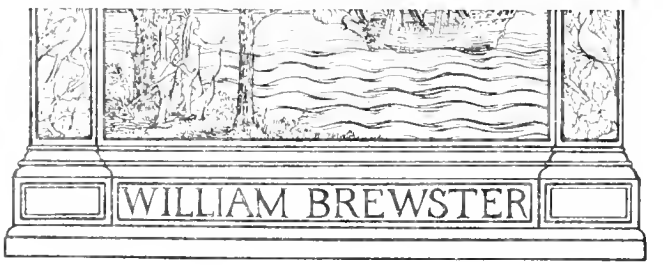

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ALBION, N. Y.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., NOVEMBER 15, 1896. No. 1

Notes from the Mohawk's Country.

P. M. VAN EPPS.

(X.)

ALONG THE ANTICLINE.

Looking westward from the slate hills (Touareuna) of Glenville across to the low anticline of Silurian rocks, whose eastern escarpment—resulting from an enormous fault—stretches in a line of low glacier-polished cliffs far to the north-east, one sees in vast panorama three groups of stratified rocks, —three chapters in the book of paleozoic time, each having its own distinctive fauna. Directly west lies a wooded elevation whose few exposures show us a very dark crumbling shale, probably the Utica. This is underlaid by the Trenton limestone, whose thick fossiliferous layers crop out to the surface more to the north. From old-time quarries in these strata many fine examples of characteristic Trenton fossils have been obtained. Yet more to the north we find the Calciferous sandrock emerging from beneath the Trenton. The dip of all these groups is toward the south-west, consequently as we travel northward, though gaining in elevation, we are continually meeting with lower and older leaves of the great geological book. Some of these pages are beautifully illustrated with proof impressions fresh from nature's press. Crinoids, corals and trilobites abound in the Trenton group but the Calciferous appears quite destitute of fossil life.

In some layers of the Calciferous are many nodular masses of flint and in certain localities on this anticline the Calciferous rocks abound in geodes containing quartz crystals. Owing to the surface weathering of this rock and the consequent breaking up of these geodes many crystals are found loosely scattered in the soil; among them are found many small doubly-terminated crystals of water-clearness. Odd forms and twins are not at all uncommon and a few crystals have been found showing a decided amethyst tinge. From a lot of crystals from this anticline examples could be selected of far greater purity and clearness than from the noted localities in the vicinity of Little Falls, N. Y. Certain indications have led some to suppose that caverns of considerable extent exist in the raised layers of this anticline, but if so the entrance way to them is yet to be discovered.

At different times in past years fruitless excavations in search of coal have been made in the black layers of the Utica shale. These are along the faulted eastern margin of the anticline in a romantic gorge known as Wolf's Hollow. One gloomy looking drift, now partially filled with water, extends for many feet into the hillside, the black bituminous character of the shales at this place leading the digger on and on, ever hoping to tap the bed of black diamonds. It is said that neighbors helped on the deception by "salting the mine." While the luckless miner would abandon his works at noontime, they would take possession and carelessly scatter bits of genuine coal along the drift, thereby encouraging false hopes. In the shales of these abandoned diggings graphtolites occur.

* * *

Along this ancient Silurian wrinkle

I went one summer's afternoon some distance to the north in search of a particular glacial bowlder. In this region the man who would go very far in search of a bowlder, odd or otherwise, would likely be pronounced daft, but this particular "hard-head" was well worth my six miles' walk, to and fro, to see. Following the low cliffs of Calciferous rock away toward the north-west—along the great fault which marks the eastern edge of this fold in the rind that appears to many so stable—I went, and finally rising the anticline I found easily the object of my visit. Indeed one could not very well miss it, if passing near, for it forms a quite prominent feature in the landscape. It is situated on the summit of the anticline and rests directly on the native Calciferous sand-rock, which here is perfectly free and clear of soil, possibly in the exact position where deposited by the retreating glacier, for some bowlders of extraordinary size were probably too heavy to be moved by the waves of the pleistocene seas which occupied this great depressed area at the close of the glacial period. Our bowlder, which was probably transported from some of the ledges of the Mayfield range in Fulton County, some miles to the north-west, is a huge block with rounded angles, and is of far more than the usual size. In material it is a coarse granitic rock with rather large crystals of dark colored feldspar and contains a plentiful sprinkling of garnet. Its weathered surface is rather rough but with no prominent projections. It is interesting to note how the surface of the Calciferous has weathered away since the deposition of this ancient erratic, for the bowlder is upheld by a pedestal of the country rock whose diameter is much less than that of the block supported. In height above the level of the surrounding rock surface this pedestal varies from six to eight inches. As a suggestion: possibly erosion by sand and gravel laden currents during the pleistocene submergence has been a principal factor in the cutting away of this surface rock.

The rocky plateau in the neighborhood presents a curious appearance, being divided into quite regular rhomboids by numerous joints, which are from ten to twenty feet apart running in parallel lines. No glacial stria are visible on the surface of this area, in consequence of the erosion spoken of, but the edges of the joints most plainly show the effects of running water, possibly dating from the time of the breaking up and disappearance of the great glacier.

THE NIMRODS.

Early in the autumn the would-be sportsmen begin to pour out from the city in legions. Overrunning the country in every direction, he goes bedecked with his hunting shirt a-la-Peck & Snyder, and begirt with his stuffed cartridge belt he "smelleth the smoke of the battle afar." In lieu of the "birds" and "big game" that he continually talks about, but has not the skill or patience to seek, he blazes away at every living thing that he can find that will stand for him to aim at. Fortunately for the innocent birds, squirrels and chipmunks his aim is almost invariably poor, consequently some friendly tree or perhaps a farmer's cow receives his charge of canister and Mr. Chipmunk has a breathing spell until another broadside can be trained. Quite often he brings down his fellow sportsman. Almost any day we can read in the papers how, "Smith, Jones and Small Calibre went gunning, and Smith's gun being accidentally discharged blew off the top from Jones' head;" or how "Small Calibre let fly with his arquebus and shot off Smith's nigh ear." Now I must confess that it is with no regret that I notice these almost daily accounts of the holocausts among the nimrods. Really I am rather pleased to read them and at one time had serious thoughts of making a scrap-book of one season's record of these casual-

ties. To the genuine sportsman who knows what he is after, and generally gets it, these remarks do not apply.

Glenville, N. Y., 1st Oct., 1896.

Reminiscences of a Trip to Schoharie.

BY ROB'T M. HARTLEY.

For several years we had been planing and talking of a trip to the Schoharie Valley, and during those years we never succeeded in getting nearer to the famed valley than "planing and talking."

The Schoharie Valley is some 30 miles to the south of us, in the county of the same name. Picturesque, fertile in soil, rich in geological specimens, Indian relics and historical interest.

However, one beautiful morning in August last, accompanied by my old friend, C. F. Van Horne of Glen, N. Y., the start was at last made. The ride during the morning was over the elevated plateau of the town of Charleston, the highest point of land in this county (Montgomery) some 700 feet above tide water. It might be of historical interest to say that years ago, over this plateau, parallel to the direction we were traveling ran the old Indian trail or foot path, which commenced in the Mohawk country at Fort Hunter on the north, leading south to the Schoharie Valley and over into that of the Susquehanna.

Speaking of this trail brings to mind that formerly along it was a large pile of stones, known as the "Stone Heap," which for many years attracted much attention from its presence, and the legendary tales that hovered about it, which have been handed down from the time of the Indian occupation.

So a few words in regard to it may not be out of order here.

It is recorded that this heap when intact, was four rods long, one or two wide, and ten or fifteen feet in height, and consisted of small flat stones.

Surely rather a curious pile to confront the eyes of the early settler or explorer?

There are several traditions in regard to the cause of its presence. One is—that it was the costom or rite in the acknowledgement of an invisible being. We may style him the unknown God whom this people worshiped. This heap was his altar, and every warrior traveling that path was enjoined to cast a stone to his heap. Another—Two Mohawk warriors were passing this place, a quarrel arose between them, one murdered the other, and his fellows to commemorate this event erected a pile of stones upon the spot. A costom of their nation required every warrior traveling that path to appease the departed spirit by adding a stone to the heap, and thus it grew to one of large dimentions.

The end or *final* of this interesting monument is recorded thus: Not many years ago the land upon which it stood was owned by an individual who cared little for the altars or monuments of the red man, and the long accumulating record was converted by him into a STONE WALL, to the unfeigned regret of pious antiquarians. [It may be in place to say that similar stone heaps have been noticed in other parts of New York.]

A large tract of land in Montgomery and Schoharie counties known as the "Stone Heap Patent" was granted to John Bowen and others, Sept. 15, 1770.

So much for the "Stone Heap".

We journey on and soon view a grand outlook as the crest of the hill is reached.

The rich Schoharie valley is before us; winding through it, glistens the waters of the Schoharie Creek. To the east are seen the rugged slopes of the Helderburgs and further away in the south tower the dim blue peaks of the Catskills.

It is four miles down the hill to the valley bottom. In the valley the highway follows the winding of the stream. The archæologic training, gained by the experience of many years search in our

own Mohawk country now asserts itself. Soon a high bit of ground is noticed at the mouth of Cripplebush Kie. The site is an ideal one for the red man's camp we think. These "suspicions" as we call them, prompts us to enquire at the house near by concerning it. The KNOWING reply from the bewhiskered native was about as follows:

"No siree! (emphatically) I've always had a likin' for them relics of the old Injuns. I've looked that point over a great many times fer flints, but nary a sign of any there."

We tell him it looks like delectable grounds.

"No, I tell ye there's none there. I KNOW, but over there [pointing to the opposite side of the creek] there's where they made 'em."

Further conversation followed regarding historical events.

"Say! be you fellows going up to Schoharry?"

We replied that we hoped to reach there before night.

"They've a heap of sich things up to the 'ole fort' as would interest ye. I've told Marier since we was up there to the circus that we ought to have went in, but the fact is the day wasn't long enoug for us to see the circus and that too."

Notwithstanding the negative reply of our talkative friend, it did not deter us from taking a look over the ground he had searched so thoroughly (?). We spent a few miuutes among the oat stubble and found five perfect arrow heads, several broken ones, and some fine hammer stones also the ground was sprinkled with a liberal supply of flint chips. Thus was established the fact that the archaeologists knew whereof they were talking when they "suspicioned" this spot as a camp site; and that long whiskers, who had a *pole* on his shoulder when interviewed, probably knew more about *fishing* and *digging bait*, than Indian relics and camp sites. At any rate we hoped he did.

We learned that the Indian trail, whose direction we had followed over the plateau from the Mohawk county, crossed the Schoharie Creek at the mouth of the Cripplebush Kil. So this high bit of ground referred to was proven to have been traveled for years by numberles hunters, warriors and war parties; also during the Revolutionary war it was the route taken by the Tories and Indians to reach the unprotected settlers in the distant valley. History tells us that in October, 1780, Sir John Johnson in command of 800 regulars, loyalists and Indians made a raid upon the settlements of Schoharie and that in his retreat toward Fort Hunter, they crossed the creek at this place, and encamped for the night upon one of the knolls near by, now enclosed and part of the modern Valley Cemetery. This old ford or carrying place is to this day called "Johnson's Ford."

Continuing on our journey up the valley we cross the Cobleskill Creek, the largest tributary of the Schoharie, and then the Schoharie itself. We make no stops to search for the implements of the redman; although we passed by many inviting fields.

As we near Schoharie village, the surface presents a variety of natural features surpassing in extent and grandeur any other portion of the county yet traveled; in fact it is doubtful if any other equal area in the state of New York contains so many interesting works of nature. The geologist, naturalist and archaeologist here find subjects for thought and discussion. While the admirer of beautiful scenery is charmed with the prospects from the heights on each side of the valley.

These majestic hills rise abruptly from the creek from 600 to 1000 feet.

To the geologist this is one of the richest fields in New York state. Commencing with the Hudson River group of the Lower Silurian it comprises all of the groups of the Upper Silurian and Devonian; some twenty-two or

more different groups or strata. I believe that on the west side of the creek, directly opposite the village of Schoharie, nearly, if not all of the above strata can be easily reached by the geologist.

Amsterdam, N. Y., Nov., 1896.

Notes on Grouse found in Okanogan County, Wis.

BY WM. L. DAWSON.

SOOTY GROUSE, *Dendragapus obscurus fuliginosus*. The spring bird of the lower foot-hills. They appear to move down from their winter home in the fir trees of the higher slopes, during the last week of March. At this time, and, indeed, until after the breeding season, they are quite unwary. The males, especially, appear so engrossed in their sole occupation of hooting, that they may be easily approached, and studied at close range—say thirty feet, if one is lying on the ground. One such I spied on the first day of April, 1896. He was on a ridge about a hundred yards away, strutting and parading like a turkey cock, in plain view. As I sneaked up within a few yards of him, he became more subdued, and stood, for the most part, quietly in the grass, with his neck inflated like a pouter pigeon's. One could see the volume of air, alternately increase and diminish as he gave his muffled "Hoot, hoot, hoot, tu-hoot, tu-hoot." This was not necessarily accompanied by any show of neck ornaments, but when he became vehement, as when he spread his fan-shaped black tail for a strut, the inflation of the throat increased to such an extent as to disclose a considerable bare spot on each side of his neck, surrounded by a large ring of feathers. This certainly made a stunning feature of the gallant's attire; for nature has provided that the feathers immediately about the bare spot shall have entensive bases below the sooty tips. Ordinarily the upper feathers completely conceal the bald spot, of which the fellow is so vain, so that during excitement, a brilliant, white circlet of feathers some five inches across, flashes forth from each side of the bird's neck, as the upper feathers are raised and reversed. When I tired of studying his vanity, I mocked his hoot repeatedly; he lowed his head with some show of hostility, but did not attack.

While this was going on another cock was to be heard at some distance and his calls were apparently being answered by a low monosyllabic "*toot*" of the hen. This cry was repeated at somewhat greater intervals than those of the cock. Of course the hooting sound is made in the wind pipe, but the inflated throat acts as a sounding-board. The large, triangular syrinx could be made to give forth a sound very much resembling the bird's efforts, by simply blowing at the proper intervals through the entering windpipe, and placing the thumb and fore-finger partly over the aperture.

A set of eight eggs of this species was discovered on May 5th, by Mrs. W. L. Dawson, and their situation is described as follows: The eggs were deposited on the ground beneath a service-berry bush, which sprang from a chance level spot on an otherwise sharp hillside. There had been no apparent attempt at nest building, as the eggs lay upon nothing but the few fallen leaves of the bush, and these had not even been scratched together. The only cover afforded the bird was the general protection of the tall bush. The eggs were of characteristic type, except that they were unusually small. Three specimens measured 1.72x1.28, 1.78x1.30, and 1.78x1.33.

When the young are nearly full grown, the flock begins to retire slowly up the mountain sides, until by the middle of fall they are to be found only on the higher ridges. Those, however whose winter homes are in the highest western ranges, do not seem to have so much latitude of movement. On August 5th, I encountered a brood of full grown young on Wright's Peak,

at an altitude of 7000 feet; and although the winter snows still clung in patches to the mountain-sides about them, I have no reason to suppose that they were raised more than half a mile away.

FRANKLIN'S GROUSE, *Dendragapus franklinii.*—Not nearly so common a bird as the last. It does not apparently range so low as the Sooty Grouse in any given section, where both are found; nor on the contrary, I suspect, is it to be found about the higher peaks.

On the 28th of April, 1896, I found a nest of this bird at an altitude of about a thousand feet above Lake Chelan. It was placed in the tall grass, which clothed the side of an inconspicuous "draw" bottom, and although the plow had recently turned up the soil within five feet of her, the mother bird clung to her post I took several "snap shots" of her at close range, and she allowed me to advance my hand to within a foot of her, when she stepped quietly off the eggs and stood looking back at me over her shoulder. The nest was a depression in the gravel-filled soil, lined with grass and dry corn leaves, besides a few stray feathers: depth 3 inch, width 7 inches. The seven eggs are unusually large: 1.98x1.83 and 1.94x1.35 are the measurements of two average eggs of the set.

OREGON RUFFED GROUSE, *Bonasa umbellus sabini.* The differentiation of the sub-species of the Ruffed Grouse is not at all clear in this region. In any case the range and habit of the local species is nearly like that of the eastern bird, inasmuch as it frequents copses, springs and river bottoms at low altitudes. One hardly knows when he hears a sharp, rapid "*dsck, dsck, dsck, dsck*" close at hand in the brush, whether he has started up a "pheasant" or a red squirrel.

WHITE-TAILED PTARMIGAN, *Lagopus leucurus.* This species is reported as not uncommon in the higher altitudes. I met with them once on the barren summit of Wright's Peak at an elevation of about 9,000 feet. So far from deserving the name of "fool hen," applied to them in the winter season, when they may be readily approached, these ptarmigan in August were excessively afraid and absolutely unapproachable; although it is certain they had never seen a human being before. One, upon sighting me at fifty yards, squawked in extreme terror and whirred away at a wonderful pace.

COLUMBIAN SAARP-TAILED GROUSE, *Pediocactes phasianellus columbianus.* The common bird in open situations which yet afford copses and cover—an invariable accompaniment of stubble fields and a habitue of grain-stacks. Although bred to a terrestial life they are quite at home in the branches of a willow or alder sapling. Indeed, from the frequency with which I have met them in such situations in the evening and at early morning, I have even suspected that they sometimes roost so.—*Bulletin No. 10, The Wilson Ornithological Chapter.*

We are in receipt of several blank cards of membership of the Mexican Botanical Club, which we will gladly send to anyone interested, or they can procure them by writing the Manager Mexican Botanical Club, Maravatio, Mexico. We can cheerfully commend to our readers and all others the object of this club. The Manager agrees to ship at least 20 plants each week during the season free by mail, postpaid, four or more of each variety, and guarantee safe arrival in good condition and suitable for either herbarium, class room or propogating purposes. Undoubtedly members of this club, at the end of one year will be able to congratulate themselves over a collection embracing 1000 plants in at least 250 varieties.

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Walter F. Webb, Editor and Manager

Albion, N. Y.

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Make articles as brief as possible and as free from technical terms as the subjects will allow. All letters will be promptly answered.

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NOTES.

Mr. J. J. Carroll of Texas is on a trip exploring some mounds in the extreme south of Mexico. He expects to find some nice things; will collect in other branches of natural history.

Numberless inquiries have been sent us inquiring after "Lattin," where he is, etc. The Natural Science News having been sold out and the Oologist having gone "where the woodbine twineth" collectors are wondering where the "editor" hath gone. From best advices we learn he is in Buffalo, N. Y., studying medicine. Further than this we have been unable to learn anything more than that he is out of the Natural History Business.

Mr. E. H. Forbush has a very interesting article on the American Crow in the Bulletin for August of the Massachusetts Board of Agriculture. It treats on migration, gregarious habits, mating and nesting habits, digestive capacity, food, protection of crops and "is he a friend?"

Mr. P. A. Tavernier of Ontario who has an article in this number announces the capture of a Sharp-tail Grouse near Beaumaris, Muskoka Lake. It was killed Oct. 10 by a farmer. Only one was seen. He says as far as he knows it is the first taken east of Sault Ste Marie, Mich.

Have any of our readers collected the eggs of the Little Brown Crane in Northwest Canada? Do you know of anyone who has taken them there? If so we would consider it a personal favor for their name and address. There seems to be a difference of opinion as to its breeding there. Some reliable collectors advise us of seeing and taking its eggs there and yet other competent authorities positively state it does not breed there. One party, a particular friend of ours, received a set from there this year with skins and as a test sent it to Washington, D. C. It was returned marked as doubtless the Numidian Crane. We should like to get the exact breeding range of the species.

Some things have been printed of late by our contemporaries that we are sorry to see. Circumstantial evidence should not be printed and circulated against any collector, official or institution. It only reflects with double force on its author, especially when it comes to be proven as all false.

We acknowledge receipt of Bulletin No. 1 of the Geological and Natural History Survey of the Chicago Academy of Science, treating "The Lichen-Flora of Chicago and Vicinity," by William Wirt Calkins.

ERRATA: In article Tonareuna, in the MUSEUM for September, page 259, second column, fourth line from the bottom, for Mohawk Museum, read National Museum. Also on page 260, for Siluvian, Silurian.

A Study of Knolls.

BY C. O. ORMSBEE, MONTPELIER, VT.

A peculiar feature in the surface of the greater part of New England consists of the numerous little hills or hummocks, popularly called "knolls," which everywhere abound. With the exception of some of the marshes and allunial meadows, they literally cover every portion of the country that the plow has not yet touched. They are seldom more than four feet high, or more than ten feet in width, or more than twenty-five feet long. In fact a knoll of these dimensions would be unusually large, although larger ones are sometimes seen.

As geolological monuments they have little or no value; but they are interesting as they illustrate, to a remarkable degree, one of the many methods which Nature employs, and has employed, to thoroughly mix the different elements which compose the soil, and to more perfectly adapt the soil to the use of man. Besides, it is important to understand their origin, lest, by a misinterpretation, serious geological errors may result.

In a word, then, these knolls are caused by the wind uprooting huge trees in the forest. As is well-known, the roots of all trees extend approximately at right angles to the trunk of the tree which they support, so that when the tree is thrown flat upon the ground the roots are placed in a perpendicular position. Naturally a large amount of earth clings to the roots and is uplifted with them. Dead leaves are blown into the hollow which is left, and, decaying, soon fill it to the level of the surrounding country. After the lapse of a few years the roots of the tree, and the tree itself, decays and the earth which had been unlifted falls to the ground and forms a little hillock. Thus the tree, in perishing, erects a monument to tell of its life, its size, and the manner of its death, and, I might also add that the knoll gives some clue to the species of the tree which formed it. To be sure this clue is rather faint, and not to be absolutely relied upon, yet, in my rambles about the country, I have noticed a regularity which seems to divide the knolls into several classes; and by watching other knolls now in the process of formation I have been able, to a certain extent, to systematize their classes.

I have noticed that a knoll is invariably steepest on the side towards the wind and this gives a clue to the direction from whence the storm came which uprooted the tree. Again, when a tree is uprooted during the summer months, when the ground is baked hard and dry, the sides of the knoll are more abrupt and percipitious than when the tree is uprooted either in the spring or fall; from this I can reach some conclusion as to the reason of the storm. Also when I see a knoll which has been broken, or torn apart, by the uprooting of a second tree, I am able to form some idea as to the comparative age of the knoll. And when I see one whole and entire, I know that it is of recent formation; or, rather that it was formed not long before the forest was cut off.

Pursuing my investigations in another direction, I find that the roots of the rock maple are long, and that they penetrate the ground to a greater depth than any other tree of this locality, for it must be remembered that the oak is not found in this county. As a natural consequence, when a maple tree is uprooted, the knoll which results is long and wide and high. The long deep roots have taken up a large amount of earth, and the result could not be otherwise. The roots of the elm are longer, even, than those of the maple, but do not penetrate deeply; consequently the knoll formed by the uprooting of an elm tree is longer than that produced by the maple, but not so high or so wide. Beech and birch roots are similar,—short and penetrating deeper than those of the elm, but not as deep as maple roots; and, ac-

cordingly, we find the knoll which results from the uprooting of a beech or a birch tree to be short, wide, not very high, and rather flat. Spruce and hemlock, and also pine, when it grows on dry ground, all have short roots, and of so feeble a tensile power that they generally break. Thus the knolls resulting from the uprooting of these trees are small. Again, when a tree of any species is partially uprooted, and lodges against another tree, a knoll is formed which is always nearly round and conical, thus betraying its origin.

I have, thus far, described only perfect knolls of each class. Modifications exist and so closely do they merge that the line of demarkation cannot always be reorganized. It is, however, a matter of little importance. It would merely serve to show the species of trees with which the country was formerly covered—a matter of little importance except in isolated cases. Still, a study of the knolls reveals some important facts. For, as before stated, they invariably show from what direction the wind came, and, also their comparative age. Now, if we find a large number of knolls close together, of the same age and extending in the same direction, it follows that, at some time in the past there must have been a hurricane which blew down all or nearly all the trees upon that area.

Acting upon its theory and by noticing the similarity of knolls, I have been able to trace the paths of two hurricanes which visited this country not far from one hundred and fifty years ago, or about fifty years before the settlement of the county. The first of these storms come from the northwest. It struck very nearly in the northwest corner of the township of Montpelier and swept a path half a mile wide, diagonally across the entire township. The timber was principally maple, and it is doubtful if a dozen trees were left standing. The second storm was much less extensive than the first. It originated about a mile to the east, and coming more nearly from the north, it swept a territory of mixed, hard and soft wood, about a mile long by forty rods wide. Besides these I have discovered traces of several other storms, but cultivation has destroyed the knolls until it is impossible to map the extent of the hurricane.

Land and Fresh Water Shells of Dodge County, Wisconsin.

BY WILL EDWIN SNYDER, BEAVER DAM, WISCONSIN.

Dodge County, Wisconsin, affords a rich field for one who delights in Conchological research among the Land and Fresh Water Shells. Her several lakes, streams and extensive marshes all afford dwelling places for many beautiful and interesting shells.

The following list is by no means a complete one, since my field of search has been limited to Fox lake, eight miles north of here, and within a radius of three miles of my home. Horicon Marsh with its several thousand acres has never been explored, nor has Loss Lake and many of the small streams. Very little has been done toward collecting the Unionidæ, and many species can be added to the list I am sure. In addition to those given below I have four or five species not yet determined.

Before presenting the list I wish to thank Mr. Chas. S. Hodgson and Dr. Berlin Hart Wright for their kindness in naming many of the species for me.

Helix multilineata Say, var. minor. Abundant in one marsh that covers at least 100 acres. All uniform in size but variable in markings.

Helix profunda, Say. Found abundantly on two small islands in Fox Lake. Principally found on *Impatiens fulva.*

Helix mondon, var. *fraterna, Say.* Abundant in the same marsh with *H. multilineata*, also in one smaller marsh.

Pupa armifera, Say. Commor

under stones in one pasture bordering on a large marsh.

Patula alternata, Say. Abundant on islands in Fox Lake and in a marsh near here. Have also taken juvenile ones from under bark of oaks early in the spring.

Vallonia pulchella, W. G. Binney. About 200 were taken on September 21st last from under boards lying in my door yard.

Zonites arboreus, Say. Common in all damp places.

Succinea ovalis, Gld. Very abundant in a certain small marsh.

Physa oleacea Lyon. Abundant in all stagnant pools. Specimens entirely black are found in a spring flowing from a rocky hill side. Mineral matter in the water causing the coloring.

Planorbis campanulatus Say. Exceedingly abundant at Fox Lake.

Planorbis armigera Say. Limited to one marsh near my home and at Fox Lake. Abundant at former place, rare at latter.

Planorbis trivolvis Say. Abundant in all marshes and bodies of water. Have them in my cabinet that measure 1⅛ inch across.

Limnæa zebra Tyron. Very rare, found in one marsh only.

Limnæa reflexa Say. Common in all marshes, lakes and pools.

Limnæa stagnalis Say. Superabundant at Fox Lake, having taken 15 from a single leaf of the white waterlilly, floating on the water. One taken from Beaver Lake on August 29, 1895.

Limnæa desidosa Say. Common in all small pools.

Limnæa palustris Mull. Somewhat scarce, found in small numbers in several marshes. A black variety is found in same spring with *P. oleacea Lyon.*

Valvata bicarinata Lea. Abundant at Fox and Beaver Lakes.

Sphærium sp. At least two species occur but are not yet determined.

Unio lutcolus Lam. A few taken from each Fox and Beaver Lakes.

Anodontus marryatana Lea. Superabundant in all lakes and large streams that I have visited.

Cycrus Trap.

I was very much interested in reading the article in the September number entitled "A Carrion Route," by F. P. Drowne. Some ten or more years ago, when I was collecting for my father, Dr. A. W. Hoffmeister, whom perhaps some of the older coleopterist will remember, I had a little experience, somewhat in the line of Dr. D. We trapped the Cycrus in almost the same way as did Mr. D. the Carrion Beetles. Thinking perhaps the method I employed will be of some interest to the Doctor as well as to other collectors, I will relate how I snared these beetles, which were then in great demand by some collectors and for which we got as high as fifty cents apiece.

In the first place I collected a lot of Snails, which were quite plentiful near a stream of running water. Then I procured some quart fruit jars into which I placed some Snails an inch or two high, according to the quantity of Snails I had, placing over them some wire screen so they could not crawl out of the jars, a few Snails were placed on top of the screen, and my trap was baited. These baited jars were buried or sunk into the ground, so the top was even with the surface, in a willow grove, in a marshy place near the river. A large piece of bark or other rough decayed wood was loosely placed over same and the trap was set.

The Cycrus being very fond of Snails would soon find their way into the jars where they were held prisoners from which they were easily transferred to the collecting bottle. Oftentimes I have found as many as a dozen and a half in a single jar at one time.

The larger of the two kinds (the names I do not remember) I caught were the most numerous. Besides these I would catch many other kinds of beetles in the same jars.

A trial of the above method will well repay the collector for his trouble.

Yours Respectfully,

B. L. HOFFMEISTER,
Ft. Madison, Iowa.

A Merry Christmas!

Some may smile, but you see our Dec. number is not printed until the 15th and frequently not mailed until the 20th, so before many of our readers see Dec. No., Christmas may be passed.

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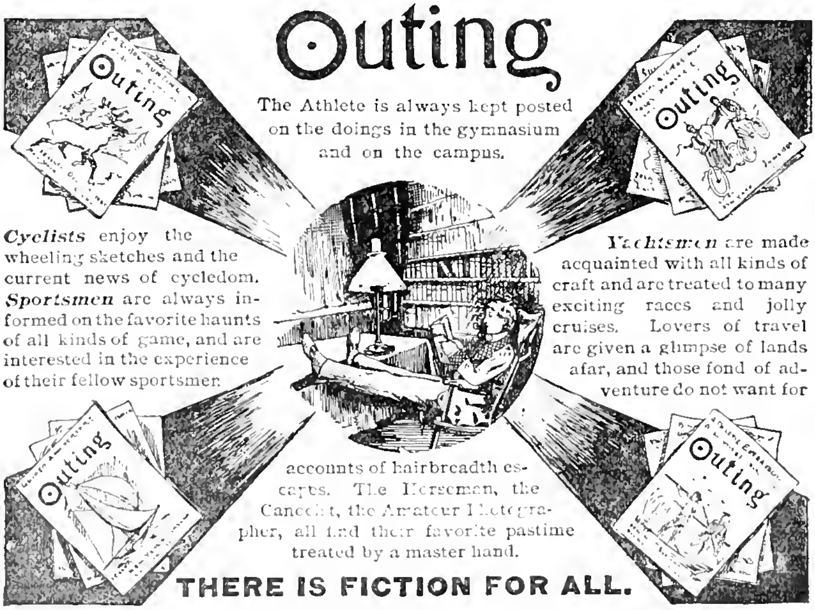

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THE MUSEUM.

WANTS, EXCHANGES AND FOR SALES.

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SEE that "fair proposition" that A. B. Crim makes in another column.

THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., DECEMBER 15, 1896. No. 2

Notes from the Mohawk's Country.

P. M. VAN EPPS.

(XI.)

THE MASTER-BUILDER'S DILEMMA.

In an overhead corner of our piazza an industrious colony of hornets or "yellow-jackets", built for themselves a habitation, after the fashion adopted by their people.

Though this paper home was rather close to our door, at certain few times too near for comfort, yet the mandate was issued that they should not be disturbed in their labors; consequently the habitation was completed and occupied for one season only. This was several summers ago.

The nest was built in an inside angle, and instead of hanging freely from one point of suspension was placed right in a corner so that it not only was fastened to the ceiling but on two sides was built against the woodwork; consequently it presented in outline the segment only of a circle.

Monsieur Vespa, the chief architect, having placed this nest in a corner no doubt was troubled at the lack of roundness in the completed habitation; perhaps his people jeered at him for his lack of forethought in so placing his foundations that the finished structure presented such an unusual form.

What could he do to better matters and pacify this family of primitive paper-makers whose sense of the how-it-should-be was outraged? We shall see. One end of the piazza adjoined a projecting linter; it was at this point that the paper-makers were working. Here, outside of the hanging-board or fascia, was another corner formed by the meeting of the hanging-board with the wall of the linter. Something might here be done in the way of making the structure more symmetrical. So the master-mind evidently thought, for his pugnacious people fell to work and threw paper arches across the outside corner. Though separated from the main edifice by an inch board yet the work went on, until six or eight concentric layers, each slightly longer than its fellows, had been superimposed. The outer or last one being concentual, or in exact harmony with the periphery of the main habitation.

The offended artistic taste of the colony had been appeased; the idea of roundness and symmetry had been carried out in so far as they were able. Evidently for this purpose only had all this extra work been done. For shelter or protection it was not needed, neither did these few concentric out-layers shelter or enclose any habitable portion of the home. Simply instinct, shall we call it? Blind, unreasoning, inward impulse? "Our fathers thus built their round houses and we their children will also so build." The same powers which instinctively induced them to carry out the idea of rotundity at all costs guided them in making accord between the main structure and its separate outer portion.

Given this same power to man and what need of the trained minds, the elaborate calculations, and the expensive instruments used to accurately align the opposing drifts of a Mont Cenis or a Hoosic. For the man a mountain range; for the insect an inch board of pine; both equally impenetrable for

the eye. Possibly sound was a factor in the astonishingly accurate alignment of the insect's work. We cannot suppose the insecct to have command of any visual powers akin to the marvelous effects of the Roentgen rays.

Try, without making any measurements, to pierce a two inch cube of wood from opposite sides having the perforations accurately meet in the center: can *you* do it? Man of the stone age generally failed. The perforations in his numerous tablets, gorgets, and other objects were made by drilling from both sides; and they generally come awry. Here is a gorget broken at the perforation. It shows holes nearly one-fourth of an inch out of line, the mass perforated being but one and a half inches thick.

Who, unaided with tools, is the better artizan, Homo sapiens or Monsieur Vespa the master-builder?

Glenville, N. Y., 1st Dec. 1896.

A Few Points Regarding the Nidification of the Red Tail Hawk in Southern Texas.

The Red Tail Hawk is far too well known to every American ornithologist for me to attempt to impose upon the readers of the MUSEUM, a paper concerning anything save their habits of nidification. For that very sufficient reason I shall confine myself strictly to the discussion of those habits. I will say, however, that this species of our Raptores is well represented in Southern Texas, excelling in point of numbers, any species that came under my observation during my stay of seven months in that vicinity.

The following are notes condensed from my observations of 1896 only.

March 2, 1896. Two fresh eggs. Nest composed of sticks and weeds. Well made and compact. Twenty-five feet from ground in hackberry tree in Rattlesnake motte, San Patricio Co. Bird on nest. A small garter snake was lying dead in the bottom of the nest.

March 5, 1896. Three fresh eggs. Bird on nest. Nest composed of sticks and lined with moss. Situated twenty feet from ground in oak tree in belt of oaks bordering prairie.

March 5, 1896. Two eggs in which incubation had begun. Nest composed of sticks with lining of moss. Situated thirty feet from ground in crotch of black jack in grove.

March 5, 1896. Two eggs in which incubation had started. Bird on nest. Nest of sticks in oak tree thirty feet from the ground.

March 7, 1896. Two eggs in which I found incubation to be three-fourths advanced. Bird on nest. Composed of sticks lined with feathers and moss. A large structure. Nest contained a snake from which the head had been eaten, but was yet alive. The tree was situated in a small motte.

March 7, 1896. Three eggs, incubasion one-third. Bird on nest. Composed of sticks, lined with moss and feathers. Situated twenty feet from ground in medium sized tree.

March 7, 1896. Three eggs, incubation begun. Bird on nest. Composed of sticks and lined with moss and feathers. Situated twenty feet from ground in oak tree.

March 15, 1896. Three eggs, one-fourth advanced in incubation. Composed of sticks and lined with moss. Situated in black jack tree twelve feet from ground, near a ravine.

March 20, 1896. One egg, incubation one-fourth. The nest was situated ten feet up in a small tree. I think it probable that the nest had been disturbed before I found it.

March 20, 1896. One rotten egg. This egg was under the bottom of the nest which was a very compact structure. Suppose the nest was confiscated while the egg was in it, as the interior was well finished but not containing eggs.

March 24, 1896. Three eggs in which incubation had begun. Bird on nest. Composed of sticks, grass and weeds. Situated sixteen feet from

ground in hackberry tree in small motte. Nest contained a freshly killed Mexican Gopher upon which the skin had not been broken.

March 25, 1896. Three eggs, incubation started. Bird on nest. Composed of sticks and lined with moss, a few feathers, green leaves and cedar bark. Situated in hackberry tree, thirty feet from ground.

March 25, 1886. Two fresh eggs. Bird on nest. Composed of sticks and lined with moss, weeds and a few feathers. Situated fourteen feet from ground in hackberry tree in motte.

March 28, 1896. Two eggs, incubation advanced one-fourth. Bird on nest. Composed of sticks with lining of moss, feathers and green leaves. Same nest from which I obtained a set of two eggs on March 5.

March 28, 1896. Two eggs, incubation advanced one-third. Bird on nest. Very large nest composed of sticks, lined with grass, moss and green leaves. Situated near extremity of projecting limb of black jack tree near arroya Medio.

March 28, 1896. Three fresh eggs. Composed of sticks and weeds with lining of moss, grass and feathers. Situated fifteen feet from the ground in hackberry tree in motte.

March 30, 1896. Incomplete set of one fresh egg. Bird on nest. Situated in top of small lone bush on prairie, ten feet from the ground. Composed of sticks lined with green leaves.

April 4, 1896. Two eggs, incubation commenced. Bird seen. Nest composed of sticks with lining of feathers, moss and grass. Situated fifteen feet from the ground in hackberry tree.

April 20, 1896. Two eggs, in which incubation was far advanced. Bird on nest. Composed of sticks with lining of moss, green leaves and feathers. Situated thirty-five feet from ground in live oak in deep wood.

JAMES J. CARROLL,
Belton, Texas.

Reminiscences of a Trip to Schoharie.

ROB'T M. HARTLEY.

(II.)

It is impossible to record in this paper all the details of our trip. We coursed up one side of the valley and down the other, stopping where fancy smiled. We hammered the various rocks for geological specimens searched the ground in many fields of standing corn and hop yards for the relics of the red men, and visited nearly every collector and geologist (who were quite numerous) we heard about. Thus was the trip made breezy, attractive and entertaining.

