a-329a Buff-breasted " "
472-331 Beardless " "

A.O.U.—R.

472a Ridgway's Flycatcher.
616-157 Bank Swallows.
719-61 Bewick's Wren.
725-67 Long-bill Marsh Wren.
758a-4a Olive-backed Thrush.

EGGS

With full data.

144-613 Wood Duck.
315-459 *Passenger Pigeon*.
390-382 Belted Kingfisher.
423-351 Chimney Swift.
494-257 Bobolink.
501-263 Meadow Lark.
517-168 Purple Finch.
529-181 American Goldfinch.

Lately Received from Ceylon.

Red Woodpecker, *Brachypternus ceylonus* \$3 75
Golden-Backed Woodpecker, *Brachypternus puncticollis* 2 50
Crimson-breasted Barbet, *Xantholaema hæmacephala* 50
Indian Roller, *Coracias indica* 1 50
White-breasted Kingfisher, *Halcyon smyrnensis* 1 50
South Indian Hoopoe, *Upupa ceylonensis* 3 00
Trochalopteron *fairbanksi* 2 00
Orange Minivet, *Pericrocetus flammeus* 3 00
Paradise Flycatcher, *Tersiphone paradisi* \$3 00 to 5 00
Magpie Robin, *Copsychus saularis* 50 " 75
Fairy Blue Bird, *Irena puella* 1 50
Bush Bulbul, *Fora tiphia* 50 " 75

Rufus Babbler, *Malaco-cercus rufescens* \$ 35
Loten's Sun Bird, *Cinnyris totenensis* 1 25
Purple Sun Bird, *Cinnyris asiaticus* 75
Ceyloneese Sun Bird, *Cinnyris Zeylanicus* \$75 to 1 00
Tiny Sun Bird, *Cinnyris minimus* 1 00
Weaver Bird, *Ploceus philippinus* 50
Ceylon Spur Fowl, *Galloperdix bicalcarata* 1 50

FROM INDIA.

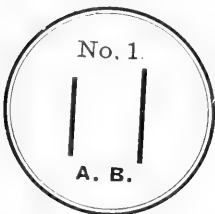
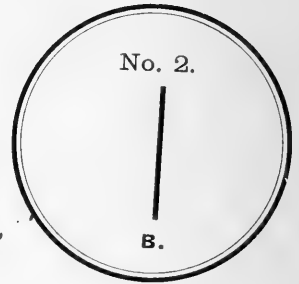
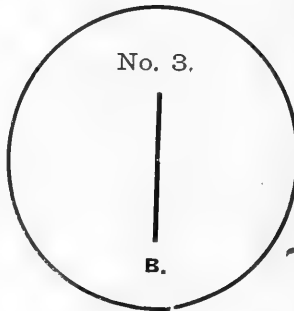
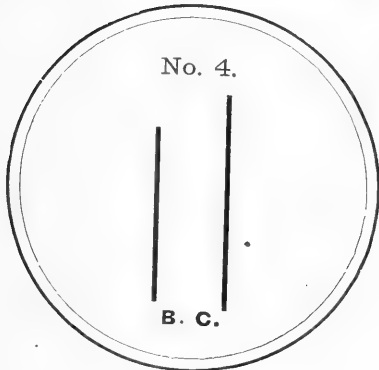
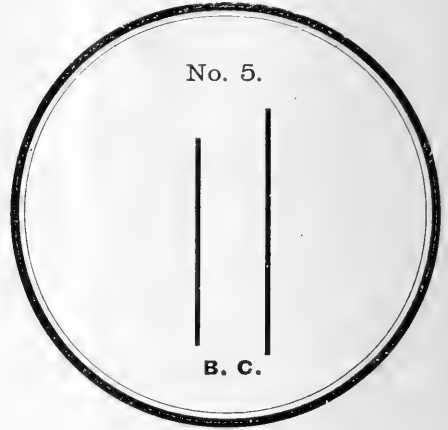
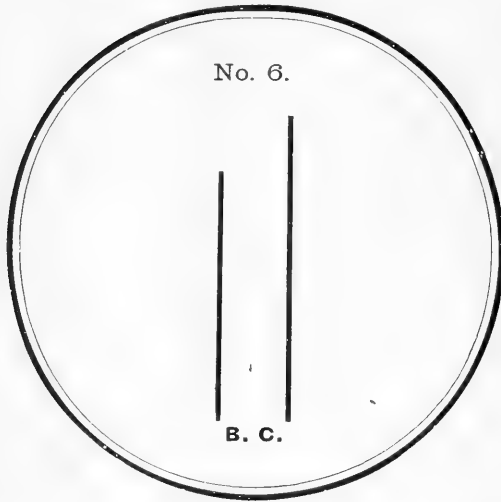
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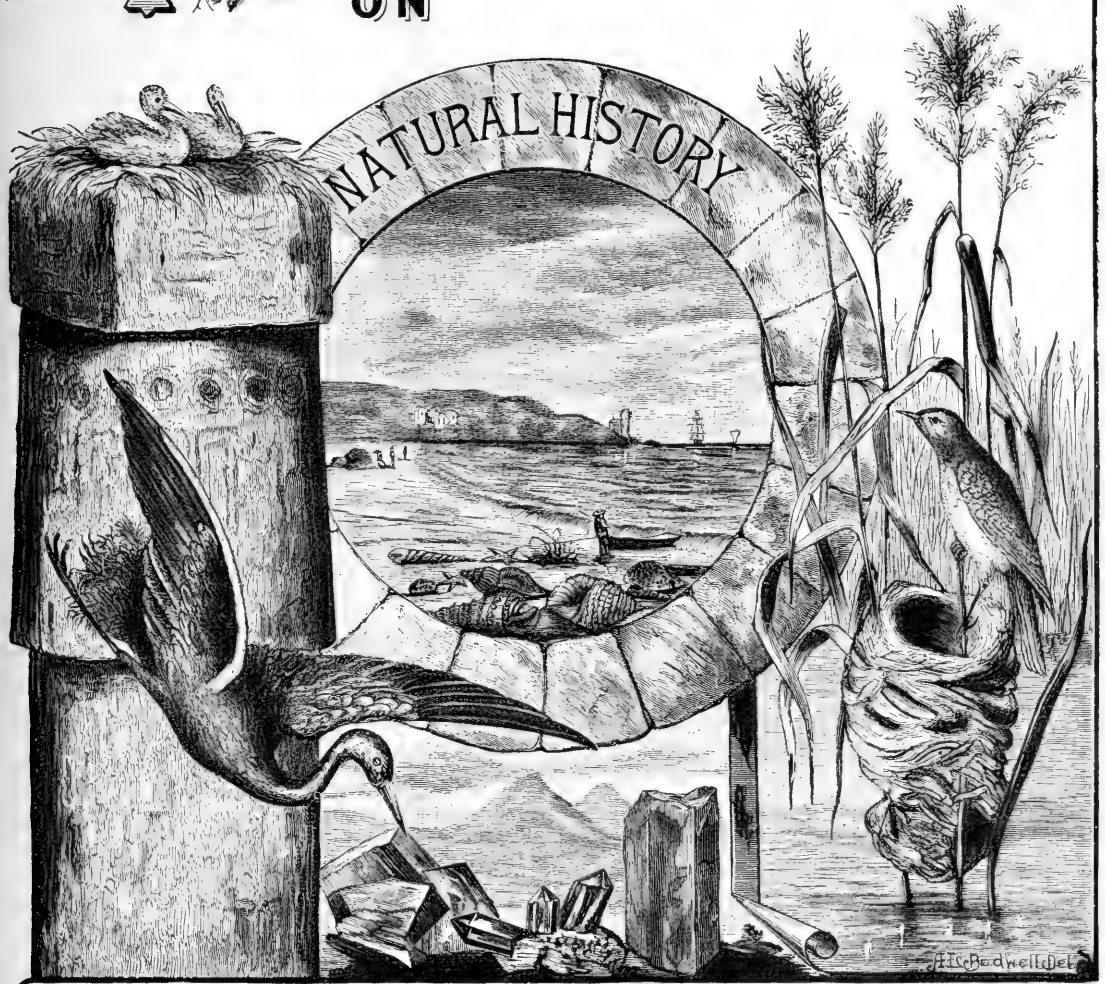
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VOL. III.

NO. X.

RANDOM NOTES

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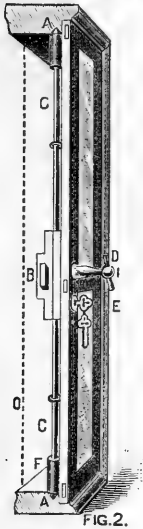


FIG. 2.

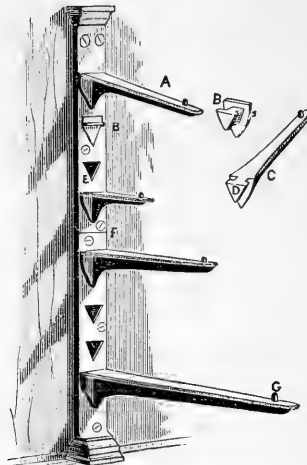


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The AUK will present, as heretofore, timely and interesting papers on the subjects to which it relates, and its readers may feel sure of being kept abreast of the advances in the science. The AUK is primarily intended as a medium of communication between ornithologists. While necessarily to some degree technical, it contains a fair proportion of matter of a popular character. Its notices of recent literature cover the whole field of North American Ornithology, and with the departments of "General Notes" and "Notes and News" render the journal indispensable to those wishing the latest and fullest intelligence of the subject.

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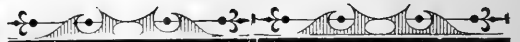
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Random Notes on Natural History.

Vol. III.

PROVIDENCE, OCTOBER 1, 1886.

No. 10.

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JAMES M. SOUTHWICK,

258 Westminster St., Providence, R. I., U. S. A.

The Black-Footed Ferret.

WHILE hunting one day last December, I saw some tracks in the snow, that much resembled the foot-mark of the mink, but being a long distance from water, I concluded it could not be that animal. I found it was a persistent hunter, as the tracks led to nearly every hole in a large prairie-dog town, but it had not attempted to descend into the hole at any place. The dogs are dormant the greater part of the winter, and their holes get filled on the outside with snow as was the case then. After following the tracks for a while, I gave it up. The next day I put up several steel traps, and on the following morning I was agreeably surprised to find a fine male black-footed ferret, *Putorius (Cynomyonax) nigripes*, in one of them. This species was named by Aud. and Bach., the word *cynomyonax* meaning the king of the prairie dogs, of which I have no doubt it would be if it could but catch them. The ferret is strictly nocturnal, while the prairie dog retires very early, and a dog hole is so constructed that a ferret would not venture to descend it, knowing that it could never get out again. I have now the domesticated English ferret, and have tried many times to get them into a dog hole but never could succeed.

Their holes run in the ground on an easy slope for about two feet, then drop perpendicularly for several feet, and no ferret could get out unaided. I have put a ferret into a box with several dogs in it, and it commenced slaughtering them just as if they had been so many rats.

I cannot indorse the powers of extermina-

tion recently attributed by some writers to *P. nigripes*, regarding their descent into the burrows of the dogs to clean them out of house and home.

I have tracked several since and have captured three, but never saw one that had attempted to enter the holes.

There are always a great many mice that live in dog holes and they are most likely the objects sought for. The last two ferrets I trapped were both killed by the swift fox while in the traps, showing that they also have more than one enemy. The male was about seventeen inches in length from the nose to the rump. The female about three inches shorter. The upper parts were of a darkish brown, under side lighter, feet, tip of tail, and forehead surrounding the eyes black. The teeth were all worn short and blunt, denoting that they were no "tenderfeet" as the Coloradians call all new settlers.

I have no doubt but the swift fox is its common enemy, as the ferret would have no show to either fight or run against it. It is evident the fox did not kill for food, but followed the natural laws of extermination.

A great deal has been written about the mutuality and brotherly love existing between the prairie dog, burrowing owl, and rattlesnake. Well, those that have seen them plying their daily avocations know as well as I do that it is all bosh. The dog is an industrious, clean house-keeper, and would never let off apartments to a dirty, slovenly, noisy owl, coming home at all hours both day and night loaded with all varieties of putrefaction, and as for the rattlesnake, he is like the process server in "Ould Ireland," when he goes in, the tenants soon get out.

I have read and heard that dogs always go down low enough for water; now here in the old Rockies, at some places, they would have to go through hundreds of feet of rock to get water. I do not believe they ever drink at all, any more than a jack rabbit does, or many other rodents.

WM. G. SMITH.

Native Forest Trees of Rhode Island.

No. XVII.

BY L. W. RUSSELL.

The American Beech. — *Fagus ferruginea.*

THE beech is indigenous to regions of temperate climate in both hemispheres. But one species is native to the United States and that is not regarded by botanists as specifically distinct from the beech of Europe and western Asia. The beech in Rhode Island is not a common tree, but is scattered sparingly in most parts of the state. Here it occurs most frequently along the cool banks of the streams, but is occasionally found elsewhere, usually among deciduous trees.

The beech, whether in the forest or upon open ground, is a singularly neat, attractive tree. When free to develop itself in open spaces, it limbs low, the lower branches forming a nearly horizontal spread, those higher gradually taking sharper angles until the whole forms a symmetrical, orbicular head of large dimensions. The limbs of such a tree are long and lithe, striking out from the centre close to each other, their combination forming the central stem of the tree. The aspect of a forest beech is in marked contrast with a "pasture" tree of this species. In a beech-growing region it is common to see wide reaches of woods almost exclusively of this tree. In such a place the trees shoot up straight and almost limbless from fifty to eighty feet, the few branches at the top meeting and mingling with each other, forming a shade which only here and there admits the sunlight. The bodies as well as the limbs are smooth in all stages of their growth, excepting that upon old trees the lower portions are generally nearly covered with a rough lichen, different patches showing a variety of dark gray shades.

The roots of the beech run very near the surface of the ground. This fact, taken with its density of shade, prevents the usual forest undergrowth of shrubs and small trees. The leaves under the trees lie in compact layers, formed year by year, decaying but slowly. Thus a forest of beech forms a sylvan scene of a remarkably neat and comely appearance.

The buds of the beech are long and pointed,

and composed of closely imbricated scales covering the plaited leaves. The leaves are noticeable for the prominent midrib and parallel veins each ending in a single tooth. They are shining above and hairy when young. The young leaves contain a sub-acid juice not disagreeable to the taste. The fruit cannot be mistaken for that of any other tree. It is an oily, edible, three-cornered nut encased in a four-valved, bristly bur. These nuts vary much in size and shape upon different trees. It is probable that by proper selection and cultivation the nuts might be made valuable as an edible product. Beech woods in Europe, and in this country even, are valued as feeding-ground for swine, the nuts being known as "beech mast." The nuts when roasted form an agreeable substitute for coffee, and the oil from them furnishes in lamps a pleasant light. For the blossoms one must look among the opening tufts of leaves at the ends of the branches where they appear, the sterile ones in pretty roundish tassels, from silky stalks two inches long. The fertile flowers are in sessile bunches at the axils of the leaves. From these the burs and nuts gradually develop during the summer months, ripening and falling with the frosts of October.