One evening as we ascended the western hills from that paradise of multitudinous strata, we reached the residence of a geologist acquaintance, who was a character withal—as geologists and scientists are sometimes wont to be. His collection was large, representing much hard labor and research, and was from all of the groups so accessable to him. Its condition, however, was lamentable—covered with dust, dirt and cobwebs. If properly cleaned, labeled and arranged it would make a valuable adjunct to some college museum. When about leaving, we enquire if he can direct us how and where to find a certain distant relative of us both, at whose house we calculated to spend the night. The incredulous and doubtful looks of our geological friend, who failed to locate the said relative, can only be appreciated by the two travelers. Darkness seemed to be hovering about his brain, for he kept scratching his head, trying to place him I suppose, and saying in a low tone of voice, "William H. Y——, William H. Y——." Turning to us he said, "You fellows must be mistaken, there's no man by that name around here." We tell him "No, we are sure about the name." All at once light and recognition came to him, for he blurted out in a loud voice, "Oh, I know *who* you

mean, you mean OLD BILL Y——, the accent strong on Bill that's the only name he is known by around here." His actions, when thinking so hard, the manner and tone in which he said it, was ridiculous in the extreme, and it was with great difficulty that we kept ourselves from laughing at him.

Obtaining the required directions we dive into the valley bottom, cross the creek and commence the three mile ascent up the opposite hills. Some half way up we feel obliged to lighten the heavily loaded wagon. So a ponderous specimen—weighing perhaps fifty pounds—containing many hundred beautiful specimens of brachiopoda was consigned to the roadside. This choice specimen had been carefully cared for several days by my friend, and carted nearly fifteen miles much to our inconvenience. Though we regretted to do it, it had to be cast aside at last.

Reaching our destination—relatives yet strangers—our welcome was a warm one. We were tired after our long day's jaunt yet the evening passed so merrily that it was midnight before we sought our rooms.

* * * *

All limestone rock is cavernous, and owing to the great depth of the strata in Schoharie County it is particularly so. Some of the most noted caves of New York State are in this County and in the town of Schoharie they are numerous.

Learning that Ball's Cave was on the adjoining farm, and having had some little experience in cave exploring, we propose to visit it. I might say here that both of us had read of this celebrated cavern, but were ignorant of its exact location, so the mention of it being in the near vicinity was a complete and pleasant surprise.

The next morning equipping ourselves with 90 feet of rope, a barn lamp and 'fat pine' for light—these the most available ones at hand—hammer, chisel and plenty of matches, and dressed up in the cast-off clothing of "Old Bill" and the boys, we made a ludricous picture as we lined up for inspection before starting. One of the boys—Elmer—agreed to take us with a wagon and to show the way; but declared "by goll, you'll never get me under the ground with you until you put me there for good." Perhaps he thought we would find inscribed over the entrance: "Abandon all hope who enter here."

The start was finally made behind "trading stock;" reaching the edge of the woods we tied the "nag" to a tree and began what proved to be an hour's search for the cave. Living so near, yet strange to say our guide had never been to the entrance before. However success rewarded us at last—the cave was found.

The entrance is the central opening at the bottom of a funnel-shaped depression or "sink hole," about twelve feet below the surface, the mouth the perpendicular passage in the limestone about ten by six feet and some seventy five feet in depth. This opening we descended by making fast one end of our rope to a tree close by, and going down in the best way we could; a dangerous and hazardous undertaking to anyone save those agile and daring. Standing against the perpendicular wall were numerous long poles, 75 or 80 feet in length, the work of former cave explorers. These poles bear evidence of once having slats nailed across as a ladder; the slats are now rotted away, leaving the poles bristling with nails.

Two of us made the descent successfully, and upon calling to our friend above to "come on, there's no danger if you hang on," we were surprised to see him, after some hesitation, grasp the rope and swing off, coming down like a trapeze performer. Lighting the lamp and 'fat pine' we take a farewell look at the sky and sunshine above and begin our journey, threading our way carefully through the gloomy gallery. The light from our

torches shines but a little way into the Stygian darkness. From the foot of the ladder commences a passage from four to ten feet in width, and fifty or sixty feet long, in a westerly direction, with a considerable downward tendency.

At the end of this inclined passage is a second perpendicular descent of some ten or twelve feet. After walking perhaps two hundred or more feet with about the same descent 60 degrees we reach the bottom of the cave. Here the opening is ten feet wide and our progress is stopped in this direction by a perpendicular wall, whose height is obscured by the gloom above. Groping around we find an opening close to the floor leading to the right or north. Lying flat upon the muddy bottom and pushing the light ahead to see the way I manage to wiggle through after a tight squeeze and call to the others, they follow. A few feet away we discover a lake, smooth as a mirror, at whose bottom, within grasp of our hands, is a small, roughly made boat with square ends. Looking ahead we see no way of getting further on foot, so we attempt to drag the boat up from the bottom. It is so heavy, by being water logged and stuck in the mud, that we fail to move it. Noticing a small ledge along one side I endeavor to go further, hoping that by sustaining myself with my hands against the opposite wall I can get around to a wider ledge some thirty or more feet away. It is a hazardous undertaking, but by sheer strength I keep going inch by inch until my body is nearly horizontal with the water below. The passage getting wider I am obliged to retrace my *footsteps upon the wall*, and at last nearly exhausted reach my companions upon the shore. The water is as clear as crystal, so after my desperate struggle I take a drink and find it as cold as ice water.

Regretting that the lake cannot be crossed, and wading out of the question, as it looked to be ten feet deep, as many feet from the shore, we crawl back through the aperture. To the left we discover another opening near the rocky bottom, larger than the first. Entering this, we find it soon grows into a passage way of considerable size—thirty feet wide in places—and whose height we could not estimate. Before going far we become convinced that this gallery is the dry bed of what was once a lake, for half buried in the mud are the remains of numerous boats, of the same character and build as the one seen on the lake bottom, already described. This lake appeared to have been of considerable size or length—we judged it to be from 300 to 400 feet long. The bottom was of that peculiar fine-grained yellowish brown mud found in all the caves I have ever visited. Humpy and uneven, of sufficient hardness to walk upon, but as slippery as grease. Some distance on we come to what we suppose is the end of the cave, although to the right, some eight feet above we notice a crevasse about two feet wide, which we make no attempt to explore, as one of our party had been unwell all the morning. So we retrace our steps and come back again over the dry lake bed.

We determined that the boats found there could have been built above ground, lowered by ropes into the cave and dragged through the aperture, but the boat in the lake to the right must have been built on the shore, as the opening to it was not of sufficient size to admit of its passage.

Arriving at the entrance we clamber up the 90 feet of perpendicular wall by the aid of the rope and old poles, and once more we are out into the sweet air again; all the world looks fairer for our temporary occuitation.

The Depositing of Gold.

An exhibition of the greatest interest to mineralogists and practical miners in relation to the much argued question as to how gold was originally depósit-

ed in auriferous quartz is reported from the Imperial Institute at Edinburgh, Scotland. J. C. F. Johnson, of Adelaide, Australia, who has given great attention to the subject, exhibited specimens of non-gold-bearing stones in which he has artificially introduced gold in interstices and on the face in such a manner as to defy detection, even by skilled experts. Some of these specimens were shown privately to several distinguished geologists, who expressed great surprise at the remarkable character of the exhibition. The discovery, some years ago, that gold could be induced to deposit from its mineral salt to the metallic state on any suitable base, such as iron sulphide, led Mr. Johnson to experiment with various salts of gold, and by which he has produced most natural looking specimens of auriferous quartz from stone which from previous assay contained no trace of gold. Moreover, the gold, which penetrates the stone in such a thorough manner, assumes some of the more natural forms. In one specimen shown not only appears on the surface, but penetrates each of the laminations, as was proved by breaking. While this knowledge of how gold was probably deposited may help to suggest how it may be economically extracted, the thought also occurs what a power for harm it would be in unscrupulous hands, for the fraudulent "salting" of mines.

A Giant Platanus Occidentalis.

Three miles southwest of Brownstown, the county seat of Jackson Co., Ind. there once stood a giant sycamore tree, which I believe to have been the largest tree that ever grew in the United States, east of the famous Yosemite Valley.

The sixteenth section of every congressional township (six miles square) was set aside for school purposes. When this section was sold my father purchased the part on which stood this tree, within one hundred yards of Driftwood River—the east fork of White River. The bottoms on this stream are wide and very rich and were once heavily timbered with black walnut, sycamore, elm, sugar beech and other timbers. I never saw the tree standing, my recollection extending between the years 1852 to 1864. During this time the outlines were plainly visible, a large section of the stump still standing. My father told me that at about the height of fifteen feet the tree formed in three branches —the smallest of which was at least seven and one-half feet in diameter. After the fall of the tree it was found to be hollow and while lacking considerable of being round, a pole eighteen feet long could be turned completely around within the hollow. The outside wood was about eighteen inches thick. The tree was measured by the surveyor of the lands and was more than sixty-six feet in circumference. I have not the exact data as to size, but distinctly remember that it was over a surveyor's chain in circumference and I believe all surveyor's at that time used a Gunter's chain.

Nearly all *P. occidentalis* were hollow and all farmers in the early times used them for holding grains. Some of them yet remain on the farms.

Prof. E. T. Cox on page 70, Geological Survey of Indiana says: "I measured four poplar trees that stood within a few feet of each other; the largest was thirty-eight feet in circumference three feet from the ground, one hundred and twenty feet high and sixty-five feet to the first limb. The others were respectively eighteen and one-half feet, eighteen feet and seventeen feet in circumference. On the same farm a red elm measured eighteen feet in circumference."

Should any reader of this know of a larger tree, of any species, please call my attention to it. M. Crabb.

Erie, Ind.

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

Correspondence and items of interest on above topics, as well as notes on the various Museums of the World—views from same, discoveries relative to the handling and keeping of Natural History material, descriptive habits of various species, are solicited from all.

Make articles as brief as possible and as free from technical terms as the subjects will allow. All letters will be promptly answered.

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NOTES.

Any of our subscribers who can give us the address of Mr. O. W. Montgomery, formerly of Allentown, Pa., will do us a great favor.

The Asa Gray Bulletin will be continued by Mr. W. R. Kedzie of Agricultural College, Mich. Every botanist should send for a copy. Mention THE MUSEUM.

We very much regret to record the death of Mrs. F. A Bailey, of Boltonville, Wis., who was greatly interested in shells.

Some new shells reported in December Nautilus are Melania vatensis and Neretina coccinea from the New Hebrides archipelago, described by Mr. C. F. Aucey; also a new American unio described by Wm. A. Marsh, Unio Askewi being named after H. G. Askew of Austin, Texas.

A new and more complete list of the Birds of Iowa is soon to be published. Mr. David L. Savage of Salem, Iowa, is chairman of the committee.

One of the most interesting collections of Indian Relics of New York State is owned by Mrs. H. M. Converse, who is an Iroquois by adoption and an honorary chief of the same tribe. She has her collection at present on exhibition in her parlors in New York City where all may see the famous Iroquois National Wampum belts. Through the efforts of Mr. E. G. Richmond of Conajaharie, the state last winter appropriated $5,000 to classify the relics of the State Museum at Albany and it is being done as rapidly as possible. Mrs. Converse, as well as others in the state, will gladly donate their entire collections if a safe place is fitted up for the same, and thus build up the best collection in the country of all that is left to us of the once powerful "Six Nations" that for centuries held full sway over the Empire State, and were the most intelligent and warlike of any North American tribes.

The Scientific American of Dec. 5 contains a handsome picture of Crater Lake, Oregon, which was described by Mr. J. A. Cottle in the MUSEUM about a year ago.

Mr. A. W. Anthony has returned from his trip to Lower California where he was very successful in securing many rare birds and a number of new species of mollusca and marine fauna.

Any collectors in the United States who are able to collect us Helix (Land Snails) in quantity, please write for particulars.

Some of our MUSEUM *office rules* which we hope subscribers will take note of are:

1. Notify us if you want paper stopped.

2. Don't order it stopped without paying up arrears if any.

3. We accept 50c. for a year's subscription if you pay in advance. If you wait until the end of the year the price will be $1.00. You save 50c. by paying in advance. Our printer has to be paid promptly. We can't hope to get a year's credit from him, and we can't extend a year's credit to our subscribers and advertisers.

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A Visit to a Lapidist's Shop.

BY BERLIN H. WRIGHT, PENN YAN, N. Y.

The desire of years, to see a lapidist at work and witness the process by which the dull, uninteresting fragments of minerals are shaped and polished into things of beauty, was recently gratified, and it was so interesting to me that I thought it would be equally so to many of the readers of natural history literature.

This disideratum to my happiness was supplied in a visit to the establishment of Mr John G. Buxton of Milo Centre, N. Y., to whom I am indebted for the kindness and attention which made my visit so pleasant and profitable.

The first object that attracts attention on entering the commodious and well lighted shop is an immense grindstone, fifty inches in diameter, of peculiar grit, and running at one hundred revolutions a minute, and so nicely hung that it is not fastened to the floor. On this the minerals are ground after being sawed into shape by the automatic feeding diamond edged saws. These saws run in oil and eat their way almost noiselessly through the hardest rocks. The clamps and lead screws which hold the mass to be sawed in place, are so nicely adjusted that very thin slabs of minerals can be taken off, and with sides perfectly parallel.

From the saw to the grindstone, and from thence to the polishing laps, the minerals go. These laps are sixteen inches in diameter, made of tin, wood, felt, etc., and are horizontal. They revolve at a tremendous speed—and by the aid of various powders they soon remove all scratches left by the rough grindstone. Then the last touch is given by the felt lap which gives the mineral a shining, mirror-like surface.

All this machinery is run by a trim little engine of five-horse power.

We turn our attention to the material, and find boxes of crude material to be reduced to cabinet specimens and wonder how the finished product will look. I had previously turned over to Mr. Buxton a lot of geodes, agates, etc , taken from my cabinet for him to operate upon. Specimens were extremely uninteresting to the average person, possessed of no external beauty. Can it be possible that those beautifully polished slabs, showing such vivid contrasts of coloration and patterns are portions of those original masses which had remained so many years upon my shelves unnoticed? The changeable undulating luster or reflections from the glassy-green Labradorite flashed its dazzling tints upon our enraptured vision and then vanished, as if by magic, leaving us to wonder what it was we saw.

Miniature forests or wooded landscapes are brought out in the slabs of Landscape Marble, giving us an exhibition of an *attempt* to crystalize—the the same as we see upon the window pane on a cold morning or in the Dendritic formations in the Moss Agate, etc. The geodes, septoria, etc., showing the *completed* process.

The architectural and mechanical skill of the minute coral insects of ages long gone by is beautifully shown in the slabs of Favosites, Madrepores and the large group of Cyathophylloid corals from the Devonian rocks whose correct determination depends so largely upon a knowledge of the structural features made visible by such sections.

A rich play of colors and great variety of markings is brought out in the Opals, forms of Chalcedony, Agates, Onyx and Sardonyx. The Chalcedonized woods, of various kinds, showed growth lines of differing degrees of fineness, and even the pores of the wood, through which the sap once flowed, are to be plainly seen. The Ribbon Agates are streaked with zones of parti-colored tints, and the Fortification variety has these color belts broken up and arranged in angular outlines bearing a resemblance to veritable works of defense. These many-colored bands show us how the different material was deposited by the water that originally held it in solution. This feature is also strikingly illustrated in the sections of stalagmitic material known as Giberaltar Stone. Every drop of water, as it reached the cavern floor, from the pendant stalactite above, left its moiety of lime or silica, and thus grain by grain, particle by particle, through long ages, the process went on, until the skilled lapidist saws the mass into slices; polishes it and lo! What beauty is brought out.

There were minerals of all colors—red Jasper and crimson Garnets, green Malachite and Jade and Jet with its perfect blackness; and yet so smooth polished that one could use it for a mirror; also Meteorites and ores whose value per ounce was named in dollars.

My conchological curiosity was excited by the skill displayed in cutting shells in twain vertically. The axis of the shell was so perfectly followed that the internal structure was beautifully shown—a great disideratum in a collection of shells. The same feature is shown in the sections of fossil Ammonites.

During our visit Mr. Buxton was working on some specimens of that scientific puzzle known as "Cone-in-cone," of which he had recently collected a large supply. They are certainly strange things—curious formations. To what kingdom do they belong? We ventured a few suggestions upon this subject and Mr. Buxton's lingual member flew faster than his saws and polishing laps, if possible, in defense of *his* theory, which was that they had once been Barnacles. It would seem that almost any theory as to their true nature can be upset by the facts concerning them; their location, form, surrounding, etc. I hope this may draw from others who have collected them in place, observations and theories concerning them, when it may be possible to arrive at some well founded cause of origin.

Honk! Honk!! Honk!!!

An arctic expedition returned from the polar regions and stopped near this place to recuperate today. Its arrival was announced by a loud honk! honk!! which was first heard far up in the sky.

The expedition numbered fifteen members and was ably led and commanded by that gray old veteran *Branta Canadensis* who led his forces arranged in the form of a letter V without the least variation due south.

It was the wild goose expedition which having summered in the arctic regions, decided to winter in more congenial climes. Although their course was so correctly laid out, it is not to be supposed that they had reasoned out the question of a change of location among themselves, consulted an almanac or time-table looked at a compass or took an observation of the sun, to reach a decision and decide or direct their course. Their action was not influenced by what psychologists call "higher cerebration" nor was it the result of education or study.

No. It was as the old timers say "they felt it in their bones" that it was time to move southward and southward they went under the wonderful influence of instinct and the guidance of the Almighty.

ISADOR S. TROSTLER,
Omaha, Neb.

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I want new or second hand copies of books on any branch of Natural History, especially the following—In *Botany* any of Gray's, Wood's, Lesquereaux, Goodale's or Hough's works. In *Geology*, *Mineralogy* and *Palaeontology* any of Dana's, Winchell's, Miller's and Geiker's works. In *Conchology* any of Tryon's, Sowerby's, Gill's or Woodward's works. In *Entomology* any of Packard's, Comstock's, Maynard's, Edward's or Scudder's works. In *Ornithology*, *Oology* and *Taxidermy* any of Baird's, Bendire's' Brewer's, Brewster's, Cassin's, Chapman's Cory's, Coues', Davie's, De Kay's, Fisher's, Gentry's, Goss', Hornaday's, McIlwraith's, Maynard's, Minot's, Nuttall's, Nehrling's, Raine's, Ridgeway's Shufeldt's, Samuels', Studer's, Warren's or Wilson's works. Also back Nos of the Auk, This. Ornithologist and Oologist, Nidiologist or any other Natural Science Journal printed in last 50 years.

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Parties having large collections of anything listed above or know of really desirable collections will favor us by dropping a card in regard to it.

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We prefer large exchanges to small ones as it is frequently as much labor to attend to a $1.00 exchange as to a $10.00 one. However send us lists of what you have and if you do not get a reply promptly you may conclude we cannot use the material you offer at present.

Faithfully, **WALTER F. WEBB, Mgr., Albion, N. Y.**

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54 Old U. S copper cents of various dates between 1803-1854. Poor to good. A few duplicates. All of the 1850's. Will send the lot by regular mail, postpaid, for $2. For further information, if wanted, write. P. M. VAN EPPS, Glenville, Schenectady Co., N.Y.

WANTED.—A few well mounted skeletons of such as: Cat, Crow, Snake, Alligator, Frog, Fish, etc. Anyone having same for sale cheap write at once. W. F. WEBB, Mgr., Albion, N. Y.

FOR SALE OR EYCHANGE—1 Bull's-eye Camera, 12 fine mounted birds, 30 skins such as Eagle, Grouse, English Magpie, etc., also an engraver's machine. Wanted, a Winchester shotgun or rifle. JNO. McKOWIN, 6527 Rhodes Ave., Chicago, Ills.

WANTED.—Vol. II of U. S. Geological Survey, 1877. Will give good exchange. What text books on Geology or Biology have you to exchange? W. F. WEBB, Mgr., Albion, N. Y.

FOR EXCHANGE:—Have 75-3 American Herring Gull, 40-1 Leach's Petrel, 13-3 Common Tern, and Florida Duck 1-1. Wanted, Davie's "Nests and Eggs" and eggs not in collection. RALPH N. KNIGHT, Bucksport, Maine.

TOOT, TOOT!—E flat cornet, the MUSEUM complete. Natural Science News complete, for best offer in bird books or eggs in sets. C. F. STONE, Branchport, N. Y.

OFFERED.—Shells and scientific books. Wanted, natural history material, books and microscope. Will send printed catalogue in return for your list. CHARLES LE ROY WHEELER, 630 Clay Ave., Scranton, Pa.

WANTED—U. S. copper cents 1799 and 1804 Will give in exchange other U. S. copper cents, mounted birds, bird skins, eggs or cash if cheap J. S. ALLWOOD, Hecla Works, N. Y.

JUST OUT.—Written and illustrated by Reginald Heber Howe, Jr. A Guide to the Identification of the Birds of Woodland Beach and Ocean. A most valuable field book for everyone who has any interest in the study of birds. Very carefully illustrated by the author with 124 new cuts showing head and foot of every genus. Also giving a complete list of all the rarer birds. A perfect pocket manual by which one can readily name a bird on sight, or in the collection. 16 mo.; cloth, prepaid $1.10. W. F. WEBB, Mgr., Albion, N. Y.

WANTED—A1 sets of large fancy eggs, water birds especially. Have A1 sets and medical books to exchange. A. J. McKAY, Girard, Kan.

FOR SALE—Mounted birds, all first-class specimens, Blue Jay 50c., Cedar Waxwing 45c., Bluebird 45c., Purple Finch 45c., Tree Sparrow 45c., American Goldfinch 35c., Slate-colored Junco 40c. Send stamp for full list: GEO. D. FRENCH, Ivoryton, Ct.

INSECT PINS.—Any style or size of bright pins at 12c per hundred, $1.00 per thousand, 5000 for $4.50, 10000 for 8.90. Special rates on 25000 or over at one time. These rates good to Feb. 15th only. Fine forceps and cork, etc., in any quantity. W. F. WEBB, Mgr. Albion, N. Y.

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EXCHANGE—I would like to exchange U. S. Revennes for U. S. Postage or Revenue Stamps. Send list and receive mine. CLAUDE COLLIER, 148 Conklin Ave., Binghamton, N. Y.

NATURAL HISTORY GUIDES by Ed ward Knoebel. Thousands have been sold Price 50c. each prepaid. The Trees and Shrubs. How to tell them by their leaves. With 215 figures from the species. The Ferns and Evergreens. A simple guide for their determination. With 11 full page plates. Day Butterflies and Duskflyers. How to find and know them. With 148 new illustrations. The Beetles and their kind. A guide to show them readily. With 580 new illustrations. The Night Moths. How to determine them readily. With 124 new illustrations. The Fresh-Water Fishes. With those ascending the streams from the sea. With 48 new illustrations. The Turtles, Snakes, Frogs, Toads, etc. And other reptiles and amphibians. With 56 new illustrations. W. F. WEBB, Mgr., Albion, N. Y.

WHO'S GOT MY GUN?—I want a Parker Bros. double-barrelled 12 ga. hammerless in strictly first-class condition and a good shooter. Will give a good collection of $250.00 worth of A1 sets of eggs, full data with all sets, for gun as above. Send complete description, amount used, etc., and receive lists of sets. GEO. W. DIXON, Watertown, S. Dak.

TO EXCHANGE.—A1 sets with full and complete data, A. O. U. Nos., 30a 1-1, 49 1-3, 51a 1-3, 58 1-3, 70 1-3, 69 1-3, 74 1-3, 77 1-3, 75 1-1, 79 1-1, 80 1-4, 191 1-6, 184 1-4, 197 1-5, 199 1-4, 200 1-5, 212 1-6, 218 1-10, 219 1-9, 221 1-10, 263 1-4, 261 1-4, 273 1-3, 316 1-2, 339 1-3, 375 1-2, 388 1-4, 393 1-4, 394 1-6, 458 1-4, 461 n-2, 467 n-4, 474b 1-4 1-3, 477 1-4, 501 1-5, 506 n-4, 507 n-5, 511 1-5, 529 n-6, 552 1-4, 563 n-5, 587 1-5, 591b 1-4, 595 n-4, 598 n-3, 604 n-4, 608 n-3, 614 1-6, 617 1-5, 622a 1-6, 624 n-3, 631 n-4, 652 n-5, 659 n-4, 683 1-4, 687 n-5, 721 1-8, 751 1-4, and 755 1-4. I would be pleased to hear from Iowa collecters. ERNEST MARCEAU, No. 869 Iowa St. Dubuque, Iowa.

X-RAY photos. Best yet produced: made with latest improved apparatus, delicate and expensive. Avoid the many humbugs now before the public and get specimens of scientific value. Photos prepaid 15 cents each, three all different for 35 cents. Will exchange a limited number at 30 cents each for fine sets with data. WILMON NEWELL, Primghar, Iowa.

TO EXCHANGE.—Have marine invertebrates, reptiles and batrachians in alcohol, land and fresh water shells to exchange for alcoholic specimens, bird and mammal skins. F. P. DROWNE, 20 Benefit Street, Providence, R. I.

TILL JUNE NEXT I will be prepared to furnish from the islands along the Alaskan coast, choice specimens of Birds, Mammals, Indian Curios and Natural History Specimens in general. Write for what you wish and enclose stamp. GEO. G. CANTWELL, Howkan, Jackson P. O. Alaska. 2t T. F.

EXCHANGE NOTICE.—Fossils for sale or exchange. Rhynchonella capax. Orthis biforata, O. subquadrata. O. striatula. Streptorhynchus planumbonus. Yygospira modesta. Strophomena (Teptaena) putenta. Monticulipora dalei. Plylodictya shafferi. Murchisonia bicincta, etc. etc. ALLEN JESSE REYNOLDS, Geologist, 2113 Virginia Ave., Connerville, Indiana.

WANTED.—Fancy pigeons such as Fantails, Jacobins, Turbits, Swallows, Dragons Antwerps, Pouters, etc. Can offer pair of Reeds climbing irons, eggs in sets or single and cash. J. O JOHNSON, Southington, Conn.; Lock Box 550.

EXCHANGE.—I have L. and F. W. shells to exchange for L. and F. W. from other localities. M. J. BECKER, Fort Scott, Kan.

THE MUSEUM.

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Notes from the Mohawk's Country.

P. M. VAN EPPS.

XII.

ARDVANE'S DISAPPOINTMENT.

"Was it a golden lance,
Into the silence hurled
By the spirit of air? a new-born star?
Or the wreck of a world?"
—*Laighton.*

Or was it but an earth-born mass,
A boulder rude, transported here
In ancient days by glacial power
From parent ledge o'er land and meer?

Ardvane the yokel was plowing for oats on his grandmother's four-acre field of boulder clay. He had finished six lands and reached the dead-furrow of the seventh, whose upturned, glistening ridges lay steaming under the hot sun. The nigh horse was wallowing in the freshly plowed soil, helping drag the heavy plow, when—bang! went the chilled share against some hidden obstruction, bringing up the weary team of castor-marked nags with a jerk that made the whiffletrees crack.

Now this was no uncommon event; "just another one of them," thought Ardvane, and with a grim determination to root that boulder from its ancient resting-place he dextrously tipped the heavy Syracuse plow, catching the point of its share against the stone. As the team slowly started there came from the rising stone an air-sucking "oof" of protestation at being disturbed in its long rest. But a louder noise came from Ardvane, who, on catching sight of the rusty old rock, at once set up a tremendous shout and writhing himself clear from the encircling tied lines, which were flung to the dirt, sprang at the boulder and soon had it lying free on top of the loose soil.

A rusty, brownish, angular mass it was, weighing, perhaps, two hundred pounds, very different in color and shape from its fellows, so numerous in that boulder-bestrewn tract. Could it be possible that here was at last that long-sought-for meteorite?

Yes, it must be so,—the proper color, a rusty brown, shading from red to black; that pitted, angular surface so different from the roundness of the common glacier-pounded boulder; just such an angular configuration as Ardvane remembered the meteorites having that he had seen in certain public museums of note—yes, without any doubt it was a meteorite.

What a treasure! a meteorite weighing nearly two hundred pounds! Would it show the widmanstaetten markings if divided, etched and polished?

It has been estimated that the earth meets over 7,000,000 of these meteoric bodies every day, in size from the smallest atom to masses of considerable weight, and from the density of gas to solid iron. The larger portion are consumed by fervent heat generated by their lightning-like passage through our atmosphere, and nothing remains or reaches the surface but a trace of meteoric dust, except possibly a part of the gas generated by the combustion. These are the ever-falling "shooting-stars." Occasionally there enters our atmosphere one of these wanderers of a size and density

sufficient to allow its core, or unconsumed central portion, to reach the surface, where, unless it falls in the water or on solid rock, it generally manages to bury itself deeply in the soil. On the whole extent of the earth's surface, both land and sea, it is likely that many such fall every day.

It should be understood, of course, that as many chance meteorites would be likely to fall during the hours of sunshine as during the night-time; indeed we have seen it asserted that more fall then than in the night, but this is probably an error. Likewise the estimate quoted of the number (7,000,000) encountered by the earth every day is probably far in excess of the truth. Proctor in his "Meteor Dust" puts the number at the average of about a million per day.

For many years had Ardvane been on the watch for just such a specimen. Hundreds of iron-stained boulders had he examined. Many an angular pebble of about the proper color had he picked up in the hopes that at last he had found the longed-for meteorite. Once before, indeed, did Ardvane rejoice in the belief that he had gained the coveted "star;" for from a sand-bank on the Cambrian slopes of the southern Adirondacks a companion had picked up a small angular mass, of a rich red-brown color, whose weight indicated some metallic substance. In appearance it was also entirely different from the ordinary water-worn pebbles and boulders common to that barren waste. But, alas! on close examination it was apparently but a fragment of fossiliferous iron-ore far-strayed from its parent bed, for was not that cylindrical portion, showing so prominently, an included encrinal column. So was the desire of Ardvane again balked, for he could not accept the imaginative discoveries proclaimed by Dr. Hahn, who supposed he had discovered visible traces of sponges, corals, and crinoids in sections cut from meteorites of the noted fall at Knyahinya in Hungary, which happened in June, 1866. If the premises of Dr. Hahn are true, then our meteoric acquisitions represent the ruin of a world,—a world with life forms similar to our own, perhaps; a world rent to innumerable fragments by some terrible explosion or cometary collision.

But here at last was evidently a true celestial visitor. The tremendous weight for its size, its color and angular shape,—all seemed to point to the one conclusion that here was a mass of meteoric iron. The impatience of Ardvane would allow him to wait no longer. Seizing a small boulder of quartzite, he hurled it at a projecting corner of the mystery, which, breaking, made mockery of his hopes. Vain delusion, cruel disappointment! Nothing but a dense mass of feldspathic rock permeated and stained with iron, and to the presence of this included iron was due the peculiar shape to which the mass had weathered.

Have no meteors ever fallen in this country of the ancient Mohawks? No finds of any such have as yet been reported and Ardvane had hopes to announce the first discovery. Have patience Ardvane and you may yet snub up against a shooting-star.

Glenville, N. Y., Jan. 1, 1897.

Have just been perusing Will Edwin Snyder's interesting article on the Land and Fresh Water Shells of Dodge Co., Wis. on page 12, No. 1, vol. 3 of the MUSEUM. He states that he has a specimen of *Planorbis trivolvis* measuring 1¼ inches in diameter. On page 57 of Henry A. Ward's catalogue of mollusca he states that Prof Karl Sempor has ascertained by experiment that the size of *Limnæa stagnalis* depends upon the size of the body of water they are raised in. Would like to ask Mr. Snyder or any of the many readers of the MUSEUM what their experience is in that way and if it may not be the case with his specimen of *Planorbis trivolvis*.

R. D. Goss,
New Sharon, Iowa.

Book Review.

A copy of Mansell's Almanac of Planetary Meteorology for 1897 is at hand for which we return our thanks. This is the 22nd annual volumn and contains an unusual number of valuable contributions. Mr. Mansills theory is that electricity is the vital force on which everything else depends. But little attention was paid for a long time to the planetory theory of meteorology, but it is now being recognized as something more than mere coincidence of phenomena and is being studied by the weather bureau and many scientists Among the most interesting articles in this annual are "Mars and its Canals, treating their Causes of Appearance and Disappearance." "The moon, its Waters, Ice Vapors and Hanging Clouds," "The Sun as a Snow Ball," etc. Copies may be had by sending 25 cents to Richard Mansill, Rock Island, Ills.

My Observations Concerning Audubon's Caracara in Southern Texas.

It was a pleasure to spend the Winter of 1895 and the Spring and Summer of 1896 upon a ranch in Refugio, one of the most southern counties af Texas, in quest of additions to my note books and collections of the different branches of natural science. While there I was offered many opportunities in these lines; especially was this true of Ornithology and Oology. One of the most common and interesting birds indigenous to this section, I found to be Audubon's Caracara. This hawk is known to the Mexican contingent of the population of southern Texas as Totache; to the Americans as Mexican Eagle. They are looked upon by the natives as nuisances in the fullest sense of the word, depredating as they do, upon the flocks of young turkeys to be found on every ranch, and even the young lambs and pigs do not always escape their vicious attacks. The Mexican Gopher and Jack Rabbit also form one of their articles of diet. Their method for capturing the Jack Rabbit is rather ingenious and unique. They hunt in pairs, adopting or rather inventing a relay system. When they discover their victims secreted in the chaparal, one of them makes a dash at him while the other calmly observes the race from his station on the top of a bush. When the "starter" becomes weary, his companion takes his place in the race and he, in turn, is allowed to be spectator. Of course it is only a question of very short time until this game of darting under and between the chaparal must end, and then, exhausted, the rabbit succumbs to the inevitable and gives up in despair and is quickly dispatched and devoured.

I had been told by several people who shonld be perfectly familiar with the habits of the bird that they would rob the Turkey Vulture of the food it had already devoured by forcing it to disgorge while on the wing, catching the vomit before it reached the ground. I thought, however, they were only seeking to guy "the fellow that thought he knew so much about birds." But one day while en route to a colony of the Great Blue Heron, the idea that the statement was erroneous was forever banished from my not very credulous mind. In crossing a hog wollow prairie, we drove near the carcass of some large animal, upon which several vultures were engaged in making a repast. At a little distance stood a Caracara majestically viewing the performance and looking as though he would not deign to stoop so low as to feast on carrion. Presently one of the vultures having appeased his hunger arose and took flight. Immediately he was followed by the Caracara

and then began a chase for the ownership of the rot just eaten by the vulture. Round and round they flew, the Caracara continually alighting upon the back of the vulture and worrying him in every way possible, until at length, in despair the vulture disgorged his putrid carrion, so coveted by his relentless pursuer. In an instant the Caracara discontinued his pursuit of the vulture and darted at the second hand meal and actually caught a dortion of it before it struck the earth, and then proceeded to eat the remainder which he had failed to catch "on the wing." Many times I have noted these robbers intently watching a feast of the vultures, I sincerely believe with no other intention than to despoil them of their horrid food after it had been swallowed.

For audacity the Caracara almost if not entirely equals the much abused Blue Jay. On one occasion I remember having thrown some ducks out in front of the camp. They were quickly discovered by a swarm of vultures and were being rapidly picked to pieces and eaten. Three or four vultures were occupied in picking at the carcass of a large duck, when a Caracara pounced down upon it and taking it firmly in its beak, flew away, leaving the vultures to mourn their loss, with only a few consoling feathers to show them there was something there one time.

In making a few remarks upon their habits of nidification, I make a few extracts from my field book.

Feb. 27, 1896. Three fresh eggs. Bird sitting on nest. Situated in small oak tree in motte near Chiltapin arroya in San Patricio Co. Nest composed of weed stalks, twelve feet from ground.

March 2, 1896. Three fresh eggs. Bird in the tree. Nest composed of weed stalks. Had evidently done service before as it was freshly lined, the lower part showing age. Not very neatly constructed and rather small. Situated fifteen feet from the ground in hackberry tree in clump or motte of trees in San Patricio Co. (This motte is known as "Rattle Snake Motte;" so named because of the great number of these venomous reptiles infesting it. Being many miles from other timber these few trees are thickly populated. In the few minutes I spent there while in camp for dinner, I found nests of Bald Eagle, Horned Owl, Red-Tail and Harris' Hawks, Caracara, etc.)

March 3, 1696. Three fresh eggs. Situated thirty feet from ground in mossy oak bordering on prairie. Composed of weed stalks throughout.

March 3, 1896. Three eggs, far advanced in incubation. Bird on nest. Composed of weed stalks (as usual). Situated sixteen feet from ground in oak tree in belt of oaks.

March 3, 1896. Three eggs, in which incubation had begun. Bird on nest. Composed of weed stalks and situated on small branch of hackberry tree near top.

March 7, 1896. Three eggs, incubation commenced. Birds seen. Composed of weed stalks and situated twenty feet from ground near top of hackberry tree.

March 7, 1896. Three eggs in which incubation had advanced about one week. Birds seen. Composed of weed stalks and grass, situated fourteen feet from ground in oak tree, near Souse creek.

March 10, 1896. Three fresh eggs. Bird on nest. Composed of weed stalks, nicely shaped, about eighteen inches in diameter. Situated in thorny chaparal bush on prairie, ten feet from the ground.

March 19, 1896. Two eggs, incubation started. Bird on nest. Composed of weed stalks. Situated fourteen feet from the ground on horizontal branch of mossy Black Jack.

March 20, 1896. Three eggs, fresh. Birds seen. Composed of weed stalks, situated fourteen feet up in small tree.

March 24, 1896. Two eggs, one third advanced in incubation. Birds

seen. Composed of weed stalks. Situated near end of horizontal limb of hackberry tree in motte, seventeen feet from the ground. Nest poorly made.

April 4, 1896. Three fresh eggs. Birds seen. Nest composed of weed stalks. Situated on projecting limb of mossy Black Jack tree, about thirteen feet up. Near a ravine not a great distance from Arroya Medio.

April 6, 1896. Two eggs in which incubation had begun. Bird on nest, composed of weed stalks and grass, situated in crotch of post oak in belt of post oaks.

As is seen from the above summary, three eggs are more often laid than two. Farther north, in McLennan county, my friend, Mr. Strecker informs me that two eggs are the usual complement. Weed stalks seem to be a very popular building material. This is the slender stemmed weed known commonly as the "Broom weed." Grass is some times a constituent Sticks are rarely found present in the structure; though occasionally an old hawks nest is appropriated and in that case the base is composed of sticks upon which is built their proper nest of weeds and grass. Owls do not adopt the nests of this bird as commonly as they do those of the Red-tail Hawk.

It seems that nidification begins a trifle earlier than is mentioned by authorities, as I found no nests with eggs after April 6

They seem to prefer the prairies to the wooded districts. I never once found a nest of the Caracara located in bottom land where the trees are high and nests difficult to find. There is no difficulty in finding their nests, as they can some times be seen for miles.

In some instances where embryos were present, I noted that some were developed more than others in the same nest; sometimes the difference was very marked.

JAMES J. CARROLL,
Belton, Texas.

Three Birds of Interest.

This last fall I have had access to some very interesting literature relative to the ornithology of that strange, and to most of us little known land, New Zealand. Australia and New Zealand stand alone from the rest of the world in their zoological position as in their geographical situation. They almost seem like fragments of a previous age set down in our times. Isolated as they are now, though once connected with Southern Asia, the laws of evolution have developed from the same general stock a fauna and flora peculiar to these islands, and in many ways entirely different to that of the rest of the world; where constant inter-communication between its parts has caused the same general scheme of development to be followed.

These few notes, though not original, and drawn mostly from Sir John Butler's most excellent work, may prove of interest and perhaps of profit to those of us to whom literature on this interesting subject is unobtainable.

Three birds seem to stand out with peculiar distinctness in the Maoriland ave fauna. These three species represent, in a way, the three great questions in zoology—what was, what is and what can or will be. These three are the kiwi orapteryx, the huia Heteraulocha acutirostris and the kia Nestor notabalis .

The kiwi is interesting as being the sole surviving member of that strange group of extinct, wingless birds of which the gigantic dinomis was a type. Though of value in itself it is most instructive when studied in relation with its consin, the moa or dinomis. The Moa stood from ten to twelve feet in height, and from the abundance of its remains must have been very common at no very remote date. The bones show no signs of fossilization and in many cases still retain their inherent grease. Some few feet have been found with the integumen and all the toes intact. Many of the Maori claim that they are still to be found in the

inaccessible interior. From the modern traditions and songs it seems that the early Maori subsisted to a large extent upon these birds and slaughtered them in great numbers, which fact accounts for the great quantity of bones sometimes found spread over a very limited area.

The kiwi itself is a small bird, comparatively, standing a little less than two feet high when erect. Its plumage is a dull, nearly uniform gray, or brownish in one variety, each feather barred with fine transverse markings of darker. The feathers are very coarse and webless, feeling more like hair under the hand. The wings are rudimentary, being composed of nearly cartilagenous bone and less than two inches long altogether. Its bill is long and straight, tapering in an easy curve to the tip which is highly sensitive. The bird in fact seems to find and recognize its food more by feeling with its bill than by sight or smell. The kiwi is nocturnal, hiding by day in the most tangled bush. It lays an egg disproportionately large to its size and its gestation and incubation period are correspondingly lengthy. The eggs are deposited in a hollow under the roots of some tree or bush, the original hole being shaped and adjusted to its owners satisfaction by the female. A peculiar thing is that all the female has to do is to make the nest and lay the egg, the male taking charge of the incubation and young birds, while his partner goes off and seeks a new mate, a wise provision in so unprolific a species.

The Huia, the royal bird of the Maories, is a member of the large family Corvidæ. It is interesting on account of the great structural differences between the sexes. Its color is black with bright orange wattles and white tip to tail. It is the bill of pure ivory whiteness, though, that strikes one forcibly. The male is provided with one much the general form of the meadow lark's but a little larger at the base, fairly long, slightly decurved and tapering gradually to the point. The head and neck are heavily built and provided with strong muscles to do chiseling like that of the woodpecker's. The female has a long slender bill, nearly twice as long as the male's, much decurved and with a beautiful even taper. The head and neck are comparatively slightly built. The two sexes feed in different ways. They are very fond of a certain grub found in decayed trees and logs. The male boldly drills in for his favorite food but the female prods about the crevices, and with her long forceps-like mandibles, draws out the unwilling grub from the deepest holes. Sometimes the male after excavating cannot reach the desired insect with his heavy aill whereupon the female inserts hers and secures it for herself.

The kea is a bird claiming our attention through something unprecedented in the annals of natural history. Here is a bird whose entire habits have become changed while we have been watching it. It would be most interesting to observe what alterations in structure these changes in their mode of life will cause. This, alas, is nearly impossible though, for to the loss of science but for the gain of husbandry this kind is doomed to speedy extinction. When white men first appeared in New Zealand the kea was a fruit-eating parrot inhabiting the snow mountains of Otago. It was an entirely inoffensive bird except when its overwhelming curiosity tempted it into the open cabin of some absent rancher away with his flocks; then it tore everything tearable, broke everything breakable and bent everything bendable—everything from the clothes on the bed to the tin culinary utensils.

When the sheep were introduced it commenced its investigations on the raw sheep skins spread out on the roofs of the huts. After tearing some of them to pieces it acquired a taste for mutton fat. Then it began to devour the freshly slaughtered carcasses of sheep hung up outside. Here it

found that kidney fat was most tasty. From dressed animals it went to dead ones on the hillside. It had now found out that kidney fat was in sheep and the easiest way to get at it was from the small of the back. From dead to dying and then to healthy sheep were but steps and a plan of concerted attack was devised. Singling out a victim from the flock a kea would light upon its back and dig and scratch, pulling out claws full of wool and holding to the thick fleece with its powerful feet. The other keas would fly around the poor animal keeping it moving until unable to rid itself of its tormentors and exhausted with its efforts to escape them sank down and allowed the exultant birds to work their will upon its living body.

The being nocturnal made the profection of the flock a difficult matter and many "runs" had to be abandoned od account of the ravages of these now frightfully numerous pests. Whole flocks were decimated in one night. At last the government put a large bounty upon their heads and soon the kea will be a thing of the past.

The manner in which these birds followed up each successive stage shows something very much akin to reasoning; first skins, then dressed carcasses, then dead and lastly living sheep—and more than that devised a way of hunting in concert and slaying an animal fifty times their size. This was not instinct. There were no animals they could have preyed upon before the advent of sheep. It shows a wonderful adaptability to changes of circumsfances and would prove of incalculable benefit to science if we could observe the bird further. If, instead of preying upon the sheep it had turned its attention to the rat, that since its introduction had increased so alarmingly, how valuable it would have been and how many vexed questions of evolution it might aid in solving for us.

P. R. TAVERNIER,
Beaumans, Ont.

Can the Big Snakes Charm?

Much has been written about the fascinating power of snakes; some affirming, others denying that the snakes in question are capable of charming small animals, birds, etc.

The following incident came under my personal observation, while camping a party of friends at Fish Lake, Wis., a small but beautiful sheet of water abounding with water-fowl and fish, especially Pickerel *Esox Majors*. One day while trolling for pickerel, and having exhausted our supply of frogs, we rowed to a small island, about one hundred yards from the shore to search for bait. One of the party in advance of the others, while in pursuit of a large bull-frog, suddenly stopped and gave a short cry of alarm, which owing to the peculiar terror expressed in the cry, instantly attracted our attention. We called to him but he appeared to be intently looking at some object in the grass immediately before him—receiving no reply to our repeated calls, we ran to his assistance. There directly before him, its head raised above the rank marsh grass, its eyes fastened upon his, was a huge snake. We urged him to run—he seemed to hear but was powerless to obey. Realizing that harm would happen I made strike at the snake, which on seeing me coming, slowly sank to the ground, and glided away toward the center of the island, the waving of the grass showing its course.

Seeing that pursuit would be useless we turned our attention to our companion, who stood trembling from head to foot and looking in the direction the snake had gone. He was greatly terrified, his face was of an ashen gray. Many days after this incident he said that the vision of that vicious head and those terrible eyes would come over him like the recollection of some horrible dream.

We searched the island and burnt

the grass but no trace of the snake could be found.

The snake was between five and six feet in length, of a yellowish brown, covered with irregular blotches of a darker color.

Whether the snake charmed him, or whether the action of sudden fright so paralyzed him that he was incapable of speech or action, I do not know; but the facts of this incident remain as above stated. A. G.

Odd Ways of Making a Living.

Occupations open to the thrifty individuals of both sexes, says the St. Louis *Republic*, have greatly increased during the last two decades, or even since the taking of the last decenial census, in 1890.

The extraordinary process of science during the time specified and the application of its principal to the practical problems of human life have not only had the effect of greatly increasing the capacity for production in the trades already firmly established, but have opened hundreds of queer side alleys which lead direct to the avenues of trade.

There are, of course, dozens of these new and remarkable occupations with which science does not deal even in the remotest sense. In this class we find the rat catcher, the skunk farmer, the man who makes his living by picking up lost things in depots, theaters, hotels, etc., and returning them to their owners with the expectation of being rewarded; the clock winder, the man who collects orange and lemon peels, and the Lake Michigan syndicate, which is now engaged in raising black cats for their fur. They are not raising these cats on water, as might be inferred from the title, but have leased an island in the great lake, which is now stocked with both sexes of screeching felines.

There are still others in the non-scientific category of queer occupations, but it will only be necessary to mention a few. One is a 'rattlesnake farmer,' who lives in the Ozark Mountains, and makes the products of his "farm" bring money from three different directions. The oil he disposes of to the druggists, who have regular customers that believe it to be a panacea for a hundred different ills; the skins he sells to would-be cowboys, who use them as hat bands, and the skeletons are always a ready sale, the purchaser being the curators of natural history departments of the different college and society museums. The man who wakes people up in the morning, the old cork collectors, and the dog catchers are well known characters in every large city.

The individuals who gain a livelihood in pursuits that are strictly scientific are equally as numerous as those who follow the more humble callings. In the list of occupations that are strictly scientific is the manufacture of artificial eggs, artificial coffee, and false diamonds. Also the industry of buttons, combs, penholders and other articles of a similiar nature from blood collected at the slaughter houses. The man who makes billiard balls, buttons and rings, from potatoes which have been treated to a solution of nitric and sulphuric acids is also the proprietor of an "industry" wherein the fundamental principals are strictly scientific.

But the queerest of all is carried on by two young Pennsylvanians who are making a regular business of extracting the poison from honey bees. According to the accounts, they have two different ways of collecting their crop of venom. In the first the bees are caught and held with their abdomens in small glass tubes until the poision sacs have been emptied. In the second they are placed in a bottle on wire netting and enraged until the tiny drops of venom fall into the alcohol which fills the lower part of the bottle. This venom is said to be a sovereign remedy for cancer, rheumatism, snake bite, and a hundred others of the more terrible ills of humanity.

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

Correspondence and items of interest on above topics, as well as notes on the various Museums of the World—views from same, discoveries relative to the handling and keeping of Natural History material, descriptive habits of various species, are solicited from all.

Make articles as brief as possible and as free from technical terms as the subjects will allow. All letters will be promptly answered.

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NOTES.

Happy New Year to you all.

On Dec. 19 last, a Mr. Carter of St. Joseph, Mich., shot a fine specimen of the common Murre, (*Uria troile.*) It was found in company with three ducks. Dr. Velie secured the specimen and mounted it; which from the locality of its capture, makes a notable addition to his collection, which now numbers 409 species and about 700 specimens.

Mr, Geo. G. Cantwell, for some time back located at Puyallup, Wash., is now located at Jackson P. O., Alaska, via MeLeods Post, Howkan. He anticipates some fine collecting in the Spring.

Mr. J. Hazelwood, an enthusiastic collector of Port Huron, Mich., writes: "You may save my copies of the MUSEUM for a few months, as I shall spend the first four months of 1897, traveling through California." Mr. H. always takes his wife with him, and together they collect from place to place during their trips. They usually take a trip every three years, and by careful management and following up this plan he has been enabled to collect from British Columbia to Yucatan.

Mr. Isador S. Trostler of 4240 Farnam St., Omaha, Neb. is a candidate for appointment as "Chief of the Department of Natural History of the Trans-Mississippi and International Exposition" which is to be held in Omaha in 1898. These things have to have attention sometime ahead and he is desirous of securing the endorsement of all brother naturalists especially throughout the west. Any collector who will write Mr. Trostler a letter endorsing his application and recommending his appointment, will be doing him a very great favor, which I am sure he will reciprocate at any opportunity. To those who have never met Mr. Trostler will say he is in his 28th year, of good education, no bad habits, a thorough young naturalist and has recommends from presidents of banks, city treasurer, other city officials and wholesale business firms with whom he had done business. We unhesitatingly recommend him for the position and trust he secures it.

We are in receipt of an invitation to the annual assembly of Cooper Ornithological club, which is to be held Jan. 9th at the residence of C. Barlow at San Jose. Among the subjects to be treated are Nesting of the Hermit Warbler by R. H. Beck; Habits of the Red-bellied Hawk by H. W. Carriger; Some Sierra Birds, W. H. Osgood; Nesting of White-throated Swift, R. B. Moran; Western Flycatcher, D. A. Cohen; A Club Retrospect, Chester Barlow and an address by the president, Mr. Walter E. Bryant.

Mr. Wilmore Newell of Primghar, Iowa is doing some of the best work in X Ray photography we have seen. Some sample photos he has sent us, show a very high grade of work.

Fracture and Displacement of Rocks.

BY C. O. ORMSBEE, MONTPELIER, VT.

In geological study one is often at a a fault because he has neglected to study the apparently insignificant forces which Nature often uses to accomplish her designs. Bearing this in mind, I will endeavor to describe some of the methods used in breaking rocks, and in moving them from their resting places.

Whoever examines the rocks of New England cannot fail to notice that most of them are covered, to a greater or less extent, with various kinds of moss, none of which have any commercial or economic value, so far as we have yet been able to discover. Nevertheless this moss plays a two-fold part in geology, or rather, in physiography. The first and most apparent part is the formation of new soil; but, as this is foreign to the subject of this article I shall enter into no description of the process in this issue of the MUSEUM, although I hope to make it the subject of a future paper.

The second purpose of the moss is to assist in breaking the rocks, which is the first step towards a final pulverization.

It will be noticed that the moss, in most instances grows in little patches. Very rarely does it cover the whole surface of the rock. Detach it and the surface of the rock will be found to be moist. In fact the rock beneath the moss is, as far as its nature will permit, "water-soaked." More than this, the rock will be found to be of unequal hardness—being softest where the moss is thickest, and where, in consequence of a greater amount of covering, it is most thoroughly saturated — and hardest in those places which are exposed to the sun's rays. Moreover, the moss shelters the rock to some extent from the extremes of heat and cold; and this, combined with the fact that the rock is of different degrees of hardness, and is also unevenly saturated causes frost to act unevenly upon the rock. The result is, that sometimes a tiny crack appears upon the surface of the rock. This crack may be smaller than the finest hair. Still a drop of water finds its way into it, and freezing, forces the rock apart, and, in time the rock is broken. And not only this, but, as the crevice becomes wider, the frost has a better leverage, and the two pieces may be forced several feet apart.

And while I am writing about it, let me briefly describe a granite rock upon which I played when a small boy. In shape, this rock resembled the roof of a house. It was about seven feet long, four feet wide and three feet high; but from one side a large slab had been split, — doubtless by this process. This slab remained in position, and I remember that, in those days I could barely squeeze my hand into the crevice. At the present time a distance of eighteen inches separates the smaller rock from its parent. The rocks have been forced apart by the action of water which found its way into the crevice, and, increasing in volume as it congealed, exerted a powerful pressure upon them.

Besides this, there are many other forces by means of which rocks may be broken. I have several times seen a large tree fall upon a rock and break it into fragments. This is frequently the case with the softer rocks and occasionally, even with granite. In my rambles through the fields I frequently find rocks that have evidently been broken by this means.

Again, it must be remembered that this country was formerly covered with a dense forest. In many instances the land was cleared by cutting the trees and burning them as they lay. It was

customary to burn them when the atmosphere gave unmistakable signs of an approaching storm. Thus the rocks often become heated, and when the rain fell upon their heated surfaces and suddenly cooled them, they often broke into many fragments. Keep your eyes open as you travel through an old pasture, which has never had its natural surface disfigured by cultivation, and from which the rocks have not been removed, and you may see many instances of this kind.

But I want to describe another means by which fragments of a rock may become separated.

My last article in the MUSEUM described some of the results of the uprooting of trees by wind storms. To this let me add, that trees often twine their roots around large stones or boulders, and when such trees are uprooted the boulders may often be moved a distance of several feet. The most remarkable instance of this kind which has come under my own personal observation, was that of a hyalim quartz rock which was held in the grasp of the roots of an elm, and, when a storm uprooted the tree, the rock was moved a distance of twelve feet. I estimated the rock to weigh one thousand pounds.

Now let me describe another rock, situated about two miles from me as I write. This rock is of micaceous quartz, and, by estimation weighs six tons. From the upper surface a horizontal slab covering the entire upper part has been split. I make no attempt to describe the process by which this was done, but the upper slab, which I estimate to weigh about one ton, was raised to a height of six inches above the lower slab. Soil formed or was blown into the crevice, and then the seed of an elm tree found its way into the crevice, took root and grew. It pushed some of its roots into the ground from which it drew nourishment, while the main root filled the space between the rocks. The body of the tree extended from the crevice, at first in a horizontal direction, and in its efforts to assume a perpendicular position has actnally raised the slab until it is in a position nearly at right angles to the parent rock, and were it not for the roots of the tree which hold it in their grasp, it would fall to the ground in an inverted position by the side of the original rock. In time the tree will decay and the rock will fall as I have described.

I could point to many other less marked instances of this kind and to several where the indication are that the rocks were separated in this manner, but all traces of the the trees have vanished. Instances in which rocks have been forced a few inches apart by the growth or the roots of trees, however, are too numerous to attract attention or to merit a description.

To avoid a misunderstanding let me say, that in the foregoing article I have used the term "rock" not in its geological sense, but rather as it is used colloquially in New England synonymously with "boulder."

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A ton of as fine specimens as one would care to look at. Sponges of all sizes, shapes and colors, Curious Flexible Corals, True Corals in an endless variety from the small kinds, two inches in diameter to the Massive Brain, Plate and Fan varieties, rare and curious Stars, Urchins, Crabs and Sea Beans. Select your orders while we have an A 1 assortment to pick from. All prices are net here. However, Collectors, who can use small specimens of say 2 or 3 inch, we will quote a price, prepaid, on receiving a list of what is required.

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WALTER F. WEBB, Mgr.,
EDITOR MUSEUM, ALBION, N. Y.

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THE MUSEUM.

WANTS, EXCHANGES AND FOR SALES.

All notices that come under above will be inserted in this department until further notice at one-half (½) cent a word. No notice less than 25c. Terms Cash with order. *No charge for address.* I shall at all times endeavor to keep parties, whose reputation is of a doubtful character from using these columns.

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BOOKS:—Some snaps in books for February are, Wilson's Amer. Ornithology, 4 vol. in one, $4; Birds of Minnesota, $1.50; vols. one and two of Dictionary of Birds by Newton, each $1 65; 3 vols Ibis, bound, each, $5; vol. 1894 *Auk*, bound, $2.50; *The Oologist*, complete, bound, $3.50, unbound, $3; *Ornithologist and Oologist* for 1889-90, bound in leather, $2; Pennant's British Zoology, covers all zoology, fine, 4 vols, $7.50; Moorehead's Fort Ancient, $1.75; Goss' Birds of Kansas, $5.25. Order quick. WALTER F. WEBB, Mgr., Albion, N. Y.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., FEBRUARY 15, 1897. No. 4

Reminiscences of a Trip to Schoharie.

PART III.

Through all that part of the cave we visited, the absence of stalactites and other formations of carbonate of lime was noticed. Scarcely a trace of any formations did we see; of those very few we did, were few and inaccessable. The walls and ceiling seemed bare of any encrustation. However we believed that had we been able to have crossed the lake to the right, we might have obtained more specimens, as in this part of the cave there appeared to be more water oozing and perculating through the walls, and running water could be heard in the distance.

On our return to the house all were anxious to hear the results of our trip. There was also present a neighbor, who had spent many day in the cave, digging in the clay for stalactites, stalagmites and alabaster formations. and therefore knew the gallerys and rooms perfectly.

From him we learned that had we only continued on and climbed up through the crevasse at the extreme end of what we supposed the end of the left passage, we would have entered the largest and most interesting rooms of the cavern.

One of them, called the "Rotunda" was where so many beautiful white stalactites, stalagmites and vast slabs of alabaster had been found. Some of them were so pure white and transpareut that objects could be clearly and distinctly seen through specimens nearly a foot in thickness. He said nearly all of the best specimens had been dug from the clay and were found two or three feet below the surface.

Upon learning that we found no water in the left lake he was greatly surprised and apparently did not believe it. He thought we had not gone far enough along the passage to reach it. But when we told him of the many old boats we passed, imbedded in the mud, this evidence, recounted by all the party, was sufficient to relieve all doubt. He had never known the lake to be dry before in the forty or more years he had been familiar with it.

* * * * * *

Since our visit to Ball's Cavern I have learned from other sources that the Rotuada is the noblest room in the cavern. A long narrow passage extends from it some four hundred and fifty feet, but it is said to contain nothing of interest; further on this gallery is filled up with a vast deposit of cave mud, so no idea can be formed of its real extent.

I might say right here that while in Schoharie and talking with that veteran geologist—Prof. Sias—he made mention of a cave a few miles away, pointing in the direction of Ball's that was larger and more interesting than Howe's, and that he had explored it two and a half miles. So perhaps some of the later explorers have penetrated this mud deposit or enlarged some of the crevasses and thereby gained access to many more spacious passage ways and rooms. I only *infer*, that as he simply pointed

in the direction of Ball's—he referred to this cave, perhaps not—as no names were mentioned—and caves are quite numerous.

While we did not visit the other parts of the cave, it may be of interest to others what we missed by not being able to go further. One account of the cavern says that: The lake to the right is rather a series of lakes, thirteen in number, being separated by semi-circular dams of calcareous tufa from two to thirteen inches high. These lakes are from fifteen to several hundred feet in length. After the passage of these lakes, a rocky hill is ascended and you enter what is called the Square Room, which is about fifty feet square and sixty feet high. From its roof or ceiling hang high shapeless blocks of stone which appear to threaten the explorer with instant death; the floor is covered with the same as though they had just fallen—though ages probably passed since they loosened and fell.

This wing contains no peculiar formations save the calcareous tufa and the above shapeless blocks of stone—as the limestone is mingled with an abnndance of sandstone.

The dams which are mentioned as separating the lakes and consisting of calcareous tufa, are a peculiar formation of lime, sand, etc., deposited by water. It is usually of a brown color, spongy and cellular in structure, soft and brittle. In its formation it assumes many uncrystalline forms as tubular, botryoidal (like clusters of grapes) and cellular.

It is said when this cavern was first explored the long passage way below the perpendicular opening or entrance was covered with that beautiful mineral *arrogonite*. I understand that none now remains. However a careful survey of the walls with long ladders might result in finding a deposit in some of the small cracks and crannies not yet reached. This very pretty mineral is essentially carbonate of lime, but differs from it in the form of its crystals. I believe that found here is of the needle-like form of crystallization. Of what color I am unable to state, but the account which mentioned the presence of arrogonite in this passage described it as very beautiful. It is found in almost any color; as subjected to foreign substances it is rendered blue, green, yellow, red, brown, etc.

Calc or Calcareous Spar has the same chemical composition as arrogonite, but differs from it only in the form of its crystals.

* * * * * *

In regard to the history of this cave I believe it was first explored in September, 1831. The name was derived from a former owner of the lands, by the name of Ball, in whose family the property was for many years. It has also been called Gebhard's Cave, probably after John Gebhard, whom history says was one of the first explorers—and who was the first to explore several other caves in the town.

Some years ago this cave and several acres of ground about the entrance were bought by parties living in New York City, with the design of opening it up, building a large hotel and making it a popular place of resort. The visions of "millions in it" probably dwindled, as the idea was given up, but the property is still in their possession.

Cave explorations are interesting to those who love to see the wonders of nature things before unseen, new and surprising—so Ball's has been an object of attraction by persons distinguished as geologists, scientists, students and others of an adventurous turn of mind. Indeed, several ladies are listed among them—even THEY went through the perils of that seventy feet of perpendicular descent to see the wonders of the underground world.

My companion recently said to me upon learning that ladies had visited it: "I do not think the cave accessable to ladies at present." I agreed

with him when he continued, laughing, "But if any want to visit it now they would have to wear *bloomers*, and they shouldn't be very *baggy* either."

* * * * * *

In threading your way carefully through these underground wonders, and trying with your gaze to fathom the darkness which your torch-light fails to penetrate, you are tempted to exclaim, "What mighty convulsions rent these walls asunder?" forgetting for a moment that the world is OLD and the memory of man IS BUT A DAY.

Caves, or rather *great caves*, can only occur in a limestone region, and they result from the chemical fact that the carbonates of lime snd magnesia are soluble in water containing carbonic acid. This acid abounds in atmospheric air, and is one of the products of the decomposition of animal and vegetable waters, so that rain water which percolates through the soil has usually been enriched with it from both sources.

With carbonic acid then, as the active agent and water as the carrier, we are able to account for the disappearance of strata however thick, and whether above or below ground. Above ground the result is a lowering of the general level, the deposition of a residum stratum of clay, and the formation of valleys where special causes have favored the disintegration of the stone. 'Hard' water flows away and a clay soil is left behind. Below ground, on the other hand, the result is a cave—if there be a fissure in the strata through which the acidified water may make its descent. In the conrse of time this fissure is worn larger, and the entering water disolves and bears away with it bit by bit the stratum through which it passes, flowing out at some lower level with its burden of lime and magnesia, but *leaving the clay behind to plague the adventurous cave explorer.*

Here you have cave formation in a nut shell. Given the initiatory crack —common enough in lime stones— it only requires time and an abundance of water to carve out the halls, galleries and avenues

("Where falls no hail, nor rain nor any snow
Nor ever wind blows loudly.")

which go to make up our caverns; and when once this work has well begun, other natural agencies contribute their aid to the enlargement of the area and the adornment of the interior.

These decorations of stalactites and stalagmites are usually found in all caves occurring in limestone regions, and their formation is simple.

Whenever through some of the minute crevices in the limestone roof or wall a drop of water trickles, it is sure to be saturated with carbonic acid, to bear along with it a solution of lime and magnesia. When emerging from its rocky channel it meets a current of air—if the conditions of dryness and ventilation are favorable—it will evaporate and leave behind it minute crystals of carbonate of lime deposited in the form of a ring, because, as the drop evaporates the solid matter becomes more concentrated around its edges than in the pendant center. This ring now becomes the snpport of the drop, and the process continues until a tube the diameter of the drop is formed. At this stage of its growth it begins to fill up, and the water trickling exteriorly deposits its solid matter and enlarges it. So it grows—the stalactites like the icicles in winter—larger at the top because the larger part of the lime is deposited before the drop reaches the tip.

In the majority of cases more water flows down a stalactite than can be evaporated and drops to the floor, depositing, particle by particle, its solid matter in the same spot directly underneath the tip of the stalactite, until a corresponding column is built up; forming what is called a stalagmite. In time the two growths may join together in a single column, reaching from floor to ceiling.

ROBT. M. HARTLEY.

Amsterdam, N. Y.

The Medusae.

Among the most interesting and, to me, the most beautiful of all marine animals are the Medusæ. Their delicate construction and the beautiful tints which some of them possess make them especially attractive. But as will be seen further on, a few species, like some other animals, are more beautiful at a distance.

In general outline the Medusæ resemble very closely the mushrooms. An organ similar to the stalk of a mushroom is present and is called the "manubrium," while the umbrella-like top of the mushroom is almost identical in appearance with that of the jelly fish. This disc is called by reason of its likeness the "umbrella," Some of the species posses a large quantity of tentacles which are suspended from the outer edge of the umbrella and vary from short filaments to streamers many feet in length.

The shape of the "umbrella" varies considerably but in all its variations resembles the different shapes of the mushrooms.

The Medusæ vary in size from that of a pea to specimens the size of a large umbrella.

All the streamers are provided with organs called lasso cells which contain a poison more or less virulent. Upon being touched the jelly fish shoot out threads from these lasso cells which paralyze the object pressing upon them. Each of these cells serves but once. When ruptured they disappear by absorption and are replaced by new cells.

I have collected and handled many hundred *Dactylometra quinquecirra*, a common species, of all sizes when fresh from the water and have never suffered any inconvenience other than a slight itching which might be felt for a few hours; but recently I observed a report of a severe case of blood-poisoning, in a local paper, which was attributed to the same species.

Physalia pelagica, a jelly fish of tropical and semi-tropical seas, which is occasionally driven north, can cause considerable pain as I have learned by experience. During the past summer I collected a few at Sakonnet Pt., R. I., and being obliged to handle one specimen longer than was proper, was severely stung. The pain, which was very acute, lasted about six hours, and I would advise all collectors, if they should happen upon a nice specimen unexpectedly (as I did) and are without collecting apparatus to use their hat for a pail or leave the "beautiful thing" alone.

The method by which the Medusæ obtain food is very simple. Upon coming in contact with any substance recognized as suitable for food it is immediately attacked and paralyzed by the threads from the lasso cells and is then enwrapped by the jelly-like body of the Medusæ until digested. The jelly fish are capable of motion and at times move quickly, though they usually float up and down with the tides.

D. quinquecirra is one of the commonest varieties and during the summer months is very abundant in the waters of Narragansett Bay, R. I. I have usually found this species at a depth of about three feet, though they float both deeper and nearer the surface. They will frequently sink when the boat passes over them which would seem to indicate that they are influenced by light, as I have often passed over them with this result, when the boat was floating with the current without making a ripple on the surface.

The remains of jelly fish which have been left on the shore by the receding tide are often seen. In a few hours what was once a jelly fish, weighing perhaps two pounds, will become, when exposed to the heat of the sun, a bit of scum weighing thirty or so grains.

Goodrich in speaking of their reproduction says: "These animals [the Medusæ] are all unisexual and propogate by eggs, which the female

produces in glandular organs, sometimes arranged in bands or patches on the surface of the sub-umbrella and sometimes in circles at the base of the peduncle. But these ova, when excluded, produce creatures very different from the parents and it is not till the second generation that the original Medusæ is reproduced."

The Medusæ are very abundant and the different species are scattered throughout the seas though the tropical waters possess the greater number. Quantities are destroyed each year by violent storms and other natural causes, the number taken by collectors being exceedingly small in proportion. They are of no special value except to scientists and probably will never be exterminated as some of the other beautiful works of nature have been.

F. P. DROWNE.

X-Ray Photography.

WILLIAM NEWELL.

To many readers the above topic may seem familiar. To all, doubtless, the greatest and most important scientific discovery of recent years, that of the X or Rontgen rays, is familiar in many of its details. Accounts of the wonderful light that can penetrate wood, flesh and even bone, and the advantages gained to the medical world thereby, have been heralded far and wide by our newspapers and periodicals.

It would be superfluous to burden our readers with detailed theories and explanations of the Rontgen rays and the Crookes tube with which they are generated. We will therefore mention only such as bear directly upon our subject, i. e., x-ray photography, or if it were more properly named would be "shadowography," since the photos are produced by shadows and not in any case by a camera.

The essential parts of the "x-ray apparatus" which we must consider are, first, the Crookes tube, an oblong circular globe, not unlike that of an incandescent lamp, having within it at one end a platinum or aluminum pole and at a point about the middle of one side a similar pole. Within the tube there is no connection between the poles but externally they are connected with the positive and negative poles of a storage battery which supplies the current. Between the battery and tube the current passes through a resistance coil increasing thereby the voltage. The interior of the tube is almost a perfect vacuum. The two poles pass through the glass at the end and sides, the glass besides being a non-conductor, excluding all air. By the passage of the electric current from one pole to the other through this vacuum the "x-rays" are produced and are thrown off from the larger end of the tube. Of course should the current be reversed the rays would be thrown in the opposite direction but for present purposes we will suppose them projected directly from the end of the tube.

The rays themselves are invisible to the eye but if all other light be excluded from the room and a florescent screen be placed a few inches from the end of the tube so that the rays therefrom be thrown directly on an object placed between the tube and the screen will throw a shadow upon the latter that can easily be seen from the opposite side. If a hand be placed before the tube so that its shadow will fall upon the screen, not only the shadow of the hand will be seen, but also the shadows of every bone therein, the bones giving a much heavier shadow than the flesh. To show how these shadows and impressions are made permanent by photographic processes, is the object of this article.

A photographic dry-plate upon which a negative of any object is made consists essentially of a glass plate upon which is an undecomposed salt of silver. Briefly stated, the making of a negative consists in allowing decomposition of the silver salt by exposure to light, the density in

different parts of the negative and hence the image thereon, being caused by difference in amount of light striking those points.

The Rontgen rays (x-rays) like ordinary light will decompose salts of silver. If then in the above experiment the florescent screen be replaced by a photographic dry-plate and the shadow of a hand or other object be retained there, it is obvious that where the shadow of the bones strikes this plate no change in the silver compound will take place. Where the rays strike the flesh, the shadow is less distinct and a slight change takes place on the plate. Entirely surrounding the object, where the rays strike the plate practically unobstructed a more thorough decomposition takes place and the negative after being developed is here more dense.

Prints, or positives are made from this negative as from all others by placing the sensitized paper in intimate contact with the negative and exposing to sunlight. These parts of course have to be toned and mounted the same as other photographs. Photos made in this way show bones, metallic objects, etc., much more clearly than they are shown upon the florescent screen. As the x-rays penetrate readily wood, rubber or leather the plate holder of an ordinary camera is used to hold the plate in position and the slide is not withdrawn from the holder at all. This allows of a photograph being taken in ordinary daylight without danger of fogging from light.

One of our most interesting experiments was as follows: An ordinary Anthony plate containing an unexposed dry-plate was laid upon our operating table and upon this was placed a large frog (*Rana maculata*) in life-like position. The specimen in question was an alcoholic one, as the living article could not be induced to hold still for much more than the thousandth part of a second—and that was not long enough for our purpose. The bulb of the Crookes tube was now suspended a few inches above the frog and the current allowed to pass for about seventy-five seconds. The plate was then developed and the result was a negative showing every bone in its natural position. All could be readily distinguished except the finer bones of the skull where some were superimposed upon others. A body in the abdomen appeared to be opaque to the rays and upon the *finished* photo appeared as a dark spot —it was presumably the liver but this has not yet been demonstrated.

Photos of other objects such as a pocketbook containing coins and keys, coins placed in books, deformed and broken finger bones, enlarged joints, etc., were made in the same manner and with equal success. A popular photo and a fine one is that of the bones inthe living human hand.

In locating broken or displaced bones this system is invaluable to surgeons and physicians and has been much used for such purposes. Upon one occasion during the past summer some of my fellow-workers in a few minutes' time located accurately a 22 cal. bullet in the wrist of a young man and which the doctors were unable to locate after continuous probing.

As the apparatus used is very delicate and expensive the average amateur photographer is not supplied therewith, but it is sincerely hoped that the day will soon arrive when this wonderful discovery can be turned to many practical uses by the masses. As it is every scientific student as well as everyone interested in modern progress cannot but be interested in experiments along these lines.

Human Relics in the Drift of Ohio

The above is the title of an article presented by Dr. E. W. Claypole of Akron, O. at the A. A. A. S., at Buffalo, N. Y., August, 1896 and also published in the November number of the *American Geologist*, Minneapolis, Minn. The find, a stone axe, seems

to attract much attention because of two things, viz; its extreme weathered condition and lightness, and the depth at which it was found, 22 feet beneath the surface. Being the finder of this curious pre-historic relic, I have been asked to write something concerning it. Dr. Claypole has done better than I could ever expect to do, but as many probably will never hear of Dr. Claypole's article, I write this short article concerning it

The stone axe of which I write was found by me in 1886 while digging a well on the farm owned by Mr. E. Chapin 1½ miles east of the center of New London township, Huron Co., Ohio, at the depth of 22 feet. In digging the well I passed through the following strata:

Eight feet lay, very firm, yellow above and blue below containing small stones; thirteen feet of silty material, very tough towards the bottom, requiring the use of a pick-axe for its removal.

Interbedded in this were streaks of sand one or two inches thick. Last was about a foot of coarse gravel, yielding water and containing small sub-angular stones.

Beneath this all was very tough, blue clay, quite impervious to water in which I bored 26 feet farther in the bottom of the well with a 1½ inch auger, but found clay throughout.

In the upper clay I found a small arrow or spear point of white flint; also a small piece of iron pyrites. I marked the specimens, time, place, depth, &c. and placed them among my other specimens. While engaged at the World's Fair I first learned of the discussions and controversies based on such implements, but thought nothing of value of my own specimens until my attention was drawn to it by Rev. Dr. Wm. Kepler, who is also a geologist of some note.

I lent him the specimens, he showed them to several learned men, Dr. Nelson of Delaware, O. being one. All expressing themselves in favor of its value. Some time after I visited Akron, O. taking the specimens with me. I showed them to Dr. Claypole, one of which attracted his particular attention—the axe.

He asked me to lend it to him which I did, because of its extreme lightness he asked permission to saw it in two, which I granted. It cut quite easily and showed concentric lines of coloration, (limonite-staines) running parallel outlines. In the center remained only a small unweathered portion of the original hard green stone of which it was made. This and other investigations induced Dr. Claypole to visit the place where it was found and the surrounding country, which he did and spent a whole day in doing so, examing water in wells and springs for some distance in each direction from the well in which the axe was found, taking elevations, examining moraines, valleys, gravels, clays, &c. In his article, Dr. Claypole dwells at length on these points, giving his reasons why the axe was where it was found and the probable cause of its weathered condition.

Nearly all of the wells and springs in the vicinity are more or less charged with sulphur.

The axe is of the groved pattern measuring four inches in length by two in breadth and one and a half in thickness and weighs five and one-half ounces only.

The railroad telegraph station is 400 6-10 feet above Lake Erie. The place where the well is, is a few feet less. To the south about three miles the ground rapidly rises to 600. About 40 miles south is the southern limit of the glacier. The well is within the Ohio drift area.

The nearest large stream is Buck Creek, three miles distant. The next is the Vermillion River five and a half miles away. For further description see Dr. Claypole's article as stated at the head of this paper.

ELMER E. MASTERMAN.
New London, O.
Nov. 28, 1896.

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Walter F. Webb, Editor and Manager

Albion, N. Y.