The straight boles of the forest beeches are in such demand for the turner's use in making chairs, tool handles, etc., that even the valleys of the Berkshire Hills and the remoter parts of northern New England are being rapidly denuded of these trees. A noticeable characteristic of the wood is the dark color of the heart-wood as contrasted with the almost white sap-wood. The greater or less degree of the development of the heart-wood gives rise to a distinction among woodmen of the "white" and "red" beech.

Among the finest single specimens of beech known to the writer, in this state, is a wide-spreading, stately tree about a half a mile north of Silver Spring, by the bay-side. It limbs very low, and although now in midst of shrubs and trees of small growth, it must for many years have stood quite alone. There are other fine trees of the same species near by. There are also fine specimens of forest beeches in the ravines within and near by the Butler Hospital grounds. One of the most perfect models of this tree which we have ever known is upon Engineer Shedd's farm in North Kingstown. It is of impos-

ing dimensions and shows all the distinguishing characteristics of a freely-developed tree. The beech deserves far more attention as a shade tree than it has yet received. It grows freely, has a very deep shade, is neat and clean throughout, being notably free from insects or blight. The "purple" beech is a beautiful "sport" from Germany. The fern-leaved beech is also a European sport and one of the most graceful trees grown. Altogether the beech is a noble tree.

Wild Flowers of Warwick.—III.

THE middle of August brings a number of flowers peculiar to that season. Among these, one of the prettiest is the "grass of Parnassus," of popular language, or the *Parnassia* of science. This plant which belongs to the Saxifrage family, grows in swampy places inland or even near the shore. It has a number of smooth, radical leaves, from among which rise several one-leaved stems, bearing a solitary, large, white flower. The five petals are beautifully veined with green, and at their base there are curious forked appendages resembling filaments. It is guessed that they may have something to do with the protection of the nectaries against small, intrusive insects. In appearance, the flowers suggest some of the anemones. They are always great favorites. With them, one finds the cotton sedges, which are such excellent substitutes for birds' plumage in the hats of ladies. We wish our earnest plea would lead fashion from a cruel to an innocent custom. But we must correct our own women folk before we criticise the general public. "Aye, there's the rub!" Another curious marsh plant is the *Xyris flexuosa*. Seekers will know it when they find a rather tall, grass-like stem, of a brown color, supporting a brown head of scales. From this protrudes a curious, yellow, three-parted flower. *Polygala sanguinea* grows in similar places, with reddish or purple clover-looking heads, and roots smelling of winter-green. *Bartonia tenella* is a plant of the gentian family, greenish and insignificant, of the same association. Certain plants have this habit of congregating together. Given one, we can decide upon the probable

presence of the others. Where we find the cardinal we also look for the monkey-flower, the spearmint, the purple and white thoroughworts and the turtle-head. All of these are now in blossom.

It is the time for the *Gerardias*, of which we have many species—either yellow or purple. Many of them are known as wild fox-gloves, a rather good name, although the true fox-glove (*Digitalis*) is not a native. The common purple *gerardia* grows by waysides, the flowers too easily deciduous. A similar one loves the sea beach. The large, handsome yellow ones frequent the woods as partial parasites, by their roots it is impossible to cultivate them. Notice how their leaves blacken in dying. This is part of the diagnosis of a parasite. While speaking of such thieving plants, we should mention the dodder (*Cuscuta*), growing over bushes and resembling coils of copper wire. Immediately after germinating the plant cuts off connection with the earth and lays hold of some neighboring herb or shrub which thereafter is made to do its work. Hence the dodder has no leaves of its own. It possesses small white flowers in clusters. As if to foreshadow the habit of the plant, its embryo is a mere coiled radicle, without seed leaves.

Frequently as we stroll to the station across the meadows we pick up in the grass that dainty orchid, the *Spiranthes gracilis*, with pure white flowers twisted in a spiral around the summit of a green stem. Later there is another species with larger flowers, the *Cernua*, which is exquisitely fragrant. The moon-wert ferns, or *Botrychia*, are also just appearing in the meadows. As the groundnut, *Apios tuberosa*, has repeatedly been sent us for a name in the last few days, we should speak of it here. This is the pea-vine everywhere seen in copses, with close, rather globular bunches of peculiar purplish or even flesh-colored flowers, with the powerful odor of violets. It has large, edible tubers. The wild balsams, or jewel-weeds, or hunter's horns, everybody knows, the *Impatiens fulva* of the books. Touch-me-not is a name for the garden species. The names fairly indicate the quick, impulsive way in which the pods burst and scatter the seeds. Most of the *Geraniaceæ* have some such trick, and all the genera, nearly, a different one. Readers should

consult in this connection Sir John Lubbock's fascinating little book, "*Flowers, Fruit and Leaves.*" It is in the Nature Series of McMillan & Company. We are sure that it will give delight to all who peruse it, and open their eyes to many new facts. Go to the Public Library or Athenæum.

But we must draw these remarks to a close. Sam Weller tells us that the art of letter-writing consists in pulling up at the precise moment when the recipient desires more. We do not always know that point, but try to stop as near to it as possible.

BUTTONWOODS, AUG. 22, 1886.

W. W. B.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXIII.

THE remaining Batrachians which appear in this list are those which have been observed in neighboring states, and though indigenous representatives have as yet not been captured here, a brief description has been appended that those interested may determine such forms as are likely to find their way into collections.

6. *Gyrinophilus porphyriticus* Cope (*Pseudotriton salmoneus* Baird, *Salamandra salmonea* Storer, *Salamandra porphyritica* Baird). The Salmon-colored Salamandra is supposed to be one of those forms which may be said to be everywhere uncommon. Specimens have been captured in Maine and Massachusetts, and diligent search will undoubtedly reveal the animal's presence in Rhode Island. While other Salamanders when captured make no effort at defense, the present animal is at times quite ferocious and as it is of considerable size, being four or five inches in length, and snapping savagely at its tormentors, it is, while in rage, quite a formidable little animal, though of course to man quite harmless. Another peculiarity is its fondness for cold water, enjoying cool springs rather than warm brooks, though it may be found in swamps. In the Alleghany region, among the mountains, it is quite abundant from New York south. Its name is indicative of its general coloration. Above a rich Sal-

mon color, dark along the back, and brighter on the flanks, becoming pale below.

7. *Hemidactylum scutatatum* Schlegel. The Four-toed Salamander is characterized by possessing but four toes on its posterior feet, a peculiarity which distinguishes it at once from all other Salamanders likely to occur within the state. Of the genus, it is the only species, and its habits are said to be entirely terrestrial. Why a terrestrial form should thus be deprived, and have its remaining toes reduced to mere rudiments, is difficult to explain. In its movements it is lively and even active, crawling about over decaying wood and among fallen leaves without the least sign of clumsiness. It is protectively colored, being ashy brown above, shaded and spotted with black. Below it is silvery. In length it seldom exceeds two and one-half inches. Professor Cope includes Rhode Island in the habitat of this animal, and Professor Verrill says it is not uncommon about New Haven.

Plant-Lice, Lady-Bugs, and Sparrows.

DURING the month of June many of the beautiful shade trees in our Providence streets, particularly the lindens, have been infested with numerous representatives of the family *Aphididae*, or plant-lice. Attention to other business has prevented any careful examination of them, but there appeared to be two species, one green, the other nearly black; these last, advancing their legions into the orchards, seemed to prefer especially the cherry trees. It is well known that these pests always appear with the first opening of the leaves in spring-time, retiring only with the cold days of late autumn, and during the interim they multiply at the rate of ten or more generations, preying upon all the different parts of trees and plants, from the leaves to the roots, and doing damage beyond estimate.

In *Half Hours with Insects*, by A. S. Packard, Jr., (page 105), M. Fougard is quoted as stating that a certain species, "*Puceron lanigère*" produces eleven generations. Each generation averages over one hundred individuals, resulting in the following tabulation:

Generation.	Produce.
1.....	1 Aphis.
2.....	100 one hundred.
3.....	10,000 ten thousand.
4.....	1,000,000 one million.
5.....	100,000,000 one hundred millions.
6.....	10,000,000,000 ten billions.
7.....	1,000,000,000,000 one trillion.
8.....	100,000,000,000,000 one hundred trillions.
9.....	10,000,000,000,000,000 ten quadrillions.
10.....	1,000,000,000,000,000,000 one quintillion.

Again, Professor Huxley is quoted as saying that the tenth brood alone, if all its members survive the perils to which they are exposed, contains more substance than five hundred million stout men, or more than the whole population of China.

They have appeared to me especially numerous this season, and many of the leaves have blackened and curled up, while the others assumed a wet and waxy appearance, occasioned by the "honey dew," an exudation from the lice, which sprinkled the pavement, and fell into the faces of pedestrians. These insects pierce the leaves with their beaks, and eat almost continuously, which they are able to do by means of two tubes placed on the last segment of the abdomen, through which the excess of fluid passes out as the afore-mentioned honey dew.

Many flies and bees, and especially ants, were attracted to these infested trees. A history of the relations common between the ants and plant-lice is of great interest, but too long for this article.

Matters remained about in this condition until July 1, when as I was walking on Broadway, about 7 A. M., I noticed the English sparrows, executing peculiar manœuvres, running up and around the trunks of the trees like woodpeckers. At a loss to account for this, I started for the nearest tree, obtaining a good view of a sparrow, who hastily seized a whitish lump of something and flew away. I noticed also that the sparrows flattened their tails against the trees to brace or hold themselves, after the fashion of woodpeckers and creepers, and wondered how much of that food, influence, and exercise would be required to bring about the peculiar stiffness and pointed ends on the tail feathers characteristic of those birds. There were more lumps upon the trees, and it was easy to decide that they were the larvæ of some beetle, and a further examination discovered occasionally a

perfect specimen. Some of these I sent to Mr. G. W. J. Angell, of New York, knowing that from his fine cabinet collection he could at once identify the species. I suggested also that this new arrival was somehow connected with, and probably predatory on, the aphidæ. His reply was as follows:

"NEW YORK, July 7, 1886.

"*Editor Random Notes:*

"The insect you send me for determination is one of our well-known coccinellidæ, (commonly called lady-birds, or lady-bugs,) *Anatis 15, punctata*, Oliv. In regard to its predatory character, I would state that it is a fact well known to entomologists that all the coccinellidæ and their larvæ (with the exception of *Epilochna borealis*, Fab., which feeds on the squash) prey on Aphidæ. See the excellent article, 'Plant Lice, their Friends and Enemies,' by Benj. D. Walsh, in *Practical Entomologist*, Vol. II., No. 4, p. 57. Coccinellidæ also prey on the eggs, larvæ, and pupæ of the Colorado potato bug (*Doryphora 10, lineata*, Say) see *American Entomologist*, Vol. I., No. 3, 1868, and are also the enemies of the chinch bug, see *American Entomologist*, Vol. I., No. 10, 1869. These facts are sufficient, I think, to show the great value of our coccinellidæ in the economy of nature, and hence the evil done by the English sparrow in so ruthlessly destroying our friends and benefactors, the lady-bugs."

And this brings me to what would seem to be one more link in the chain of evidence against the English sparrow.

A similar behavior by these birds was observed in other localities by Mr. Samuel Gorham and Mr. Charles Achorn. We all failed to discover that they eat the lice, but the evidence is not conclusive, as no dissections were made.

MESSRS DICKEY AND ALLEN report the recent capture at Charlestown, N. H., of an Albino Flying Squirrel (*sciuroptorus volucella*), the captor, a cat.

I quite frequently receive reports of the capture of squirrels, moles, birds, and small game in general, by domesticated cats.

—Ed.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXIII.

120. MELAMPUS BIDENTATUS, SAY.

Syns. :

Melampus biplicatus, Pfr.

Auricula biplicata, Desh.

Auricula cornea, Desh.

Auricula bidentata, Gld., DeKay, Kuster.

Melampus bidentatus, Say, Russell, Pfr.,

W. G. Binney, etc.

Shell ovate-conic; whorls five, the body whorl three-fourths the length of the shell; the others are flattened, forming a short blunt spire; suture distinct; aperture long and narrow; outer lip thin and sharp; inner lip furnished with two folds or teeth; within the outer lip are seen several ridges which do not reach to the margin. Length one-half inch by three-tenths in breadth.

It inhabits marshes on grass just below high tide. It crawls up the stems of the grass to escape the rising tide, but can bear submergence in salt water without injury. It is very common in Rhode Island though extremely rare north of Massachusetts Bay. It is found everywhere near Narragansett Bay and along the ocean shore as far south as Florida.

The young shells are usually smooth and dark brown, ornamented with two or three revolving bands. As they grow older they become eroded and the surface becomes rough and of a greyish white color. The ridges within the outer lip are not developed until the shell is fully matured so that it is rare to find a perfect specimen, *i. e.*, having the ridges and bands with the smooth surface and brown color united in one individual.

Family Otinidæ, not represented in America.

Family Limnæidæ.

The members of this large group of mollusks inhabit fresh water rivers, ponds, and ditches in all parts of the world and it is almost impossible to find any body of water, however small, which does not contain one or more species of this family. While on a visit to Germany this spring, I noticed in a

small town, ditches of stagnant water standing in front of some of the houses, not over three feet in width, and from two or three inches to two feet in depth, evidently receptacles for the sewage of the adjoining houses, yet in these ditches were living thousands of specimens of at least seven different species of this family.

These animals although living in water are air breathers like all of the Pulmonata and therefore they are obliged to come often to the surface to obtain air. They float along on the water, with the foot or creeping disc just level with the surface, and the shell hanging down beneath. By expelling a portion of the air contained in the lungs they can immediately sink to the bottom. They lay their eggs in spring and early summer on stones and sticks in clusters surrounded by a gelatinous substance. Under the microscope we can watch day by day the development of the eggs and finally the little mollusks eating their way out of the jelly with which they are surrounded, and provided even at this time with a minute shell. Like the terrestrial mollusca, both sexes are united in each individual. All the air-breathing, fluviatile mollusca belong to this one family which is divided into four sub-families, three of which are represented in Rhode Island.

Sub-family Limnæinæ, with twelve genera is represented in Rhode Island by three genera and eight species.

121. LIMNÆA (RADIX) COLUMELLA, SAY.

Shell thin, fragile, horn colored; whorls four, longitudinally wrinkled; spire prominent, acute; suture not much impressed; aperture ovate, dilated. Mr. W. G. Binney in *Fresh Water Shells of North America*, 1865, has included (as synonymes) a dozen or more shells described by different authors at different times; some of these are undoubtedly distinct species of themselves. There is one variety, differing much from the typical species, which was originally described as new, and in my opinion ought to be considered as a separate species. The author, however, afterwards seemed disposed to regard it as a strongly marked local variety of columella, because it had never been found in any other place than the muddy pool in Cambridge where he first discovered it, and other writers since have taken his later view of the subject. This species I

have found in large numbers in Rhode Island but only in one place. It was named *Limnæa chalybea* by Gould in *Silliman's Journal*, XXXIII., 196, 1840.