Correspondence and items of interest on above topics, as well as notes on the various Museums of the World—views from same, discoveries relative to the handling and keeping of Natural History material, descriptive habits of various species, are solicited from all.

Make articles as brief as possible and as free from technical terms as the subjects will allow. All letters will be promptly answered.

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NOTES.

Beginning with March 20th the subscription price for the MUSEUM will be $1.00, payable in cash or specimens at cash rates. No deviation but payable in advance. We expect to give you a good round dollar's worth. Any whose subscription expires soon can renew between now and above date for 50cts.

We extend our thanks to Mr. Willard N. Clute, of Binghamton, N Y., for a copy of "Ferns and Fern Allies of New England" by Raynal Dodge, which he has just published. Mr. Dodge says, "The Fern and Fern Allies comprise in New England 82 species. Including well marked varieties the number would be one hundred. Many are peculiar to certain districts, some being found on the mountains and others are near the lakes." The little volume contains 52 pages, neatly bound in cloth, and we predict will be a valuable manual for all Fern lovers.

An "Annotated List of the Birds of Winnebago & Hancock Counties, Ia., by Rudolph M. Anderson of Forest City, is a neat little booklet of 24 pages just published by the author. The nomenclature of the A. O. U. check list is followed and we note 217 species are recorded. Some of the rarer species he has found breeding and taken eggs are Whooping and Sand Hill Crane, Loon, Canada Goose, Wilson's Phalarope, Krider's Hawk, etc. We are glad to see these sectional lists of birds. They furnish much valuable information in the determining of the range of species.

Forestry Notes.

TO THE EDITOR OF THE MUSEUM:

The very interesting notes on the formation of mounds by the up-rooting of trees, which you have recently published, recall to my mind some features of the trees of Western New York, that seemed to me, when I first went to live in that region, worthy of record.

I observed peculiarities in the forms of trees. In exposed situations trees were noticably unsymmetrical, in that the branches springing from the north-east side of the stem were much larger than their fellows of the south-west quarter. Such trees had an appearance as if they had received a combing, for every little twig, toward whatsoever point of the heavens budded, was now turned about to look into the north-east. In the woods, while the lower trees were not unbalanced by reason of the winds, yet high tops of pines were often peculiarly modified, many pointing with long arms in the direction followed by the prevailing wind.

I further found that the points of the compass might be easily ascertained simply by inspection of fallen trunks. With few exceptions they lay with heads toward the north-east.

I noticed that far the larger number of trees in the woods are of nut-bearing species. Maples and light-seeded trees are few. At once, whether rightly or not, I connected this fact of distribution with the prevalence of high and constant winds, the marks of which are so conspicuously set in the outlines of every tree within the range of the eye, and which I thought, by preventing the spread of seedlings to the windward of parent trees, had in the ages weeded out the absent kinds. In the nice balance of the arboreal struggle, a small and unnoticed cause may raise or sink the fortunes of a species. But I found in an examination of the annuals many wing-seeded *compositæ*, etc. I saw, too, that under a solitary great maple in the woods the seedlings were as numerous and far scattered from the parent on the west as on the east. And this observation I repeated in several places. I concluded, therefore, that if prevailing winds had to answer for the absence of maples, elms, basswoods, etc., at least the result was not due to transporting power.

Yet the speculations founded upon the relationship of wind and wing is not easy to give up. Can it be that the broad vanes designed to catch the lighter airs of a more quiet region, offer only too ready a hold to the rending force of the heavy drafts peculiar to level countries, so that the seeds are removed before the germ has fully matured, with the result that the seedling trees are too feeble to wage successful war against oak and hickory?

R. G. Leavitt,
Williston Seminary,
Easthampton, Mass.

A Colossal Boulder and its History.

The town of Italy, Yates Co., N. Y., is justly noted for its lofty hills, deep valley and the "Big Elm," the largest in the state. To these should be added, the largest boulder in the county of Yates, and of its kind, perhaps the largest in the state. So few are recorded that exceed this one in size that we think it deserves special mention and distinctive place in the geology of Yates county.

This wonder from the Archæan region British America—the Laurentian Mountains the so-called "Backbone" of North America, was stranded during the "Great Ice Age" almost on the very summit of East Italy Hill, fully 1,000 feet above the valley. It is on the farm of Mr. George Ray Hayes, in the eastern part of lot No. 38. It is about 33 feet long, 16 feet broad and 9 feet high and in shape like a prolate spheroid, and by computation must weigh fully 400 tons.

Looking at this giant we are deeply impressed by the omnipotence of the forces of nature and reminded of the great changes wrought in the earth's surface by such forces. Where did it come from? How did it get here? No rocks like it here in place! Such are the questions and thoughts that are suggested to everyone at first sight of it.

All boulders are divided into two classes travelled or untravelled. The former are distinguished by being rounded and sometimes polished and more or less remote from their habitat, while the latter are rough and angular, and at or near home. The one in Italy belongs to the former class, being well rounded, and is known in lithology as gneiss—a form of stratified granite. It is called primary rock to distinguish it from the later rock made of mud and called secondary, sedimentary and shale rock. It forms the bed rock of the earth and was once in a molten condition: In this part of our state many thousand feet of shale rocks are above it, but in the Adirondack region and portions of Canada it is the surface rock, therefore we know it must have come from the north.

By what means was it transported from the Canadian mountains and left

upon the highest land in this part of our state? It was certainly brought here, as were all other boulders, in ice beds, either in great detached masses of ice or icebergs, detached portions of glaciers or glaciers themselves. These ice masses carried with them from their rockbound mountain homes portions of their confining walls and these have been distributed over the Eastern States, the largest ones melting their way through thousands of feet of ice and dropping upon the ocean floor first, and the smallest last. Thus it is that as one travels southward the smaller the boulders are until none can be found large enough to throw at a bird. When these boulders are more or less exposed they are scoured by the ocean floor until their journeyings are abruptly brought to an end by impact with some high ground; during this stage of their journeying they ploughed furrows in the earth's rock surface. Hence boulders are usually on high or the highest ground. After losing their ice hold they are rolled and tumbled about by fierce currents, still further rounded and polished, and often rolled down to lower levels. The boulder floor thus produced by all this rolling and scouring is carried on and eventually deposited as clay beds. Thus we see our big friend on the top of Italy Hill becomes to us as a "bench-mark" to mark the height of the ancient ice-tide.

But the ancient sea extended much higher than this, for this is the sea bottom. In proof of this we climbed some 200 feet higher and found fossil sea sponges in an old stone pile. These sponges grew there for we have found them in places in the highest hilltops in Italy. What changes our earth has passed through! Italy Hill once an ocean bottom where disported the leviathans of the deep, as the continent rose higher, the waters receded eastward and swift currents rushed madly in varying directions, scooping and deepening valleys, precisely produced by sub-glacial streams.

Thus we see in a stranded boulder, one of the elements necessary for the solution of the problem of the history of the earth prior to the creation of man. BERLIN H. WRIGHT.

Further Notes on the Mosaic Account of Creation versus Science.

In the February and March numbers (1896) of the MUSEUM, also in the May number appeared articles on the above subject. In the February number, last half of second column, page 104 and a third of the first column of 105, Mr. Whiting made some good statements, but failed to prove them.

I will here attempt to prove his statements and briefly consider several points of Mr. Cooper's article in the May number.

Since none of the scientists agree among themselves as to the age of this world, and God Himself has not told us how old this world is, therefore nobody knows.

When Mr. Cooper states on page 178 that "According to Genesis the world is 6000 years old" he makes a statement that cannot be proven from the Bible, if it were correctly rendered. By reference to Gen. I, 1 we find that it says that "In the beginning God created (bara) the heavens and the earth.

Now in Hebrew this word has the meaning of creating or bringing into existence. Between the first and second verses of Genesis I is an immense, unmeasurable chasm of time.

* The correct translation of verse two of Gen. I is "The earth came to be a wreck (tohu) and a ruin (bohu.)

The next question that comes to our mind is, did God create it a wreck and a ruin?

No sir!

* Read a book entitled Earth's Earliest Ages, by G. H Pember. A. C. Armstrong & Son, 714 Broadway, New York City. Price $1.50.

Isaiah XLV, 18, "Thus saith the Lord that created (bara) the heavens; God Himself that formed (assah) the earth and (yatsar) it; he hath established it; he created (bara) it; not in vain (bohu); he formed (assah) it to be inhabited."

Gen. I, 2. It came to be a wreck and a ruin. Gen. I, 28. God said unto them, be fruitful and multiply and replenish the earth, etc. The above shows us that it had been filled before, became empty and needed to be filled again.

The word bara is used four times in Gen. I, viz: in the 1st verse, the 21st, and twice in the 27th.

The word (assah) means to prepare or make ready. In Gen. I, 8 it is rendered "made";in Lev. VII, 9 (assah) is rendered "dressed"; also in I Sam. XXV, 18 it is rendered the same; Ex. XXXVIII, 24 it is translated as "occupied";Gen. XXX, 30 it is rendered "provided"; II Chron. XXXII, 27 it is also rendered "provided"; Job XX, 8 it is rendered "fashioned";Is. XLIV, 13 "fitted";Gen. I, 15 God made two great light-holders, etc.

In Mr. Cooper's article, page 178, the word for made is (assah) and not (bara). Gen. II, 7. And the Lord God formed (yatsar) man, etc. Gen. II, 8. And there he put the man whom he had formed (yatsar), etc.

The Hebrew word "yatsar" is a word derived from the noun which is the common word for *potter* in the Bible, hence the meaning is moulded or formed.

I would here call attention to the fact that the words created, made and formed are three *differing* English words, hence they do *not* mean the same thing. This is just as true of bara, assah and yatsar and *they* do *not* mean the same thing.

Gen. V, 27 states that Methuselah lived 969 years, *not* 999 as stated on page 178.

"There is no doubt but what the deeper the research and knowledge of geology is extended the closer to absolute exactness will the harmony be between Genesis and science."

"Geology has nothing to do with the Bible, so far as I know, other than the Pentateuchal account of the creation, and as time goes on the *supposed* breach between these two will be less and less, for every discovery in the field of geology is met by a *strengthening* of the Mosaic account.

J. MAURICE HATCH,
Escondido, Calif.

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Snowbird, m, f	60
Redpoll, m, f	40
Prairie Horned Lark, m	50
Spotted Sandpiper, m	60
Pine Grosbeak, m, f	90

Also have others send stamp for list. Will send at prices named, on stands, prepaid.

JESSE T. CRAVEN,
HINDSBURGH, Orleans Co., N. Y.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., MARCH 15, 1897. No. 5

Reminiscences of a Trip to Schoharie.

(IV.)

Visiting this valley for the first time, in which cluster so much thrilling history, and which is so interwoven and connected with our own—the Mohawk—it is not at all strange that we should seek all the knowledge and points of interest available to us, during even a few days' sojourn.

We are told by this one, of this exploit—by another of that narrow escape from capture or death by the Indians—of their forefathers during the early times.

So we cannot but admire those worthies whose names have come down to us in history, surrounded by a halo of glory; but we must not withhold our praise from those obscure individuals in the frontier settlements—like Schoharie—who amid the most appalling danger, surrounded on all sides by enemies and worse still—traitors, for the part they performed in the strngle for National Independence.

Many fell in battle; in skirmishes with the enemy at home; and many fell silently in the fields by the rifle, the tomahawk and the scalping knife.

"Their ashes flew, no marble tells us wither."

So I would not deem these little sketches on Schoharie complete without jotting down some of its early history, as gleaned from various sources.

* * * * * *

During the early part of the last century, Europe was subjected to a series of religious wars. One of the localities seriously affected by this conflict was the Lower Palatinate in Germany. To escape persecution these refugees fled from their native country and came to the new world. The first of the Palatinates (as they were called) arrived in New York about 1707. The projectors of this colonization scheme intended that they should settle in the Mohawk Valley, but through some cause after reaching New York, they separated; some going to Pennsylvania, and to the Hudson River country, while a few staid in New York.

Those who settled in the Hudson River country were put to work by Gov. Hunter making tar. Many causes wrought dissatisfaction; chief among which was that they were obliged to serve under government agents, who were both tyrannical and dishonest. They thereby became discontented with their abode and determined to seek homes elsewhere.

History tells us that they journeyed to Albany in 1711, when hearing of a beautiful valley to the south-west, a few of the most intrepid, piloted by an Indian guide over the Helderbergs, penetrated the wilderness in that direction. After traveling several days they arrived on the height of land—the estuary of the Schoharie and Foxes Creek.

Here a scene of extraordinary beauty burst upon their sight; at their feet the valley spread out before them like a neglected garden, emblazoned by rock-clad hills. The course of the Schoharie Creek was seen, now washing the base of the western hills, now meandering through the flats; sometimes its course was hidden from view by the thick foliage, and again as

its channel spread out, its clear waters were seen glittering in the sunbeams.

No trace of any occupants was seen, save here and there the ruins of a deserted wigwam.

The travelers returned to their friends, and gave such glowing accounts of the country they had visited that a company of about fifty families started immediately for the *land of promise*, loaded down with heirs, provisions and unmentionables. Their progress was necessarily slow, and nights, as they had to sleep in the open air, they made fires to keep off the wolves so numerous in their pathway.

It is said that it was on a Sunday when they arrived at a brook, which descends from the hills on the east side of Foxes Creek, almost in sight of the Schoharie Valley.

Judge Brown in his History of Schoharie, published in 1823, in narrating this event says: "Here they halted and resolved on a general, personal cleansing. As they were washing the LICE were a-swimming down the brook; the brook is called Licekill until this day." It is not difficult to account for this fact (?) as poor people, although usually cleanly, often in those days found it difficult to exhibit neatness in traveling a long journey. However the neatness of their descendants has become proverbial. The night after their purification, the pilgrims bivouacked in the *land of promise*, and no doubt offered devout thanks to Him who in His care had safely brought them hither.

The Indians conveyed them lands, and upon a large stump in Middleburgh they cut the figures of a turtle and a snake, the ensign of the tribe—the Indian seal or evidence of the conveyance.

They settled upon the east side of the Schoharie in seven Dorfs *—and each was given the name of the leader or head man as denominated at the camps.

"Weiser's Dorf" was near the present village of Middleburgh, and was the farthest south, then came "Hartman's Dorf," Brunnen Dorf"—now Schoharie village, "Smith's Dorf," "Fox's Dorf," "Garlock's Dorf" and "Kneiskern's Dorf"—the latter near the mouth of the Cobleskill Creek.

The first years were full ot vicissitudes, but being frugal, hardy and industrious they passed through those first years in comparative safety, and lived in prosperity over fifty years. More than this, standing by their principles and integrity upon the frontiers of civilization, their descendants were taught those lessons of patriotism which always vindicates its rights against arbitrary laws. So they largely became the nucleus of that army of yoeman who, under the gallant Herkimer met and drove back the enemy at Oriskany, and gave impulse to the war which resulted in victory at Saratoga and final triumph at Yorktown.

It is supposed that about thirty years previous to the coming of these colonists, a number of Indians belonging to several tribes united together and came to this valley, forming the Schoharie Tribe. They were subordinant to the Six Nations; and remained at peace with the settlers until the beginning of the Revolution, when the influence and offers of the English were so strong and tempting that they at last took up arms against their neighbors and friends.

In the fall of 1777, the inhabitants began to suffer from straggling parties of Indians and Tories, and the Committee of Safety sought means of defense.

With aid from the government three forts were erected, called the Upper, Middle and Lower Forts. All the forts consisted of a strong palisade or picket enclosing about half an acre of ground.

Within the Middle Fort was a two story stone dwelling house, and was situated about a mile east of the village of Middleburgh. The house is

* "Dorf" is a German word, and means a compact farmers' town or village.—*Brown.*

still standing in comparatively good preservation. This was headquarters during the war and the business involving the welfare of the people was generally transacted here.

The Upper Fort was five miles above. It also enclosed a house, but was of wood. No trace of its position remains, as the land has long been cultivated where the buildings stood.

The Lower Fort was situated at "Brunnen's Dorf" six miles below—or north of the Middle Fort—and was built around the stone church (erected in 1772). This was the most exposed, as it was at the gateway or entrance of the valley. So, besides the usual strong pickets or palisades, there was built two block-houses on the south-west and north-east corners mounting small cannon. Each family who claimed the protection of the garrison and the shelter of the walls, erected along the sides of the enclosure rude huts of rough boards, to deposit their most valuable effects in times of danger.

ROB'T M. HARTLEY,
Amsterdam, N. Y.

Prof. H. A. Ward's Trip Around the World.

A SCIENTIFIC TRIP OF THIRTY THOUSAND MILES.

After an absence of almost eleven months, Prof. Ward is home again, and has completed the longest and most successful collecting trip ever made. He reached Rochester on January 20th, and on the following day, during an interview, gave the following brief summary of his trip

"When I left Rochester last February I went immediately to Europe. I spent a short time in Italy and then crossed over to Alexandria, giving a week or two to Cairo and the pyramids, getting hold of some mummies and other interesting specimens of ancient Egyptian times. After shipping these back to America, I went on through the Suez canal and the Red sea to Abyssinia, where I had been during the previous winter. From there I went to Bombay, and thence into the interior of Northern India, stopping at Delhi, Lucknow and the other principal cities. From Benares I struck the valley of the Ganges, and went down to Calcutta, and from that place came back across India on the southern line to Poonah and thence to Madras.

"From Madras we went to the tip of India, to the town of Tuticorin, and there took the steamer for Ceylon. In India I made some considerable collections for the establishment, in the shape of mineral specimens, particularly, and shells to some extent, and some polished stones of jasper, onyx and agate. We spent a week in Ceylon, and then went back into the interior again. It was insufferably hot in India. Usually I enjoy hot weather, but that was altogether too much, the temperature averaging about 114 degrees. The carriages and cars have to have peculiar matting floors which are kept soaking wet all the time, in order to cool the atmosphere somewhat.

"We found Ceylon much cooler, being higher land, and more or less surrounded by water. From Ceylon I went in a southeasterly direction across the Indian ocean to the southwest corner of Australia. It was just in the midst of their winter making it necessary for us to put on our heaviest winter clothing. I visited the mining regions, and particularly the museums of Western Australia, and then came back to the town of Albany, and moved eastward along the coast to the city of Adelaide, in South Australia. There I made arrangements with the leading museums to exchange some of their better specimens for some in the Rochester establishment. Then I moved eastward again to the city of Melbourne in Victoria, which is the largest city in the southern hemisphere. It is a splendid, lordly city.

"Well, I stayed in Victoria a while,

and then went northeast to Sydney, in New South Wales. Sydney is a few miles north of Botany bay, where Captain Cook first landed when he took possession of the island. It is much older than Melbourne. It is a large city with elegant parks and a most beautiful harbor, one which ranks with Rio Janeiro and Naples, which you know are the finest harbors in the world. It is about twelve miles long and is indented with hundreds of beautiful coves, one for each day in the year, they say. It is certainly one of the grandest places in the world for picnicking. The temperature the year round will allow of it, and there are twenty or thirty steamers used for this purpose every day.

"New South Wales is red hot for protection, whereas Victoria is a free trade province. The two colonies are side by side, and each has a population actively engaged in all kinds of trades. They are so close together, and the totality of their business transactions is not so immense but that one can easily make a comparison between them, but despite all this it is very difficult to determine which system brings the best results. The men are expert stone workers, and the cities and villages contain very many fine buildings and bridges as monuments of their skill.

"From Sydney I went northward to Queensland. The vines, olives, figs, bananas and oranges all meet at that latitude. The pears, cherries and apples are left further south where it is colder. I had shipped from America to Brisbane a lot of apparatus in the way of collecting tools and dredges for gathering shells, corals and other objects of natural history. I found that these instruments had already arvried, so I took them by steamer for 1,200 miles along the coast to the most northern point of Australia, where the headquarters for the pearl fisheries are. Here we made up our outfit and sailed into the Torres straits to get the corals and pearls.

"In the meantime I had sent to this field my assistant, Mr. E. L. Potter, a very capable, trained zoologist, who has been with me here in Rochester for a number of years. We chartered a schooner with a crew of ten men, took our diver and the apparatus, and a great lot of provisions, lumber, and some baled hay and straw for packing purposes. By the way, a bale of hay, weighing about 200 pounds, costs $7 in that country.

Well, we started out and worked for two or three months among the coral reefs in the Torres straits, and over on the New Guinea shore. Our work was to go out on the reefs when the tide was out, wade in and pick out the finest specimens, and then send them to the schooner in the small boats. We had a great choice of material, and we simply picked out the best. This work was delightful. The forms and colors of the corals were so beautiful, resembling lettuce heads, cabbages, forming domes and fluted columns. Oh, yon can't imagine what a great variety of forms and colors there were. It looked like a great garden of flowers beneath the waters.

"My work especially, and the main purpose of my journey was to collect corals for Professor Agassiz, of Harvard University, and I got the finest collection that has ever come to America. Of course I sent a large number to our own establishment.

"The great coral reef extends along the coast for 1,200 miles, and is anywhere from five to twenty miles off the coast. It is built probably on a ground work of volcanic rock. The crust of the earth here has gradually sunk, and the animals keep building up the reef. This place and the Red sea are the two best coral grounds in the world.

"I went occasionally over to the mainland in New Guinea, where it was not safe to go when I was there fifteen years before. The natives are still in the stone age. All their implements are made of stone, partly

from necessity, partly from their ultra conservatism. The aborigines are the most conservative people in the world. They make their fire by rubbing two sticks together, and what is more, they will keep to the sticks even though you present them with some of the latest kind of matches.

"When we got there we coasted down to Cooktown, where we discharged our boats and made our shipments to America. We then went by way of Sidney to New Caledonia, the French convict island. Prisoners are kept in barracks near the city of Noumea, but some of them escape and get into the interior where there is now a population of free convicts, so to speak.

"We next went to the Fiji islands, where we spent about two weeks collecting more corals. Thence we went to Samoa, an island governed by England, Germany and the United States. These islands are largely covered with cocoanut trees. As you sail around you see millions of trees and each tree has about fifty nuts. The natives dry the fruit and send it to Europe. Cocoanut and palm oils are used largely in making our best soaps. From Samoa we sailed to the Friendly islands, and thence to New Zealand.

"New Zealand is a much more progressive country than Australia. It is more like the American countries. From New Zealand we went back to Samoa again, and thence to San Francisco by way of the Sandwich islands. Since then I have been going through the Southern states and then came along home

"When I arrived in Rochester I found that I had traveled over 30,000 miles in my journey of ten and one-half months. I sent to Rochester 125 boxes of material collected in Europe, Egypt, India and the other countries. It's a very simple thing to travel nowadays It is just a question of days and dollars. I think, however, that I shall stay in Rochester for a while, now that I am home. There is no place like home, after all.

Pearls in America.

THE FISHERIES TO BE INQUIRED INTO OFFICIALLY.

The United States Fish Commission has employed George F. Kunz, the famous expert in gems, to inspect the fresh water pearl fisheries of the United States says the Fishing Gazette. These fisheries are by no means prospering, having produced only $100,000 worth of pearls within the last twenty years, and it is hoped that some method will be developed for renewing the output which was in former times enormous. The mollusks which yield the water-born "gems" are large mussels called "unios," and they would an annual profit of many millions of dollars under proper conditions. Unfortunately the beds, which occur in streams, have been ruthlessly destroyed by pearl-seekers.

Thus it comes about that few fresh-water pearls are now found east of the Ohio. In this State this sort of fishery was prosecuted in pre-Columbian times on a great scale, and the aboriginal residents of the Miami and Scioto valleys possessed the largest and finest collection of pearls ever known. The streams in those days were full of pearl-bearing mussels, and some of the pearls obtained from them were as large as English walnuts. Big chiefs owned astonishing quantities of them, wearing them sewn by thousands on their clothing. A warrior of distinction was adorned with an assemblage of pearls that would excite the envy of the wealthiest modern monarch. Often the biggest pearls were set in bears' teeth for ornaments. The pearls were usually pierced by means of red-hot copper wire, and alas! it was considered necessary to bury all such jewels with their possessions.

The main point of the Government's investigation lies in the fact, that the pearl-bearing mussels can be propagated artificially without difficulty. Everybody knows what wonderful success has attended efforts in the culture

of the oyster. There is no reason why corresponding results should not be achieved with unios, though the problem would be different in some respects. In Saxony, says Mr. Kunz, a family named Schmeler has had a monoply of "pearl-raising" since 1646, and a record has been kept of every pearl obtained. The system adopted consists simply in giving encouragement to the natural multiplication of the unios, which when taken out of the water are presently returned to their native element. Thus the animals are preserved, instead of being exterminated, as by the ordinary plan. To discover whether the individual mollusk contains a pearl, sharp-pointed pliers are inserted between the two valves and the handles are slowly pressed together, opening the sheli. If a pearl is found, it is easily removed.

It seems not at all unlikely that a method will be found by which the fresh water mussels may be made to yield pearls as a regular crop. Under ordinary circumstances ninety-nine out of a hundred are barren, but the process of pearl formation is so well understood that it can be started by a simple treatment of the mollusks individually. The Smithsonian Institution has in its great conchologica collection a mussel that contains a lpearl as large as a pigeon's egg. The pearl is button-shaped and in color a beautiful rose-pink. It has for a core a morsel of beeswax, which was introduced into the shell of the living animal purposely. To avoid irritation by the obtrusive article, the mollusk covered it with layer on layer of its own nacre. That is the way in which pearls are always formed—about a small foreign body, not uncommonly a grain of sand. When they are round they have been so formed by being revolved continually by the animal.

The quantities of pearls collected and owned by the pre-Columbian Indians were in truth astonishing. In one series of mounds excavated not long ago, near Chilicothe, Ohio, hundreds of thousands of pearls were found, some of them as big as large hickory nuts, and fit for crown jewels. They were discovered, together with human skeletons, which wore copper masks—a freak by the way, unheard of hitherto by archæologists. With two skeletons were obtained enough pearls to fill a gallon measure, varying in size from a millet seed to two-thirds of an inch in diameter. Explorers in Georgia and elsewhere have got pearls by quarts, literally, from aboriginal mounds. More than half a bushel were dug out of one ancient tumulus in the Little Miami Valley, and two bushels of pears secured from a prehistoric altar in the same neighborhood are preserved in the Peabody Museum of Archæology at Cambridge, Mass. The mounds of yet another group yielded 500,000 pearls—enough to fill fifteen good-sized boxes.

If the pearls thus recovered were in their pristine condition, they would be valued at several million of dollars, but, unfortunately, they are worthless, except as curiosities. Many of them are blackened and spoiled by fire, having been thrown apparently into the flames of altars. Others are rotted by long burial and cemented into masses by water filtering through the soil. Unlike precious stones, pearls, being an animal product, easily decay. The pearls which adorned the necks and hair of fair women thousands of years ago, have all passed out of existence; their lustrous beauty is naught but dust. For this reason the water-born "gems" are not very satisfactory property; only great care can keep them in good condition, and the colored ones are apt to fade. Nevertheless an occasional pearl of size from the Indian mounds is still found to have lustre and some value when the outer layers are removed by the process known as "peeling." The process is otherwise known as "faking" a pearl. The pearl is formed of a series of concentric layers, and the removal of an imperfect outer coat

may yield a "gem" of price. A few years ago an expert purchased for $20 an old gold brooch in a small German town. In the centre was what looked like a spherical piece of hematite. On examination it proved to be a superb black pearl, weighing seventy-seven grains. The outer coat had become faded by sunlight, but when it was removed one of the most beautiful black pearls known in modern times was exposed. It is valued at $10,000. "Faking" is practised to a considerable extent by the Chinese, who use for the purpose a keen-edged knife, files, some pearl powder, a scrap of leather and, for the final polishing, a leaf of a peculiar kind. Pearls are dyed rose color or lilac or gray by chemical means, and nitrate of silver is employed to turn them black. Only an expert can detect the cheat.

The trouble with the fresh water mussel fishery in the United States today is that the mollusks have been recklessly exterminated. Nobody has thought of inspecting the bivalves after the method practised in Saxony, returning the barren ones to the water. Thus hundreds have been destroyed for every pearl found, and now the species is getting quite scarce. In 1846 a very large pearl was found in a brook near Notchbrook, N. J., and sold to the French Empress Eugenie for $2,500. Advertisement of the discovery created a great excitement, and for a while the remaining beds of unios were recklessly attacked without any very profitable result. Sugar River, Wis., has yielded a number of fine pearls recently, however, and some of fair size have been obtained from Fish Creek, Lewis County, N. Y. Unio pearls are rarely spherical or pear-shaped; they are most apt to have the form of buttons and, while usually pink, they are sometimes light blue and occasionally white.

The Taxidermist.

From other men he stands apart,
  Wrapped in the solitude of thought
  Where giddy fancy enters not;
With star-like purpose pressing on
Where Agassiz and Audubon
Labored, and sped that noble art
  Yet in its pristine dawn.

Something to conquer, to achieve,
  Makes life worth well the struggle hard
  Its petty ills to disregard,
Hindrance to battle day by day,
With high incentive—that he may
Somehow mankind the richer leave,
  When he has passed away.

Forest and field he treads alone,
  Finding companionship in birds,
  In reptiles, rodents, yea, in herds
Of drowsy cattle, fat and sleek;
For such to him a language speak
To common multitudes unknown
  As tones of classic Greek.

Unthinking creatures, and untaught,
  They to his nature answer back
  Something his fellow-comrades lack,
And oft educe from him a sigh
That they unnoticed soon shall die,
Leaving of their existence naught
  To be remembered by.

Man may aspire—though in the slough,
  May dream of glory, strive for fame,
  Thirst for the prestige of a name;
And shall these friends that so invite
The study of the erudite,
Ever as he beholds them now
  Perish like sparks of light?

Ah, no! his project and design
  Would keep them not like mummies old,
  Papyrus—mantled fold on fold,
But elephant, or dove, or fawn
Its freshness, hue, and raiment on,
In effigy of plumage fine
  Or skin its native tawn

"What God hath wrought," thus art shall tell,
  And thus endowment rich and vast
  Be rescued from the buried past;
And rare reliques that never fade
Be thus in manikin portrayed,
Till Taxidermy witness well
  The debt to science paid.

Lo! one appeareth unforetold
  A re-creator! yea of men
  Making him feel as born again,
Who looketh up with reverent eyes
Through wonders that his soul surprise,
The great Creator to behold,
  All-powerful,—all-wise.

—*Hattie Howard in University of Chicago Weekly.*

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

Correspondence and items of interest on above topics, as well as notes on the various Museums of the World—views from same, discoveries relative to the handling and keeping of Natural History material, descriptive habits of various species, are solicited from all.

Make articles as brief as possible and as free from technical terms as the subjects will allow. All letters will be promptly answered.

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NOTES.

Only a few days more to renew your subscription at 50cts. After March 20 price is \$1.00 to all.

Messrs A. G. and C. L. Howes report that they took a set of 2 fresh eggs of Great Horned Owl at Chauncey, N. Y., Mar, 1, '97. Nest was 30 feet up in a hickory; new this year. Early nesting this in New York. Most boys have not begun to think about collecting in this locality in March.

Patronize our exchange column. If you have anything to exchange, sell or wish to buy you will find these columns will usually bring you rich returns.

Tell your brother collectors about the MUSEUM. It's the only small natural history journal that comes out *every month*, Isn't this so? Of course we can't compare with the young journals just "cutting their eye-teeth," but it's fair to assume that most of them will begin to "double up" numbers before they are many months older. We guarantee you 12 numbers every 12 months and a good big dollar's worth. A great many have written us that they save several times the price of the magazine by taking advantage of the SPECIAL OFFERS in its columns from month to month and we believe this to be true.

Correspondence.

Interesting letter from Mr. Amos Pyfer, formerly of Nebraska, now of Gallatin county, Montana.

Feb. 5, 1897.

FRIEND WEBB:

As I promised to write you about the country I will now take the opportunity.

We did not go on our hunt up the Gallatin river. While waiting on another fellow the boys did not get to go at all. I would not have gone as from the third of January I was laid up in the house for three weeks.

We are situated here in the mountains or rather in the foot hills, and surrounded by mountains. The mountains do not look as high as I expected them to, but when a person attempts to climb up, then it is pretty far to the top. They look nice covered with snow and patched and streaked with drab and green, showing where the timber grows. Some places the dead timber stands thick and trees lie in every direction on the ground having been blown down after having died. The trees were killed by fire which would burn over a large scope of country. Frequently large trees will be seen burned to the top. The mountains are generally covered with fir and white pine, but balsam fir grow at places, while the cedar grows nigh up on the sunny side. Along the streams cotton wood, willow, cedar and quaking asp are found beside shrubs of different kinds.

The creeks and rivers are perfectly

clear. The Gallatin river has a fall of 71 feet to the mile while the small streams have more yet. The rivers teem with trout, white fish and graylings.

The Gallatin Valley is about ten miles wide and in some places wider. It begins almost all at once as the river leaves the mountains, where the slopes of the mountains reach the water's edge or are perpendicular. Getting up on a high point and looking around over the valley and hills a person has a picture like he often sees in books. It looks like a large disk with the bottom bulged and furrowed, while the edge is scolloped.

All around are mountains whose peaks extend up high leaving a lower line showing where the two mountain peaks join; looking beyond peak after peak arises. Looking over the valley a person can trace the Gallatin river, also see the Madison valley and far beyond where the Jefferson flows along, the mountains all joining farther north.

The hills at places have heaps of loose stone lying on top of the ground while the tops of some have boulders piled up and lying around. At places where the rocks crop out of the ground the strata lies slanting showing an upheaval or a collapse of the surface.

This is a good place for the collector whether of animals or birds. We have here the elk, black and white-tailed deer, mountain sheep, lions, lynx, bob cats, badgers ground hogs, minks, martins, weasels, prairie dogs, coyottes, wolves, antelopes, and mountain rats. Of course a person must go into the mountains for some of these but does not need to go so very far.

I am told in summer a great many birds come and breed here. I have noticed some of the winter residents that breed also. Those I have seen are our Dusky, Gray, Ruffed and Common Starp-tailed Grouse, the Magpie, Canada Jay, Crested Jay, Townsend's Solitaire, Kingfisher, Eagle and Hawks of different kinds, besides Ducks and Snipes that stay in the swamp along the East Gallatin, whose waters are warm. When the weather is very cold the White Snowbird, Rosy Finch, Snowy Owl and Bohemian Waxwing come from the north. We also have two kinds of squirrels. They are small but cute and pretty. I have noticed the Western Great Horned Owl, also Screech and Short-eared Owl. The Curlew breeds here, so do Sandpipers of different kinds, numerous Sparrows and Hawks and a number of Woodpeckers and both Red and Yellow-shafted Flickers.

I am watching the old nesting places of the Eagle and some Hawks and expect to get some fine eggs. Clarke's Crow is plenty here, but they breed so early I don't know whether I will be able to get their eggs or not. They build in trees along the rocky places and crags. The Gray Ruffed Grouse goes up in the mountains to nest while the Dusky comes down into the hills. In winter the Duskies go up and the Grays come down.

We also have the snow-shoe rabbit, the jack rabbit and the cotton-tail. I killed one snow-shoe rabbit and it was better eating than any of the other rabbits. The jacks are white in winter.

Well, I will close for this time as breakfast is about ready and we are going to the mountains for logs. Monday we were after logs and found two porcupines in one tree, one was very large but the other was smaller.

The weather here this winter is fine. We have very little snow in the valley and hills but plenty in the mountains. We have the nicest winter in the history of Montana. The snow melts most every day. The other week it was 4 degrees below zero. In November for three days it was cold; it was 40 degrees below zero, but it is pleasant to live here. The chinook comes over the mountains from the southwest and the snow goes real lively. Cordially yours,

AMOS PYTER.

[Mr. Pyfer wrote the above as a personal letter, but it contains so many interesting items, at least to collectors who have never lived in a mountainous country, we take the liberty to publish it. EDITOR.]

Indiana Notes.

Indiana, with her beautiful prairie land in the north and the almost mountainous sections in the south, is a paradise to the naturalist. Her scenery is as grand as the grandest and the fine geological collecting grounds have made her famous the world over, while the recent mollusca of the state is up to the standard.

Fayette county is situated in the south-eastern part of the state and is well drained by numerous creeks that empty into the White Water River which runs through almost the entire length of the county.

The river and creeks are splendid collecting grounds for fresh water shells while the deep ravines and timbered uplands are the homes of a great many varieties of land shells.

The following list (with notes) is not one-third of the species that have been found in this county, but with the editor's permission I will gradually give the list to the public until it is published in full. I wish to thank Mr. Thomas Curry of this city for his kindness in naming a great many species for me.

Helix (Patula) alternata, Say. One of our most common shells, plentiful in shady places.

Helix (Patula) perspectiva, Say. Not plentiful and those found by me were mostly in a small marsh.

Helix (Mesodon) profunda, Say. Common.

Helix (Mesodon) elevata,, Say. Abundant everywhere. I have good reason to be well acquainted with this snail. While on a geological collecting trip I came across an enormous lot of this species. Having my collecting box full of fossils I put about 200 of the snails in my pockets. In a short time snails were crawling all over me, so I pinned the pockets down and carried them home in that way. You can imagine my fix after walking five miles with those snails in my clothes.

Helix (Mesodon) clausa, Say. Common but appears to be mostly in woods bordering on the river. They seem to prefer the "nettle weed" to any other. My largest "catch" at one time was a little over 100.

Helix (Stenotrema) hirsuta, Say. Somewhat rare.

Zonites arboreus, Say. Common, have often noticed them with *Patula alternata*.

Zonites demissus. Somewhat rare.

Helix (Triodopsis) tridentata, Say. Scattering; have never found them together in large numbers.

Vallonia pulchella, var. *costata*. Scattering, but most abundant at the cemetery which is within the city limits.

Succinea ovalis, Gould. Found in ponds, etc.

Pupa armifera, Say. Common, but most abundant on or near tomb stones in cemetery and in a certain grove of willows near the river.

Pupa fallax, Say. I don't remember finding this species in any place except the cemetery.

ALLEN J. REYNOLDS,
Connersville, Ind.

(TO BE CONTINUED.)

The Condition of Archaeology in Mexico.

The Mexicans, as a nation, are possessed of peculiar ideas on almost any subject that can be mentioned, and their mighty conceptions concerning Archæology are in no particular, exceptions to the general rule. In fact no science finds room for existence in their capacious craniums.