Limnæa columella as found here, resembles a *succinea* in color, shape, and size, although quite large ones are found in the pond at Lonsdale, near the railroad, nearly an inch in length. It is a delicate, fragile shell, almost transparent, with an aperture four-fifths the entire length of the shell, so that the whole body of the animal can be seen by looking in at the aperture. It attains the growth early in the spring. The animal is dark with small whitish spots, the tentacles are broad, pyramidal, compressed, and the eyes are small, black, and situated at the inner base of the tentacles.

The variety called *chalybea* is covered with a bluish-black epidermis and the interior of the shell is the same color of a little lighter shade. The shell is as thin as the typical *columella*, but is not so brittle and rings like hard burnt crockery. The spire is more pointed, the aperture more expanded and the fold on the inner lip more conspicuous. The locality for this variety is on the left side of the cross road from Lonsdale to the Diamond Hill road. It is an excavation containing more or less water the year round—a very dirty, stagnant pool containing all sorts of rubbish. Collectors who are susceptible to poison had better keep away from this place, as a dog wood tree grows over it, and the water in it being supplied only by the rain, and is being constantly evaporated by the sun, the pool is simply a concentrated infusion of dogwood leaves. How the mollusks stand it is a mystery, but personal experience has taught me to “keep in the middle of the road” when passing that locality.

122. LIMNÆA (LIMNOPHYSA) CAPERATA, SAY.

“Shell sub-oval, yellowish horn color; spire half the length of the mouth; apex acute; whorls slightly wrinkled across, with very numerous elevated, minute revolving lines; suture not very deeply impressed; aperture rather dilated; fold of the labium not profound. Inhabits Indiana” (Say).

“This species is found in the British possessions as far north as Hudson’s Bay and through the northern tier of states from New England to Lake Superior” (W. G.

Binney). Found in Rhode Island, so far as I know, only at Harris Lime Rock in Smithfield.

Professor Adams described in 1840 a new species of *Limnæa* which he called *umbilicata*, found in New Bedford, Mass. It has a large umbilicus for so small a shell, about a quarter of an inch long, while *caperata* has none. Mr. W. G. Binney follows Haldeman and Kuster in calling it a synonym of *Limnæa caperata*, but I am satisfied that it is neither a synonym nor a variety of *caperata*, but rather of *Limnæa humilis*, Say. My reason for this will be explained under the description of *L. humilis*.

123. LIMNÆA (LIMNOPHYSA) DESIDIOSA SAY.

This species was first found by Mr. Augustus Jessup, in Cayuga Lake and described by Say in *Journ. Acad. Nat. Sci., Phila.*, II., 169, 1821, as follows: “Shell oblong, sub-conic; whorls five, very convex, the fourth and fifth very small, the second rather larger; aperture a little longer than the spire; suture deeply indented; labium, calcareous deposit copious, not perfectly appressed at the base, but leaving a very small umbilical aperture.”

It has been found from New England to Kansas, but is not common in Rhode Island. Its habitat is on the margins of pools and muddy ponds, but it may be seen on stones in the river, under the bridge at Olneyville. Its length is from one-half to seven-tenths of an inch. I have never found any in Rhode Island to exceed four-tenths of an inch.

(To be continued.)

TENNESSEE WARBLER IN RHODE ISLAND.—On the morning of Saturday, September 18, Mr. Walter Angell captured in an orchard at Centredale, Johnston, a fine specimen of the Tennessee Warbler, (*Helminthophila peregrina*). It was a single specimen in company with a flock of Pine Warblers, (*Dendroica vigorsii*). I think the species has not previously been reported for this state.

PURPLE GALLINULE.—(*Ionornis martinica*). A specimen was captured alive in Warwick, R. I., about the middle of August. The second occurrence reported for Rhode Island.

CHECK-LIST OF GENUS *CLAUSILIA*. VI.

J. RITCHIE, JR.

- | | |
|---|---|
| <p> <i>teres</i> Olivier.
 <i>tersa</i> Parr.
 <i>tetragonostoma</i> Pfr.
 <i>tettelbachiana</i> Rossm.
 <i>thebana</i> Blanc.
 <i>theobaldi</i> Blanford.
 <i>thermopylarum</i> Pfr.
 <i>thessalonica</i> Friw.
 <i>thomasiana</i> Charp.
 <i>tiberiana</i> Benoit.
 <i>tichobates</i> Parr.
 <i>tinei</i> Bourg.
 <i>torticollis</i> Olivier.
 <i>transiens</i> Möll.
 <i>translucida</i> Ziegler.
 <i>tridens</i> Chemn.
 <i>trinacrina</i> Boettger.
 <i>tristrami</i> Pfr.
 <i>troglydytes</i> Parr.
 <i>tschetschenica</i> Pfr.
 <i>tuba</i> Hanley.
 <i>tumida</i> Ziegler.
 <i>turgida</i> Ziegler.
 <i>turrita</i> Pfr.
 <i>unicristata</i> Boettger.
 <i>unidentata</i> Küst.
 <i>ungeri</i> Zelebor.
 <i>urlaiensis</i> Zelebor.
 <i>valida</i> Pfr.
 <i>validiuscula</i> Martens.
 <i>vallata</i> Mouss.
 <i>varians</i> Ziegler.
 <i>varicosta</i> Boettger.
 <i>variegata</i> A. Adams.
 <i>varnensis</i> Pfr.
 <i>vasta</i> Boettger.
 <i>ventricosa</i> Drap.
 <i>venusta</i> A. Schmidt.
 <i>vesicalis</i> Friw.
 <i>vespa</i> Gould.
 <i>vestusta</i> Ziegler.
 <i>vibex</i> Rossm.
 <i>vicina</i> Fer.
 <i>villæ</i> Möll.
 <i>vinacea</i> Heude.
 <i>virginea</i> Pfr.
 <i>virgo</i> Mouss.
 <i>voithi</i> Rossm.
 <i>waageni</i> Stolickza.
 <i>yocohamensis</i> Cross.
 <i>zebriola</i> Küst.
 <i>zelebori</i> Rossm.
 <i>zeigleri</i> Küst. </p> | <p> <i>marginata</i> Ziegler.
 <i>marisi</i> A. Schmidt.
 <i>maritima</i> Kleciach.
 <i>martensi</i> Herk.
 <i>massenæ</i> Pot. et Mich.
 <i>masoni</i> Theobald.
 <i>mathildæ</i> Kleciach.
 <i>medleycotti</i> Tristram.
 <i>meisneriana</i> Shuttl.
 <i>mellæ</i> Stab.
 <i>menelaus</i> Martens.
 <i>menonia</i> Parr.
 <i>menschendoeferi</i> Bielz.
 <i>messenica</i> Martens.
 <i>miles</i> Küst.
 <i>milleri</i> Pfr.
 <i>minuscula</i> Parr.
 <i>mirabilis</i> Parr.
 <i>mitylena</i> Albers.
 <i>modesta</i> Küst.
 <i>modesta</i> Ziegler.
 <i>moësta</i> Fer.
 <i>monilifera</i> Parr.
 <i>moniziana</i> Lowe.
 <i>montana</i> Stenz.
 <i>monticola</i> G-Austen.
 <i>moveletiana</i> Blanc.
 <i>mouhoti</i> Pfr.
 <i>mucida</i> Ziegler.
 <i>munda</i> Ziegler.
 <i>muralis</i> Küst.
 <i>huriata</i> Parr.
 <i>nævosa</i> Fer.
 <i>nana</i> Küst.
 <i>narentana</i> Parr.
 <i>negropontina</i> Pfr.
 <i>nervosa</i> Parr.
 <i>nilssoni</i> Westerlund.
 <i>nivea</i> Pfr.
 <i>nobilis</i> Pfr.
 <i>nonybarica</i> G-Austen.
 <i>notabilis</i> Küst.
 <i>obesa</i> Pfr.
 <i>obeiscula</i> Lowe.
 <i>obvoluta</i> Friw.
 <i>oleata</i> Rossm.
 <i>oleosa</i> Westerlund.
 <i>olivieri</i> Roth.
 <i>olympica</i> Friw.
 <i>opaca</i> Küst.
 <i>ornata</i> Ziegler. </p> |
|---|---|

[This column was omitted by error from List No. IV.]

RARE TROPICAL BIRDS

Among my late arrivals are a few specimens each of

Paradise Birds.

COLLARED EPIMACHUS, KING PARADISE,
Epimachus magnus. *Cinnurus regius*

MAGNIFICENT PARADISE,
Dyshylloides magnifica.

REPUBLICAN PARADISE,
Schlegelia wilsoni.

RED PLUMED PARADISE,
Paradisea raggiana.

LESSER PARADISE,
Paradisea minor.

TOUCANS.

SEVERAL HANDSOME SPECIES. (UNNAMED.)

CROWNED PIGEONS,
Goura Victoriae.

VIOLACEUS PLANTAIN EATER,
Musophago violacea.

ROSY COCKATOO,
Cacatura roseicapilla.

PENNANT'S LORY,
Platycercus penanti.

SWAINSON'S LORY,
Trichoglossus, novæ hollandiæ.

GROUND PARRAKEET,
Pezoporus formosus.

WHITE-BREASTED KINGFISHER,
Halcyon smyrnensis.

PITTA,
Brachyurus cuculatus.

REGENT BIRD,
Sericulus melinus.

LYRE BIRD,
Menura superba.

RING PARROT,
Palæornis torquatus.

LATELY RECEIVED FROM COLORADO,
SKINS OF THE BLACK FOOTED FERRET,
Putorius (Cynomyonax) nigripes.

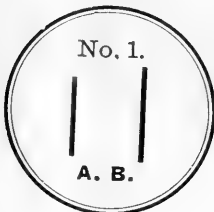
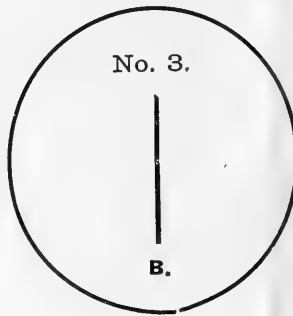
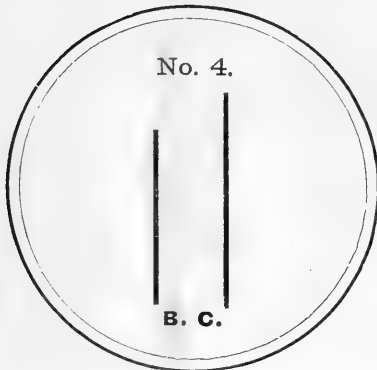
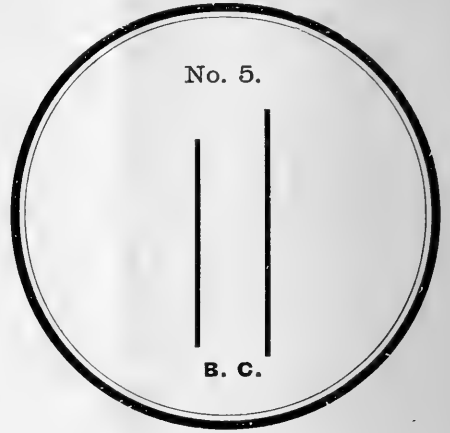
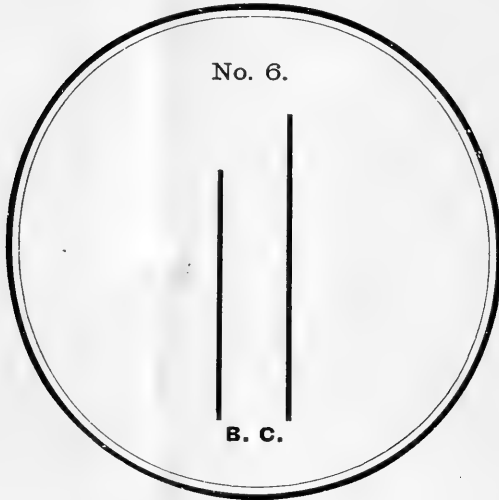
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A COLLECTION OF MITRES, 25 SPECIES.
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" 4,	- - - -	75 " "
" 5,	- - - -	85 " "
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The lines lettered A. B. C. correspond in length with the depths of the boxes.

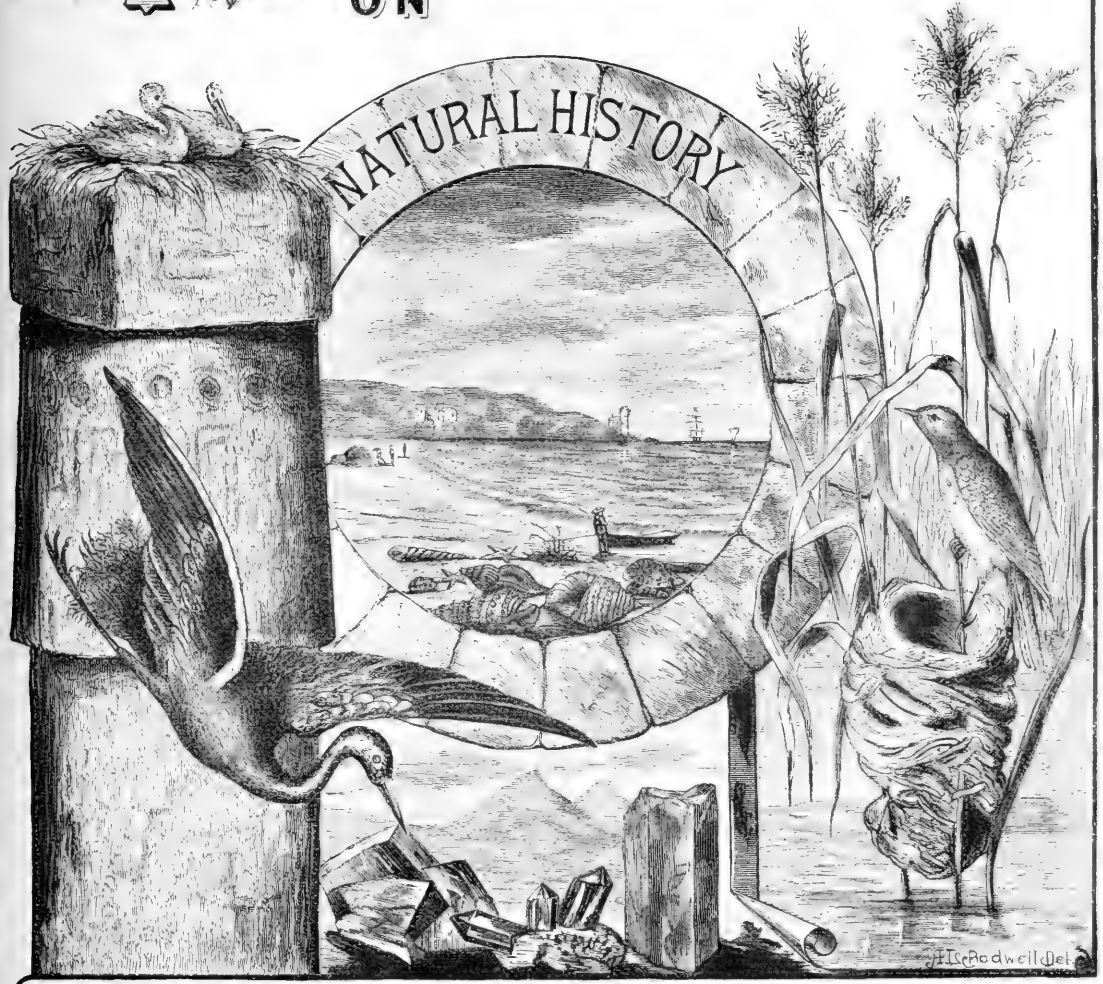
The shoulders of these boxes are beveled, thus preventing the edges turning over when placing on the lids.

JAMES M. SOUTHWICK, PROVIDENCE, R. I.

VOL. III.

NO. XI.

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ON



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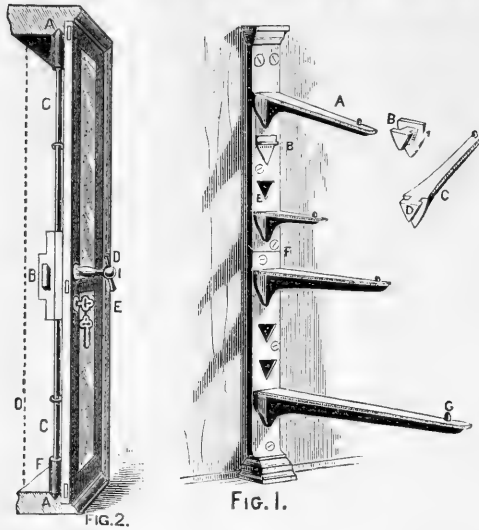
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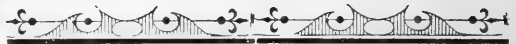
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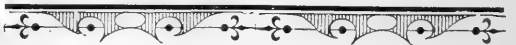
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Vol. III.

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No. 11.

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Kames in Rhode Island.

I HAD the pleasure of examining, last summer, two interesting examples of this rather common form of glacial deposit. They both lie in the town of Burrillville, one being on the farm of Job Ballou and the other about a mile northeast, on the farm of Isaac Steere.

The former is about half a mile in length, extending in nearly a north and south line with only slight curves. At the north end it is perhaps fifteen feet above the level of the pasture-land around, but gradually becomes higher southward until it ends abruptly with an altitude of fully fifty feet. The summit of the kame is gently rounded and just about wide enough for a railroad track. In fact the whole ridge has almost exactly the appearance of a railroad embankment.

At the north end an excavation has been made sufficient to show the character of the materials. It seemed to be of mixed sand and gravel similar to most of our modified drift, and having in places the oblique lamination often seen in banks of such material.

This kame is on the side of a gently sloping tract of country, and has a little stream a few hundred yards to the westward. The greater part of it lies in open pasture-land, and on this account its extent and regular shape arrest the eye from quite a distance.

The other is very similar in general extent and conformation, but lies mostly in the woods, and is less easily examined.

At its northern extremity it seems to widen out and enclose a large and very regular sink-hole. This is perhaps forty feet in depth and as regularly oval in shape as if it had been formed artificially.

The origin of these kames and sink-holes does not seem to be very well understood, although several theories have been offered to account for them. They were probably formed by some peculiar conformation of the great glacial ice sheet that once covered all New England, by which sub-glacial streams resulting from the melting ice, piled up and arranged the eroded drift material within or beneath the slowly moving mass.

T. J. B.

Autumnal Suggestions.

ALREADY there are symptoms of the approaching autumn. The red maple in the swamps is coloring on one side; the sumacs here and there hang out their scarlet banners. Everywhere the golden rods begin to assert supremacy, and the blue and white asters show their stars in the copse. Long wreaths of blossoming clematis clamber over the bushes — things of exquisite beauty. There is an abandon and reckless grace about the clematis, or Virginia tower, which commends it to the artist. What is there, we wonder, about the leaves which to us suggests a storm-beaten flock of birds? This notion, which we deem original, in a week's time we will find has long ago occurred to some other writer. Truly there is nothing new under the sun.

Among other intimations of autumn is, we are told, the gathering of swallows on the telegraph wires. Do they in this manner communicate a message of departure to comrades further north? There are more things in heaven and earth than we or Horatio wot of. Scollops will soon begin to drift up Cowesett Bay, followed by the white-winged fleet of fishing-boats. Even at noon-tide we hear the rattle of the cicada, that policeman of August, who is perpetually

sounding his alarm. It was old Anacreon who said :

"Happy the cicadas' lives,
For they all have voiceless wives."

What depth of connubial experience suggested these ungallant lines? Daily we expect to hear the katydid, due in this part of the world about the 8th of August. When we say daily, let no one suppose that we are ignorant of their habit of singing at night.

We have often wished that Tennyson, who has done so much to embalm the English wild flowers, could know our golden rods and asters. They would well grace an Arthusian idyl. Our own poets are beginning to comprehend them, and we find many American verses aglow with these September blossoms. Other composites, too, are prominent in the landscape, notably the tall purple thoroughworts (*Eupatorium purpureum*) and the iron-weed, or *Vernonia*. The common white thoroughwort is not very showy, but is curious from its perfoliate leaves. We mean by this that the leaves are opposite, and unite around the main stem or axis, so as to leave a sort of cup at the junction. In some plants, like the teasel, this cup is full of water, and isolates the portion of stem above from the approach of unwelcome insects. Flying creatures, on the contrary, like bees, are welcomed by many alluring devices, as by color, nectar, or pollen. Very strange and interesting is this whole matter of the relation of insects to flowers.

The emerald globes of wild grape, in the happy terms of Mrs. Whitman, now begin to "turn to amethyst." If any are yet ignorant of this author's "Still Day in Autumn," they should find and read it. Few word-pictures are truer to nature, or so tinged with local color. Why cannot we have her prose pieces collected and published as well as her poems? Everything she wrote was a finished composition, in which each word was chosen and weighed for its appropriateness. Her name must ever stand high in our Rhode Island Valhalla.

We should not leave this subject without a word of tribute to the cardinal flowers, the summer's crowning glory. By some cool stream, glassy from its depth, and overhung with alders and willows, over which again the larger trees form gothic arches,

we will see long ranks of scarlet cardinals stand majestic. This is the place to view and prize them. They are of the woods woody; their charm is lost by plucking.

W. W. B.

BUTTONWOODS, Aug. 10, 1886.

Native Forest Trees of Rhode Island.

NUMBER XVIII.

BY L. W. RUSSELL.

THE BIRCHES.—BETULACEÆ.

The Black Birch, Betula lenta.

THERE are five species of birch found native in Rhode Island. They are the black birch, *B. lenta*, the yellow, *B. excelsa*, the red, *B. nigra*, the white, *B. alba*, the paper, *B. papyracea*. Of these, *B. nigra* and *B. papyracea* are simply local, and the others, except the white birch, can hardly be regarded as common.

The birches, as a genus of trees, must take a second rank in importance in this state. Farther north, they are, relatively, more numerous and important. In the northern parts of New England the birches occupy, as the chief forest tree, extensive tracts. These are frequently found along the flanks of the mountains, belts of wood, almost exclusively of yellow birch. In the British Territory of North America the birches form the chief growth of immense tracts. Approaching the higher latitudes these trees appear gradually more dwarfed, until near the Arctic Circle they dwindle to mere knotty, compact shrubs a foot or two high, the last of woody growths, except the willows.

Some of the birches are among the most graceful and attractive of deciduous trees. The black birch, when freely developed, is in this state, a large, round-headed symmetrical tree, with long slender limbs, and dense, heavy foliage, giving the branches a weeping tendency. But few such trees are seen as they are rarely left single. They are usually found in Rhode Island along the banks of streams and ponds, where the location is cool, and the roots can find abundant moisture. Although nowhere very abundant, they are scattered in considerable numbers, in the locations named.

Upon the edge of a pond on the banks of a stream, the long lithe branches reach towards the water, sometimes dipping into it, forming a beautiful fringe-like border.

The bark is dark iron-gray in color, smooth when the tree is young, rough and in scales upon the outside upon old trunks. The bark of the young shoots has a sweet, aromatic taste, giving it the name of "sweet birch." The leaves are oblong, ovate, and heart-shaped at the base, tapering to a point, finely serrate, smooth, dark green upon the upper surface, paler beneath, veins straight, prominent and hairy upon the under side.

The sterile blossoms upon their jaunty pendent aments, are among the first harbingers of spring. The aments both the fertile and sterile, are formed in July of the season previous to the blossoming. The fertile aments are short, stiff, and erect. The seeds are furnished with a circular wing or samara, by means of which they are freely scattered abroad. It is not uncommon for them to germinate upon a mossy log or in rocky crevices, from whence they grow, throwing out branch-like roots, making the tree, as it develops, a most picturesque object.

The wood is fine grained, of a silky lustre, and has a pinkish tinge, from which it is sometimes known as "mahogany" birch. Veneers made from wood formed by the juncture of limbs of this tree are of notable beauty, being much prized in cabinet work. The toughness of the wood makes it valuable for yokes, wooden bowls, and other wood-ware. As fuel it ranks next to the rock maple, while its aromatic odor in burning, makes it very pleasant for an open fire.

For the lover of trees the black birch has many points to commend it. When well developed, it is stately and graceful, the light airiness of its ramification preventing any aspect of stiffness. Its blossoms are the delight of early spring gleaners; its foliage and shade are cheering all summer, while the orange tinting of the leaves in autumn gives them attractiveness to the last of the season. The specimens observed by the writer in this state appear in a healthy, thrifty condition. Near Providence may be found fine specimens on the borders of

Mashapaug Pond, in the woods near Silver Spring, and along the banks of the streams in the vicinity. When the fine qualities of this species of birch are better known, it will be prized as a shade and ornamental tree.

Reptiles and Batrachians of Rhode Island.

BY HERMON C. BUMPUS.

NUMBER XXIV.

8. *Spelerpes bilineata* Baird (*Salamandra bilineatas* Green). The Two-lined Salamander has the teeth small, the tail short and compressed, the flanks presenting thirteen or fourteen grooves, and the inner toes longest. The posterior limbs are, moreover, nearly double the anterior in size. In coloring, yellow predominates, while there are two narrow lines of a deep black shade passing along the back from the orbits, nearly the entire length of the animal. The tail is dark along the sides while below and continuing on to the belly a beautiful unspotted bright yellow shade obtains. Though small and delicate, seldom exceeding three inches in length, the Two-lined Salamander is extremely active, sometimes seen skipping about from under one damp rock to another, or, after rain or in the dusk, emerging from its hiding-place to search for the then inactive gnats, and other small insects. It is interesting to examine the lower side of the animal and observe that the integument is so delicate and transparent that the intestines can be seen passing along as a dark line; quite like that presented by some of the smaller fishes.

The three previous genera are united with the genus *Plethodon* into a family known as the PLETHODONTIDÆ, which is characterized by having the carpus and tarsus unossified, though the vertebræ are as in the genus *Amblystoma*, already described.

9. *Desmognathus fuscus* Rafinesque, (*Salamandra picta* Harlan, *Salamandra quadramaculata* Holbrook). The Painted Salamander is the only one of four North American species of the present genus likely to occur within the boundaries of Rhode Island. The genus *Desmognathus* is the sole representative of the family DESMOGNATHIDÆ,

a family differing from those hitherto treated in several structural peculiarities, though externally indistinguishable from the PLETHODONTIDÆ, with which they have been often confounded.

Desmognathus fuscus is perhaps the most abundant of North American forms. It is over three inches in length; has fourteen costal folds; a long tail equaling the animal in length, and keeled along its upper part. It is brown above with gray and pink shades, the latter being much more apparent in the young than in the adult animal. The flanks and belly are marbled, pale shades predominating. The animals enjoy most the shallow and rapid waters of mountain rivulets. In places under every stone an adult animal or its larva is found to take concealment, from which it darts forth on being disturbed, rapidly swimming from rock to rock evidently quite dissatisfied with all.

A most interesting fact in connection with this animal must not be omitted: Professor Baird has noticed that the eggs are wrapped in a long string around the body of the female, who now seeks a damp situation where she remains until all are hatched. This method was for a long time supposed to be only characteristic of the so-called *Alytes*, an anurous Batrachian of Europe.

Before closing with this list I feel it my duty to thank those who have assisted me by giving facts or in making more complete the collection in the museum of Brown University. This now, especially through the courtesy of Professor Baird, contains types of all the forms which I have here mentioned and will be, I trust, of much help to those who may interest themselves in this branch.

Anemones.

WHILE on Chesawannoc or Hog Island, on the twenty-ninth day of September, I climbed down the broken away part of the old wharf, on the east side of the island, for the purpose of observing the *Littorina littoria*, which were covered with serpula to an extent I had never seen. I do not think a single shell among hundreds were free from these white threads, and the effect both under water and up and down the sides of the wharf, where the *Littorina* had climbed,

was very striking from quantity. While looking to see if the serpula confined its work to the shells, or if the stones were likewise attacked, I saw suddenly blooming beneath me in a hollow of the wharf under water, four sea anemones (*Myrtilidium marginatum*). They were fixed upon one stone, and varied in size from a dime to a half dollar at their point of attachment. This is my impression as to their size; I had no means of measurement. By some cautious movement of stones near by, I found two or three others, and making signals to friends in a boat at hand, we were able by use of the boat to make farther search, and soon came upon two more, one much larger than either of the first found.

We moved three small stones to a cove opening out of Bristol Harbor, hoping that the conditions of their new surroundings will be favorable to the increase of this beautiful creature, and left undisturbed in their original home a sufficient number to ensure their continuance in that place.

H. M. K. BROWNELL.

Abnormal Embryos.

IN *Science Observer*, No. 49, Prof. Samuel Garman discusses at some length the occurrence of twins and triplets among the young of the trout and salmon, under culture in hatcheries. In the discussion of the subject some twenty-four examples have been selected, which, drawn by Mr. S. F. Denton, serve to illustrate the principal abnormal peculiarities. The conclusions at which Professor Garman arrives seem logical, and have already attracted considerable attention among those who are interested in embryology.

Professor Garman says: "In the absence of exact data for comparison, in regard to relative abundance, frequency of occurrence, etc., it only remains to offer a few conjectures as to the cause and manner of origin of these monstrosities.