As a study Archæology possesses no charms for their non-scientific minds and dispositions and but few years

have transpired since objects of antiquity were considered of no more value than the same quantity of stone. Indeed, in some cases, precious relics of the Aztecs have been found doing service in the walls of their adobe huts as common building stones. With them an Aztec idol was on a parity with an adobe brick. The people of this country made absolutely no use of any of the excellent and valuable Archæologian material, distributed at large over the entire land, until it gradually dawned upon their minds that foreign scientists were making the matter a study and forming collections of the relics of the ancient Aztecs and Taltecs. Upon recognition of this fact, the Mexican government was immediately transformed into a scientific assembly and began the formation of a most magnificent collection of these relics, but at the expense of the labor, in many instances, of foreign scientists. For example we refer you to that precious object Chaacmol the Tiger King, one of the chief attractions of their much boasted National Museum situated in the City of Mexico, the capital and metropolis of the republic. How did it come into their possession?

To many the incident is well known. Dr. LePlongeon, an enthusiatic and enterprising Archæologist, after spending seven years in the studying and decyphering of the hireoglyphics found in Yucatan, gained sufficient knowledge of their significance to locate in a wilderness in Chichen the wonderful relic, buried about six feet below the surface of the earth. It required great hardship of the doctor to exhume it but he was indefatigable and at length had the Chaacmol ready for transportation to the United States where he intended that it should remain. Before shipping his discovery, however, he made another trip of exploration and in his absence the relic was confiscated by the Mexican government and removed to the National Museum where it continues to remain.

This is not a solitary instance but has many parallels. Aztec remains are now considered valuable in this country, not for their scientific value, for they have no knowledge of the science, but for their *intrinsic* worth. There is not sufficient talent in this conntry to bring to light and develop the vast Archæological deposits within its confines and yet it is not desirable to them that anyone else should do so. It reminds one very forcibly of the fable of the "dog in the manger." Objects that a few years ago would not have received a passing notice are now guarded with the utmost zeal and simply for the frustration of the desires of foreign Archæologists. A law has been inacted prohibiting Aztec relics of any nature to be exported from the country. Not satisfied with this they have recently passed another law prohibiting all further excavation. It seems that the government has decreed that it is better for them to rest forever concealed in the earth than for some one to make use of them. But will this law be respected? *That* remains to be proven. It should certainly enhances the value of these relics already in the United States and they will now become quite scarce.

A fair idea of their appreciation of such things may be gained from this fact. Some time since the Museum of the State of Mexico located here in the city of Toluca, came in possession of some very fine stone idols. But the features presented by these idols failed to satisfiy their delicate tastes so with mallet and chisel in hand they proceeded straightway to remodel and alter them to accord with their more refined fancy, thinking of course their work would be a great improvement over those of the ignorant "Indians" as they term the Aztecs. Of course, however, they thereby destroyed their true value. How can *any* science make any progress or advancement in a country where such fanatical selfishness and ignorance universally prevail.

JAMES J. CARROLL,
Toluca, Mexico.

A Trip After Gelasmius Minax.

Early one fine morning in July I set out to procure specimens of the fiddler crab, *G. minax*. On a former walk I had noticed burrows belonging to this species on the bank of a very brackish river and thither I directed my steps.

After a walk of two miles I arrived at the desired spot, a point on the bank where there were many burrows in a small area. None of the crabs were out of their holes but a glance into some of these assured me that they were inhabited.

The burrows, in general, extended in a diagonal direction from the surface for a short distance and then curved in such a way that it was impossible to trace the direction with a stick.

Although most of the burrows were occupied, not one out of nearly seventy examined, contained more than one crab, the two sexes, it would seem, living apart.

The female crabs were carrying around their eggs, only in part concealed under the "purse" and odd enough they looked with such a burden. Several other crustaceans which I noticed at this same time (July 8th) were spawning.

The specimens varied in size, the average width of the body in the widest part being one and one-fourth inches. The legs of course make them look larger. In color they resembled the mud in which they burrowed, the legs and especialiy the large claw of the male being lighter.

The crabs would retreat quickly to the depths of their burrows on the least provocation and I found it necessary to use the following method to capture them.

Upon locating a burrow with a crab in it near the surface, a position which they seem to take most of the time, I drove a broad-bladed case knife through the moist earth in such a way that it would cross the burrow just in the rear of the crab and prevent his retreat. Then it was an easy matter, by a little upward pressure to eject from the hole and secure him.

Although a dangerous looking instrument (always reminding me of a dentist's pincers) the large claw of the male is no protection to him against human beings as far as my experience goes.

About forty specimens were secured from the seventy burrows, this number being almost equally divided between the two sexes.

Probably sixty out of the seventy burrows contained crabs and the piece of ground occupied by them was not more than eight feet square.

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Pied-bill Grebe	10	Black-tail Godwit	40	Arkansas Kingbird	06
Cassin's Auklet	1 50	Willet	40	Cassin's "	25
Black Guillemot	25	Spotted Sand-piper	15	Girraud's Flycatcher	1 00
Mandt's Guillemot	75	Bart. "	40	Crested "	12
Pigeon "	50	Whimbrel	40	Mexican-crested Flycatcher	10
Murre	25	Lapwing	15	Ash-throated "	25
California Murre	25	Golden Plover	50	Phoebe	05
Razor-bill Auk	25	Killdeer	20	Say's Phoebe	15
Gt. Auk Cast (net)	1 00	Ring Plover	20	Black "	15
Skua	75	Least Ring Plover	50	Wood Pewee	15
Parasitic Jaeger	50	Snowy Plover	50	West Wood Pewee	15
Glaucous Gull	75	Oystercatcher	30	Western Flycatcher	20
Iceland "	1 25	Bobwhite	10	Little "	30
Western "	30	Fla. Bobwhite	15	Traill's "	15
Herring "	25	Texan "	15	Least "	10
Am. Herring Gull	25	Mountain Quail	75	Acadian "	20
California "	30	California Quail	15	Wright's "	1 00
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Franklin "	30	Willow Ptarmigan	1 00	Desert " "	25
Caspian Tern	50	Rock "	1 00	Ruddy " "	35
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Cabot's "	40	Sage Grouse	75	Yellow-bill "	40
Common "	08	Chacalaca	75	Blue Jay	05
Sooty "	35	White-crown Pigeon	75	Florida Blue Jay	25
Bridled "	1 00	Mourning Dove	05	California Jay	20
Black "	10	White-front Dove	20	White-neck Raven	75
Noddy "	75	White-wing Dove	25	American Crow	10
Black Skimmer	15	Ground Dove	50	N. W. "	35
Fulmar	75	Mexican Ground Dove	75	Florida "	25
Leaches Petrel	20	Inca Dove	75	Fish "	10
Gannet	35	Turkey Vulture	75	Starling	10
Cormoraut	50	Marsh Hawk	30	Bobolink	25
Farralone Cormorant	50	Sharp-shinned Hawk	1 00	Cowbird	05
Brandt's "	30	Cooper's Hawk	30	Dwart Cowbird	25
Baird's "	30	Harris Hawk	60	Bronzed "	40
Double-crest "	30	Esp. Buzzard	35	Yellow-head Blackbird	05
White Pelican	35	Red-tail Hawk	50	Redwing "	05
Brown "	25	Kriders "	1 50	Bicolored "	10
Red-breasted Merganser	30	West Redtail	60	Tricolored "	15
Mallard	25	Red-shouldered Hawk	35	Meadowlark	10
Gadwell	75	Florida Red-shouldered Hawk	75	West Meadowlark	10
Baldpate	75	Swainson's Hawk	40	Mexican "	25
Esp. Teal	25	Rough Leg "	75	Hooded Oriole	50
Blue-wing Teal	20	Merlin	50	Arizona Oriole	40
Shoveler	40	Kestrel	30	Orchard "	06
Pintail	40	Sparrow Hawk	25	Baltimore "	06
Redhead	35	Aud. Caracara	1 00	Bullock's "	10
American Goldeneye	1 25	American Osprey	50	Brewer's Blackbird	05
Old Squaw	40	Barn Owl	30	Purple Grackle	06
American Elder	30	Long-ear Owl	35	Florida "	10
King Elder	1 50	Short-ear Owl	1 50	Bronze "	06
Velvet Scoter	60	Barred "	1 00	Great tail "	15
Ruddy Duck	40	Great-horn Owl	1 00	Boat-tail "	15
Canada Goose	1 00	Screech Owl	50	Cassin's Purple Finch	1 00
White Ibis	35	Texan Screech Owl	50	House "	05
Wood Ibis	1 00	California Screech Owl	50	American Gold "	05
American Bittern	1 00	Hawk Owl	1 00	Arkansas "	10
Least Bittern	20	Burrowing Owl	25	Lawrence "	20
Great Blue Heron	30	Groove-bill Ani	1 00	Chestnut-colored Longspur	35
American Egret	30	Road-runner	25	Grass Finch	05
Reddish Egret	25	Yellow-bill Cuckoo	12	Western Grass Finch	15
Louisiana Heron	12	Black-bill "	15	Savanna Sparrow	15
Little Blue "	12	Belted Kingfisher	20	Yellow-winged Sparrow	25
Green "	10	Hairy Woodpecker	50	Lark "	05
B. C. N. "	12	Southern Hairy Woodpecker	1 00	Western Lark "	05
Y. C. N. "	20	Downy Woodpecker	25	Gambel's "	15
Virginia Rail	20	Gardiner's Woodpecker	50	Chipping "	02
Spotted Crake	50	Baird's "	1 00	Clay-colored "	35
Sora Rail	10	Nuttall's "	1 00	Brewer's "	35
Corn Crake	25	Yellow-bellied "	10	Field "	05
Florida Gallinule	15	Red headed "	08	Black throated "	10
American Coot	10	Red-bellied "	25	Song "	05
Esp. "	20	Gold fronted "	50	Mountain Song "	25
Red Phalarope	1 50	Flicker "	05	Heermann's Song "	15
Nor "	1 00	Red-shaft Flicker	10	Rusty Song "	30
Wilson's "	75	Whippoorwill	1 50	Swamp "	15

Texas Sparrow 50
Towhee 15
Arctic Towhee 75
Spurred Towhee 25
Oregon " 25
Canon " 50
California " 10
Abert's " 75
Cardinal 15
Arizona Cardinal 50
Texan " 50
Gray-tailed Cardinal 50
Rose-breasted Grosbeak 20
Black-headed " 20
Indigo Bunting 10
Lazuli Bunting 20
Painted Bunting 10
Sharpe's Seedeater 1 00
Grassquit 1 00
Dickcissel 10
Lark Bunting 50
Louisiana Tanager 75
Scarlet Tanager 20
Summer Tanager 20
Purple Martin 15
Cliff Swallow 05
Barn Swallow 05
Bank Swallow 05
Rough-winged Swallow 10
Violet-green Swallow 40
Tree Swallow 15
Cedar Waxwing 15
Phainopepla 50
Logger-head Shrike 10
White-rump Shrike 10
California Shrike 10
Red-eyed Vireo 10
Warbling Vireo 15
White-eyed Vireo 15
Bells Vireo 15
Least Vireo 75
Prothonotary Warbler 50
Parula Warbler 20
Yellow Warbler 05
Myrtle Warbler 75
Magnolia Warbler 75
Prairie Warbler 30
Ovenbird 15
Florida Water Thrush 50
Yellow-breasted Chat 10
Long-tailed Chat 15
American Redstart 15
Meadow Pipit 10
American Dipper 1 00
Sage Thrasher 75
Mockingbird 05
Catbird 05
Brown Thrasher 05
Texas Thrasher 15
Curve billed Thrasher 15
Bendire's Thrasher 75
California " 25
Cactus Wren 15
Carolina Wren 15
Bewick's " 25
Baird's " 25
House " 10
Parkman's Wren 10
Western House Wren 10
L. B. Marsh " 05
Tule Wren 10
White-breasted Nuthatch 30
Brown-headed " 25
Tufted Tit 25
Chickadee 10
Bush Tit 20
Blue-gray Gnatcatcher 20
Wood Thrush 05
Wilson's Thrush 10
Russet backed Thrush 15
Olive-backed Thrush 30
Hermit Thrush 25
American Robin 05
Western Robin 10
Bluebird 05
Western Bluebird 10
Mountain Bluebird 10

Introduced Species.

English Pheasant 25
Ring-necked Pheasant 25
Silver Pheasant 40
Black Grouse 50
European Goldfinch 15
English Sparrow 02
European Tree Sparrow 15

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37 Little Owl 60
41 Great Grey Shrike 1 00
43 Lesser Grey Shrike 25
44 Red-backed Shrike 10
46 Spotted Flycatcher 10
48 Pied " 20
51 Golden Oriole 50
52 Common Dipper 25
54 Mistletoe Thrush 10
55 Song Thrush 10
56 Red-winged Thrush 25
59 Blackbird 10
60 Ring Ouzel 20
65 Robin 05
66 Nightingale 40
68 Redtail 10
70 Black Redstart 15
73 Wheatear 15
74 Black-throated Wheatear 35
75 Rufous Warbler 25
76 Icterins " 20
79 Marsh " 25
80 Sedge Warbler 12
85 Whitethroat 10
86 Lesser Whitethroat 10
87 Golden Warbler 10
88 Black-cap Warbler 10
89 Orphean " 25
90 Barred " 15
91 Wood " 15
92 Willow " 10
93 Chiffchaff 15
94 Gold crested Wren 75
95 Common " 10
97 Tree Creeper 15
99 Nuthatch 25
100 Great Titmouse 25
101 Blue " 15
103 Whiteheaded Titmouse 15
105 Bearded Titmouse 50
109 Pied Wagtail 10
110 White " 10
111 Grey " 25
112 Grey-headed Wagtail 30
111 Blue headed " 25
115 Tree Pipit 10
116 Meadow Pipit 10
119 Rock " 30
121 Tawny " 50
124 Wood Lark 50
125 Crested Lark 20
126 Short-toed Lark 15
127 White-winged Lark 50
128 Calandra Lark 60
131 Reed Bunting 15
132 Corn " 15
134 Cirl " 25
135 Ortolan Bunting 40
136 Black-headed Bunting 20
137 Chaffinch 05
139 Tree Sparrow 25
140 House " 05
141 Canary 20
143 Greenfinch 05
144 Goldfinch 10
148 Lesser Redpoll 25
149 Linnet 10
151 Bullfinch 25
156 Starling 10
160 Carrion Crow 15
161 Hooded " 15
162 Rook 15
163 Jackdaw 15
164 Magpie 15
165 Jay 15
168 Green Woodpecker 30
169 Great Spotted Woodpecker 20
173 Wryneck 15
174 Hoopoe 50
177 Roller 75
179 Kingfisher 30
180 Swallow 05
182 Martin 10
184 Swift 30
188 Ring Dove 10
189 Stock Dove 10
190 Rock Dove 10
191 Sand Grouse 75
192 Pheasant 25
193 Silver Pheasant 50
194 Pea Fowl 40
195 Guinea Fowl 10
197 Capercallie 75
202 Partridge 15
203 Red legged Partridge 25
204 Barbary Partridge 40
205 Quail 20
209 Great Plover 1 00
210 Collared Pratinole 1 00
211 Golden Plover 40
212 Lapwing 15
215 Little Ring Plover 40
216 Kentish " 40
219 Avocet 50
223 Redshank 20
227 Common Sandpiper 20
230 Dunlin 40
234 Woodcock 1 75
236 Snipe 25
238 Black-tailed Godwit 40
248 Heron 25
249 Purple Heron 40
250 Great White Heron 1 50
252 Squacco 50
256 Water Rail 35
257 Land Rail 20
258 Spotted Crake 50
259 Moorhen 12
260 Coot 20
274 Wild Duck 20
273 Pintail 25
274 Widgeon 25
275 Gargency 30
278 Red-crested Duck 75
280 Tufted " 50
284 Long-tailed " 40
285 Scoter 50
287 Elder Duck 25
290 Red-breasted Merganser 30
292 Goosander 40
295 Great crested Grebe 40
296 Red necked " 40
297 Sclavonian " 35
298 Eared " 30
299 Little " 20
301 Auk 25
303 Guillemot 25
308 Shag 30
309 Gannet 40
313 Black-headed Gull 20
315 Common " 20
321 Lesser Black-backed Gull 25
322 Greater " " 40
324 Richardson's Skua 75
325 Yucatan Jay 50
326 Miner Bird 40
327 Gular Oriole 50
328 Military Macaw 1 50
329 Rockhopper Penguin 1 50
330 Victoria " 1 50
331 Rose-throated Flycatcher 50
332 Golden-winged Oriole 25
333 Gray's Thrush 25
334 Mountain Mockingbird 25
335 Icterus aurata 25
336 Tyrannus sapreta 25
437 Cardinal coccencus 20
338 Euphonia affinis 30
339 Lampropsar dives 25
340 Gavial (India) 3 00
341 Turtle, Sun 10
342 Snapping Turtle 10
333 Milk Snake 25
344 Ostrich (cracked) 1 00
345 Rhea 3 00
346 Skate 08
347 Devil Fish 10
348 Leopard Shark 15
349 Nurse Shark 60

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THE MUSEUM.

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A Visit to the Bat Cave at Tapueleele.

I had been stopping for a few days with a native family in Iva, at the eastern end of Savaii, the largest of the Samoan Islands. My guide and interpreter was a native boy from Apia—the principal town of the islands—who spoke very fair English, and was moreover reliable and trustworthy; traits none too common among those who have come most under the influence of tricky and unscrupulous whites.

My baggage consisted of a lot of spirits, and other material necessary for the collection and preservation of scientific material. The coal-reefs along the shore teemed with life, birds in variety flocked through the thickets, strange plants and flowers were abundant on all sides, but I was concerned for the moment with the preparation for a visit to a bat cave some seven miles distant. I had been told that there were two caves in the islands in which small bats lived in great abundance, the one most easily reached being Tapueleele, a little village a few miles back in the mountains. Misi my interpreter was a bright youth, and as I learned later was much in favor with the young ladies whom we met along our way. A couple of baskets containing green cocoanuts, a tin or two of meat for our consumption, and some pieces of tobacco, and of kava root, to give as presents, was all we took with us.

A young man from the house went along to carry our baskets and show us the way. Having said "tafa," goodbye we started about nine in the morning on our journey. Our route was along a well beaten footpath to the westward much of the way along the coast, where our view, hidden by thick undergrowth among the stems of the ever present palms, now opened out on the broad expanse of ocean to the northward. The brown-skinned natives in their odd little outrigger canoes were often seen paddling around over the reefs, or wading about, spear in hand, in quest of fish for the morning meal. The reader will wonder what time these people have their breakfasts, but patience, I shall tell you about it later. At frequent intervals as we advanced we came to stone-walls about four feet in height built of black volcanic rocks, and serving to keep the pigs of one village or household from straying into the next. Stepping stones or slanting logs with notches for the feet in the upper side assist the barefooted natives over in safety and ease, but were not convenient for my stiff-soled shoes. Often too we passed fresh water pools, opening directly to the sea, furnishing good water for drinking and cooking, places for washing clothes, and that which is still nearer to the Samoans heart, an excellent place to bathe.

The Samoan people, naturally a sociable folk, have established themselves in villages, most of which are scattered along near the coast. There is no regularity in the positions of their house, being nestled away under the shade of the bread-fruit tree or the slender cocoa-palms.

The morning is the best time to see them at their various occupations, for

in the afternoons they are most apt to be asleep, and as we passed on through their villages I saw many things that were of interest to me. A woman was spreading something on a piece of corrugated iron roofing which was lain on two supports, so that one end was slightly lower than the other. We stopped to watch her and through my interpreter I learned that she was preparing cocoanut oil. The meat of the dry nuts is scraped up fine and mixed with the pulp of another nut called ifiifi, which gives it a pleasant scent, and is then spread on the iron in the sun. The powerful rays of the sun extract the oil from the pulp and as it tickles down is caught in a wooden bowl. The oil although often made to sell is always kept in a Samoan house, for with it they are in the habit of rubbing their bodies to give them a sleek appearance, a pleasant scent, and also probably to protect the skin against changes of temperature. Another woman was sitting in a pool of water scraping a strip of bark on a board with a cockle shell, and a little farther on in a house we heard the tap, tap, tap, of the mallets with which similar strips of bark were being hammered out thin preparatory to being pasted together to farm the "tappa" cloth with which they dress themselves. Out in front of the house on the pure white coral sand a large piece of the tappa cloth is spread and women artists with their paints in cocoanut shell pots, and brushes from the ripe pandanus fruit are putting on spots and figures in various colors, with some skill and much comfort, their tongues meanwhile perhaps working much faster than their hands.

At other places we saw them weaving mats of cocoanut or pandanus leaves, or stringing sugar cane leaves into sticks a yard long with which to thatch some newly constructed house. But the women do not do all the work in this land of sunshine and song, for we often saw the men preparing the meals in the little square cooking sheds at the rear of the houses. They, too, build the churches, bringing the coral blocks from the reefs to burn for lime, and the timbers from the forests, and this morning we saw several men plaining and sawing and nailing, well along in the construction of a war-canoe or long-boat. It was fully 50 feet in length and was arranged for 24 oarsmen. Adjustable sailing gear was also to be shipped. It is in these that they go on their "melanges," or visits, to Apia to take their produce. It is a scene to which I cannot do justice in description, to be out in a boat and be passed by one of these long slender war canoes, propelled by 24 powerful pairs of arms, some 25 or more gayly dressed men, women and children besides the rowers, crowded into the boat and all singing a lively chant in perfect measure with the oar-stroke.

In the village of Sasai we entered a house to inquire the path to Tapueleele and to rest awhile. We were greeted with "talofas" and hand shakings all around and then seated ourselves on the clean matted floor. The Samoan houses are encumbered with no useless furniture, the floor of its only room serving as a place to sit, eat, and sleep. It is said that a person can accustom himself to most anything, but I never succeeded in accustoming my somewhat lengthy legs to Samoan life. After greetings I presented my hosts with some bits of kava root. I was soon asked if I would like some kava to drink, and being very thirsty after the morning's walk in the hot northern sun, I readily assented. As it is always the duty of young girls to prepare this cooling drink, and there were none in the house, one was called in from a place near by. The root is ground up on a flat stone and then soaked with water in a wooden bowl. Afterwards the fibre is strained out leaving a dirty looking liquid which tastes very much like soap-suds. It is passed around in a cocoanut cup, and must be gulped, not sipped. I soon became used to the taste and found it very refreshing.

Another girl came in to prepare a paste of lime with which she smeared two men's heads, rubbing it thoroughly through their hair. This custom is common in many countries, the purpose being to bleach the hair to a yellowish or reddish brown.

After drinking the kava I lay down to rest and Misi went off with one of the girls to catch some fish. When they returned and the fish were cooked we had our dinner.

A man from the village to which we were going, with his wife and child, came to me and offered to escort my party there. The path was choked with weeds; in some places ran through banana patches, and in others followed the dry bed of a stream. It was a constant surprise to me to see how the natives could walk barefooted over the sharp rocks without apparently hurting their feet. Towards dusk we arrived at Tapueleele, a village consisting of but four houses.

We found that our escort was the "big chief" of the place, and according to his wish stopped with him for the night. But before it become to dark we hastened to the cave to try to secure some bats. I had previously tried my best to make sure whether they were bats or swallows which haunted the cavern, but could get but little satisfaction since the natives' ideas did not seem to be very clear on the subject. The entrance to the cavern was at the bottom of a deep depression, down the sides of which we scrambled, hanging to roots and branches, and sticking our heels in the soil to keep from getting down too soon. The interlocking trees above cut out most of the remaining light of day, and gave the place an air of gloom and awe. I now found the cause of my trouble in learning from the natives whether birds or bats occupied the cavern. There were both, and numbers of each were fluttering and flitting about the entrance, some coming out and passing away between the tree tops, others returning, would whirl back and forth a few times at the mouth of the cave before entering. To my great disappointment I found that it was impracticable to enter, owing to the muddy floor, caused by the recent rains. I had hoped to enter and study the habits of the winged inhabitants of those dark chambers, but now I must content myself with standing at the open door and slay them, as they entered or emerged, with branched switches. This was a cruel sport, but it is so often the fate of the naturalist to be a destroyer of life and producer of misery. Far better would it have seemed to let them flit on in happiness undisturbed, but no, science calls for their cadaverous bodies. We secured in this manner about 100 bats and a few swallows

In the evening I was entertained by several of the village folk. A large tin of meat was distributed to those assembled at the evening meal and was, I am sure, quite a treat to them, as their customary diet is mostly on fruits and starchy foods. Aside from fish they do not often have meat, although they have some fowls and pigs. Rectangular palm-leaf mats about 12 by 20 inches are lain on the floor, on which to place the food, each mat serving for one or two persons. The food is only cooked in the morning and is kept in palm-leaf baskets hung on pegs on the cross beams of the house. After it is distributed around on the mats, all sit around—on the floor also—with the legs curled up, and eat, using fingers for forks. Bread-fruit, taro, yams, bananas and cocoanuts are the customary food. All are cooked even the banana which are almost always used green.

In the evening, family prayers were said in each house, followed by the singing of a hymn.

Naturally I was the whole topic of conversation among the natives, but as I could not understand them I amused myself studying their actions and habits. During the evening I quite surprised one of the young misses

by writing down long strings of figures on a pad of paper and then reading it off in her own language. She in return interested me with writing down some of their native songs.

Nearly all of the Samoan people, especially the young ones, are able to read, write and figure in their own language.

When bed time arrived most of them stretched out on the mats where they happened to be sitting. The head is rested on a bamboo stick 3 or 4 inches in diameter with legs under the ends to hold it up about 3 inches from the floor. As my neck was not yet toughened to such a pillow I was given a roll of tappa cloth instead. I was also honored with a mosquito-net screen to hang around the "bed" or rather mat.

In the morning early we visited the cave again and got as many more bats as I desired. The chiefs who have the charge of these caves claim a right to a slight fee for allowing any one to go to them. It was plain to see when I gave them 50 cents for my lodging and 50 cents for the fee, that they were not very much used to getting money.

Out of decency I had to wait until after the morning meal, which was served about 10 o'clock, before starting on my return. While waiting I sat in the house and looked out upon a pouring rain, anticipating the pleasure of walking through the tall wet grass. Breakfast was rather sumptuous and I fear I ate too much. After the usual exchange of presents—my boys being nearly loaded with cocoanuts and other eatables, even a fowl, as a result—I bid all good bye. There was an aged woman in the house who was nearly blind. She held out her hand when she heard me coming, I took it and said "tafa" and started to go but she clung to my hand saying, "love to you," that she was sorry they had nothing nice to give me, and many endearing things which unfortunately I could not understand, then kissing my hand twice allowed me to go. When we reached the coast we were as thoroughly soaked as though we had been wading, that is I was, but the boys who only wore a bit of cloth about the hips, were not much inconvenienced.

Many things of interest occurred on the journey home, but to try to give the reader a good idea of Samoan life would be beyond the limits of this article.

Suffice it to say that we arrived at Iva, after making several stops on the way, before night and were warmly welcomed.

E. L. POTTER,
Rochester, N. Y.

Botany.

The study of Botany has from the first been very popular, and no doubt will continue so to be in the years to come, says M. J. Elrod in the Illinois Weslyan Magazine. There is an attraction about flowers that has charms for all. Their colors are so beautiful, the fragrance so noticeable, the leaves so odd or something else so specially noticeable that few can resist the charm. We would not want it otherwise. And this being the case, the question comes to the student as to how to study plants to the best advantage.

The first study of plants, as of animals was wholly systematic. Classification of plants, with descriptions on blank sheets or books prepared for that purpose, was the larger part of the study. The beginner spent the greater portion of his time in pressing, mounting, analyzing and naming his collection. In the end he had a nice, showy collection, properly labeled and very attractive.

This process of study was very wasteful. Hundreds of plants were destroyed annually, many rare species became rarer, and the profit was small. Bloomington and Normal are adjoining towns. In Bloomington the students of the Illinois Wesleyan University and in the high school of the city study plants every year. In Nor-

mal the students of the Illinois State Normal it is perhaps a low estimate to say that 300 students annually study botany. If each of these is to collect fifty specimens the number at once reaches 1,500 plants. It is not unfair to say that each student will pluck, for bouquets or extras ten plants for every one mounted. This brings the list to 150,000 plants annually. Residents from the cities will easily double this number while out riding during fine weather, and we are then above the half million line. Let this be kept up for twenty-five years and the figures are appalling. The question of how to preserve the native flowers around large towns or cities is fast becoming of grave importance The first start on the remedy is to stop collecting on so extensive a scale. It is obvious, however, that this argument will not apply to all places.

But this method of study was not only a useless waste of material, but it was beginning at the wrong end. Classification is the most difficult of scientific work and should be brought in after a study has been pursued for some time rather than at first. There must be a foundation. Plant characters must be studied, their adaptation to surroundings worked out, their structure must be known, the food determined, before any generalizations can be made or affinities traced, and the average student who begins the study by classifying sees nothing of the meaning to be conveyed by the process of analysis.

Again, classification must of necessity for the beginner be confined to higher types, or flowering plants In this day of microscopes and laboratories it is not only a desideratum but a necessity that lower types be studied. No one would think of studying birds alone and claim to even approximately gain a knowledge of the animal kingdom. And no one can hope by a study of one branch to get even a passing knowledge of the vegetable kingdom. Bacteria, smuts, moulds, mushrooms, seaweeds, etc., greet us daily during a large portion of the year. Our practical eye demands that they be given attention.

Every teacher knows that the primary object of a study is to cultivate some of the faculties of the student, to give him proper habits and methods of thinking, observation and study, and that the facts he gains from his labors, while very important are secondary. As Dr. Jordan puts it, "To the child, training in method of acquiring knowledge is more valuable than knowledge itself. In general throughout life the sound methods are more important than sound information. Self-direction is more important than innocence." Botany as it was taught failed in accomplishing the ends sought. The good ones carried the poor ones, who relied on help to get through. It was largely memory work, mechanical, often distasteful, and not infrequently barren of good results. It presented no problems of life for solution. It did not introduce the student to those nice adaptations between insects and plants. It presented nothing of the struggle for existence. The philosophy of life and growth had a small place in it. Plant food, plant movements, respiration and circulation were touched upon briefly; and all these should have been discussed to some extent before an attempt was made at drawing fine distinctions among species.

Yet the study was not without its benefits. The rambles in search of flowers cultivated acquaintance with nature and gave health to the student. There is much of profit in the careful examination of leaves and flowers, if it is not made mechanical and thoughtless. Properly pressing and preserving flowers likewise has its valuable qualities to the student. It is not because the study had no value to the student that it changed. It was because it could be made far more valuable.

The knowledge that all the animal

and vegetable matter was composed of cells was first discovered in 1838. Since that time all our knowledge of tissue, growth, reproduction, and matabolism in plants has been discovered. In America Botany has not been a study all these years. The classic books of Asa Gray really made the tudy a science for American students, and the great numbers of them yet in use testify to the popularity of the books and the study. In the last ten years a great change has taken place. The laboratory largely takes the place of the field, and the microscope has displaced the plant press. The higher institutions of learning could readily adapt themselves to new methods to correspond with later discoveries. But to reach the high school requires more time. Yet at the present time the change is quite complete. The little volume of Spalding is witness to this fact and the wide circulation it at once received is evidence of the value American teachers put upon laboratory, class and library work combined in the study of Botany. The next year after the publication of the work mentioned, Bergen's Text-book of Botany appeared, which was at once given a hearty reception and a wide sale, and introduced the subject in a new way.

But how will all this apply our non-resident workers? It is taken for granted they have no one to give class-room instruction, and are obliged to work out the subject alone. What they need is some books to point out lines of observation and investigation. They have abundant material before them, can with little difficulty work out many interesting and important problems, and can cultivate habits of accurate observation as well as secure abundant material upon which to philosophize and reflect. With a proper guide to direct the worker in right channels, the non-resident may have very satisfactory results He will need some material, but much of it is at hand. While a microscope may be called a necessity, much good work may be done without it. It is to be bourne in mind, however, that Botany is a study of plants, and not of books and pictures. It does not mean memorizing terms or writing long and meaningless descriptions on blanks with spaces to be filled in It does not mean reading effusions on the botany of color. It does not mean roaming through fields, plucking bouquets, nor collecting to see how many kinds may be had. It means the study by direct observation of the morphology and physiology of plants, their means of propagation, protection and dispersal; the influence exerted on them by their environment, the struggles they have for existence, the forces within them, the process of food manufacture, and kindred subjects. After such study the student understands what he is doing when he takes up systematic work, and a properly classified collection means something.

The student must of necessity record his observations and results, or they will become useless through being confused or lost. Permit an illustration. Dr. William Trelease, Director of the Missouri Botanical Gardens, at the recent meeting of the Botanical Society of America, at Buffalo, N. Y., gave an admirable address on "Botanical Opportunity," which is worthy of wide circulation Next to clear idea of the end aimed at he would place the immediate making of full and exact notes as their most essential part Referring to the noted botanist, Dr. Engelmann, who was also a physician, and referring to the time he arranged Dr. Engelmann's notes and sketches, he says:

"I was far more surprised at these than I had been on collecting his printed works, for when mounted and bound they form sixty large volumes. In addition to their intrinsic value, these are of more than usual interest as showing the methodical manuer in which Dr. Engelmann worked. On his table seems to have been always a bundle of plants awaiting study. As

each specimen was examined, its salient features were noted and sketched on the back of an ever-ready prescription blank. When interrupted he laid his unfinished sketch away with the specimen, to resume his observation and complete his study at the first opportunity,, without any doubt as to what had been seen in the first instance. And so from individual to variety, from variety to species, from species to genus, and from genus to family, his observations were preserved in memoranda which facilitated the resumption of interrupted work at any time and lapse of time. In no other way could the odd moments between the daily calls and occupations of a busy physician have contributed so much to botanical knowledge. In no other way could his seemingly small opportunity for investigation have been converted into a great one."

The busy people, who employ every minute of their spare time to complete some observation or work, are mainly the ones who accomplish results of importance. Those who have plenty of time are not likely to appreciate its value, and let it pass unused. The botanical opportunities of American students are great, and the subject ever widening in its scope. If the individual student will look about him, form some systematic plan for work, pursue that plan, record accurately by notes and drawings everything examined aud read, he will meet with such success as to make him satisfied with the results, and to give him interest enough to continue investigations at leisure moments on some particular phase of the study. But the worker who is isolated, away from the laboratory and library, must of necessity confine his work to larger forms of plant life, and more of external characteristics than to microscopical structure. He must consider his opportunities and plan his work accordingly. But the study of the book prescribed, if unaccompanied by such work as has been suggested, or by works of reference, must be very unsatisfactory and not productive of good results.

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Walter F. Webb, Editor and Manager

Albion N. Y.

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NOTES.

Collectors interested in Birds and Eggs should read the notice of Chapman's Birds of Eastern North America in another column. We have in our work discarded the antiquated works of 15 to 30 years ago and take up the new with joy, covering as it does every phase of the subject. While limited to Eastern Birds western collectors will find it one of the most valuable manuals of modern times.

Reminiscenses of a Trip to Schoharie.

PART V.

At the commencement of the Revolution, the whole country now embraced within the limits of Schoharie county, contained scarcely a thousand inhabitants; the greater part of them lived in the valley of the Schoharie.

In the last paper was given a short history of its settlement. Their life,

after a few years of many vicissitudes, was a quiet and uneventful one, until the gathering storm of the Revolution broke upon them in 1775.

While the settlers were for the most part loyal to the mother country, they were literally forced through persecutions and taxes to espouse the cause for liberty.

During the two years subsequent to 1777, no large party of the enemy appeared, but individual after individual and family after family were missing from the more remote parts of the settlements. The smoking ruins of their dwellings, the mutilated remains of the inmates and the butchered domestic animals killed by the enemy record their fate. Many of their old neighbors were Tories who were generally in command of the Indians in the raids upon the valley. It can be said of the former, that in point of ferocity and inhumanity they were worse than the Indians. Many of the Tories lived in isolated or secluded places, and their Tory friends would come down from Canada and there find place of retreat. Not infrequently on such occasions would they take back to Canada the scalps of their former neighbors and friends. Nor was this all, many of these same Tory friends were poor and had to be fed by the very men the heads of whose families they were helping to destroy.

Early in 1777 the enemy matured their plans and Captain McDonald—a a refugee from Johnstown, a noted Tory leader—was to make his way from the Susquehanna through the Schoharie settlements, destroying as he went, and then to proceed on to Albany to meet Col. St. Ledger—who with a large body of British Tories and Indians was to start from Oswego, and ravage the Mohawk valley. Sir Henry Clinton was to do mischief on his march from New York to Albany and Gen. Burgoyne was to leave Crown Point on the north and push his way outh to Albany also. Thus were the four worthies to each do his part of the campaign, and all to meet at the general rendezvous—Albany.

This was a most trying time to the people of New York. To meet and repel the several attacks appeared to some of the most patriotic a matter of impossibility. Let us see what was done by the people of Schoharie.

The Schoharie militia was called into service early in the year. They first proceeded to arrest several Tory leaders who lived in their midst and were enlisting recruits for the Royalist forces. After thirteen days' search Col. James Hultson was secured together with some twenty genial spirits, who were delivered at Albany. (Hultson was afterwards hung.) Learning that Capt. Mann—a resident and member of the Schoharie militia was enlisting a force of Tories, he was arrested. Through fear of him Capt. Mann was causing the patriotic inhabitants to take up arms against their own people. He also was in correspondence and league with Capt. McDonald who was in the upper part of the valley.

Col. Harper being notified that McDonald's force was at Breakabeen, and being afraid to risk an attack with so small a force, proceeded at once, alone, on horseback, to Albany for assistance. His trip was full of dangers and escapes, as the road was beset by Tories to stop him. He reached that city in safety however and returned with a "mounted *army* of twenty-eight stout looking men."

The effect of these few men was marvelous; soon a large body of the friends of liberty gathered, who proceeded to Breakabeen. In the battle which followed Lieutenant Wirt of the cavalry was killed and two were wounded. McDonald fled towards Niagara. Thus did the bold settlers of Schoharie do their part in the campaign of 1777. During the Fall, to better protect themselves they began the erection of the Upper, Middle and Lower Forts. The principal event of the next year was the battle between

Capt. Patrick and a body of Tories and Indians at Cobleskill, in which the Captain and 22 of his force were killed. The same year Col. Wm. Butler, with one of the Pennsylvania regiments and a detachment of Morgan's riflemen was stationed at Schoharie to protect the people. His arrival had a salutory effect, by discouraging the disaffected and by the presence of a stronger force than had yet been among them, establishing the confidence and reviving the spirits of the people. Col. Butler was a brave and experienced officer especially qualified for the service upon which he was appointed.