"Were we to adopt for these cases the general conclusion that one spermatozoon only is concerned in the fertilization of each egg, we should be driven to conclude that the embryo has, by more or less complete division, split up to form the monster or the group. And we can not claim that the freak results from fusion without admit-

ting that more than one spermatozoon enters the egg. That the embryo should be split up to such an extent as to produce the various forms noted is quite improbable; but that deformities of the embryo do not occur from fission is undoubtedly true. A hypothesis that would go far toward satisfying the queries is this: An egg might have several micropyles. Many of the eggs bearing deformities are not more than the usual size; plurality of micropyles would meet their cases better than double yolks. It does not seem at all necessary, however, to demand even the malformation of the egg in this manner. Prof. Alex. Agassiz furnishes a clew in his statement that in all his experience in collecting eggs at sea, he has never yet found one of these freaks. If we compare the conditions at sea, and at the hatcheries, we shall find immense differences. At sea the eggs are laid only when fully matured; this is not always the case at the hatchery. To be sure, there are differences in the species at the two localities, but we do not know that any of the various species that have been collected among pelagic fishes have been reported productive of deformities.

In the hatchery, about the time the eggs are ripe, the female is caught, and more or less force is used in taking the eggs. Naturally with those that are fully ripe others not so mature are taken. The finishing touches being put on the outer covering of the egg, the capsule is most likely to prove unfinished if the eggs are taken too soon. The contents may be perfected, though the capsule may not be completed. While the capsule in maturity may resist the intrusion of spermatozoa, compelling entrance at the micropyle, in imperfect condition the same capsule would prove a less effective barrier at its pores or elsewhere. In the imperfection of the capsule we may find at once a means of accounting for the occurrence of the abnormal forms and groups on the egg, and for their frequent appearance at the hatchery. It does not seem unreasonable to conclude that the occurrence of the monsters at the hatcheries is in great measure due to forcible and premature extrusion of the eggs, consequent imperfection of the capsules admitting spermatozoa at various points, possibly before aggregation of the germinal matter at one of the poles has taken place,

and resulting in the formation of two or more embryos, which may or may not coalesce."

Sitta Canadensis.

I WOULD like to note through your columns of the capture by myself in Clarendon County, S. C., on the 4th of October, 1886, of a fine male specimen of *Sitta Canadensis*. I was collecting in a thick swamp, and observed a small bird fluttering about the terminal branches of a large Tripolo, or "Gun" tree, after the manner of a *Dendræca*. The height of the tree prevented my determining the bird, but the dark colored head seemed unusual, and so I shot and brought down the unknown.

I can find no *direct* quotation of any previous capture of this species for South Carolina.

Audubon says, "Southern limits seldom farther than Maryland, . . . some at the approach of winter venture as far as South Carolina, although never seen in the *maritime districts* of that state."

Unless I am mistaken this will prove the first occurrence of *S. Canadensis*, certainly in the seaboard in South Carolina.

ELLISON A. SMYTH, JR.

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXIV.

124. LIMNÆA (LIMNOPHYSA) ELODES, SAY.

SHELL tapering, elongated, inelegant; color nearly black; whorls five to six, sometimes perfect at the apex, but generally decollated; aperture about one-half the total length of the shell, sub-oval; lip thin, sometimes with a reddish thickened margin; inner lip covered with a white enamel not closely appressed at the umbilicus. Average length of shell nine-tenths of an inch. It is very variable in form and size, and the largest ones are thinner than the adult small specimens. I have one in my collection an inch and a quarter in length. Found from Hudson's Bay to Pennsylvania and from New England to Oregon.

Like the preceding species, it was first discovered by Mr. Jessup, and described by Say at the same time with it. Many conchologists are of the opinion that this

species is identical with *L. palustris*, Müller, a species which inhabits the whole of Europe and Siberia. This is not my opinion, but if they should be identical, its name should be *L. palustris*, Müll, as that species was described in 1774.

L. elodes are found all over Rhode Island in slow and rapid streams, stagnant ponds, or wherever there is an abundance of decaying vegetable matter. Very large specimens may be obtained from a pond near the railroad, just this side of the Lonsdale station, while the most perfect ones are found in the Providence and Worcester Canal near Log Bridge, where they are very abundant. They must be collected in June to obtain them in their best condition, for after that month only young ones can be found alive. They attain their full size and age by the first of July, and at this time they cluster together and begin to devour each other's shells. The young mollusks grow rapidly during the summer and fall, and on the approach of winter bury themselves in the mud until the spring opens.

125. LIMNÆA (LIMNOPHYSA) HUMILIS, SAY.

There are eight or ten species of *Limnæa* found in the United States, which have been referred by different authors to the species, making as many synonyms of it as their opinions concerning it. As most of these are probably distinct species, I will mention only the one variety which is found in Rhode Island, which differs from the typical species.

Limnæa humilis, as Say named it in 1822, is a small, ovate-conic shell, of a light olive, or sea-green color when clean, but as found living, it is almost always covered with a coating of mud. Those found in this vicinity are easily cleaned, but the western specimens, covered with the calcareous mud of that section, require a little dilute chlorhydric or hydrochloric acid to remove the lime. The animal is of a bottle-green color above, dotted with amber spots, and paler beneath. Shell seven-twentieths of an inch in length, with four or five whorls, a little shouldered or flattened above; body whorl two-thirds the size of the shell; aperture a little more than half the length of the shell, rounded; inner lip reflected over a small umbilicus. It is found on the margins of muddy pools, especially in de-

pressions in the earth filled by rain or melting snow in spring, and dry during the summer. On the cross road from Lonsdale to the Diamond Hill Road, about half-way, on the right hand side, under a tree close to the road, is a good locality, where in spring they can be found clinging to stones, and in the summer in the dried mud. If placed in a vessel of clean water they will crawl out of the vessel and will live several days out of the water, but if not replaced by this time they will die, although they live all summer after the pond has dried up, by the side of stones, which condense a little moisture from the atmosphere, even in the driest weather.

The variety alluded to above, was called *Limnæa umbilicata* by Professor Adams, who described it in the *Am. Jour. Sci.*, XXXIX., 374, 1840. Some authors consider it as a distinct species. W. G. Binney in *Land and Fresh Water Shells of North America*, Part II., p. 56, 1865, makes it a synonym of *L. caperata*, Say. Several years ago I visited a small pool at Pawtucket, called the "Fountain," a depression about twelve feet in diameter, perhaps two or more feet deep, filled with water most of the year. In summer there are times when it is nearly dry, and on one of these occasions I collected a few specimens of what was then a new species to me. A short time afterward I showed them to Prof. E. S. Morse, who pronounced them *L. umbilicata*, Adams. Two years after, having used most of my specimens for exchanges, I again visited the spot. To my surprise not an *umbilicata* could be found, but in their place were plenty of the typical *L. humilis*, of which none were present on my former visit. Unless the *umbilicatas* were young or undeveloped *humilis*, in order to explain this curious phenomena, we must call in an act of special creation during the period of two years, and the utter extinction of the former species.

Besides the genus *Limnæa*, containing over two hundred species, of which five inhabit Rhode Island, as above, there are also eleven other genera in the sub-family *Limnæinæ*, of which two are represented in the United States. These are *Physa*, with one hundred or more species, and *Aplexa*, with twenty-five. We have two species of *Physa* and one of *Aplexa* in Rhode Island.

126. *PHYSA ANCILLARIA*, SAY.*Syns:*

Physa obesa, DeKay, N. Y., Moll., 1843.
 "Shell ovate-globose, pale yellowish; whorls four, rapidly attenuated; spire truncate, very little elevated above the general curve of the shell; suture not impressed; aperture rounded in front, seven-eighths the length of the shell. Animal bright lemon color. It inhabits from New England to Louisiana, and is very plenty in some localities, though not abundant in Rhode Island."

It was described by Say in the *Journ. Acad. Nat. Sci.*, V., 124, 1825. It attains a length of over one-half inch by seven-twentieths in breadth. It becomes stout and thick by age, and the reddish rib along the outer lip and the enamel on the columella becomes quite hard and solid.

All the species of *Physa* and *Aplexa* are left-handed, *i. e.*, they have the aperture on the left side of the shell and are called sinistral, in distinction from all other fresh water shells inhabiting America which are dextral or right-handed.

127. *PHYSA HETEROSTROPHA*, SAY.

The synonymy of this species is terribly mixed. Our conservative friends who hate to drop a word which no longer has a meaning, but who would still be contented to call spiral shells, land, fresh water, or marine, of any shape or style, by the name of *Helix*, might, perhaps, agree with Mr. Binney, who in *Fresh Water Shells of North America* adds about a dozen distinct species of shells to the already numerous synonymy of *P. heterostropha*.

Say first described this shell as *Lymnæa heterostropha* in Nicholson's *Encyclopædia* in 1817, but changed the name to *Physa* in 1821 in *Journ. Acad. Nat. Sci.*, II., 172. "Shells sinistral, sub-ovate; color yellowish, chestnut, or blackish; whorls four,—the first large, the others very small,—terminating abruptly in an acute apex; aperture oval, three-quarters the length of the shell, within of a pearly lustre, often blackish; lip thickened on the inside and tinged with a dull red."

This species is abundant everywhere in ditches, ponds, and rivers all over North America, north of Mexico. It resembles *P. ancillaria* but is distinguished from it by the following characteristics: The animal

of *heterostropha* is olivaceous, surface very smooth and silky; *ancillaria* is bright lemon color. The shell of *ancillaria* has a shorter spire, a more angular outline, the suture is more closely appressed to the whorls, and the surface of the shell is perfectly smooth. The surface of *heterostropha* under a glass, is covered with waved, revolving and longitudinal lines. It attains a larger size than *ancillaria*, and when fully grown, the lip is thickened and the broad, pearly layer of enamel on the columella has a very prominent fold.

*(To be continued.)**Hyalinia Wheatleyii*, Bland.

IN chapter XXIX., page 47, of RANDOM NOTES, June, 1886, I published an error in describing species 101 of Rhode Island shells. This chapter was devoted entirely to the new species found by Mr. John H. Thomson, of New Bedford, Mass., which had never been seen by me, or hitherto found in our state.

This species was called *Mesodon wheatleyii*, Bland, a species found in North Carolina, and described by Mr. Bland, in *Ann. N. Y. Lyc.*, VII., 118, 1860. I supposed this to be the shell meant by Mr. Thomson, and not knowing that Mr. Bland had given two *Helices* the same specific name, I reprinted Bland's description of *Mesodon Wheatleyii*. I have since been informed by Mr. Thomson, that this was not the shell discovered in Tiverton, but on the contrary a very different one, namely, *Hyalinia Wheatleyii*, a small shell also found in Georgia, Tennessee, and North Carolina, and described by Mr. Bland in 1883. I am happy to correct the error at once, and below is the true description of the shell in question:

101. *HYALINIA WHEATLEYII*, BLAND.

"Shell umbilicated, depressed, thin, shining, pellucid, brownish horn color, finely striated; spire sub-planulate, suture slightly impressed; whorls little convex, the last rapidly increasing, more convex on the base, scarcely descending at the aperture; umbilicus rather wide, margins of peristomes approximating, joined by a thin callus." Diameter one-fifth of an inch.

It resembles in some respects *H. electrina*, Binneyana, and arborea.

H. F. CARPENTER.

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5	.05	.40	.06	.4502	.08	.25	5
6	.05	.45	.06	.50	.1002	.10	.30	6
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15	.18	1.70	.24	2.20	.26	2.50	.30	2.80	.06	.45	1.60	15
16	.22	2.00	.27	2.60	.28	2.70	.34	3.20	.07	.50	1.90	16
17	.23	2.20	.30	2.80	.32	3.00	.36	3.50	.08	.60	2.00	17
18	.26	2.50	.32	3.00	.36	3.40	.42	4.00	.09	.70	18
19	.32	3.00	.36	3.50	.40	3.80	.46	4.50	.11	.85	19
20	.36	3.50	.40	3.80	.46	4.50	.58	5.50	.14	1.10	20
21	.40	3.80	.46	4.50	.50	4.80	.64	6.00	.18	1.20	21
22	.50	4.80	.60	5.40	.70	6.50	.80	7.50	.20	1.50	22
23	.60	5.30	.72	6.30	.80	7.40	.90	8.50	.22	1.75	23
24	.65	6.30	.84	7.50	.95	8.70	1.10	10.00	.24	2.00	24
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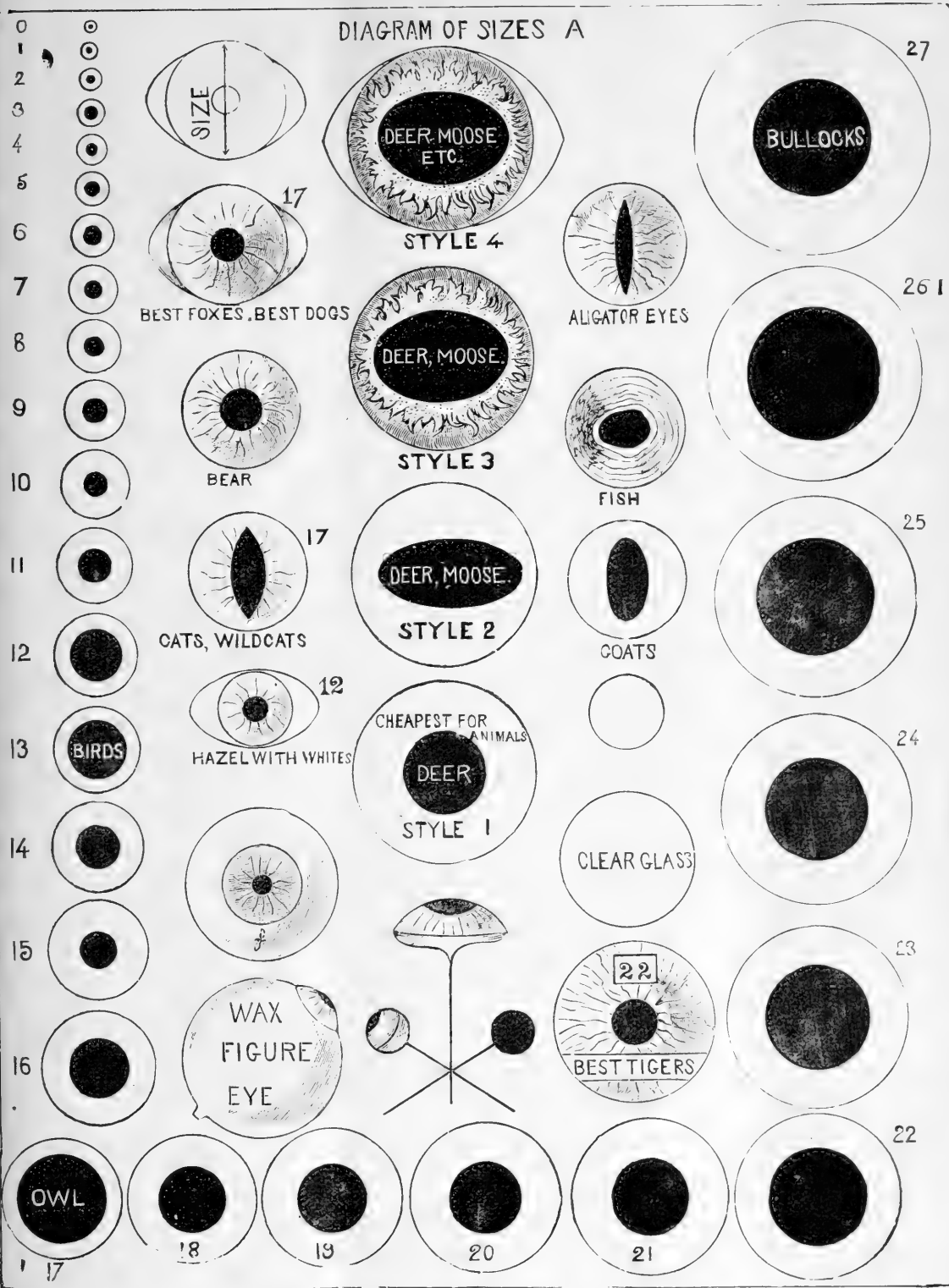
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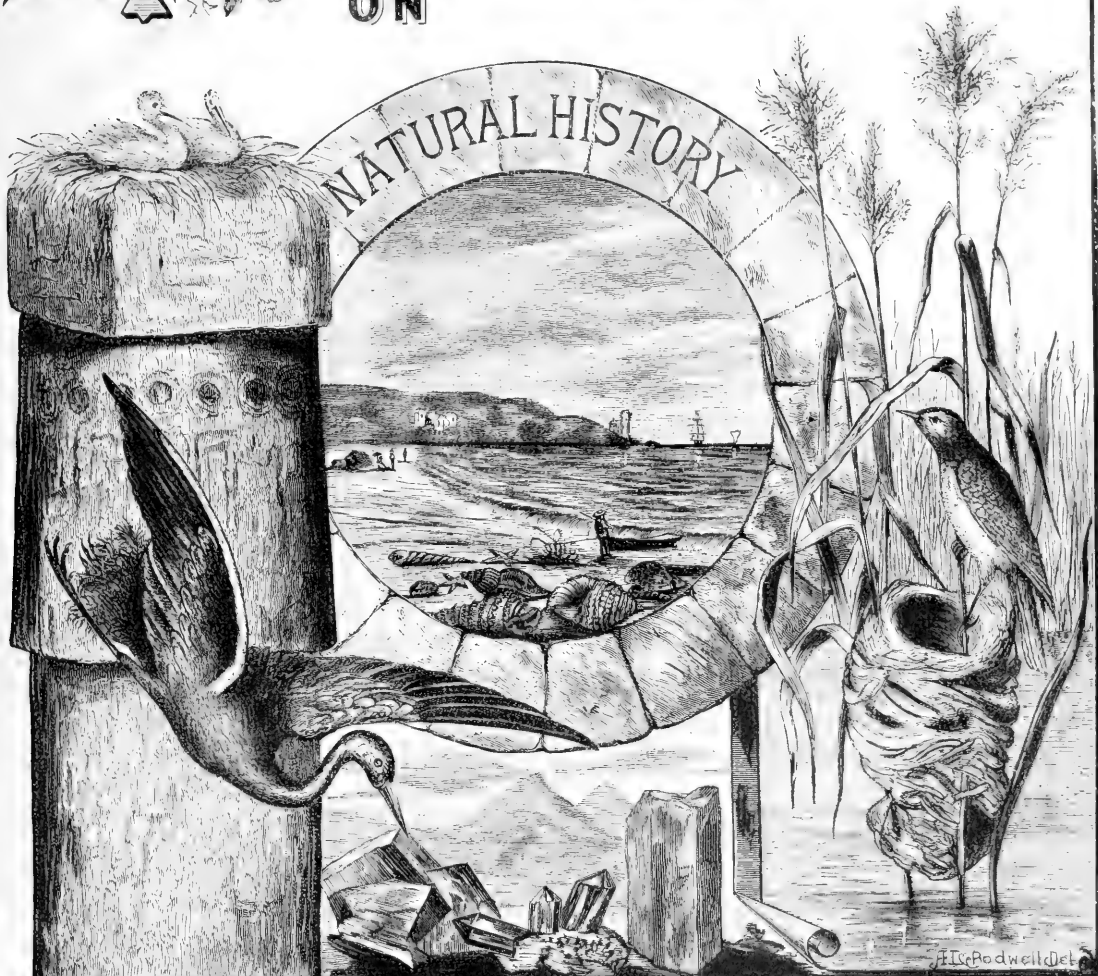
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WITH this number, RANDOM NOTES ON NATURAL HISTORY will have completed its third year of issue, and will be discontinued as a regular publication.

Some errors have appeared in its columns which I trust, have been rectified in later issues. On the subjects to which it was devoted I have endeavored that it should be comprehensive and explicit, especially as regards Rhode Island natural history.

From the first, as I anticipated, the expenses of its issue have been in excess of the subscriptions.

Thousands of sample copies have been distributed.

I desire to express my thanks to those whose regular subscriptions have shown their appreciation of my efforts to present articles that should be popular so far as could be consistent with accuracy.

Whilst regretting to leave unfinished the very able articles upon the mollusca and the trees of Rhode Island, there yet seems to me no special need for this publication except to advertise my business.

In view of the numberless claims upon my time by my constantly increasing business, I can now do this to better advantage through other channels.

IF a sufficient number of subscriptions can be obtained it is proposed to print during the coming year the "Shell-bearing Mollusca of Rhode Island," by Mr. H. F. Carpenter, *complete*, in book form. The price will be \$2.00 per volume. Subscribers are not expected to pay until the work is ready to be issued.

The Nebular Hypothesis.

BY E. A. PLUM.

IN endeavoring to explain the formation of the solar system, scientists have advanced many theories; one of which, called the nebular hypothesis, bids fair to develop into an established fact. This theory supposes the system to have existed originally in the form of a vast cloud of igneous vapor, "without form and void" and in condensing gradually, to have assumed the form of a greatly flattened spheroid, from which the sun and all the planets were evolved.

Immanuel Kant, one of the greatest of the world's metaphysicians, was probably the first to advance this theory in its undeveloped form; but we must credit that great French scientist, Laplace, with having presented it to the world in its present finished form, and also with having brought about its almost universal popularity. The more we study the writings of Laplace on this subject, the more are we impressed with the grandeur of this theory, and the more are we convinced that it is the true solution of a great problem that has puzzled philosophers of all ages.

In order that we may better understand the nebular hypothesis as it is now believed, let us first briefly consider some of the striking peculiarities of the solar system. First, we find that all the planets revolve around the sun in the same direction. Not only is this true of Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus, and Neptune, but it is also true of a host of other small planets, all of which are moving with mathematical precision around a common centre. Again we learn that each of these bodies has its orbit on nearly the same plane, and all, including the sun, have axial motions in a common direction.

How shall we account for these remarkable facts? If we ask the question, could all this have happened by chance, our reason answers, no; but reason working through the minds of such men as Laplace

Kant, Herschel and others, holds up before us this grand hypothesis, and if we seek our explanation here, these perplexing questions will soon cease to trouble us. Let us then, keeping before us the facts just stated, trace the development of the solar system from "the beginning," using the nebular hypothesis for our guide.

We begin with an almost infinite mass of igneous vapor, whirling in space. As this vast mass cooled and condensed, the outer portion, called the peripheral portion, attained a velocity so great that it entirely overcame the power of gravity. As a consequence, the peripheral portion became detached in the form of a ring—as water is thrown from a revolving grindstone. The ring continued its rotation about the mass till its own oscillations caused it to break into pieces. These pieces gathered themselves in the form of another globe, revolving around the first. In the progress of time, the principal mass, continuing to condense, threw off another ring, which likewise became a globe. This process was repeated from time to time, and the globes thus formed became the planets, and the remaining mass is the sun, which is still cooling and shrinking, and may yet throw off other rings.

Let us now turn to the detached globes. The larger are farthest from the sun, because they were detached when the whole mass was largest. Each began to repeat the process of condensation. Some of the larger ones, from the same cause that brought themselves into existence, threw off rings which eventually became their satellites. Owing to difference in size and velocity some planets threw off more than others. Saturn, for instance, threw off eight rings, one of which still remains unbroken. Our earth detached but one, and then became too solid to repeat the process. Mercury, Venus, and Mars—all smaller than the earth—attained the solid form before the peripheral portions could become separated.

We might cite various other facts that help to prove the truth of the nebular theory. We will mention but one. The spectroscope reveals to us the presence of certain minerals in the sun, which are identical to those found on the earth. Are we not justified in assuming that this fact alone

is sufficient proof that the earth and sun were once a part of one great mass?

Some have objected to the nebular hypothesis, because they think it conflicts with the teachings of the Bible. It does nothing of the kind. On the contrary, it agrees perfectly with the biblical account of the creation. What better description of a vast infinite cloud can we find, than is contained in these words "without form and void." The hypothesis only supposes that "God has brought the world into existence by the use of second causes, exactly as He brings a plant into existence." The maples around about us have all undergone "developments." The delta of the Mississippi is undergoing "development." Many islands of the sea owe their existence to the law of development. *All* nature is governed by this law. God has evolved the solar system according to method, exactly as He evolves a tree from the seed. The nebular hypothesis only assumes to take us back to the beginning of natural development. There it leaves us; and, as Alexander Winchell writes: "we dare go no farther; we can go no farther. If science leads us here, she deserts us at this point, and leaves us to lean only on the arm of Omnipotence. Beyond is only God. The beginning of the history of creation does not stretch into inscrutable eternities. We discover the firm rock of support from which all existence hangs. It is the 'Rock of Ages!' We feel comforted and strengthened in knowing that 'in the beginning God created.'"

The Amethyst Locality of Burrillville, R. I.

MINERAL collectors of this state have long been aware that crystals of amethystine quartz of singular clearness and purity have been found at a place known as the "Battey Farm" in the town of Burrillville.

Nearly forty years ago, while an excavation was being made on this place for a barn cellar, many quarts of these crystals were found and given away or preserved in the family.

Some of these were of rare beauty and would have graced any cabinet.

The dirt from this cellar was dumped along the road near by, and for years afterwards, one could pick up beautiful crystals after a shower had washed the dust from them, so as to reveal their purple facets.

The crystals seem to have originated in a bed or seam of vein-granite, in gneiss or mica schist.

The bed rock in which this vein occurs is of a peculiar rusty-brown color, is much broken up by joints, and appears to consist mainly of quartz and a little mica. I do not remember to have seen any rock closely resembling it elsewhere.

It is easily recognizable after being once examined, and I have traced it in a narrow belt from the south end of Herring Pond in a direction about south southwest, to a point just beyond the "Battey place," a distance of nearly three miles.

This rock is well seen where the Providence and Springfield Railroad cuts through it, between Oakland and Harrisville.

Amythysts of good size and shape have been found at this point also, but they were in the drift and were pale in color, somewhat marred and far less clear than those farther south. Lumps of kaolin are also found at this locality, with the crystals, and probably originated from the feldspar in the vein-granite which held the amethysts in its cavities.

I had the exquisite pleasure at one time of emptying a "pocket" of its amethysts in a much decomposed block of this granite. Some of these crystals were clear as glass and highly colored. In many of the larger specimens the color does not seem to be evenly distributed through the crystal but is in layers parallel to the faces of the pyramid, giving rise to "phantoms."

I am not aware that any competent geologist has ever examined this locality carefully, but I think it would present some points of interest to one who could interpret its records, although the ground has been dug over so much that it is difficult to find any amethysts now.

T. J. B.

A FINE specimen of American Barn Owl, *Strix pratincola*, was taken at Sand Pond about the third of this month, and on the eighth Mr. Charles H. Lawton obtained, at Newport, a very nice Razor-bill Auk, *Alca torda*.

Native Forest Trees of Rhode Island.

NUMBER XIX.

BY L. W. RUSSELL.

THE YELLOW BIRCH.—*Betula excelsa*.

THE Yellow Birch, *Betula excelsa*, belongs, as a common forest tree, to regions having a colder climate than that of Rhode Island. It is found scattered in considerable numbers, however, in cool, moist localities in this state. It is rarely seen here, either in open ground or as a forest tree, in its full development. Farther north, in New England and in Canada, it is in the woods, a lofty tree, rising sixty or seventy feet without a limb, bearing a few feathery, spreading branches, overtopping, usually, the other trees with which it is mingled. When grown upon open ground from the start, it is a wide spreading tree with a symmetrical orbicular head. In such a situation, the limbs strike out low, are long and lithe, the lower ones taking a graceful curve downwards. At first the limbs form very sharp angles with the main stem and with each other; but their slender habit of growth, combined with their elastic quality in yielding to the winds and coming back to position redeems the tree from any aspect of stiffness. Indeed, it is a tree of notable grace and beauty, deserving a prominent place in arboriculture.

The tree is easily distinguishable from other birches by its bark. The bark upon the limbs, except the smaller spray, and upon the body, unless the tree is old, is yellowish, having a firm, silky luster. The outer portions hang in thin plates, which quiver even in a light breeze. Upon the body of old trees the bark appears in dark, ragged plates, easily broken off.

The leaves of this birch are oval in shape, somewhat narrowed, or slightly heart-shaped at the base, coarsely serrate, and upon short, hairy footstalks. They appear in twos except near the ends of the spray, where they are alternate. In the autumn, they take on fine shades of orange and yellow.

The catkins of the male flowers appear in pretty, yellowish tassels with the opening of the leaves. They are shorter and thicker than those of the black birch. The female

flowers are in short, erect, cone-like catkins, formed of stiff, three-lobed scales containing three winged seeds each, which fall out in autumn.

The wood of this birch is light in color, with a yellowish tinge. As fuel, if well seasoned, it ranks high, next to rock-maple. It is an important market wood from the Northern New England States. Like the wood of the birches generally, its value is lessened for timber by its lack of durability when exposed to alternate moisture and dryness; but for turners' uses, for lasts, and some other purposes it is in constant demand. The tree roots very freely, the bulging from the body of the main branches being prominent and often fantastic. In rocky situations, the roots frequently over-run a boulder or fragment of a broken ledge, clasping it with a Titan's grip.

In regions where the soil and climate is best adapted to this tree, it frequently occupies the ground almost exclusively. This is particularly true in belts upon high hill-sides and the middle portions of mountain slopes, between the belts of maple and ash and those of the red oak and the spruce and fir balsam. A marked example may be seen upon the southern slope of the Monadnock Mountain, N. H., in ascending the path from the Mountain House to the summit.

I think the tree would thrive well in most parts of Rhode Island; at any rate, it deserves the attention of those interested in the trees adapted to local growth.

THE RED BIRCH.—*Betula nigra*.

The Red Birch, *B. nigra*, is reported to be found in one or two localities in the north-western part of this state. It grows, naturally, by streams of water, usually bending over the brink. It is easily identified by its reddish, ragged bark, hanging from the trunk and larger limbs in long, loose flakes, an inch or two wide. It grows quite large with considerable spread. It grows quite abundantly from New Jersey south to Georgia.

THE CANOE BIRCH.—*Betula papyracea*.