Attached to the Morgan rifle corps were several bold spirits who signalized themselves in the partisan warfare in which they were engaged. Chief among them was a Virginian named Timothy Murphy who was remarkable for his fleetness on foot, his great courage and extreme accuracy in firing.

Each year until the close of the Revolution brought many raids by the Tories and Indians. The most important was in 1780 when Sir John Johnson with a force of about 800 entered the valley from the south. They were much annoyed in their march by a small force of the militia under the command of that valiant officer—Col. Harper. Their movements were watched and a timely alarm was sent down the valley to the settlements. The people fled to the forts upon the firing of the alarm guns.

The fort was but feebly garrisoned to engage so large a force, and worse still—it is recorded that in the Middle Fort, which was first invested only a single pound of powder remained in the magazine. Their ammunition wagons had been sent a few days before to Albany for a supply but had been detained beyond their usual time. To attempt to defend the fort in this plight appeared to be madness; to surrender was to deliver up themselves, their wives and their children to immediate death or at least to long captivity.

It is said that Major Woolsey, who commanded the continental troops, was inclined to surrender on the first appearance of the enemy, but was prevented by the officers of the militia. The Major's presence of mind forsook him and he hid himself among the women and children. Being ridiculed by his men he crawled around the intrenchments on his hands and knees, amid the jeers and bravos of the militia, whose courage revived as their laughter was excited by the cowardice of the Major. The enemy perceiving that their shot and shells did little or no execution, formed and prepared to carry the works by assault. At this period they sent a flag towards the fort with the summons to surrender; nearly all were inclined to admit it, when Murphy, who suspected it was only a ruse to learn the strength of the fort, fired upon it. The flag returned and soldiers were ordered to arrest Murphy, but so great was his popularity among the militia that none obeyed.

The second time the flag approached and was a second time driven back by Murphy. Major Woolsey then ordered a white flag to be raised from the fort, but Murphy threatened instant death to any who obeyed. The enemy sent a flag the third time which was again compelled to retire.

The British officers now held a counsel of war and after a short consultation withdrew their forces, proceeding down the Schoharie Creek towards the Lower Fort, burning and destroying everything in their path. The loss of the garrison was only one killed and two wounded. *

Thus by Murphy's determined spirit of resistance was the lives of hundreds within the fort saved, else there is no doubt but that the tragedies of Wyoming and Cherry Valley would have been depicted over again.

The invaders showed little disposi-

* Campbell's Border Warfare of New York.

tion to attack the Lower Fort, though its garrison did not amount to a hundred men. They approached near enough however to fire a few shots into the tower of the stone church, but a discharge of grape from the fort drove them back, when they continued down the valley and through the woods to Fort Hunter on the Mohawk.

The beautiful valley of the Schoharie presented a scene of devastation that evening not easily described. Homes, barns and numerous stacks of hay and grain were consumed by fire; domestic animals lay dead everywhere over the fields. The buildings belonging to the Royalists alone had been spared, but the militia turned out and set fire to them in revenge. After the burning of Schoharie, this settlement ceased to be so much an object of tory vengence; during the years 1781 and 1782 though, there were frequent alarms, but little damage was done by the enemy.

Nearly 125 years have elapsed since the tragedies were enacted; the actors themselves are no more, yet the very mention of the events sends a chill current to every youthful heart in the valley.

It can be truthfully said of those honest and God-fearing Germans who rooted themselves in the Schoharie valley, that they proved one of the best stocks which have made the American people. They were never popular with the men or women who wanted to make America a new London or a new England, with courts and castles, aristocracy and nobles.

What ever in their wanderings they lost or were robbed of, they managed to hold to their hymn-books and Bibles, and in the case of the Reformed Churchmen, their Heidelburg catechism.

Though other nationalities afterwards helped to make the Schoharie valley cosmopolitan, it was by this branch of the Teutonic race that the region was settled and defended. Their characteristics were the intense love of liberty, deepseated hatred against feudalism and the encroachments of monarchy in every form. Especially did they find destestation in the established or government church. Theirs was the democratic idea in church and state, and they expressed it strongly

ROBERT M. HARTLEY,
Amsterdam, N. Y.

Cuba as a Naturalists Paradise.

The Island of Cuba is just now hardly a desirable place for the average non-combatant to find himself in and if we are to believe the reports sent into an eager press concerning the epidemic of Yellow Jack and Small Pox which are once more beginning to rage now that the wet season has set in we can readily imagine that the warring men upon the Island find themselves in not exactly a desirable residential portion of the western hemisphere. And yet not withstanding James Creelman's woeful tales of the stamping flat of towns and the ravaging of provinces with the embellishments of dying thousands wasted with starvation and fever—notwithstanding the harrowing nature of the pictures which this great war correspondent and his equally talented purveyors of horrors conjure up before the minds eye, even now at this seemingly inauspicious time, do I a normally constructed and rational human being, yearn that I may wander again upon the white sands and amid the glorious verdure of the Pearl of the Antilles—despite the popping of the Mausers and the waving of the yellow flag—for be it known to you readers—that I am of the collectors a collector and all that is strange and beautiful in Nature's offspring is of vast interest unto me—be the object bird, beast, insect, reptile or shell, in me it will find a willing worshiper at its shrine and upon the hills and in the valleys of the Isle De Cuba I have roamed and collected of old and know from personal experience that rare treasure dear to he who fills his cabi-

net with what he terms specimens—but the rude outsider terms trash—are to be found in profusion there and hence do I long to once more reach its now bloody shores. Yes give me the full paraphenalia demanded by necessity for one who collects in the particular branch of natural history which I have chosen—namely Lepidoptera—and I will run the risk of wild shooting and deadly army canned mule in order that I may collect and be joyful. The Island of Cuba is a most splendid spot to delve who would collect Birds, Butterflies, Reptiles, Botanical specimens, Shells and Crustacean horrors. I make no mention of Animals for outside of Cuban vs. Spaniard very little shooting of mammals can be enjoyed in Cuba. As is usual in the tropics the Birds in the Island are of very bright colors as a rule and so great a variety is presented to the notice that I feel confident that he who would write a history of the Cuban feathered life must be possessed of great patience and long life else he will hardly live to complete it. Parrots by the dozen varieties chatter and scream amid the dense vegetation; Pigeons, of kinds the Northern States wot not of, coo and bill in the most approved manner provided by the poet; Catbirds with most melodious wailing voices are ever present to remind the reminiscent collector of the nocturnal weeper of the American cities and Quail and Patridge line the plantation hedges in droves and Guinea Hens and wild fowl unknown to any ken save that of the expert oologist flap their wings in defiance of man and coops and wanders in large numbers rarely disturbed by humanity. On my own particular branch of study we have in Cuba a plentiful representation. The most superb varieties of Butterflies and Moths exist in profusion. I remember in particular during my last trip there in 1895, that I found the beautiful *Heliconia charitonia* in exceedingly great numbers. Several varieties of the rare *Papilios* were also very common and the moths were both beautiful and plentiful, the exhibiting of a bright light in the open at dusk being all that was necessary in order that a large collection might be made. In the other orders of insect life there were many really wonderful examples of ugly and yet beautiful crawly things. The much talked of Tarantula, for instance exists there in considerable and most uncomfortable profusion and I must say concerning that creature that to the contrary of my considering the newspaper stories concerning its horrible appearance to be exaggerated, I sincerely believe that the usual reports you read concerning this nasty sprawling hairy monster of a spider hardly do justice to his creepy ugliness. One time in particular I remember one day seeing one, in which my whole being recorded a sickish chilling sensation which commenced in the *Medulla oblongata* and ended in my hair. On this day I saw a great big one run across the stone floor of a sugar house, he was bristling with agressiveness and looked as deadly as I have no doubt he was. on this particular case he met a sudden and awful fate, for a shoe propelled scientifically from the hand of a machinists assistant caught it fairly amidship and presto my spinal cord registered a cold chill and my hair became a dream of pompadour perfection for wonderful to behold the hairy nightmare crinkled up into a little tiny bunch of wool so insignificient when compared with the original size of the living specimen that I immediately had recalled to my mind the case of the lamented "She" of the immortal Rider Haggard tale and her transformation into nothingness in the whisking flame of life.

Then I remember the large number of trapdoor spiders, peculiar creatures they are surely. In a few respects I think resembling human beings, for when an innocent insect of cumbrous dimensions alights near its concealed door—pop he goes within and tremblingly closes down the trap and tells his

wife and offspring to go over to his mothers a dozen blades of grass south, then when out of curiosity he finally cautiously peers out and perceives that he has only a great stupid blundering grasshopper or stupid fly to deal with he immediately becomes valorous and opens the door of his home and stomach to the wretched victim and goes rejoicing to his wife, having snatched victory from the very jaws of defeat and proceeds to live and bask in the sunshine of cheap success, false as the promises of a land agent and cuddles himself into a smirking belief that he is a hero. If the reader declines to believe that there is anything human-like in the above described actions I will consider that I have cause to congratulate he or she for I clearly perceive that the people who have crossed their path in life have been very different from a few whom I have met in my sojourn. Of the waving palms with stems straight as arrows and 50 to 60 feet up clean as a pipe stem till the first leaf is reached, of the twining vines and hanging moss and the wild lemons and oranges and fruits unknown to any save a Cuban and uneatable by any save an ostrich or a small boy of these I have herein not sufficient epace to more than mention. Of the enormous snakes which are in themselves subjects fit to fill several pages of THE MUSEUM in describing and of the horrible goggle-eyed land crabs and other spidery crustaceans, on these also I must reluctantly only touch, but I wish to make it quite clear before I close that Cuba bathed as she is in the blood of contending armies and ravaged with contagious diseases, is yet trite with interest for the Natural Historian and well worth an extended collecting trip by the enthusiastic naturalist even though it may be deferred until the bombs have ceased to tear humanity into fertilizer and when the drum head court martial and shooting of war correspondents shall have been as things which have passed away.

ROBERT PHILIP FROELICH.

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THE MUSEUM.

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VOL. III. ALBION, N. Y., MAY 15, 1897. No. 7

Reminiscences of a Trip to Schoharie.

(PART VI.)

Among the many objects of interest in Schoharie county, perhaps none are of greater notability than the old Stone Fort in Schoharie village, and as it has been mentioned many times in these articles, I believe that a short chapter should be given to its history.

THE OLD STONE FORT.

This edifice was built in 1772, as a house of worship under the pastorate of Johannes Schuyler. The material of which it was built—it is said—was contributed by the inhabitants of the valley and surrounding neighborhoods, and, it may be seen upon investigation, that the stone is from different localities. Also in evidence to substantiate this bit of interesting history, there can be seen upon many of the stones in the structure, carved in deep letters the names of many of the donors, which now after a lapse of 125 years, many are still as eligible as when carved. Among the names we find that of their beloved Domine—Johannes Schuyler. Johannes Ball, (chairman of the Committee of Safety), Thomas Eckerson, (donor of the ground) and those of other good men whose decendents are among the first in the county, viz:, the Vroomans, Werths, Richtmyer, Rickert, Lawyer, Becker, Enders, etc., etc.

It may also be of interest to know that this church was not the first built in the valley. Soon after the settlement of Schoharie their fathers built a wooden structure upon a knoll a little to the east of the new site, which stood until the stone church was completed.

Domine Schuyler preached to his congregation each Sabbath for two hours in the morning and two hours in the afternoon, in unalloyed Low Dutch and John W. Brown led the singing. (Brown was afterward County Judge, also author of a History of Schoarie county.)

The good Domine preached to his flock, in the old and new church 31 years with so much influence that his labors successfully pacified the political views of his people during his life. After his death in 1778 or 1779, the congregation became demoralized by the existing political troubles constantly arising and increasing, so in many cases fathers were arrayed against sons, brothers against brothers and reckless vengeance actuated many to desperate deeds.

As has already been said in a former paper, an armed force was constantly quartered at the Lower Fort (Stone Church) at all times, owing to its exposed position, and the people sought its friendly protection each night.

The occasional invasions by the Indians and Tories and the flying rumors were sufficient to arouse and awaken the settlers to caution.

When the proclamation of peace came in 1783, the suffering patriots had a jollification around the Fort which lasted three days and nights. The little cannon in the fort echoed their great joy in welcoming peace. The valley scouts and soldiers returned to their homes, and at once rebuilt their houses.

Many were the vacant places around their firesides, yet *Liberty* was the purchase price.

In 1785, the block-houses and pickets around the fort was razed, seats were again placed in the building and the structure once more became a place of worship; it was used as such until the year 1844, when a new church was built further up in the village. From 1844 to 1857 the church was little noticed by the residents, as it was a too familiar object to be attractive, and to the stranger, its simplicity and dimentions as a fort were in ridicule.

In April, 1857, the building was deeded to the State of New York for the sum of $800. Its preservation as a Revolutionary Fort being the strongest argument that could be brought to bear to secure the appropriation to purchase it. The State remodeled it in a measure for an arsenal, but not having use for it, in 1873 through the efforts of Assemblyman Peter Couchman of Schoharie, it was donated by the State to the County. Although it was to revert back to the State if the County failed to keep it in repair. The Board of Supervisors each year donate small sums for that purpose.

Upon the organization of the Schoharie County Historical society in 1879, the county gave them the use of the building as headquarters and a museum.

A most fitting thing to do and a very appropriate place for Historical Rooms, by reason of its being connected with so much Schoharie Revolutionary history. So today within the walls of this old structure which has withstood successfully through all its perils—and the march of progress, may be seen the relics of other days.

Here on lhe lower floor are many old, quaint and rude agriculture utensils, and tools of the mechanic, furniture, spinning wheels and many other household goods and common articles once owned and used by those who were early connected with the building of the church and the early history of the county.

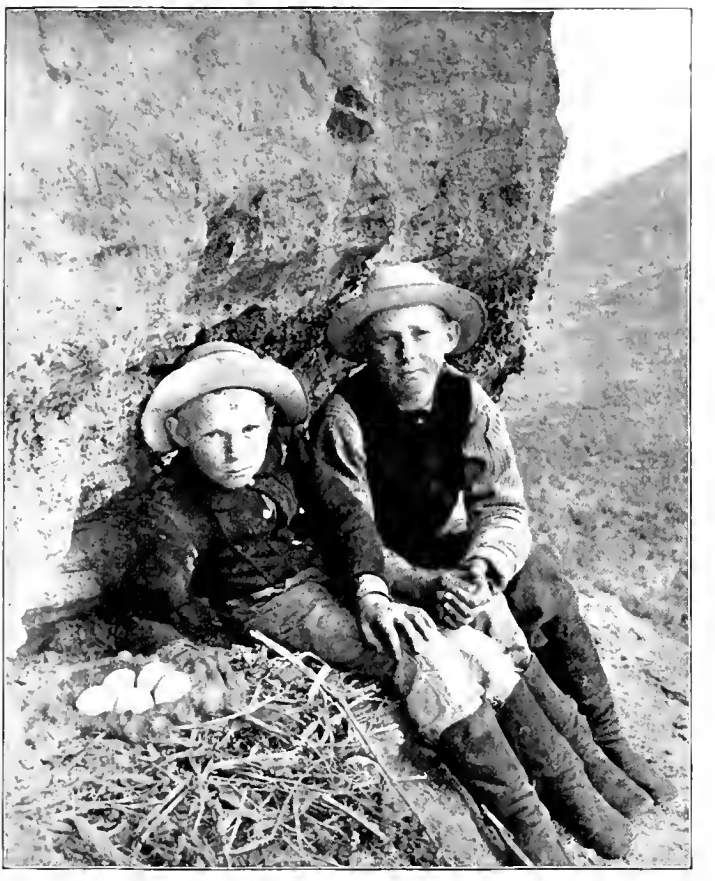
Upon the second floor are found many old public documents, maps, letters of many of the most noted men of the early days, ancient Revolutionary flint lock guns and pistols, carved powder horns and other accoutrements, old books, Dutch Bibles, early newspapers and public notices, collections of Indian relics (mostly local), geological specimens, and many other things too numerous to mention. The whole collection is not surpassed in variety, curio and value by those of many older societies

Many of the articles, to be sure, are only loaned by the members of the society and individuals, althongh the greater part have been donated to the society. The largest collections loaned, are those of two Schoharie's noted antiquarians, Dr. C. H. Kingsley and Henry Cady—the latter secretary and curator of the museum. Both collections are local and contain many fine specimens of aboriginal stone art. The collection as a whole is quite complete, interesting and well worth seeing by the tourist as he passes through the beautiful valley.

So today the "Old Fort" is an object of great interest, as the visitors' register reveals. Looking over its pages we find thousands visit it annually, and still they come from all distances, all with equal interest and veneration. Once so full of heart rending scenes, heroic deeds and valorous exploits, it is today venerated and highly valued by each and every one of Schoharie's patriotic residents.

It is patriotic to preserve and gather here the articles of the early residents and builders of the county. Thus preserving to memory the price of true devotion of what we are indebted to now enjoy—LIBERTY.

ROBERT M. HARTLEY,
Amsterdam, N. Y.



Canada Goose found Nesting on the Cliffs, in Routt Co., Colo

Away out here in extreme Northwestern Colorado some certain individuals of the wild goose family have developed a new and charming trait by seeming to prefer some old deserted hawks' nest, in a tree or on a cliff near the river, in which to deposit their eggs and bring forth the rising generation, says Amos S Bennett in *Sports Afield.*

I had frequently been told by people examining my collection of eggs about a pair of geese that were in the habit of nesting yearly in a tall cottonwood tree near Cross Mountain; but I never really gave the story much credence until quite recently, when, out hunting with a camera one day, I came to a limestone cliff overhanging the river. In the layers of this cliff was a strata of rock, softer than that above or below. The soft rock had been formed along the entire length of the cliff. An object on the ledge attracted my attention and seemed to demand an investigation. Not being able to get a clear view of the thing, I thought it might possibly be a lion or a bob-cat, and knowing it would have to escape along the shelf, I originated a plan for catching his photograph as he came along. Returning to a neighbor's house, I secured the assissance of his two sons and their gun. Returning to the cliff, I made a circuit over the mountain to the farther end of the ledge. Carefully focusing my camera on the spot where the supposed lion would come in making his escape, I signalled the boys who opened fire at

the rocks near the lion. Imagine our surprise when, with loud squawking, an old goose flopped down off the cliff and settled in the river below. This was evidence enough that a nest was somewhere near, and a climb along the ledge began—resulting in our finding a nest containing five eggs in an advanced state of incubation. With much difficulty the camera was brought up and three snaps made of the nest (only one of which proved good)

Now, can anyone tell me how Madame Goose was going to get her goslings down in safety from their extremely elevated home? Unthinkingly I took the eggs home for my collection, instead of leaving them to be hatched out—which would have enabled me to have solved the mystery with respect to the safe removal of those youngsters to their native element.

Prehistoric Ruins in Arizona.

While the ruins in the Salt River Valley are not so often heard of, perhaps, as Casa Grande (in the Gila Valley) or Montezuma's Castle (on Beaver Creek), they are none the less interesting to the student of Archæology.

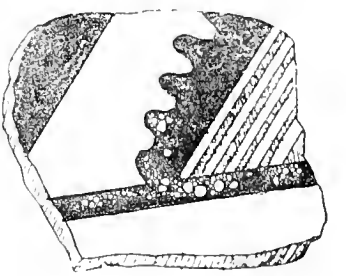
There are seven important groups of ruins in this valley, besides a number of smaller ones They are all situated within a radius of twenty miles from the city of Phœnix.

Each of these groups contain two temples (?) ruins. One of these is elliptical in shape, and Mr. Frank H. Cushing, who was in this Valley some eight or nine years ago, says these are Sun Temples They are often called reservoirs by the tourists and others who visit the ruins. They are not the ruins of reservoirs as the ancients had numerous canals which brought the waters of the Rio Salado to their land, and they would, without a doubt, prefer this water to that from reservoirs.

The other are rectangular in form, and are, as a rule, the largest ruins in the group. Specimens are not often found in these temple ruins, but when one is found, it is a valuable one to the Archæologist.

I have never found any entire pottery in the ruins in which the people are supposed to have lived. When excavating one of these ruins, I find, after a little surface dirt has been removed, a layer of chunks of hard dirt, some of which is from the walls, and some from the roof. That from the roof is imprinted with sticks. After this is removed a layer of ashes and charcoal is enconntered. This is but a few inches in thickness. Charred corn cobs, often with the grains of corn still sticking to the cob, are frequently found in these ashes and on the floor. I have been told that charred bread (?) was found in a ruin not far from Tempe.

When this layer of ashes and charcoal is removed, the hard dirt floor is brought to light. Many fragments of pottery, a few of them decorated are found on the floor.



The homes of these people appear to have been destroyed by fire. Finding the ashes and charcoal prove this: the roof was of brush covered with dirt.

I fear that I have made this article too long for publication so I will close, hoping to have the pleasure of writing again sometime for THE MUSEUM.

BURT OGBURN.

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

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NOTES.

Subscribers who do not care to avail themselves of the advantages of our exchange columns can send 50 cents for the MUSEUM one year as formerly, but the MUSEUM with the two coupons is $1 a year. The two coupons to any collector for 50 cents is the best investment he could make. The following is only a fair sample. Mr. Glover M. Allen of Mass. writes us under date, May 8, 1897: "I recently asked you to insert an ad in the April and May numbers of MUSEUM advertising a camera for sale. The April ad. was enough, and I sold the camera, so please do not insert it in the May number." Its a fact that practically anything that is used by collectors can be sold or exchanged through our exchange columns. Try them. The cost is only one cent a word.

Dr. F. Henry Yooke of Foosland, Ills., author of "Days with our Upland Game Birds," "Days with our Waterfowl" is preparing a new work entitled "Our Ducks," a history of our various birds both divers and nondivers from egg to maturity, in which he carries one from the south to the extreme north and back, showing their habits and nesting grounds, based on parallel lines, flights both migratory and local, above and below frost line, full description of all foods, depth of water, and practical ideas for stocking and restocking new or old grounds, in lakes, sloughs, swamps or marsh, with charts of nesting and foods; is a new departure in the annals of duck lore, and must prove very interesting not only to clubs owning or controlling grounds, but naturalists and hunters generally. It will be published in book form in August, provided the list of 500 subscribers be filled by that time. The Dr. is well known as a sportsman and field naturalist.

We are in receipt of an advance copy of "The Story of the Farralones" a small pamphlet 5x7 inches, 16 pp. It is finely illustrated with 27 half-tone engravings, which give a splendid idea of the difficulties of collecting in the large Bird Rookeries. The text is from the pen of C. Barlow and published by the editor of *The Nidiologist*. Copies may be had by sending 50 cents to H. R. Taylor, Alameda, Calif.

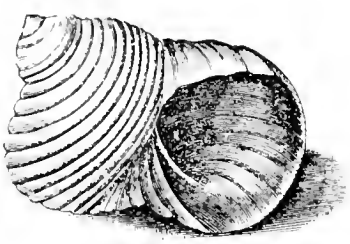
INDIANA NOTES.

II.

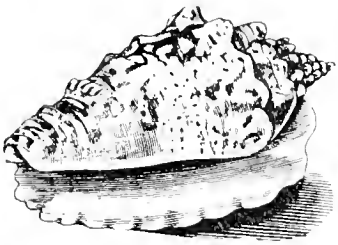
Shells of Fayette County.

CONTINUED FROM MARCH NUMBER.

I must beg the reader's pardon for not listing all the species of land shells in their proper places. Notes for some *Patulas*, *Mesodon's*, etc., appeared in the March issue but I found it necessary to hold over the others until this month. While the list has not appeared in proper running order I hope the notes will be of interest to some of my brother naturalists.



Turbo argyrostoma, from Algoa Bay, finely polished, showing all pearl.



Strombus lentiginosus, "Silver Lip," from Singapore.

Auricula Midæ, from India. The type of the genius.

Helix (Patula) lineata, *Muller*, confined to one locality and is plentiful there.

Helix (Patula) solitaria, *say*, rare.

Helix (Mesodon) exoleta, *Binney*, common.

Helix (Mesodon) albolabris, *Say*, common.

Helix (Stenotrema) monodon, *Rackett*, common.

Helix (Triodopsis) palliata, *Say*, rare.

I have found only two specimens and they were *dead shells*. One was found in some drift along Little Williams creek and the other was in a woods about two miles from where the first specimen was found.

Zonites fulvus, *Draper*, common.

Zonites fulginosus, *Griffith*. Dead shells were very plentiful in a certain clearing but no remains have ever been found in any other locality. *No live specimens found.*

Zonites minatlus, not common.

Zonites nitidus, *Muller*, common.

Zonites limatulus, *Say*, not common.

Succinea avara, *Say*, common.

Pupa rupicola, *Say*, not common.

Pupa contracta, *Say*, not common.

Pupa corticaria, *Say*, not common.

Vallania pulchella, *Mull*, rare except in extreme southern part of county, it is reported as being plentiful in that section. I have found a few live specimens, with the variety, *costata*, on tombstones in the cemetery. The cemetery is full of cedar and maple trees, the cedars are mostly in the center and the maples more to the outer edge of the cemetery. Having read about snails seldom being found under cedar trees I thought I would investigate and see how true the statement was.

After carefully investigating the tombstones and ground under a great many of the cedars, I failed to find any snails excepting some *Pupa armifera*, *and they were on the bark of a large cedar.*

Carychium exigaum, *Say*, not common.

After tramping mile after mile along the different streams I find the canal is the best collecting ground for *Unionidæ*, although some large Unios have been found in the river. Univalves are more or less abundant in all streams.

Limnæ humilis, *Say*, very common in all streams and ditches.

Limnæ desidiosa, *Say*, common—often found in wet sand and mud, several yards from the water.

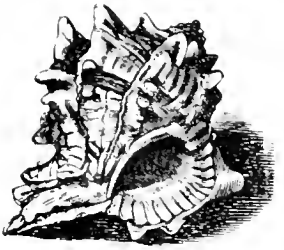
Limnæ palustris, *Muller*, rare. Mr Curry has found three live specimens.

Physa gyrina, *Say*, common. Very few in canal, but abundant elsewhere.

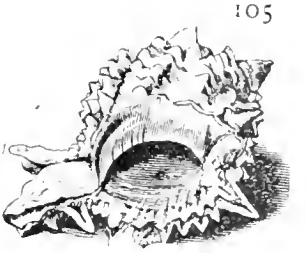
Physa anatina, *Say*, rare in this locality.

Spaerium straitinum, *Lam.* Found in nearly all streams, but not abundant in any.

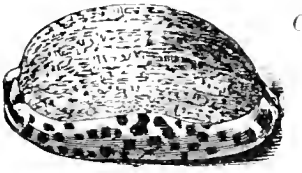
ALLEN J. REYNOLDS,
Connersville, Ind.



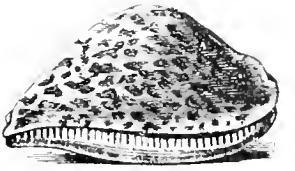
Murex Regius, from Panama. Commonly called "Rose Murex."



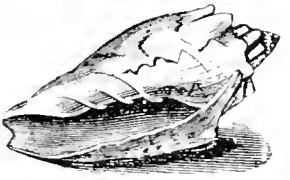
Murex princeps, the "Pink Murex" from Panama



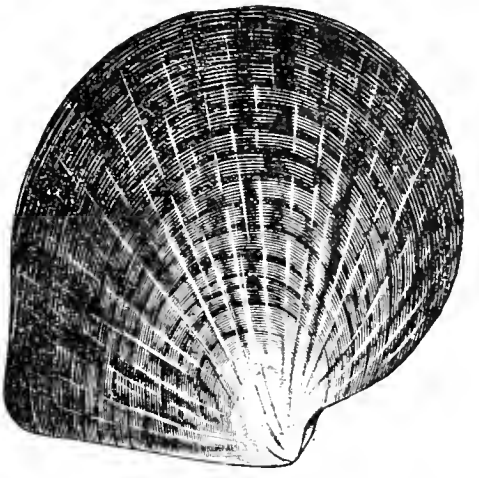
Cypræa Arabica. "Arabian Cowry" from Amboina



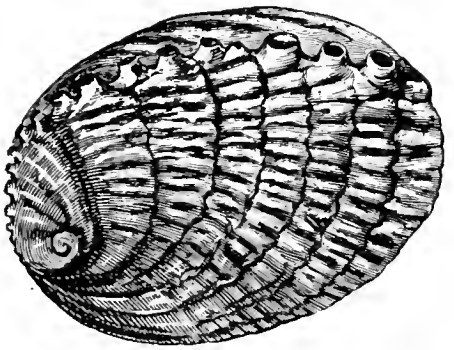
Cypræa Tigris, the Tiger Cowry from Australia.



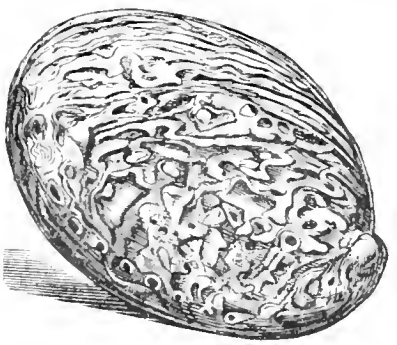
Voluta vespertilio. The commonest Volute from Singapore.



Mother of Pearl. Considered one of the finest of Pearl Shells. The ones showing black when polished are frequently called "Black Scotch."



Haliotis tuberculata. The "White Ear," polished Showing a beautiful White Pearl.



Haliotis Iris, Calif. Young Sheil, polished, often called "Blue Ear," very showy.

Black-crowned Night-Heron.

(*Nycticorax nocvius.*)

BY F. HENRY YORKE M. D.

The black-crowned Night-Heron, is not virtually a night bird, as the name implies, although nocturnal in its habits in the south, and during its Spring and Fall migrations; for dating from its arrival in Illinois, about the last week in April, when it commences nesting, laying and setting, it is frequently observed during the day, especially during cloudy weather, drifting off in pairs, or three or four together in a string, to ponds or marshes adjacent to its nesting colony; especially is this the case whilst feeding the young,

which do not leave the nest or grove until they become good flyers, and to follow the parent birds some distance, after which they go to their feeding grounds about sun-set, and travel backwards and forwards all night, often going a long distance. Their peculiar 'quack' can frequently be heard as they pass over; from which they obtain their name—Squack or Quabird—the latter being the Indian.

Like all the true Herons, they have a straight, stout bill with cutting edgges and three long white filamentous plumes, drooping from the glossy blusish-green crown, about 7 in. in length, upon the back of the neck; tibia naked, basal web between outer and middle toes, the latter of wbich is pectinated on the outer side, hind toe longest, and most curved, powder-tracts in pairs on breast and thighs, containing an acid oily substance, the use of which has not yet been discovered; possibly, it may be a provision of nature to aid them in fishing; either to attract the fish or color the water, by the exudation of an oily substance, drop by drop being squized out by muscular contraction at will, upon the surface of the water.

Nesting places are not commonly observed, although the birds may be seen and heard flying over; they may consist of five or six nests to a colony of thirty or more, built in groves of maple or walnut, Jack oak or cypress swamps; but usually near some marsh, slough or pond. The nest is a clumsy affair, built of sticks, lined with hair or a few feathers, usually one in a tree, but two to four are not uncommon; they return year after year, if the trees on the nesting ground are not disturbed and water still remains, stay until the young are able to fly some distance, then leave their nesting grounds for some other quiet resort, usually going northwards; and return in the Fall through the month of October, during the dark of the moon.

I have had the pleasure of knowing, and frequently visiting a colony, for a period of over twenty years. It contains about 18 to 20 nests situated in a walnut and maple grove, $\frac{1}{4}$ of a mile from a farm house, distant about $\frac{1}{2}$ miles from a pond in one direction, and a creek upon the other, within a radius of $1\frac{1}{2}$ miles from a small town. They feed in both the creek and pond, on frogs, tadpoles, fish, etc.; and although shot at, even in the roosting and nesting grounds, do not desert the place. Should a stranger appear in their midst or a gun be fired, they will take flight, and sentinels post themselves upon trees on the outskirts of the grove, in size about 20 rods wide by 40 in length. After a lapse of 10 or 15 minutes, scouts will pass over, and occasionally alight in the grove; they 'quack' as they alight in the dense foliage of the trees, revealing their presence.

I have never heard them call or utter any sound while feeding, for they are silent birds; and like the Great Blue Heron, will stand motionless in one place for a long time.

The measurements of an adult taken from many specimens averages: length, 26 to 27 inches; wing, 14 inches; tarsus, 5 inches; bill and middle toe, 3 inches.

The eggs are of a pale greenish-blue color, four to five in number.

Old Magazines
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Collectors look over your old Magazines and see if you have any of the following We want all named below and will give best of exchange for same

Date of publication.

1883 Acadian Scientist. All.
1890 A. A. Bulletin Vol 1, No 3 Vol. 2, No 2 and after.
1888 Agassiz Record, Vol 1, No 6 and after.
1892 Amer. Mag Nat Science, Vol. 1, No. 6, Vol. 2, No. 11 and after.
1885 Amer. Osprey, Vol. 1, Nos 1, 3, 4, 5, Vol. 2 and after
1884 American, Vol. 1, No. 1, 2 and 4 and later.
1891 Amer Orn. and Exchange, Vol. 1, No. 2 and later.
1890 Bittern, Vol. 1, No 7, 8, 10 and later.
1882 Boston Zool. Society, Vol. 1, No. 1.
1888 Curlew. All.
1892 Calif Traveler and Naturalist. All.
1886 Collector. All.
1893 " All.
1888 Collectors Exchange. All.
1886 Collectors Science Monthly, Vol. 1, No. 2 and later.
1886 Cumberland Collector, Vol. 1, No. 1, 2, 6, 11, Vol. 2 and later
1883 Curiosity Collector All.
1894 Eggs and Stamps, Vol. 1, No. 3 and later.
1889 Empire State Exchange, Vol. 1, No. 1, 2, 4, 6, Vol. 2, No. 3,4, 5, 6, 7, 8, 9, 10; Vol. 3, No. 5, 6, 7, and later.
1878 Familiar Science and Fanciers Journal. All.
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1886 Golden State Scientist, Vol. 1, No. 2 and later.
1885 Hoosier Naturalist, Vol. 2, No 11 and 12.
1891 Kansas City Scientist, Vol. 5, No. 6; Vol. 6. All.
1886 Milwaukee Naturalist, Vol. 1, No. 9.
1886 Mocking Bird All.
Mystic World, Vol. 1, No. 1, 3, 4, 5, 8, and later.
1885 Museum, Vol. 1, No 5 and later.
1890 Maine Ornithologist and Oologist, Vol. 1, No 6, 7, 9, Vol. 2, No. 4 and later.
1893 Naturalist (Des Moines, Ia.), Vol. 1, No 2 and later
1885 Naturalists Companion, Vol. 1, No 4, 5, 6, 7; Vol 2, No. 5 6 and later.
1890? New England Naturalist All.
1889 Naturalist (Valpariso) Vol. 4, No. 2.
1895 Naturalist and Collector, Vol. 1, No. 3 and later.
1877 Naturalist and Fancier All.
1884 Naturalist in Fla., Vol., No. 2 and 3.
1884 Naturalists Journal. All.
1880? Old Curiosity Shop. All Vol 1, 2, 3, 4, 5, 6, 7, (8, No. 12,) (9, No 8) and later.
1891 Oologists Journal, Vol. 1, No. 4 and later.
1891 Ornithologist and Botanist, Vol. 2, No. 3, 4, 5, 7 and later.
1885 Owl (Glens Falls), Vol. 1, No. 1, 2, 3, 4; Vol 3, No 3 and later.
1890 Owl (Chatham, N. Y.), Vol. 1, No. 2, 3, 4 and later.
1875? Observer of Nature. All.
1885 Our Birds, Vol 1, No. 2 and later.
1875 Rambles in Nature, Vol. 1, No. 2, 4 and later
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1890 Stormy Petrel. All except Vol. 1, No. 4
1891 Taxidermist. Any Vol. 2 or later.
1884 Tidings from Nature. All.
1873 Valley Naturalist. All.
1884 West American Scientist. All, 8 Vols.
1890 Wolverine Naturalist, Vol. 1, No. 5 and after.
1891 Weekly Oologist and Philatelist. All except Vol 1, No. 2 and Vol. 2, No 1.
1887 Western Naturalist, Vol. 1, No. 3, 4, 5, 6; Vol. 2, No. 3 and later.
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1887 Witch City Collector. All.
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" " var. latefasciata	25
" lemniscata, W. and B.	05
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" marmorata, Fer	08
" Massylaea, Morel	25
" Mackensn. Ad. and Rb	15
" modesta, Fer	25
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" melanotragus, Barn	15
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" nemoralis, L	02
" neglecta, Pils	03
" obvia, Mke	02
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" rata, Brod	20
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JUNE, 1897.

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1888 Cadley All

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1886 Collector All

1893 All

1888 Collectors Exchange All

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1886 Cumberland Collector, Vol 1 No 1, 2, 6, 11 Vol 2 and later

1883 Curiosity Collector All.

1891 Eggs and Stamps Vol 1 No 3 and later

1889 Empire State Exchange, Vol 1 No 1, 2, 4, 6 Vol 2, No 3, 4, 5, 6, 7, 8, 9, 10, Vol 3, No 5, 6, 7, and later

1878 Familiar Science and Farmers Journal All

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1890 Kansas City Scientist Vol 5 No 6 Vol 6 All

1886 Milwaukee Naturalist Vol 1 No 9

1886 Mocking Bird All

Mystic World Vol 1 No 1, 3, 4, 5, 8 and later

1885 Museum, Vol 1, No 5 and later

1890 Maine Ornithologist and Oologist, Vol 1 No 6, 7, 9, Vol 2 No 1 and later

1893 Naturalist (Des Moines Ia) Vol 1 No 2 and later

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WALTER F. WEBB, Editor Museum,

ALBION, N. Y.

THE MUSEUM.

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Not so, however, with many sportsmen who would, if they could, spend their entire lives in the woods fishing and shooting.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., JUNE 15, 1897. No. 8

A Description of the Snake Dance of the Moquis.