The Canoe Birch, *B. papyracea*, is merely local in Rhode Island. It is found in considerable numbers upon the Diamond Hill range, near the Massachusetts line, but is rarely met with elsewhere in this state. It

is a tree of more northern growth. In Northern New England and Canada it reaches lofty proportions. The bark of larger trees furnished the material for the canoes of the Indians. The trunks are tall, straight, and beautifully white. It has properly been named the "Lady of the Forest." The leaves are quite broad, dark-green, and coarsely serrate. The wood is white, fine grained, and valuable for the turner's use.

THE WHITE BIRCH.—*Betula populifolia*.

The White Birch, or Little Gray Birch, *B. populifolia*, is common in Rhode Island. It will grow in mere sand or gravel, hence, is often associated with poverty. It grows rapidly, and springs readily from the stump when the tree is cut. It takes usually a cylindrical form, tapering sharply at the top. When a half dozen or more sprouts grow from a single stump, their combination forms a wide spreading, symmetrical group of much grace and beauty. The limbs are very numerous, the spray being fine and delicate. The whole tree is very elastic. Covered with ice, as they often are in winter, they form objects of beauty unequaled in art. The leaves are very shining and particularly noticeable for their long pointed tips. Their footstalks are long and slender causing them to quiver in the wind like those of the aspen poplar. The impervious, resinous bark causes the wood to decay when the tree is cut down, unless it is split or deprived of its bark for seasoning. The tree is small in comparison with most others of its genus, but sometimes attains a height of forty feet with a diameter of a foot in the body. Considering the rapid growth of the tree and the fact that it will flourish upon the poorest ground, it is not to be despised.

With respect to their bark, our birches may be distinguished as follows:

Black Birch.—Bark black, peels off with difficulty; scaly on old trunks.

Yellow Birch.—Bark yellow, silky or metallic luster; adhering closely, excepting thin, loose, stringy flakes.

Red Birch.—Bark reddish or copper, very loose, thin plates looking exceedingly ragged.

Canoe Birch.—Bark white, chalky; easily peeled, very resinous.

White or Gray Birch.—Bark grayish-white, containing numerous knots, highly resinous.

The Coast Fox (*Vulpes littoralis*), Baird.

BY E. W. BLAKE, JR.

NEXT to Santa Rosa, Santa Cruz is the largest of the group of islands off the coast of Southern California. It is situated about three hundred miles south of San Francisco, and lies nearly twenty-five miles off shore. The island is about twenty-three miles in length, and in its widest part, perhaps seven miles broad. Santa Cruz is owned by a stock company, and is employed as a sheep ranch, about twenty-five thousand head being kept there.

In general character the island is mountainous, the highest peaks being about twenty-eight hundred feet above the sea. Between two long ridges, extending nearly the entire length of the island, is a narrow but comparatively level valley, where stand the ranch-house and its adjoining sheds—the only buildings on the island. Along the shore are lines of lofty cliffs, with occasional coves or harbors which form the extremities of cañons running up the sides of the mountains.

In winter Santa Cruz is covered with grass and flowers, and there is plenty of water in the cañons, but in summer everything becomes dry and the streams shrink to mere rivulets, or disappear altogether.

A volume might easily be filled with an account of the curious birds and animals upon the island; it is the purpose of the present sketch to describe the habits of one species which is not very generally known—the coast fox, (*Vulpes littoralis*), Baird.

The coast fox is found only upon the Santa Barbara islands, and seems to be entirely distinct from the fox upon the mainland. Upon Santa Cruz it is very common; I have often seen a dozen in a morning's walk. The most noticeable peculiarity of the Coast Fox is its diminutive size. Full-grown individuals measure only about thirty inches in length, including the tail. The coloration is as follows: above, including the upper half of the tail, silver gray; beneath, including the lower half of the tail, reddish fawn color; chin and throat pure white; forehead and a spot at the corner of the mouth, dusky brown; a dark stripe along the tail.

As Santa Cruz is but rarely visited, the foxes have become wonderfully tame.

While I was camping out upon the island during the past summer (1886) the foxes soon learned to come around camp about dinner-time, to secure the scraps of meat and fish which were thrown to them by my companions and myself. Our camp was in a cañon, where the stream had washed out a deep channel for itself in winter, and diminishing in summer, had left a convenient place beneath the overhanging banks. The foxes would approach quite boldly to the very edge of these banks—within a few feet of our heads—and carry off whatever we left for them. Nor were their incursions entirely confined to legitimate spoils. Any small article, edible or not, which we left lying about camp in the evening, was apt to disappear in the night,—gloves, stockings, handkerchiefs, sponges, soap, even a pocket of fish-hooks were thus mysteriously spirited away. In general, however, the missing articles were discovered not far from camp, lying where the foxes had dropped them, but some of them we never saw again.

As we saw the foxes every day, we soon learned to distinguish them by their individual peculiarities, and even named several of our most regular visitors. "Dick," "Jenny," "Pete," and "Uncle Joe" came nearly every afternoon; sometimes all four would be eating together. They were especially fond of fish, whether raw or cooked, but did not refuse corned beef, ham, or bacon. They even ate ship's biscuit, and "Dick" was once discovered surreptitiously licking the grease from a sauce-pan, but their favorite delicacy was spoilt blackberry jam. We had brought over a can of this preserve, which upon examination proved unfit for use, so we abandoned it to the foxes. In two days the can was as clean as the most exacting housewife could desire.

On going down to the beach one day, we found it literally covered with hundreds and thousands of little fish, about the size of sardines, some dead, and others still alive. They had evidently been driven into our cove by a school of big bass, and were being cast up by the surf and left on the beach by the receding tide. We picked up about eight hundred and fifty—weighing eleven pounds in all—and took them up to camp. We soon found that we had a good many more than we could eat, and we gave the foxes a treat. They were very

much excited, and after devouring as many as they could, proceeded to carry off the rest to their hiding-places among the rocks and bushes. They carried them, of course, in their mouths, sometimes taking five or six at once. That night, we could see in the bright moonlight many dusky forms roaming up and down the beach. It seemed as if all the foxes in the cañon were come to take advantage of the unwonted opportunity.

The foxes did not often quarrel over their food, and even when they did, their only demonstrations of anger were muttered growls or hisses. On the other hand, they were apparently of very affectionate and playful dispositions, chasing each other in sport, and licking one another like kittens. Indeed, their actions and appearance, strange as it may seem, reminded us far oftener of cats than of dogs. They had an eminently feline gait in walking and running—gliding noiselessly and stealthily through the underbrush, or darting with remarkable agility up the precipitous hill-sides. Moreover, upon tasting anything disagreeable, like mustard, pepper, or salt, they would nervously shake a forepaw in a manner wonderfully like a cat.

As the climate in summer is very fine, we slept out in the open air, without a tent, and not infrequently were awakened by feeling something clambering over us, or tugging at the blanket, and, as we started up, saw a badly frightened fox scampering away into the darkness.

Although we continually saw them during the day, the foxes are in general of nocturnal, or, at least, of crepuscular habits. During the evenings the cañon resounded with their barking. This bark or cry is a very peculiar and quite indescribable sound; a fair imitation of it may be produced by turning the handle of a well-filled coffee mill half-way round, sharply and suddenly. The foxes commonly inhabit caves and crevices in the rock, or sheltered retreats in the thick bushes, during such time as they are not abroad, and one of my companions once came upon one fast asleep, under a low bush, during the heat of the day.

Their food seems to be of the most varied and miscellaneous character. The berries of certain plants are undoubtedly their main reliance, and to obtain these the foxes ac-

tually do a good deal of climbing, for we more than once discovered them awkwardly perched in the *top* of a good sized bush, eight or ten feet from the ground. Besides berries, they eat crabs, for which they search diligently along the rocks at low tide. While walking among the hills near the sea one morning I discovered the half decayed body of an old ram, which had evidently died a couple of days before. Upon coming nearer I observed the tail of a fox protruding from a huge hole in the side of the carcass, and as I approached the fox came out and ran up to me, apparently impelled by curiosity. He presented a spectacle more easily imagined than described; suffice it to say that his appearance afforded ample evidence of the nature of his repast.

During the spring, the foxes undoubtedly devour the eggs of the smaller birds, when they are fortunate enough to secure them; the gulls, cormorants, and oyster-catchers all nest on the isolated rocks.

More than once we came upon foxes blind in one eye; sometimes both eyes were half closed up. We attributed this misfortune to the long spines of the cactus (*Opuntia engelmanni*) which abounds upon the island.

The jays (*Aphelo coma insularis*) Henshaw, do not seem to be much afraid of the foxes, and we often saw amusing quarrels between the two. On one occasion a fox was eating a good sized piece of fish bone on the bank previously referred to, and a jay was perched upon a low branch about a foot above his head. Every time the fox's attention was distracted for a moment from his meal, the jay would dash down from his perch and try to carry off the bone, but always without success, though he occasionally captured a morsel of fish.

Although the foxes were, as I have stated, wonderfully tame we did not succeed in inducing them to take food actually from our hands, though they would often approach within a yard of us when we held out some tempting morsel to them. I have no doubt, however, that they would have soon conquered this natural timidity if we had remained longer at the island, as we took care not to frighten them in any way, valuing too highly our remarkable advantages for observing the habits of these curious animals in their natural state.

Sea Beans.

WE would like to ask any of your readers who have been in Florida whether the so-called "sea beans" employed in jewelry grow there? We have brought them from Cuba where they are "at home" and have heard that the common name was given from their being found at sea. They might easily drift to the main coast but have they found the soil and climate suited to their development in Florida?

The yellow bean "*Bromis spinosus*" is commonly known in Cuba by its Mexico-Indian name Guacalote; its old aboriginal name was Guanana. The boys of the *Vueltarriba* (*veulta de arriba*), or eastern part of the island use these yellow guacalotes as a kind of money, playing their cards and various games of chance for them, and even passing them as money for some articles. The roundness and smoothness of the smaller yellow ones cause them to be much employed in games similar to our marbles, which they call "horyitos" or little holes, "uñate," and "pila." In one game of "pila" four of these beans are used, three being placed together and the fourth piled above them; in another they strive to overturn a "little house" and call the game from this "casilla" from what they build up of the beans. The small, perfectly rounded ones are known as "teritoes" or "mingoes," while a large, flat, variety is called "catatas." Among the yellow ones a gray bean is often mixed which is the *Guilandina bonduc* scientifically.

As the boys of the eastern end of the island favor the guacalote, what is more natural than the hostility shown by the boys of the western end? So in the *Vueltabajo* (*veulta de abajo*) where the fine cigars come from, the red beans are employed and the yellow ones scorned. The red ones are commonly called mates, and we have been unable to find its scientific name in a very minute work on Cuban natural history. Was the author a *Vueltarriba* boy?

The boys of Bayame name the last bean left in playing their games the *gaubino*.

H. M. K. B.

"I NEVER argy agin a success," said Artemus Ward. "When I see a rattlesnake's head sticking out of a hole, I bear off to the left, and says I to myself, that hole belongs to that snake."

The Shell-Bearing Mollusca of Rhode Island.

BY HORACE F. CARPENTER.

CHAPTER XXXV.

128. *APEXA HYPNORUM*, LINNÉ.

Syns.:

Physa elongata, Say.

Physa glabra, DeKay.

Physa elongatina, Lewis.

Physa turrita, Sowb.

Bulinus hypnorum, W. G. Binney.

This species was described by Linnæus in 1758, as *Bulla hypnorum*, and afterwards described in English works under ten different synonymous names, none of which are included in the above list. It seems to be one of few species which inhabit the circum-polar and temperate regions of Europe, Asia, and America. Shell very thin, fragile, transparent, sinistral, oblong; color, pale yellow; whorls, six or seven; spire tapering, acute; suture impressed; aperture obliquely ovate, narrow, one-half the length of the shell; columella callously edged. Length seven-tenths of an inch, breadth three-tenths. This is the description of the European specimens, and will apply to those of British America and the Western United States. In 1821 Say described a shell which he called *Physa elongata*, which has been referred by most authors to *hypnorum*. The specimens vary a great deal from different localities and those from Rhode Island compared with the typical species might easily be taken for different species, we find them here much smaller in size, rarely over three-tenths of an inch in length, very slender, brittle, and thin, with no callously ridged columella, and with one to two whorls more than the larger, more solid English specimens. I have them labelled *Physa elongata* in my cabinet, side by side with another tray of *hypnorum* from England, and to look at them together, nine out of every ten persons would say they were different species.

In *Am. Jour. Conch.*, II., 7, 1866, is a list of new localities for *Physa*, in which is the following remark: "*Physa integra*, Hald, Rhode Island. (Coll. Tryon)." I would like to ask for further information. I know of no such species in the state, and would like to know on whose authority this remark was based, also the precise locality etc., etc.

Sub-family Planorbinae.

The shells of this sub-family are all discoidal, spiral, and the apex sunk in the nucleus of the coil; whorls three to seven, smooth or striate, sometimes keeled.

The animals have the orifices of their generative, excretory and respiratory organs on the left side like those of Physa, but their shells are dextral like all other gasteropods, with few exceptions. This sub-family contains two genera, Planorbis and Segmentina, both of which are represented in Rhode Island.

GENUS PLANORBIS GUETTARD.

All the shells of this genus existing in the Old World, belong to one type and number only about thirty species, eleven of which inhabit Great Britain and the remainder scattered through Europe, Africa, India, Ceylon, and Australia. On the other hand we have over seventy species in America, belonging to five or six distinct types or sub-genera. They are all very sluggish in their habits and prefer stagnant pools.

129. PLANORBIS LENTUS, SAY.

Mr. Say discovered a shell in a canal near New Orleans and afterwards other specimens of the same in Mexico, which he described in 1834 in the *American Conchology*, published at New Harmony, Ind., under the name of Planorbis lentus; previous to this, in 1817, he described a shell which he called Planorbis trivolvis. Authorities quote both species from all parts of the United States, but the subject is somewhat mixed. I have never found or heard of P. trivolvis being found in Rhode Island, but have plenty of P. lentus, if one can tell anything by descriptions and plates. Professor Adams in speaking of this shell refers it to P. trivolvis in the *Shells of Vermont*, and in his list of "Middlebury shells" to P. corpulentus. Gould says: "This shell has hitherto borne the name of trivolvis in New England, but it is not the trivolvis of Say, and is either his lentus or a new species." Gould's figure and description of lentus is referred by Hadleman to P. fallox. W. G. Binney says: "It is not the lentus of Say," and refers it to trivolvis. Perhaps trivolvis and lentus are the same species, modified by locality, etc. But I am of the opinion that our Rhode Island lentus is

a distinct species from the trivolvis of the Middle and Western States.

It is a discoidal shell, concave on both sides, the spire sunken in on the upper side showing three volutions, just like the umbilicus on the under sides of many helices; lower surface cup-shaped, formed of four whorls; aperture large; lip sharp, thickened within by a dark reddish-brown callous; color of the shell brownish or chestnut; diameter seven-tenths of an inch.