Having spent four years in northwestern New Mexico and Arizona, where much of my labor was devoted to a study of the various tribes of Indians of the Southwest, especially the Navajos, the Pueblos of Zuni, and others,, and the Apaches, possibly the readers of the MUSEUM would like to learn of the above dance. On the 17th of August, 1889, the Navajos held their annual Snake Dance at Wolapai, and my friend, Mr. B. got down there with his camera, and succeeded in obtaining two excellent photographs of the ceremonies.

Wolapai, or Hualpi, as it is sometimes written, is the best known pueblo in the group of Moqui villages in Arizona. Through the writings of Cushing and others, Zuni, of course, is more familiar to the public, but that pueblo is in New Mexico, and they have long given up having the Snake Dance there. Wolapai is situated at the extreme end of a rocky mesa, 600 feet above the level of the surrounding plain, and is the home of a bare remnant of a nation which at one time, before they quit the valleys, must have been quite numerous and powerful. Ethnologists never tire of studying those curious and most interesting people. Their ceremonies, their religion and myths, their arts and manufactures, their customs, habits and dress, indeed everything about them, are brimful of interest for the student.

In my estimation the best book that has appeared, giving an account of this whole matter, is one entitled *The Moquis of Arizona*, and was written by Captain John G. Bourke, of the Third U. S. Cavalry, and I believe its anthor has seen parts of the Snake Dance, never witnessed by anyone save a Moqui dancer, either before or since. Those interested in such subjects should certainly read the work. These dances take place in August at the time of the full moon, and Wolapai is the best pueblo at which one of them may be seen. The snakes which are to figure on the occasion are caught by the young men about a week in advance of the dance, and are kept up to the proper time in jars in one of their underground houses or "estufas" as they are called. At least a dozen species of snakes are used, but the "rattlers" predominate. It is in one or more of these estufas that all the preparatory steps are taken to prepare for the dance; it is there that the men arrange and paint their peculiar costumes for the occasion. The head medicine man alone possessed of the secret, prepares the drugs for the cure of snake bite, and it is believed, semi-narcotizes the snakes to be used, by the use of another fluid, but the fangs are never taken out of the rattlesnakes. Prayers are also offered in the estufa, and all these preliminary proceedings are secret and are entered into only by the men that are to take part in the dance. The women who afterwards engage in the ceremony outside the estufa are both matrons and young maidens, and rigged out in their most gorgeous costumes, but quite in conformity with the requirments. It is their duty to sprinkle the

sacred meal, which they do, over the snakes, the dancers and the ground, from shallow dishes held in their hands. The snakes are kept in training by a snake attender, with his wand, called the eagle wand, consisting in a painted rod-like handle of wood, with two eagle feathers at the extremity.

Outside the estufa all are eagerly awaiting the approach of the dancers; the entire pueblo has turned out, and all are decked in their best holiday costumes. The dance takes place around the sacred rock, and they also erect a small hide lodge and plant a cottonwood sapling, around all which objects the dancers pass after they emerge from the den of the estufa.

Finally all is ready, and out they file—a sight most imposing indeed, and one that makes a never-to-be-forgotten impress upon the memory.

Three old dignitaries, in costumes most remarkable, marching in single file, lead the van. Then, also in single file, follow eight boys, wearing and carrying their own distinctive paraphernalia. Following these come about fifty bearers of the eagle wands, whose duty it is to attract the attention of the snakes, while they are being carried between the teeth of the other men dancers, in order to prevent them from biting them. Much singing is done, and a monotonous noise is kept up with bead-covered gourds and rapidly whirled slings held in the hands of especial dancers. There are also peculiar ceremonies to be enacted at the sacred rock, the sacred lodge and the tree. But everything is done according to a prescribed programme, which dates far back into the ages. Some of the male dancers are nearly naked, having their bodies painted in the most extraordinary manner. Above all, however, the ghastliest sight is to see them handle the great five-foot "rattlers." These they carry in their mouths with impunity, cast on the ground, *step on*, and gather up by the handful.

The sight is positively blood-curdling, and they keep constantly changing the snakes for fresh and more vigorous ones in the estufa, taking back those that have been used in the dance.

My space will by no means admit of a detailed account of this remarkable ceremony. The snakes are finally (after a closing and most imposing formality) piled up in a circle and completely covered with the sacred meal and prayed over, when "the Indians of the second division then grasped them convulsively in great handfuls, and ran with might and main to the eastern crest of the precipice, and then darted like frightened hares down the trails leading to the foot, where they released the reptiles "to the four quarters of the globe."

Diamonds; How Formed.

Since the late discovery of diamonds in a meteorite, speculation has been rife as to the origin of this gem, and, as is often the result, hasty and—it appears to the writer—unwarrantable conclusions have been formed. Not the least of those theories is one which would relegate diamond production, in every case, to meteoric disturbances. Even the geologists at Washington have pronounced their fiat in this direction, and have attributed the find at Kimberly to a *possible* impact of meteorites in that district. □ Professor Sayce has said, "A single solid fact which can be observed and handled by science is worth more than a dozen brilliant theories." Let us, then, in seeking to solve this problem in sober earnestness, deal with known facts and leave wild theorizing to speculative minds, remembering that for one happy hit they make, countless are the mistakes. Chemistry has long told us what the diamond is—a crystalized form of pure carbon—but further progress seemed barred. Analysis had done much, but all attempts at synthesis failed. From their compo-

nent parts chemists succeeded in manufacturing rubies and sapphires by fusion, but the diamond always baffled them. Evidently fusion (the application of heat) was the means, but heat dissipated carbon in the form of gas. Here, then, was the difficulty. How could heat be efficiently applied so as to fuse and crystallze the carbon? To answer this, we must discover the nature of tool we work with. What, then, is heat? Science tells us it is *matter in motion* It gives us the same definition of light and electricity. This definition advances us one step. The application of heat, therefore, to an amorphous (without shape) mass, sets its atoms in motion and rearranges them. Thus, synthetic chemistry built up the rubies and sapphires, if it failed to produce the diamond. Other means, therefore, must be employed to produce the rearrangement of the carbon atoms. Light was of no service since carbon absorbed it greedily, and, like Dickens' little boy, "asked for more" yet without being changed. Electricity, therefore, must solve the problem, or all our available means will fail us. Electricity is largely present with both heat and light in all meteoric disturbances, hence to electricity we turn. As is widely recognized, we are only yet cognizant of this powerful agent in its infantile development, each year revealing new phases of its power. Electricity is present in the planetary bodies, in space and in our earth. Diamonds, we know, are found on our globe, and have come to us from space, as meteorites, yet we fail to see the reasoning which declares diamonds to be simply meteoric products. Can electrical science help us in any way? While Swan, of Birkenhead, England, was experimenting with the electric light, he used as carbons filaments of thread, thoroughly carbonized. These were so fragile that he enclosed each carbon in a hermetically sealed glass globe, first having produced a vacuum within. Success attended his efforts. The accidental breaking of one of his lamps, which had been in constant use for some months, revealed to him that the carbon, previously so fragile, was now possessed of a tenacity surpassing a metallic wire of the same thickness, which tenacity he found to increase in other carbons on a ratio with the time under the electric current and the volts employed. Here, then, must be the solution of our difficulty. Given a pure carbon enclosed in a vacuum and subjected to a sufficiently powerful electric current, it is demonstrated that (1) a rearrangement of its particles has taken place; (2) that greater cohesion of these particles has been developed. Hence, we reason, this cohesion, if further increased, will so modify the carbon structure as to render it ultimately impervious to light, and from a black, fragile substance it would reflect all the rays of light and assume a crystalline form.

Now, not to be too hasty, let us see if the above conditions are given in meteorites, for all will allow they are to be found in our earth structure. The discovery of diamonds in meteorites has hitherto been in closed cavities, which the super-heated mass warrants us in supposing must be vacuous, and we already have noted the presence of powerful electricity in conjunction with all meteoric displays.

Remarks on Some of the Birds from Guadalupe Island.

Taken from U. S. Government Surveys.

By reference to the published catalogues of the various dealers we find that the skins of Guadelaupe Birds are seldom quoted hence we have thought that possibly some description of what is found on this lonely island whose fauna is included in the U. S. may be of interest.

The collection of birds on which the following descriptions are based were taked by Dr. Palmer and very interesting, from the fact that every one of the resident species is distinct from

any found on the neighboring mainland, although each has a continental representative more or less nearly related. The collection is said to include all the species of land-birds found on the island, with the exception of a humming-bird, a hawk, and two kinds of owls, no specimens of which were obtained.

It is much to be regretted that the notes accompanying the specimens were so meagre; they only furnish the information that the position of Guadalupe is between latitude 28° 45′ and 29° 10′ north, and off the coast of Lower California, two hundred and twenty miles southwest from San Diego.

DUSKY KINGLET, *Regulus obscurus*.

CH. —*Adult*:—Above olive-gray, with a slight greenish cast, the primaries and tail-feathers edged with dull sulphur-yellow; both rows of wing-coverts tipped with dull grayish-white, forming two well defined bands. A distinct, broad, dull-white, orbital ring. Lower parts pale grayish-buff, the sides slightly tinged with olivaceous. *Male*, crown with a large central patch of vermillion-red, concealed or exposed at pleasure; wing, 2.15-2.20; tail, 1.85-1.95; bill, 0.25; tarsus, 0.80; middle toe, 0.38-0.40. *Female*, without the red on the crown; wing, 2.00; tail, 1.70; bill, 0,22; tarsus, 0.80; middle toe, 0.40.

Remarks.—This resident insular race of the Ruby-crowned Kinglet differs very appreciably from the continental form in the considerably darker, more plumbeous shade of the upper surface, the larger bill, and rather shorter wings and tail; the tarsis and toes are also appreciably longer.

First seen April 1. During the winter, the bird was not seen on the middle or northern portions of the island, but is supposed to remain in the warmer canons, whence it becomes generally distributed during March. A male, closely observed during the act of singing, was seen to display the red of the crown to its full extent; this conspicuous ornament being concealed again as soon as the notes closed.

GUADALUPE ROCK WREN, *Salpinctes Guadeloupensis*.

CH.—*Adult*:—Above dull grayish-brown, indistinctly speckled with dusky, and becoming light cinnamon-rufous on the rump; wings and tail indistinctly barred with dusky; tail-feathers, except the middle pair, broadly tipped with pale cinnamon, this preceded by a less regular and more broken black bar; the cinnamon frequently finely mottled with dusky. Chin, throat, and jugulum dull white, the jugulum distinctly streaked with dusky; rest of lower parts nearly plain dirty white, becoming light pinkish-cinnamon on the sides; crissum heavily barred with black. *Male*, wing, 2.60-2.75; tail, 2.20-2.30; bill, 0.58-0.60; tarsus, 0.80-0-90; middle toe, 0.50-0.55. *Female*, wing, 2.50-2.60; tail 2.00-2.20; bill, 0.55-0.60; tarsus, 0.80-0.90; middle toe, 0.50-0.55.

Remarks.—The upper tail-coverts are strongly barred transversely. There is a tolerably well-defined light superciliary stripe. In No. 70049 there is a deep reddish-brown suffusion across the breast, apparently an accidental stain from contact with ferruginous earth. The differences exhibited in these insular specimens from the continental series are quite slight, but they are so constant as to demand recognition. As to colors, there is no difference beyond slightly darker shades throughout; the lower parts being soft pinkish cream-color instead of creamy-white, the other portions of a darker shade to correspond.

Eyes brown. Stomach contained caterpillars and other insects. These birds are generally distributed over the island, but are found especially in the sheltered canons of the middle portion, where they are numerous They also frequent the slaughter-yards, where goats are killed, to glean insects from the drying bones. Their notes are

often heard early in the morning, when the birds mount some prominent rock or stump. Their general habits are not peculiar. April 5, 1875, a female was taken, with the nest and eggs. The nest was built on the ground beneath a rock, which sheltered it from the prevailing winds; it was lined with goat's hair, and contained two fresh eggs; a third, nearly ready to be laid, was found on opening the bird. Another nest, containing three eggs, was found in a crevice of a large rock, some 5 feet high. The fissure was about 18 inches deep; and being more capacious than was necessary for accommodation of the nest, was divided by a partition, which the birds had built across it, leaving an interior space for the nest, and an aperture just large enough for the birds to pass with ease. This partition, which effectually blocked up the passage to the nest was composed of pebbles. A third nest was discovered so far under a large solid rock, and with so small an entrance, that it could not be secured. The passage to this nest was also blocked with small stones.

GUADALUPE WREN, *Thryomanes brevicauda, nobis.*

SP. CH.—*Adult:*—Above grayish hair-brown, brownest on the rump, grayest on the tail; remiges just perceptibly, and tail-feathers very distinctly, transversely barred with dusky; three lateral tail-feathers light dull gray terminally, with one or two broad dusky bars across the anterior portion of they gray. A very conspicuous white superciliary stripe from the nostril to the occiput; below this grayish-brown stripe, covering the lore and widening on the upper posterior portion of the auriculars. Lower parts white anteriorly, passing gradually into dull ash-gray on the sides and abdomen; crissm broadly barred with black.

Wing, 1.85-1.90; tail, 1.80; bill, 9.45-0.50; tarsus, 0.70-0.75; middle toe, 0.50.

Remarks.—This Wren appears to bear about the same relation to *T. bewicki leucogaster* that *Junco insularis* does to *J. annectens;* and it is a curious fact that the analogue of each should be the form from the interior of the continent instead of that from the neighboring coast. This insular form is much grayer than the *T. bewicki spilurus* of California and Western Mexico, and presents other decided differences from all the continental forms.

Iris brown. Stomach contained remnants of some small black insects which feed upon the blossoms of the White Sage. The bird is resident upon the island, but not numerous. Their motions are very quick; their general habits restless, impatient, and shy. Their almost incessant activity, together with their shyness, renders them difficult to secure. They live in the brush, being rarely seen on trees.

Montana Sapphires.

The only locality in Montana which has been at all prolific of sapphires in the six or seven miles of placer ground between Ruby and Eldorado bars on the Missouri River, sixteen miles east of Helena. Here sapphires are found in glacial auriferous gravel while sluicing for gold, and, until now, have been considered only a by-product. Up to the present time they have never been systematically mined. Several years ago a company took the option on 4,000 acres of the river banks, and several smaller companies have since been formed with a view of mining for these gems alone or in connection with gold. The colors of the gems obtained, although beautiful and interesting are not the standard blue and red shades generally demanded by the public. The stones embrace a greater variety of the lighter shades of red, yellow, blue and green. The latter color is found quite pronounced, being rather a blue green than an emerald green. Nearly all the stones when finely cut, have an apparent metallic luster.

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

Correspondence and items of interest on above topics, as well as notes on the various Museums of the World—views from same, discoveries relative to the handling and keeping of Natural History material, descriptive habits of various species, are solicited from all.

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NOTES.

The Birds of Colorado by W. W. Cooke is a neat pamphlet of 140 pp. Mr. Cooke says in the opening, "The total number of species and varieties of birds known to occur in Colorado is 360 of which 228 are known to breed. This is a larger number of species than has been taken in any state east of the Mississippi and is exceeded by only one state in the Union, and that is by Nebraska, with nearly 400 species." The pamphlet is brim full of valuable information.

If you receive a sample copy of this number and are not a subscriber we should like to have you examine it carefully and especially the offer on back page of cover. We need your help in making the MUSEUM a success.

We should like to hear more frequently from collectors in the field. It does not seem as though it should be necessary to offer prizes for articles and notes of interest. We have hundreds of subscribers able to give us interesting and valuable articles on natural history. We do not care for descriptions of mere pleasure trips, etc., but descriptions in detail of rare finds, successful collecting and natural history notes in general are of interest to collectors in all parts of the United States.

We regret that the Natural History Journal published at New Bedford, Mass., should have died with the first number.

Parties having good copies of illustrated Government Reports will please write us with list of same and what they wish in exchange.

A Companion of the Sunfish.

Around the southern islands of the Santa Barbara group, where the tides come up and down in fitful measure, is a famous feeding ground for the sunfish of the Pacific, Mola mola. This extraordinary member of the family, though standing high in the list of fishes, is very unfishlike in appearance, resembling some Japanese monstrosity. The fish is more or less oval, covered with a hard skin, that is enveloped with a thick mucus. The dorsal fin is large and high, and directly below it extends the anal fin, which resembles it in size and shape. Tail the mola has none, the body apparently being chopped off, a mere ridge, controlled by powerful muscles, taking its place and being entirely useless in the sense of a tail.

Thus equipped the sunfish would naturally be a slow swimmer, and so lethargic is it that the writer has often approached it in a boat. On one occasion a boat hook was hooked into the gills of a large sunfish, which was caught with little or no resistance,

One of the largest specimens observed by the writer grounded on the bar of the St. Johns River and attracted so much attentien that it was

caught and carried ashore where it was provided with red eyes and exhibited as a "sea monster." The fish was ten feet high, or that measurement between the tips of the upper and lower fins. A much larger specimen, eleven feet high, was observed in California waters.

Off the islands of the Santa Barbara channel these fishes are very common in midsummer, lying at the surface in the choppy sea and apparently exposing their sides to the hot semi-tropic sun. When lying in this position, the sea washing over them, they resemble a piece of wreakage, and are, without doubt, so considered by numbers of birds, especially the shags, which when weary from long flight and preferring a dry roost, alight on them and retain their position without alarming the fish. Several birds have been observed resting on a single sunfish, and some of the fishermen assume that the fish, being infested with parasites, take this position either to allow the sun to destroy them or thinking that the birds will devour them. In all probability the matter of parasites does not enter into the question as an explanation. The fish enjoys floating at the surface where the water is warm and the birds alight upon it simply as a rest, just as they would upon any floating object.

Sunfish could be caught in numbers off the islands mentioned, but no use having been discovered for them, they have no market value. Their muscles are so hard and elastic that when cut into small pieces and thrown upon the ground they rebound. In one small seaport the writer found that the elastic tissue was used by the fishermen's boys in the manufacture of baseballs.

The young of the sunfish is a singular looking little creature, hatched from eggs deposited on the high seas, floating at the surface. They were supposed for many years to be a different species, so unlike were they in general appearance to the adult sunfish.

Sponges of the Deep Sea.

Some of the most beautiful things that live in the ocean are the sponges of the great depth, which have often very curious and interesting forms. Not least remarkable are the so-called "sea nests," which are in the form of spheres or sometimes egg-shaped. The outer coat of one of these specimens is a complicated network, over which a delicate membrane is spread. An ornamental frill adorns the upper part, while the lower portion throws out a maze of glossy filaments like fine, white hairs. These hairs penetrate the semi-fluid mud in every direction, thus holding the sponge in its place, while a continuous current of water is drawn by waving "cilia" through all parts of the mass, passing out by a hole at the top. In this manner the animal absorbs whatever food may be afloat. Another singular sponge is the "glass rope," which sends down into the mud a coiled wisp of filaments as thick as a knitting needle. The latter opens into a brush, fixing the creature in place after the manner of a screw pile. Still another remarkable sponge is found in the deep water off the Loffoden Islands. It spreads out into a thin circular cake, surrounded by what looks like a fringe of white floss silk. Yet another curiosity is the "eupectella" sponge of the Philippines, which lives embedded to its lid in the mud, and supported by a lovely frill.

Flint Implements and Weapons.

Many persons are apt to associate the flint implements, which are found in such large numbers in the United States, with our North American Indians and overlook the fact that they are found in even greater numbers in Europe, Asia, and, in fact, all parts of the known world, and that they are even used at the present day at some of the out-of-the-way corners of the world.

In the Scandinavian peninsula they

are found in great abundance and of exquisite workmanship. Denmark, also, abounds in fine specimens of these relics. France has furnished some of the finest specimens ever seen, and Switzerland, also, gives many fine examples from her caves, and from the lakes, where lived, in unknown ages, the Lake Dwellers. These weapons are found in caves, associated with the remains of extinct animals, as well as those which live at the present time.

Of the many kinds of stone implements found, arrow heads are by far the most numerous. They are of all sizes and shapes and made of many different kinds of material, but flint is the favorite with all and in every country. Fine specimens are made of jasper, quartz, and, in some instances, slate is used.

In England these arrows are commonly called elf arrows, from an old tradition, and in Germany they are referred to as thunder stone and are often looked for after a heavy rain by people who are uneducated. This is accounted for in the fact that you would naturally find the points after a heavy, dashing rain had washed them free from the soil in which they were enclosed.

In the United States, and particularly on the Atlantic side of the continent, they are found in great numbers and of many different kinds and sizes, and, while they occur more abundantly along the rivers, they are occasionally met with far from any stream of importance. Large numbers are found along the Connecticut, the Delaware—both in New Jersey and Pennsylvania—the Susquehanna and the Ohio. The points from Ohio, Indiana, Tennessee, and, in fact, from all the interior states, are generally flint and of superior workmanship. Besides arrow heads, large numbers of spear heads, axes, celts, and other objects are found in nearly all the localities mentioned. Spear heads from two to six inches long, are often found and at the Museum of Natural History at Central Park can be seen some fine specimens, eight, ten, and, in one case, eleven inches long, a splendid specimen, found at Lake Luzerne. And one was found in a grave in Georgia which is fourteen inches long.

Axes are found in great variety, both in shape and size, but nearly all have the one distinguishing feature which consists of a groove for fashioning the handle.

In some cases the axe consists merely of a water-worn pebble with a roughly chipped edge, while in other cases they are finely finished and even polished, showing a great amount of patient labor in their manufacture. I have a specimen from Puma, on which scarcely any labor has been bestowed, and I also have one from New Jersey, which is seven and one-half inches long and six and one-half inches in diameter in the largest place, which is a beautiful specimen of the skill displayed by the makers of these implements.

In digging a cellar in Trenton, N. J., a few years ago, 125 stone axes were found huddled together about three feet below the surface, and other lots have been found under about the same conditions in other parts of this state. At the museum of Rutgers College may be seen an axe which weighs over nine pounds and is about ten inches in length. This axe was found in the city of New Brunswick, and is a very finely finished specimen. Celts are also abundant in nearly all localitles where other stone relics are met with.

The size and style of all these objects vary in different localities, also in the material of which they are made. On Long Island nearly all the specimens are made of milky quartz which is abundant on that island. In New Jersey many are made of the trap rock, which abounds in that locality, but by far the larger number of those from the interior are made of flint. New Jersey is not noted for the

fine quality of the points found in the state, but she can hold her own when it comes to quantity.

Much more could be said of the different kinds of arrow heads, some having serrated edges; others which are so made that they will rotate when shot from the bow, some having a stem to attach the point to the shaft, and others having none; others triangular in shape, beautifully wrought and exceedingly regular in outline.

When we consider that all the various forms were wrought without the aid of any tool other than stone, we marvel at the amount of skill and patience displayed by the being who fashioned these objects.

A Home Without Hands.

J. F. ILLINGWORTH.

I was sitting at my window early in April when I noticed a pair of Bullock's orioles in a tree just outside. They were the first I had seen of the season so I was much interested in them. The male, in his gay coat of orange and black, seemed trying to cheer his mate. He flitted from one branch to another singing very sweetly while she sat quietly, probably planning for the home which they had come to build. I saw them flying about the yard almost every day, but it was not until about two weeks after that I noticed the female with a long horsehair in her beak, fly to the tree where I had seen them first. I was greatly pleased to see her choose that tree as it was only a few feet from my window, and I would have an excellent opportunity for watching the building of the nest.

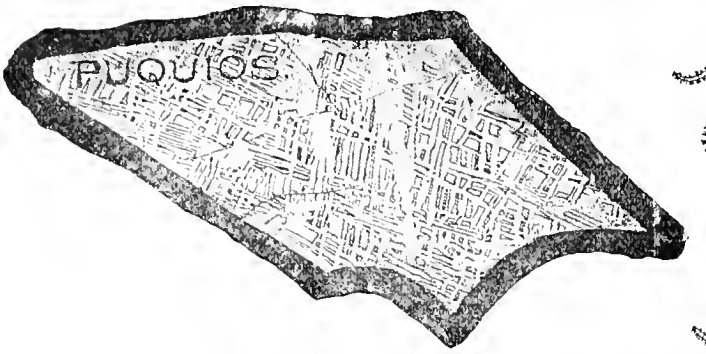
Mrs. Oriole kept her mate busy carrying horsehair from the barnyard. She seemed to do all the planning herself, as she would only let him assist when it was necessary for two to work together. After they had finished the framework, which took them about a week, they began work in good earnest. The female would station herself inside of the nest and the male would take a horsehair in his bill and push it through the side; then she would take the end and pass it out again. In this way they wove the nest so neatly and smoothly that it resembled somewhat the cheap grade of manufactured camel hair goods. Now came the lining and concealing of the nest. The leaves were brought down and tied closely about it so that a casual observer would think it was only a thick bunch of leaves. I dropped some cotton batting out of my window and the birds were quick to see that it would make an excellent warm lining for their home. They also went to the chickenyard and gathered soft, fluffy feathers, which they placed snugly about the sides of their nest.

I ventured to look into the nest one day while the birds were away feeding, but its mistress was not so far away but that she could see the nest, and she quickly came, scolding. I could pardon her ill-temper for I suppose she thought I was going to destroy her pretty home.

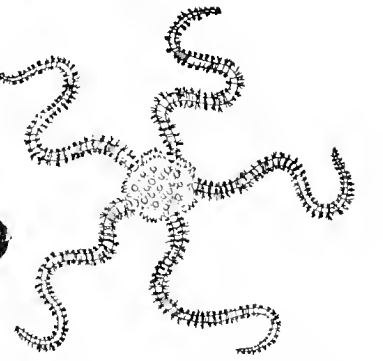
Several weeks after the nest was finished I saw the male bird bring a worm in his beak. This told me that there were hungry little mouths to feed in the nest. The birds made many trips during each day after provisions, but the young birds seemed never to be satisfied as they would always open their mouths for more when the old birds came to the nest.

The youngsters grew very fast and were soon anxious to try their wings and leave the home roof. I was very sorry to see them go as it had been a constant pleasure to watch them and to hear the sweet melodies of the old birds under my window every morning.

Bargains for June.

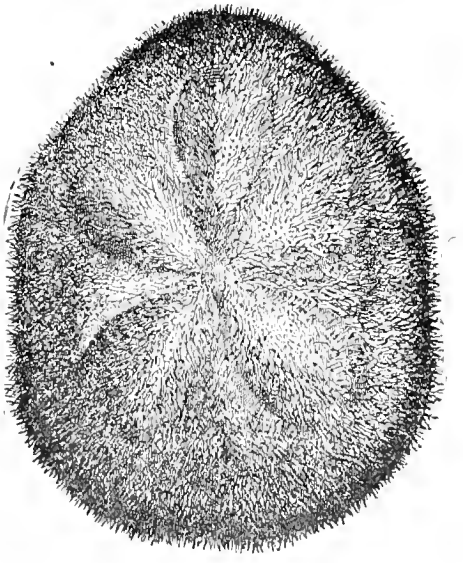


The Puquios Meteorite, of which the above is a section, fell in 1884 near Puquios, Chili, S. A. and was secured by Prof Ward It was 5x10 inches and weighed 14½lbs The Widmanstatten figures show very plainly A specimn trifle larger than cut finely polished for $4 prepaid or about half size $2 The composition is nearly pure iron



This is the Common Brittle Star of the Atlantic Coast, being found in deep water only. The arms are covered with short spines. Prepaid for 20c

A serpent star, quite similar, lacking the spines and rays prepaid for 20c or imperfect specimens for 10c.



Atlantic Sea Biscuit, a handsome and curious specimen for the cabinet, 4 inches long, black, covered with spines, prepaid 35c.

A larger form, 9 inches long, similar shape, &c., called the Sea Beaver, prepaid for 90c.

Sand dollar or Sea Plate. Belongs to same order as the Sea Biscuits, 2 inches, black prepaid, 10c.

Another species, larger from Florida, 20c.
" " from Trinidad, 16c.
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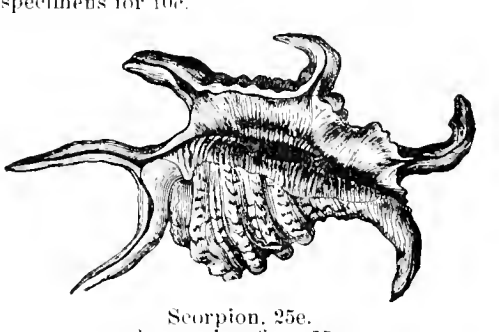
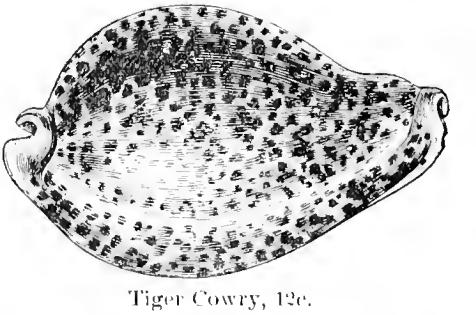


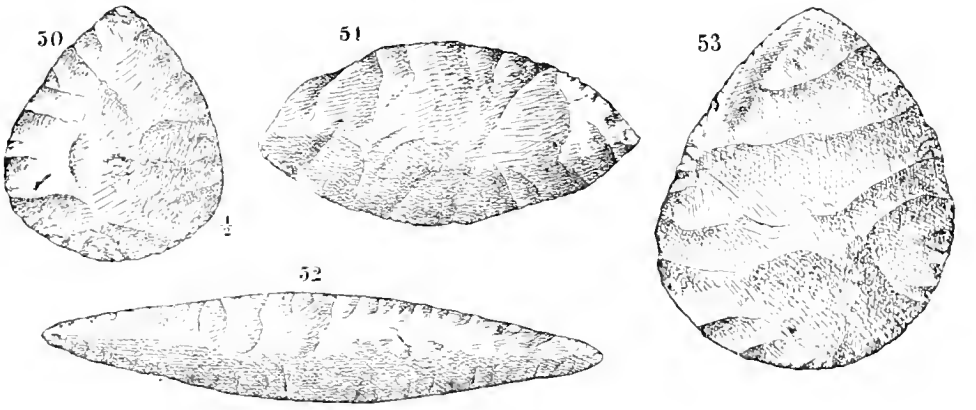
Scorpion, 25c.
Large size, fine, 75c.



Tiger Cowry, 12c.

Ear Shells, black, 20c; red, 25c; white, 15c.

Strombus pugilis, 10c.



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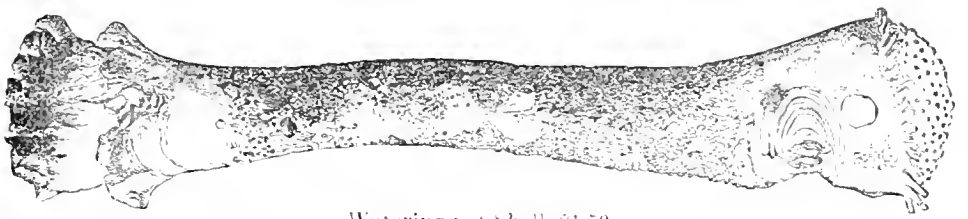

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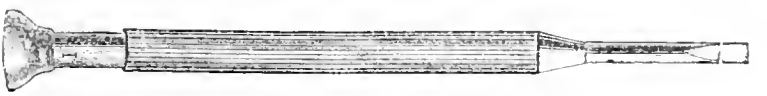
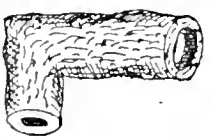


Small neat screw driver, 20c.



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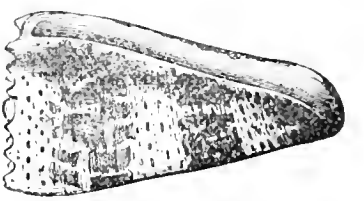
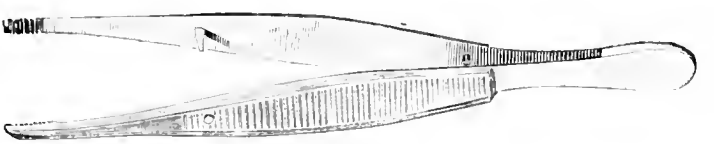


Marbled Cone, 20c.



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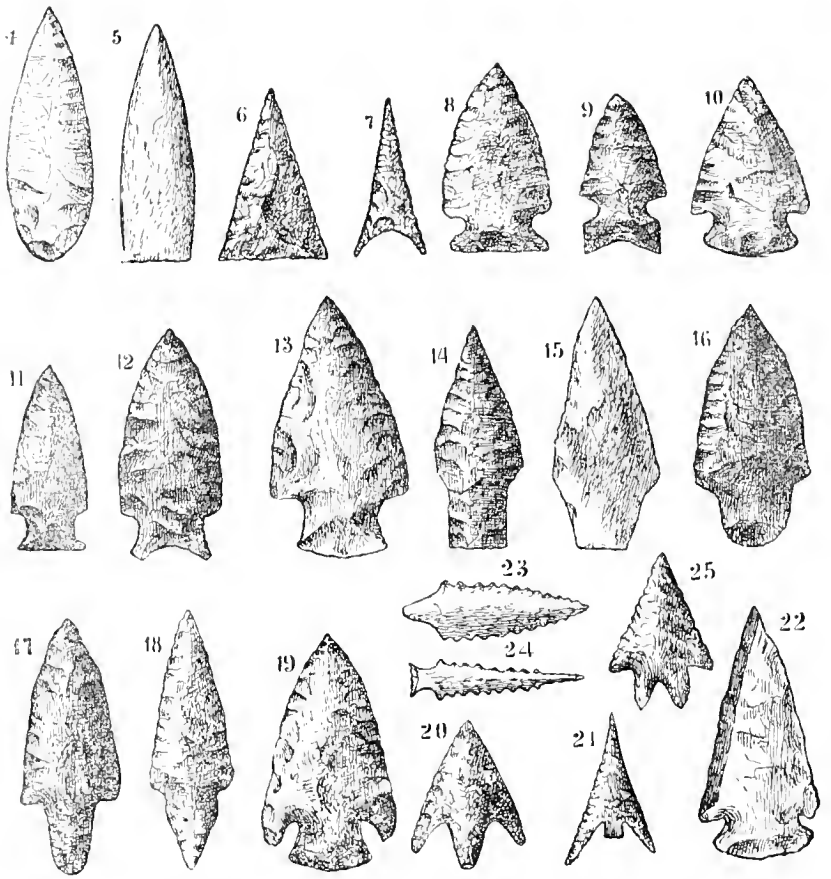

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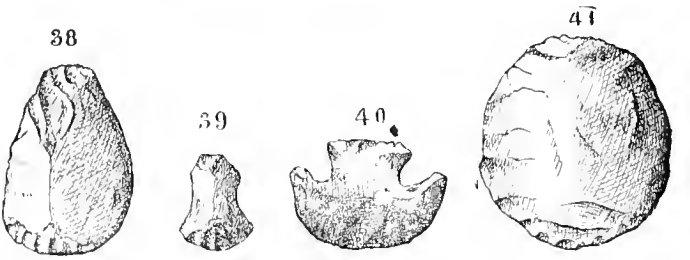

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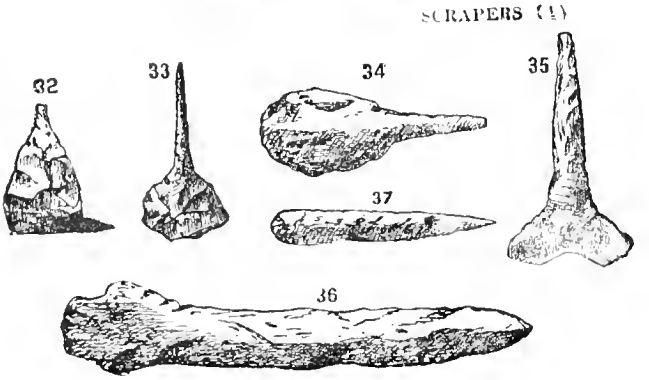

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We have a special call for Helix and Unionidæ from all parts of the U. S. Fine modern Indian Relics, such as beaded tobacco pouches, war clubs, etc., ancient stone and flint relics or all kinds desired. Do not particularly care for points but want drills, axes, celts, hammer stones, pipes, pottery, discoidals, gorgets, banner stones, bird amulets, etc., any copper of bone implements, iron axe or tomahawks. Rare clutches of birds eggs and the rarer skins always desired.

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I CAN OFFER in exchange a very fine assortment of birds eggs in sets or singles, fully 200 kinds and several thousand specimens, some good Florida bird and mammal skins, subscriptions to the MUSEUM and copies of our O. & O. Manual, fully 100 kinds of minerals that we have a large surplus of, some nice fossils from Bad Lands, Ohio, etc., curios, such as Shark, Skate or Devil Fish Eggs, Hermit Crab in shell, Shark and Alligator Teeth and a hundred other curios, some choice Star Fish, several kinds Sea Urchins, etc., Sea Ferns, Fans, Sponges, Flexible Coral, etc., fine marine shells from Florida, fully 100 kinds, and for extra desirable material will offer books and supplies of all kinds.

We prefer large exchanges to small ones as it is frequently as much labor to attend to a $1.00 exchange as to a $10.00 one. However send us lists of what you have and if you do not get a reply promptly you may conclude we cannot use the material you offer at present.

Faithfully, **WALTER F. WEBB, Mgr., Albion, N. Y.**

THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., JULY 15, 1897. No. 9

A Week's Egg Collecting in Ontario.

W. Brewer and I went to Morrisburg, Ont., on May 29th at 1:30. We arrived there at 6:05, got our boarding house and felt very much satisfied as the house was near the river and we had the full view of the long marshes and the surrounding islands.

May 30th we got up at 5:15 a. m., got our lunch and started to walk down the track east for a mile and a half. First thing we saw was an old dead maple tree about 45 feet high in the middle of a field near G. T. R. track. My friend walked up and hit the tree with a small hatchet and out flew a Red-headed Woodpecker. I climbed up and got a beautiful set of six fresh eggs. Hole was 40 feet from ground, 18 inches deep, 2½ inches in diameter. We stood looking at the tree for a while and saw about 15 more holes in the same tree. Then I walked up and hit the tree and out flew an American Sparrow Hawk and a Swallow. I was thunderstruck at seeing the Hawk and Sparrow fly out at the same time and the holes they flew from were about 10 inches apart. However I climbed up to the Swallow's nest and got a set of 6, incubated so heavily that they were impossible to blow. Hole 8 inches deep by 2 inches in diameter.