My specimens were found in a meadow overflowed with water near Ashton, on the Cumberland Hill road. What seems strange in the instincts of these animals is, that although the place overflowed is quite large, and after searching in vain, by wading into it in several places, and in looking carefully around its entire circumference, not a shell could be found; they were found abundantly in one spot, exactly under the shadow of a willow tree, standing at the edge of the pond near the road. Other species of shells were found in all parts of the pond, but of this species none, excepting those under the tree.

130. PLANORBIS (HELISOMA) BICARINATUS, SAY.

Syns.:

Helix angulata, Rackett, Wood, Hanley.

Helix bicarinatus, Eaton.

Planorbis engonatus, Conrad, Lister.

The sub-generic name, Helisoma, was given by Swainson in 1840, to those species of Planorbis which are ventricose in form, with but few whorls, and in which the spire is sunken below the body whorl. This sub-genus includes eight species of North American Planorbis, only one of which, bicarinatus, inhabits Rhode Island.

The shell is orbicular, deeply excavated and carinated on both sides, color brownish yellow; spire sunken, forming a cavity nearly as deep as that on the under side; whorls three and a half, visible on both sides; aperture large, embracing a large part of the body whorl and vaulted above; lip white and expanded, interior brownish red; diameter of shell one-half inch. It ranges from New England to Kansas, and from British America to Georgia. It is not very common in Rhode Island, but is found in still water, on the margins of large ponds and not in muddy pools. It is quite abundant in the Providence and Worcester

Canal near the Mineral Spring Pike and in Cunliff's Pond.

131. PLANORBIS (PLANORBELLA) CAMPANULATUS, SAY.

Syns. :

Planorbis bellus Lea.

“ bicarinatus, Sowb.

Planorbella campanulata, Chemn.

Helix angulata, Shep.

This and one other species, found in Mexico, constitute the sub-genus, Planorbella of Haldeman, characterized thus: “whorls few, aperture campanulate or bell shaped, prominent.”

This species is widely spread from Nova Scotia and New England through the northern tier of states to Minnesota. It is not abundant anywhere except in certain local spots. It was first found by Mr. Augustus Jessup in Cayuga Lake, New York, and described by Say in 1821 in *Journ. Acad. Nat. Sci. Phila.*, II., 164. Shell discoidal, sinistral, brownish green in color, lighter at the sides; the right side exhibits a little more than two volutions, which are elevated to an obtuse ridge, and forms an umbilicus which nearly perforates the shell; the left side shows four volutions, and forms a shallow cup; the whorls are very regular and symmetrical up to the last portion of the body whorl, where it is suddenly distorted and enlarged, forming a bell-shaped throat; the aperture is dilated and angulated on the left side; lip brown within; diameter one-half inch. Dead shells are found plentifully on the banks of the Blackstone River, at Pawtucket in the spring, among the *débris* left by freshets, but Valley Falls Pond is the place where they are found alive, also in Sneach Pond in Cumberland.

Hazel - Copses.

WE often think that the loveliest things in the woods are not the flowers, but the green buds, the leaves, and fruits. At present our attention is called to this fact by the grace and elegance of the hazel-copses. On each branch hangs a group of nuts, and each nut is inclosed in a superb casket with crimped and scalloped edges. The vessel itself fits closely to the nut, and its lower or body part often assumes shades of delicate brown, otherwise the whole object is of

tender green. The rough leaves of hazel, too, with their doubly serrated edges, are things of beauty. Already the shrub bears the young tassels of next year. So in nature, do youth and age walk hand in hand.

In these days, when all sorts of objects are glorified by the art-lover, has the hazel ever received its need of attention? In Rhode Island we have another species, not so common, the so-called beaked hazel. It is not so handsome as its relative. Do squirrels or boys hereabouts eat these nuts? All of a sudden they disappear. That filberts are good, every dessert service shows. Often an animal is the first to indicate the value of a vegetable. Rarely does an insect mistake its food plant. Cattle have, ere now, discriminated differences which the botanist only half surmised. So are we linked with chains invisible, but binding, to the lower forms of creation. W. W. B.

The Dispersion of Seeds.

GEOGRAPHICAL botany or the distribution of plants over the earth has deservedly received the attention of the profoundest students. Humboldt, Decaudolle, Grisebald, Hooker, and our own beloved Gray, have all taken up the subject at one time or another. It presents many problems to exercise the most philosophical minds. Plants are so affected by environment and conditions that one must know something of kindred sciences, such as geology and physical geography, and even meteorology, to approach it *understandingly*. But among the most fascinating chapters of modern botany are those which treat of vegetable dispersion. Let the reader to substantiate our words, consult the admirable lecture on Sequoia (the giant tree of California), in Gray's “Darwinians,” or the wonderful *Introduction to the Flora of Australia*, by Sir Joseph Hooker, or the same author's preparatory remarks in the *Flora of New Zealand*.

It is a smaller and lighter side of the subject to which we now desire to direct attention, viz., to some of the ways in which seeds or fruits are disseminated. In popular language the two are often confused, and no wonder, as they frequently resemble each other. Suffice it here to say that a seed proper is a definite and restricted body

having its own coatings; to which, however, those of the fruit may adhere. By a fruit, in science, we mean the ripened pistil, with all adhering portions and the contained seed. Nature's object is to disperse this seed, not always widely, but at a distance more or less remote from the parent. Thus the future offsprings have a show in pastures new and under more favorable conditions, as the parents may have exhausted the original soil. To bring about this result many devices are resorted to. One of the commonest is a tuft of hairs, simple or plumose, such as we know in the thistle and dandelion, where it is attached to the fruit, or in the milkweeds and willow-herbs (*epilobium*), where the seed itself is so endowed, we rarely, if ever, find both pod and seed so furnished. In other words, there is no waste of devices. If one gathers the floating thistle-down, in many cases he will perceive that the parachute has dropped its precious burden near home. How beautiful are these featherly balloons, wafted about by the slightest breeze.

Among trees it is more common to find winged seeds or fruits, as the case may be. Thus, the maples, elms, and ashes, all have such. In the lime or linden the whole cluster of berries is borne off attached to the bract. Notice as these fall from the tree the rotatory movement, giving the body a divergent propulsion. In the ash the wing twists on its axis, and forms a sort of propeller fluke. Hooks and grapnels are favorite mechanical contrivances. The heads of burdock are covered with retrorse hooks. Every one knows how the little fruits of the bed straw (*Galium*) attach themselves to garments. So do the troublesome beggars ticks and the jointed pods of *desmodium*, and many fruits of the forget-me-not family. The armature of some foreign fruit is very formidable; he must pity the unwilling agents of dispersion.

Many seeds are expelled from the fruits by curious mechanical contrivances. The witch-hazel shoots off its seeds as from a pistol. Some of the violets and the related ionidium throw them many feet. The squirting cucumber ejects them in a jet of liquid. The wild geranium throws them at maturity by the tension of a spring. The blossoms turn the pod inside out with a jerk. There are seeds that at a particular time, say when they reach moist soil, release from their surface long flexible hairs which bind

them to the earth. The seed of mistletoe is viscid, and causes it to adhere to the surface of trees, its future medium of growth.

We must not forget that many fruits are covered with a luscious pulp, at maturity colored, and attractive to birds and other animals. The continued seed is either rejected or undigested. Darwin tells us that wading birds carry many seeds attached to the mud on their feet. So the migrations of animals and the operations of man tend to scatter plants over the earth. They pass on attached to fleece or feathers, to cotton buds, to wool, and other fabrics. We cannot wholly dissociate ourselves from these humble attendants. They follow us everywhere, for good or for evil. Sometimes they spring up as useful plants or showy flowers. Quite as often they disturb us as pestilent weeds.

In an article of this length it is quite impossible to present more than the barest outline of this subject. We have long been amassing notes from personal observation and from careful reading. The more we study, the more astonished and delighted do we become. There is absolutely no end to the beautiful adaption exhibited. It is but tantalizing to offer the public this mere luncheon when the feast, free to all, is so bounteous.

W. W. B.

A REMARKABLY fine specimen of ruddy duck — a male — in *perfect* plumage, with the neck and upper parts brownish red, lower parts silvery, shaded with dusky, sides of the head white, crown black, bill a very striking blue, has just come into my hands. It was taken in this locality* and is regarded as a rare bird, being the first that has come under my manipulation in this condition of plumage.

THOS. W. FRAINE.

* [Rochester, N. Y.]
of course p. 35.

AN ORIOLE built a nest in a small apple tree near my house. I watched the building, and soon discovered there one egg. A week later there was only one egg and no female appeared for several days. I then took the egg. The male still lingered about the tree, and three weeks later a female came and laid a set of eggs, and reared her brood late in the summer. I surmise a cat had killed the first female. I watched the constancy of the male through his month of loneliness with much interest.

JOHN N. CLARK.

It will be interesting to entomologists to note that a fine specimen of *Heliconia charitonia* was captured near Beaufort, S. C., in March, 1886. As this fly has been taken in Florida, it is not remarkable, but still worthy of note, to record this more northern range. Our Carolina swamps are so little searched by naturalists, and this more from their impenetrability than from other cause, that it is not surprising what results will repay the ardent collector who forces his way through the knife-like leaves of the bamboo thickets with which the swamps are overgrown, as is evinced by Mr. Wayne's rediscovery of Swainson's Warbler. Kirtland's and Bachman's Warblers are possibilities that go far to smooth a rough path. Even the moccasin's deadly sting loses its venom at the thought of such captures, and swamp fever cannot be mentioned in the same breath.

I would also like to record the observance by myself at three separate times this past August, of *Myiarchus dominicensis* on Sullivan's Island in Charleston Harbor. A year or so ago Mr. Wayne and Mr. Brewster took the nest and eggs and parent bird of this species on the same island. B. A. S.

On examination of the sixteenth annual report of the Entomological Society of Ontario, I find a tabulated description of fifty-two species of butterflies belonging to the province of Quebec, also a very interesting article on the catocalæ or underwing moths, describing with care thirty-two species. Most of these butterflies and moths are to be found in the United States, particularly our Northern and New England sections. Any entomologist who has not ready access to many works on insects, should try to secure a copy of this work, for beside the articles mentioned, the sixty pages are replete with articles most instructive and interesting.

A QUICK METHOD OF CLEANING GREASY COLEOPTERA, ETC.—Lately I have employed the following method with the happiest results. It may be old and well known, but I do not remember to have seen it suggested. Dip the insect one half to one minute in spirits of ammonia (Liquor ammonæ), wash in water (the hotter the better), and the thing is done. Offensive beetles like *Trox Silpha*, etc., can be

cleaned and purified instantly. How far the ammonia may be employed in cleaning Lepidoptera and other insects, I do not know, but it renewed the beauty of two very greasy specimens of *Cossus Centerensis*.

This liquid also dissolves the verdigris that forms on the pins passed through insects; but the insect must remain longer in the ammonia and be more carefully washed.—*Canadian Entomologist*, June, 1886.

“HOW TO RESTORE THE RUBBER RINGS OF CANS.—The rubber rings by the use of which fruit cans are made air-tight, after being used, become hard and unyielding, so much that fruit seldom keeps as well when they are used the second time. Though new ones cost but little, it is not always convenient to get them. Every one should know that the elasticity of the old ones can be restored, and that they can be made as good as new by soaking them a half-hour in a mixture of ammonia and water—two-thirds ammonia and one-third water. Try it.”

If a sufficient number of subscriptions can be obtained it is proposed to print during the coming year the “Shell bearing Mollusca of Rhode Island,” by Mr. H. F. Carpenter, *complete*, in book form. The price will be \$2.00 per volume. Subscribers are not expected to pay until the work is ready to be issued.

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Tyrannus

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4	.04	.35	.05	.4501	.08	.20	4
5	.05	.40	.06	.4502	.08	.25	5
6	.05	.45	.06	.50	.1002	.10	.30	6
7	.06	.50	.07	.60	.1002	.12	.35	7
8	.07	.60	.08	.70	.1202	.14	.40	8
9	.08	.70	.09	.80	.1203	.16	.50	9
10	.09	.80	.11	1.00	.15	1.40	.16	1.50	.03	.18	.70	10
11	.11	1.00	.13	1.20	.16	1.50	.18	1.70	.04	.20	.80	11
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13	.14	1.30	.17	1.50	.22	2.00	.25	2.40	.04	.25	1.20	13
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16	.22	2.00	.27	2.60	.28	2.70	.34	3.20	.07	.50	1.90	16
17	.23	2.20	.30	2.80	.32	3.00	.36	3.50	.08	.60	2.00	17
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19	.32	3.00	.36	3.50	.40	3.80	.46	4.50	.11	.85	19
20	.36	3.50	.40	3.80	.46	4.50	.58	5.50	.14	1.10	20
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22	.50	4.80	.60	5.40	.70	6.50	.80	7.50	.20	1.50	22
23	.60	5.30	.72	6.30	.80	7.40	.90	8.50	.22	1.75	23
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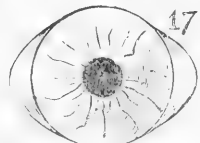
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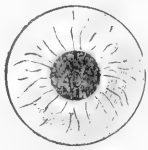
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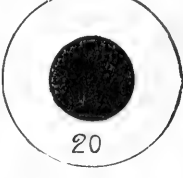
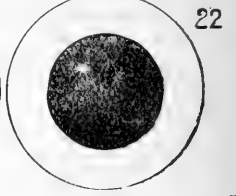
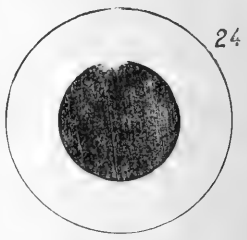
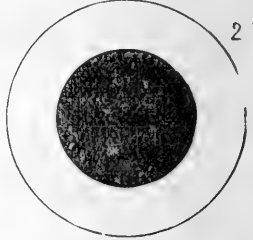
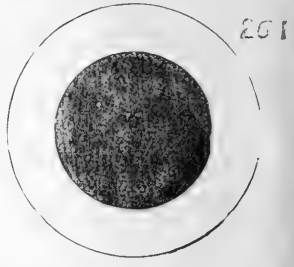
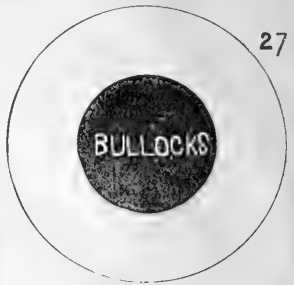
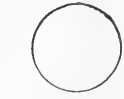
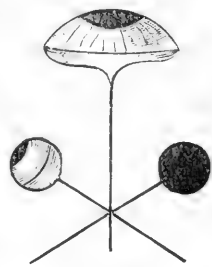
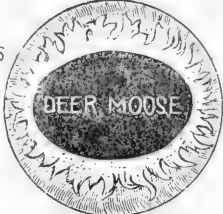
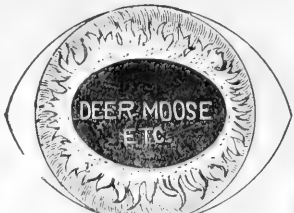
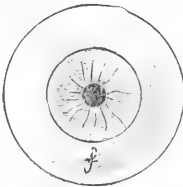
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