Then I looked for the Hawk's nest but could not find it. I came down again and walked away for a while and then I came back. My friend hit the tree while I watched and out flew the Hawk from the highest hole in the tree. I climbed up and shaped the hole big enough for my hand to enter and got a beautiful set of 5, incubated. All the time the female Hawk flew around my head. At one time she came within a few inches of my head. Hole was 18 inches deep by 3½ inches in diameter. Eggs were creamy white clouded with brown spots and some were spotted.

I spoke to several of our collectors in Montreal about finding the Hawk, Woodpecker and Swallow in the same tree and they said they never knew or saw anything like it in all their days of collecting. It seems such a strange thing for a small bird to nest in the same tree as a bird of prey.

We returned to our boarding house at 5:15 p. m. with three boxes of eggs, Sandpipers, Plovers, Woodpeckers, Song Sparrows, Black Martins and several others. Blow our eggs and go to bed at 9:15.

Get up next morning at 6:30, May 31st. We go down to the river and look at it for a while and see it is very dangerous. Whirlpools and boilers and the current running 15 miles per hour. So we go and get a guide and he takes us all around the islands.

We struck a long marsh at the back of one of the islands and found a colony of Red-winged Bluebirds. We took about 20 sets each. We went up to another island and found another big marsh where I found American Bittern, 5 eggs heavily incubated; nest in a clump of grass composed of reeds. Further up on the islands we got Bobolinks, Meadow Larks and a few King birds. Then we came back to our

boarding house at 4:45, well satisfied with our day's collecting.

Next few days we stroll around the town as we are getting tired of collecting in the same place. So on Saturday, June 5, we go down the river for 32 miles and put up at the Stanley Island Hotel Sunday, June 6.

We get up at 4 a. m. and get our breakfast and the cook, who was so kind, made us up a big lunch for the whole day. We had a nice boat and the water was like a sheet of glass and not dangerous. We rowed up the river, that is south, until we struck a big bed of reeds. The river is full of these beds. The first one we landed on was ½ of a mile from shore. These beds as soon as you walk on them they shake so much that you would think they were floating and you sink up to the knees. In fact at one place I went over the top of my hip boots in soft mud. There we found Florida Gallinule 1-5 on the reeds; nest was floating on the water attached to the long reeds. Then we went further south and struck another bed ¾ of a mile from shore and found another set of Florida Gallinule 2-7; nest in same position as the other, composition the same. Then we went on further and in crossing from one bed to another we struck a colony of Black Terns. We found their eggs deposited in the mud and on the reeds and we found 2 sets of 2 deposited on a board floating in the marsh; eggs were at the end of the board stuck in the mud along with a few small reeds. We were a little too early for these Terns; we only found 5 sets in all and they were sets of 2 and 3. There were over three hundred of these Terns. For the past 10 years these Terns have been known to breed in the same place. We went further on and found another set of 3-12 Florida Gallinules; nest and composition the same as the other two. Further on I found Sora Rail 1-13 in deep water in a clump of grass composed of dry grass and reeds; eggs incubated. Then we found 5 sets of 6 Long-billed Marsh Wren. Nest fastened to tall reeds composed of reeds and lined with feathers of the bird; eggs were all fresh. Then we returned to the hotel and blew our eggs and retired for the night at 8:45 p. m., well satisfied with our day's collecting.

Next morning up at 8:45 a. m. and strolled around Stanley Island, got 3 sets of 5 Baltimore Oriole, some Robins and a set of Bronzed Grackle. There is a veranda at the side of a large wood house near the water and on the eaves of this veranda we found 6 sets of robins 5 feet from each other 7 feet from the ground.

Then we came back and packed up and rowed across the river. It was raining very hard and we got a carriage and drove 8 miles to the station, boarded the 4:36 express and reached home at 6:15, well satisfied with our week's collecting in Ontario.

C. N. SONNE,
Montreal, Que.

Indiana Notes.

III.)

SHELLS OF FAYETTE COUNTY.

(*Continued from May number.*)

Pissidium abditum, Lam. Only reported.

Goniobasis semicarinati, Say. Common in a great many streams. I have seen large bowlders in the river that were entirely covered with them. Extraordinary large specimens are abundant in Big Williams creek.

Goniobasis grosvenori. Only reported.

Unio occidens, Lea. Abundant in canal, also found in river. A few words right here in regard to my experience may be beneficial to some young collector. My first attempt at collectfng Unios was a failure. I had collected about 50 fine *U. occidens*, etc., and had succeeded in cleaning them nicely after which I put them all out where the sun struck them full force and left them for a time—just

long enough for the entire lot to be cracked all to pieces.

Unio pressus,, Lea. Not common, but more are found in canal than in any other stream.

Unio ligamentinus, Lea. Found in canal but not abundant.

Unio parvus, Barnes. Same as above.

Anodonta plana, Say. River and canal, most common in canal.

Anodonta subcylindricus, Lea. Our most common Unio. This shell is found oftener in the small streams than any other Unio.

Anodonta edentula, Lea. Common.

Margaritana rugosa, Barnes. Plentiful in canal but seldom found elsewhere to any great extent.

Planorbis parvus, Say. Abundant in a small pond in railroad cut, west of city.

Planorbis bicarinatus,, Say. Canal, not common.

Since these notes were begun I have added two more varieties to the list, viz:

Selenties concava. Very rare. A few were found in company with *Helix elevata* and *H. exoleta* on a hill that is covered with beech, thorn and locust trees. Still further south about six miles I found one live specimen.

Vallonia tricarinata, Say. Very rare.

Careful search has brought to light an abundance of *Limnaea palustris* in a small stream that is full of watercress. This specie was reported in last issue as being very rare.

I recently made a great "find" of shells within the city limits population 8,000. A certain lumber yard is within a block of the business centre of town and has been in use for a great many years. A friend had told me about there being so many shells there, so I went down one morning just after a rain and was well paid for my trouble. Thousands of young *Helix alternata* were on the ground under the boards and in the grass making it impossible to walk in places without crushing great numbers of them. *Vallonia costata* was abundant on dead weeds. Time being limited I collected only 400 *H. alternata* and about 300 *V. costata*. Several *H. alternata* were on a Republican flag-pole that stands in the lumber yard. Were they looking for "prosperity?"

ALLEN JESSE REYNOLDS,
Connersville, Ind.

The Navajo Belt-weaver.

For a number of years the writer of the present article lived in New Mexico, and, while there, such time as could be spared from his duties as a military surgeon at one of the stations in that little frequented part of our country, was entirely given to studies of everything the region afforded.

The camera and pencil were constantly in use, and the several tribes of Indians studied, with their simple arts, their habits and their history. I have watched the native weavers, both among the Zuni and the Navajos, manufacture their beautiful blankets, belts and sashes, fabrics now so celebrated in works devoted to the ethnology of these interesting people. Among the Navajos one will see a great many blankets made before an opportunity will be presented for him him to observe the labors of a belt-weaver. The reason for this is that blankets are a universal necessity with them, while the belt is principally used as a supplementary adornment in dress. As my time for leaving the country drew near, I almost despaired of getting a good photograph of the belt-weaver and the study of the loom she used. But a month before my departure, an Indian came into my study one morning, beaming all over with the welcome information that one of the best weavers in the tribe had started the making of a belt in front of one of their huts. These Indians were then building close to the confines of the garrison.

The first day I studied her methods of procedure and the second day I succeeded in obtaining several excellent pictures of this weaver at work. The woman has rigged up her loom in front of her house, she is busily engaged in her weaving and her child sits beside her. Standing up by the loom is an excellent figure of a Navajo Indian, wearing the dress of the daily costume of the men of his tribe.

Navajos raise their own sheep, spin their own wool, manufacture their own dyes, and as we have seen, weave their own blankets. And surely it is a sight not easily forgotten to see one of these superbly colored and woven fabrics coming off a loom made from undressed and unseasoned pieces of timber from the forest, at the hand of an Indian, the representative of a civilization so entirely primitive. European art has, to be sure, slightly affected this industry, but even to-day its influence is easily traced, and apart from this, these *serapes* and belts, as they are now made, saw their origin among the aborigines themselves.

Among all the native weavers of the Southwest, the Navajos have no equals, and are indeed far in advance of any of the others in this line of manufacture.

The weaver had constructed the subvertical, outside part of the frame of her loom of two trunks of small pine trees, averaging a little over three inches in diameter, and from which the bark was not removed. Parallel to each other and placed about a yard apart, these she had fixed in a slanting position against the front of her house outside. The upper ends were strapped to the house, and the lower ends slightly planted in the earth, being held more secure there by a few stones. Next she had firmly tied on cross-pieces, a double one a few inches from the top, and a single one at about a foot above the ground. Over these cross-pieces the warp passes, and in such a manner as to produce a double shed only. Then a smooth, short rod is made to take up the alternate threads of the warp above the intersection or in the upper shed. Below the intersection of the threads of the warp the weaver serves the lower shed with a set of healds, which are usually composed of yarn, have their own rod and as in the case of the rod above the intersection, include alternate threads of the warp. When drawn towards the weaver, these healds serve the purpose of opening the lower shed, and still another short rod is used to keep the threads in place, which is also well seen in the figure where the woman has her hands resting upon the batten, a smooth, flat and rather rather narrow piece of hard wood. This is the last and yet one of the most important adjuncts composing this primitive loom, and is used be the weaver in turning it horizontally to open the shed to admit the passage of the weft, and afterwards to pound the latter down firmly into its place as the weaving proceeds.

These belt-looms, as in use among the Navajos, are not always exactly alike in their construction, for we find in some of them that the side posts of the frame are omitted, and the upper cross-piece is fastened to a tree and the lower one served with a loop of rope, through which the weaver passes her limbs and then sits down upon thus holding the warp of her belt firm and tense by her own weight as she sits cross-legged afterward at her work. Other modifications of this simple loom are also to be seen in the contrivances in use among the Zunians and other pueblo tribles, and there are a number of departures from the main details of the weaving (also to be noted) as we have described them above.

Nearly all the belts and the blankets manufactured by these tribes are made by their women, though it is not difficult to find among them also most excellent male weavers, and a very elegant blanket I once secured from the Navajos was made by a man, and its weaving took him considerably over a

month to accomplish. A good belt can easily be bought for about $12.

Curves are never found in the figure patterns on the belts or blankets, but the employment of horizontal stripes, the diagonals and the lozenge are interwoven with a variety that appears to be almost endless in the matter of design. The leading colors used are red, brilliant orange yellow, a blue and by combination a green, and finally, black, white and gray.

The manufacture of these dyes is an exceedingly interesting process, but its description does not properly fall within the scope of the present article.

As civilization advances westward and makes intrusion into the haunts of these simple people, these aboriginal industries of theirs must eventually die out rather than be stimulated and enhanced by the contact. For with it civilization brings bright and cheap dyes of many shades, excellent Germantown wools that are not expensive but more fatal than any of these, very good and durable blankets, of bright tints, that may be purchased by these Indians for a few dollars at the store of the trader, and thus obviate the tedious necessity of any further manufscture of their own in the future.

Queer Superstitions.

The world is full of thoughtful students. The old time dogmas are one by one being exploded and, thanks to careful study and patient research of these self-appointed observers, we are constantly learning new things.

An exchange's reference to the antiquated belief of an old ignoramus who still fondly clings to the idea that "swallows and swifts hibernate in the mud, at the bottoms of rivers during the winter season, and that the juncos turn into sparrows in the summer and back to juncos when winter approaches," recalls to mind a number of other absurd theories that educated people no longer countenance. The first is the joint-snake, or, as it is more commonly called, glass-snake, which after throwing away its tail, is credited with "hitching on" to it again. It is nothing unusual for otherwise well read and intelligent people to assert with all the force of conviction that these snakes will, on being disturbed, throw themselves into numerous pieces and eventually, always after the observer has retired, jump back together again. To such an extent has this "yarn" been circulated, that the average school boy repeats it with apparent candor. As a matter of fact, the throwing or breaking apart process only occurs when frightened, and is caused by a sudden contraction of the muscles of the tail, which cause it to break off and usually into several pieces, as if it were brittle. According to the classification of most authorities, it is not a snake at all, but a lizard. Mr. B. W. Drinkard has one of these handsome little fellows in captivity. Some interesting facts not generally known concerning the habits of this lizard will probably result from the forced confinement of this specimen.

The quick eye of a frollicking school boy detects a moving thread-like object in a roadside puddle left by a recent storm. Lo! He has discovered a horsehair possessing life. The hair-snake is captured and critically examined by all the school children; teachers as well. Even if the teachers have given zoology some attention and know better, many of them do not take sufficient interest in the matter to contradict the old time nonsense, and the boys go home, procure a number of horsehairs which are put afloat in the "rain-water" barrel, or some other receptacle, and patiently watched for a number of days. Of course they never come to life, but the boys, having positively seen *one* "live horsehair," grow up and tell the same ridiculous tale to their children. Like the glass snake, this tiny worm is not a snake at all, being placed by naturalists among the vermes. They are closely allied to the fatal trichina, though

they develop in much lower forms of animal life, leaving them at maturity.

Another exploded old time notion is that owls see only during the night, whereas they are now credited with seeing equally as well during the day as by night. That owls turn their heads round and round until twisted off, in their efforts to watch an enemy, who, "knowing his bird," is repeatedly walking around his prey, impatiently awaiting the fall of the head that he may enjoy a dainty meal, is equally as rank rubbish.

Notwithstanding the assertion in Wood's Natural History, that rattlesnakes and burrowing owls live in prairie dogs' burrows, "finding an easy subsistence off the young dogs," it is known to a certainty that the rattlers and owls "in all cases occupy the deserted burrows of these quadrupeds, not living in common with them as usually supposed."—Cours.

The emblem of our country, the bald eagle, is no longer considered a noble bird, but is known as an ignominious thief.

Years ago, the natives, in preparing skins of the birds of paradise for foreign markets, for some reason, best known to themselves, always removed the legs, and in such a manner that an examination of the skin supported the deception, so that for many years these birds were supposed to be legless.

That the wishbone of a goose can in any way indicate the future condition of the weather is as hopelessly untrue as that, if the woodchuck sees his shadow on the 2d day of February, we may expect a cold and backward spring. Likewise, we may accept the "charm" theory of snakes with a considerable doubt, and it is now the belief of naturalists that the opossum does not "play 'possum," but is simply paralyzed with fear.

Our Atlantic seals possess large and intelligent eyes, and as some species have manes, it is not to be wondered at, that ignorant Eskimo and superstitious sailors, on seeing these animals unexpectedly emerge from the sea, with their manes dripping with water and uttering sounds strangely human, should mistake them for human beings. This, no doubt, gave rise to the mermaid, merman, siren, triton and sea nymph legends. The so-called mermaids to be seen in dime museums are all manufactured.

The story of the Ibex dropping from lofty precipices and lighting on its horns as composedly as we would jump a few feet, has long since ceased to be considered anything but a "fake," though early naturalists reported it as a fact.

"Blind as a mole" no longer prevails, as moles have eyes, though they are small and well hidden in the thick coat of soft fur covering their head and body.

Thus, gradually, the fiction and romance connected with and surrounding many of our animals is succumbing as reason and study penetrates and disperses the fog of ignorance and superstition.

The Soap Plant.

A few more facts concerning the *yucca angustifolia* or soap plant may be of interest. It is called *amole* by the Mexicans in southern Texas. They attribute their fine hair to the constant use of the plant in washing. The roots look like stunted stringy sweet potatoes. A few pieces are bruised with a stone, then placed in a tub and cold water poured on them from a height. It makes a beautiful lather, even with hard water. It is very fine for washing blankets, which become beautifully white and fleecy. The only drawback is that a rank vegetable smell clings to the wool for a few days, but thorough sunning removed this in about a week. A great recommendation to housekeepers is that no garment washed in amole is ever attacked by moths or crickets.

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

Correspondence and items of interest on above topics, as well as notes on the various Museums of the World—views from same, discoveries relative to the handling and keeping of Natural History material, descriptive habits of various species, are solicited from all.

Make articles as brief as possible and as free from technical terms as the subjects will allow. All letters will be promptly answered.

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NOTES.

Mr. G. G. Fielder of Winchester, Ind., reports the finding of a hen's nest under edge of rail fence containing four eggs of the Quail.

Mr. Wm. B. Crispen of Salem, N. J., sends us notes on collecting this season in which he records the finding of several Osprey and Fish Crow sets. A Heronry near his town was entirely deserted as also a Bald Eagle's nest on Eagle Island. The onward march of civilization will soon sweep away the last Herony on the North Atlantic coast and the Osprey is sure to become scarce. Speaking of Herons there is a Great Blue Herony within 8 miles of the office of the MUSEUM, which is remarkable in so thickly settled a community as Western New York. Farm houses are only a short distance from the nests of the big birds and while the birds are frequently shot at, the eggs and young birds occasionally gathered, yet they seem to *hold their own.*

New Ornithological and Natural History magazines come to our desk quite frequently of late and we do not much more than review them when they are conspicuous by their absence. We do not wonder that they "fail in getting started" for collectors have been gulled considerably in the past by amateurs trying to conduct natural history magazines on air. It takes $$, which if they fully realized it, would deter them from starting.

A score of collectors who have sent in their renewals to the MUSEUM for 1897-98, write "The MUSEUM continues to be the only natural history magazine that comes out promptly on time." If your subscription is behind renew at once. The price is surely consistant.

We advertised in May and June for old numbers of defunct magazines. Have you any of our wants? If so look them up and mail at once and we will allow you all they are worth in Specimens and Supplies.

Recreation for June notes the appointment of Mr. Frederic S. Webster as Taxidermist and Zoological Perforator of the Carnegie Museum at Pittsburg, Pa. Mr. Webster is well known to Washingtonians, as his place of business was for several years on Pennsylvania Avenue. He did a great amount of custom work as well as making quantities of artistic fur rugs for the trade. He also executed considerable contract work for the U. S. National Museum of the Smithsonian. Workmen from his shops are at work in nearly all parts of the country.

The Fish Commission steamer Albatross has gone to Alaska. She will meet Professor Jordan and his party at Sitka, and transfer them to the Pribilob Islands. The Albatross has aboard three members of the Fish Commission, who will be engaged in

scientific research this summer in the waters off the coast of Southeastern Alaska, returning in September. Accompanying Major A. B. Alexander, the fishery expert, this year, are H. C. Fassett and E. M. Chamberlain. The last is a young student just from Washington City. Previous to coming to the sound these three members of the scientific corps have been prosecuting their work along the Pacific coast between San Diego and Cape Flattery.

Useful Insects.

Nearly all the lace-wings, which include the ant-lions, aphia-lions, dragon-flies, etc., are a benefit, living wholly on other insects, and so help preserve our crops. Most of the locust order are destructive, yet even here we find the curious preying mantis, common at the South, with its jaw-like anterior legs, one of the first of predaceous insects. True, it attacks bees also, though it certainly does much more good than harm. Several bugs, like the great wheel bug and the soldier bug, feed exclusively on other insects.

Of the beetles the beautifully spotted lady-bird beetle, the black, long-legged ground beetles, the quick, fierce tiger beetles and a few others are valuable aids in holding our insect pests in check. One may repeatedly see the grubs of the ground beetles eating cut worms. The good work of the pretty lady-bird beetles in destroying the pestiferous plant lice can hardly be too much appreciated. Of the two-winged flies we have the tachina flies, which are internal parasites on other insects; they resemble in form and color the house flies to which they are closely related. These also prey upon cut worms, laying their eggs on the caterpillars, and as these eggs hatch, the maggots eat into their host and destroy its life.

Two other families of two-winged flies do much good in eating other insects. The robber flies are so fierce and strong they destroy even the honey bee, while the conical maggot of the pretty yellow-banded syrphus flies feed upon the plant lice to an extent surpassed by few other insects; they are nearly or quite equal to the lady-bird beetles as aphis destroyers.

Among the highest order of insects the one that includes the bees and wasps—we have the ichnuemon flies and the chalcids—wasp-like insects that are parasites and do incomparable good. They are of all sizes and prey upon almost all kinds of insects. They are far more helpful to the farmer than the tachina flies. They saved the wheat crop in Ohio, Michigan and Indiana in 1889. The wasps also belong to this order and do much good; indeed, we think we may say that the wasps are only our friends. They are dreaded needlessly, for unmolested, they rarely, if ever sting. We have seen wasps carry off slugs and tent caterpillars in great numbers. Every farmer should become acquainted with these friends and learn their habits that he may help—not hinder—their good work.

The Gold-fish in America.

The gold-fish or golden-carp (*Cyprinus auratus*) belong to the same family as the carp, which like them are fresh water fish. Some people claim they were introduced into America in the summer of 1697. This seems quite improbable, because authorities state they were not introduced into Europe until the last of the seventeenth or the beginning of the eighteenth century. Previous to this time they were only found in China, where they are also said to have been originally confined to a small lake near the mountain Tsien-king in the province of The-King. But at the present day they have been introduced into nearly all the countries of the world where it breeds in fresh water brooks and ponds.

The color of gold-fish is liable to the greatest variation; some are nearly all gold, mingled with red; others are marked with a fine blue, brown or a bright silvery line, but the usual predomitory color is that of a brilliant gold. The silver fish, differing only in size and color, are of a silvery hue, sometimes peculiarly marked, particularly on the fins and eyes. It often has double or triple tails, scarlet in color.

The fish have no value as an article of food, but the brilliancy of its color and the ease with which it may be kept in glass globes, made it the favorite (for keeping in globes) and it has continued to be so, chiefly for the reason they can live equally well in a jar, tank or outdoor brook.

The best method for keeping gold or silver fish, if there is a best, is in a round, square or rectangular glass vessel with about three-quarters of a foot of surface for every two fishes, increased by half for every additional one. You should never crowd too many fish into the same jar or expose them to the burning sun or the direct heat of a fire. They can endure great heat or bitter cold and it has been said they have been found frozen solid in water, but after gently thawing became perfectly healthy and well.

The best food for gold and silver fish is the prepared fish cracker. It is superior to bread or biscuit, because it does not sour or corrupt the water. Some people suppose they can get along without food. They can for a long time, but prefer a more substantial diet. Aquatic plants are beneficial and fine gravel should be strewed in the bottom of the vessel that contains fish.

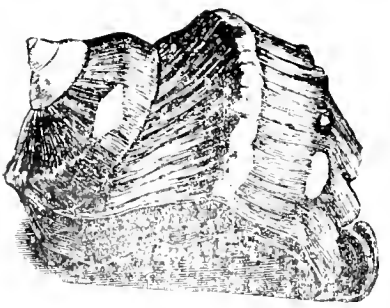
R. C. STEVENS,
New York City.

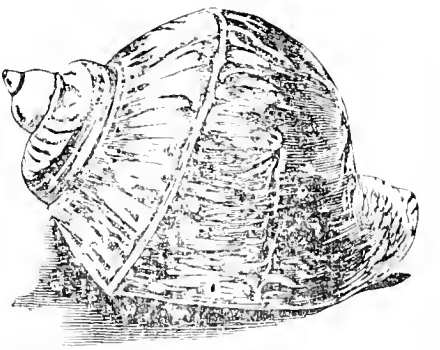
How Insects Breathe.

If we take any moderately large insect, say a wasp or a hornet, we can see, even with the naked eye, that series of small, spot-like marks running along the sides of the body. These apparent spots, which are eighteen or twenty in number, are, in fact, the apertures through which air is admitted into the system, and are generally formed in such a manner that no extraneous matter can by any possibility find entrance. Sometimes they are furnished with a pair of horny lips, which can be opened or closed at the will of the insect; in other cases they are densely fringed with stiff interlacing bristles, forming a filter which allows air, and air alone, to pass. But the apparatus, of whatever character it may be, is always so wonderfully perfect in its action that it has been found impossible to inject the body of a dead insect with even so subtle a medium as spirits of wine, although the subject was first immersed with the fluid and then placed beneath the receiver of an air pump. The apertures in question communicated with two large breathing tubes, which extended through the entire length of the body. From these main tubes were given off innumerable branches, which run in all directions, and continually divide and subdivide, until a wonderfully intricate network is formed, pervading every part of the structure and penetrating even to the antennæ.

A Curious Fence.

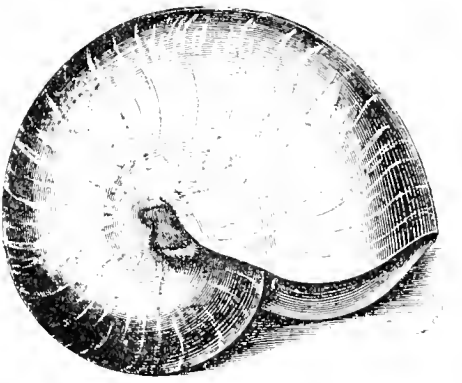
At Mammoth Hot Springs, Yellowstone Park, there is a fence made of elk horns. It incloses the greater part of the grounds of photographer F. Jay Haynes' studio. The fence is composed of over three hundred selected elk horns. All of them have twelve points, and a great many have the royal fourteen points. They were shed in March, 1895, and were gathered in June of the same year by Mr. Haynes and three of his men, within a radius of ten miles of Mammoth Hot Springs and within four days' time. There are a large number of elks in the park now.



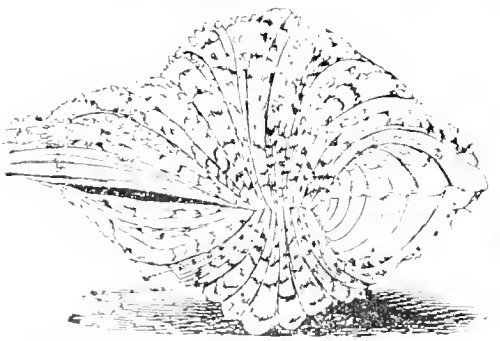


Above two cuts show Turbo marmoratus from China. The first being simply cleaned and polished showing the beautiful green and occasional streaks of Pearl. The latter showing all pearl. They rival the rare Pearly Nautilus. Either style range from 25c. to $2.50 according to size.

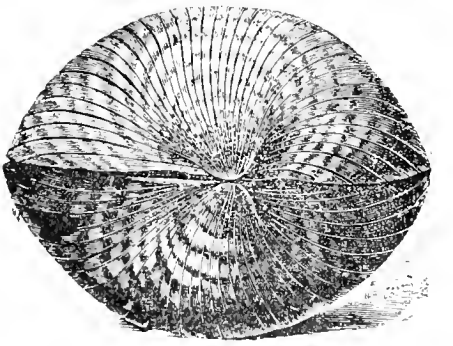
Voluta scapha, Singapore, (Foxhead), 25c.



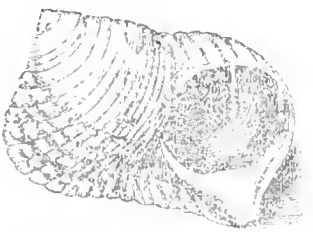
Nautilus Pompilius from Polynesia. Finely polished, $1.50.



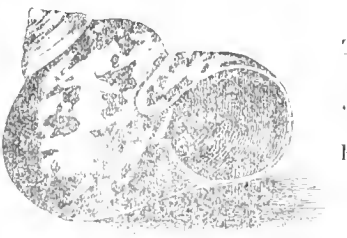
Tridacna maculata, East India Clam, 50c to $1.50. Very Showy.



Cardium psendolina, E. Indies. Large and very showy, 75c.



Turbo argyrostoma from Algoa Bay. Silver Mouth, 15c.



Trochus pica, Bahamas, "Magpie Trochus" Finely polished, 25c.

A CORRECTION.

Through a printer's mistake *The Osprey's* advertisement in the last MUSEUM read "25c for one year's trial;" this should have read, 25c FOR 3 MONTH'S TRIAL." It would be quite impossible for the *Osprey* Company to give more than 3 months subscription for 25c, for they are giving in *The Osprey* more for $1 than any similiar magazine is, or ever has attempted to give for that amount. *The Osprey* Company were advised repeatedly by their friends a year ago not to attempt to publish such a magazine for the small subscription price of one dollar. But the magazine was published and it was found that the magazine could be appreciated and supported by ornithologists and oölogists. And not only that but *The Osprey* has been constantly improving It is now just starting on another volume. Back numbers are selling at an advanced price. Subscriptions should be sent at once to include all numbers of the present volume. Address at once with 10c for sample, 25c for 3 month's trial, or $1 for one year's subscription. Published by,

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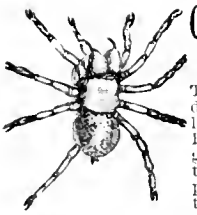

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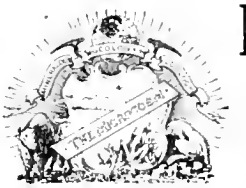

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VOL III. NO. 10.

AUGUST, 1897.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., AUGUST 15, 1897. No. 10

A Meeting of the American Association.

BY MARCUS BENJAMIN.

It has often been noted as an interesting fact that the American Association has commonly three presidents at one of its meetings. These are the retiring president, who yields the chair to the coming president at the opening of the session and delivers his address on the same evening, and the president elect, who is chosen at the meeting held on the last day. This year, by the death of Edward D. Cope, whose demise in the spring deprived this country of one of its most brilliant scientists, a fourth name presents itself in that of the senior vice president, who succeeded to the presidency, and who will call the meeting to order in the place of President Cope and deliver the retiring address, which on this occasion, at the request of the council, will take the form of a critical description of Cope's contributions to science. No one is more competent to attempt this task than Prof. Gill, for he has been the friend and fellow worker of Cope in similar lines since the early sixties, when the two young men were fellow students in natural history under Prof. Baird in the Smithsonian Institution. That the address will be a splendid summary of the work of natural history for the last quarter of a century is confidently expected by those who are already familiar with Gill's admirable biographies of Huxley and Goode that were prepared on the deaths of these two men.

Theodore Nicholas Gill, who ranks among the very first of American zoologists, is a native of New York City, where he was born on March 21, 1837. His early education was received in private schools and from private tutors, and then he studied law, but never was admitted to the bar. As he grew to manhood he developed an interest in natural science, and during the winter of 1857-58 he visited Barbados, Trinidad and other West Indian islands for Mr. D. Jackson Stewart, for whom he collected shells and other specimens in natural history. The results of his explorations were worked up mainly in the library of Mr. J. Carson Brevoort, and published in the Annals of the New York Lyceum of Natural History and in the Proceedings of the Philadelphia Academy of Science. It was in the library (the best of its kind in the United States) of this patron of science that he laid the foundations for that great knowledge of books and authorities which, combined with a splendid memory, has stood him in such good stead in his latter days. In 1859 he visited Newfoundland and studied its fauna, and in 1860 prepared a report of the fishes of the northern boundary for the State Department.

It was about this time that he came to Washington, which has since been his home, and in 1862 he became librarian of the Smithsonian Institution. This office he held until 1866, when the library was transferred to the Capitol, where he was continued in service until 1874, having become chief assistant. Subsequent to the last named date he has devoted his attention al-

most exclusively to studies in natural history, and is a daily worker in the Smithsonian Institution, having since 1894 held the honorary office of associate in zoology on the scientific staff of the National Museum.

Meanwhile he had became connected with the Columbian University, at first as associate professor of zoology and subsequently as full professor, which appointment he still holds, and gladly meets his classes regularly, considering it a privilege to contribute his services without compensation to the universty. It was from the medical department of Columbian University that in 1866 he received the degree of M. D.; that of Ph. D. came to him from Columbian University in 1870, and that of L. L. D. in 1894, from the same source.

His activity as a zoologist has been unceasing, and his contributions to that science have included over five hundred separate papers, most of which have been on ichthyology. Of these, many appeared in the Proceedings of the Philadelphia Academy of Natural Sciences, but since 1878 the Proceedings of the United States National Museum has been his favorite place of publication. His work has been chiefly on systematic ichthyology, especially with the arrangement of fishes in their classes, orders, and families, yielding a more natural and restricted distribution of genera, which has been almost universally accepted in the United States, and recognized in Europe. Among the most important of his contributions are "The Arrangement of the Families of Mollusks" 1871, "The Arrangement of the Families of Mammals" 1873, "The Arrangement of the Families of Fishes" 1873; the zoological portion of "Johnson's Universal Cyclopedia," the greater part of the volume on fishes and a portion of the volume on mammals of the "Standard Natural History," and the zoological text of the "Century" and "Standard" dictionaries.

Prof. Gill is a member of over seventy-five scientific societies, including the National Academy of Sciences, to which he was elected in 1873. His connection with the American Association began in 1868, and in 1874 he was made a fellow. Last year he was chosen vice president of the section on zoology, and as the senior vice president succeeded to the presidency on the death of Prof. Cope.

Oliver Wolcott Gibbs, the president upon whom the duties of presiding over this year's meeting will devolve, is also a native of New York City, where he was born on February 21, 1822. His education was likewise received in his native city. After passing through Columbia Grammar School he was graduated at Columbia College in the year 1841. Turning his attention to chemistry he studied for a few months under Dr. Robert Hare in Philadelphia, and then took a course in the College of Physicians and Surgeons in New York City, after which he spent several years in Europe studying under such famous masters as Pammelsberg, Heinrich, Rose, Liebig, and Regnault. In 1848 he returned to the United States, and for a year lectured on chemistry in Delaware College, Newark, Del., whence he was called to the chair of physics and chemistry in the College of the City of New York, where he remained until 1863, and then was elected to the Rumford professorship in Harvard University, with charge of the laboratory of the Lawrence Scientific School, which place he held for a quarter of a century, and then was made emeritus. Prof. Gibbs fitted up a private research laboratory in Newport, R. I. in 1887, where he had long had his summer home, and there he still continues his chemical studies. His personality attracted a large number of students to him at the Lawrence Scientific School, including such men as Frank W. Clarke, Charles E. Munroe, Samuel P. Sadtler, Thomas M. Chatard, and others of the foremost chemists of the United States. His research work

has included elaborate memoirs on the platinum metals, on the ammonia-cobart bases, on new analytical methods, on complex inorganic acids. It is this last research, which has extended over many years, that led to his discovery of the platino-tungstates, and the molybdates. He has also contributed valuable papers to the literature of physics.

During the civil war he was in New York City, and at time became actively associated in the workings of the United States Sanitary Commission and was chosen a member of its executive committee. In this connection he frequently met the other members of that body, and out of their daily contact grew the idea that, for the successful carrying on of their work, their meetings should "take the form of a club which should be devoted to the social organization of sentiments of loyalty to the Union." This was the inception out of which quickly matured the Union League Club, of New York City, whose original meeting was held at his residence on January 30, 1863, and of which he is today the senior honorary member. Prof. Gibbs has been honored at home and abroad as no other American chemist has. He has received the degree of L. L. D. from Columbia and from Harvard. He has been elected an honorary member of the Chemical Society of London, and is also the only American who has ever received an election to honorary membership in the German Chemical Society. He is one of the four surviving original members of the National Academy of Sciences, and of which he has held the office of foreign secretary, becoming in 1896 the president of that body. Prof. Gibbs has long been a member of the American Association for the Advancement of Science, and as far back as 1866 was a vice-president of that organization.

At the meeting helu last year, when it was proposed to hold a joint meeting with the British Association, the nominating committee, in casting about for the most distinguished American scientist to represent the American Association, were prompt to recognize the fact that the president of the National Academy of Sciences was indeed the most eminent living American scientist. The wisdom of this choice was universally conceded, and the American Association quickly ratified the action of their committee.

Groug Work in the University of Michigan Museum.

No one who is interested in common birds of Michigan, either for their song, plumage or otherwise, can help but admire and appreciate the several different groups, which have been placed in neat and appropriate wall cases in the Museum of the U. of M. The hand of the master has touched every detail. These groups have been selected and arranged so as to illustrate important facts in bird life. Some 15 in all were secured, very near Ann Arbor, together with nests, eggs, section of trees or lands, as were necessary to show the true habit or fact. In this, great care has been exercised in the field work where there were any material of a perishable nature, notes and casts were taken, by N. A. Wood, who has this work in charge, then with the skill of the wax artist, Mr. Wood, the leaves have been reproduced in art fabric, true to nature, sections of trees stand laden with leaves by the art of this fabric, plots of ground are thickly covered with grasses or flowers, as the case demands; water and snow are represented, the whole combining beauty and knowledge.

The work stands as a tribute to to Prof. D. C. Worcester the Curator, not only for his knowledge and energy in directing this work; but also for the good he has done in making it possible to visit our friends and find them in their true habits.

The veteran Ornithologist, Mr. A. B. Covert, deserves credit for his able advice, and a large share of the taxi

dermy work, so nicely executed, in this he has placed the birds in the various positions to correspond with the facts, to illustrate:

The Orchard Oriole (*I. spurius*) is used to illustrate plumage, correalated with age, the nest and eggs show nesting habits.

The Scarlet Tanagers (*P. rubra*) are used to illustrate plumage correalated with season, one bird about May 5th in bright scarlet, another May 10th, part scarlet and part olive green, and another Sept. 1st, in bright olive green.

The Marsh Hawk (*C. hudsonius*), is used to illustrate plumage, correalated with sex, as well as the Hawks which build a nest on the ground. The two birds in this group are an original pair, taken with the nests and eggs in a low meadow, two miles west of Ann Arbor. The male is perched on a stump, the female stands by the nest.

The Whip-poor-will (*A. vociferus*), is to illustrate protective coloration, it being very difficult to distinguish the pair of birds from the old logs which they are near, one is perched upon a log, the other upon some leaves. The nest and eggs are also shown, the accessories are idenical.

The Hawks that build nests in a tree are illustrated by the Red-tail Hawk, birds mounted by Covert and Wood.

The Grouse group shows a pair of birds, nest and eggs, in a brush pile, near a stump, with sheep near by, birds by Covert and Wood accessories by Wood.

The groups of King birds, Yellow Warblers, Yellow-billedCuckoo, Grasshopper sparrow represent important facts.

Groups not yet completed are the Loon, Green Heron, Spotted Sandpiper, Carolina Rail, Kill Deer, Plover, and Ptarmigan in summer plumage.

The Common American Crow is placed in a corn field and is at his bad habit in pulling the corn. Near him is an Albino Crow. Birds and wax work by Mr. Wood.

The Ptarmigan (*L. albus*) four in all, in winter plumage, and mounted in different positions, are used to show protection, and coloration. The acessories are very fine and represents a winter scene. Artificial snow, rock work, ferns, ground pine are used.

The Para Jacana is used to show the birds which run upon water lily pads and other aquatic plants, and artificial water rushes and water lillies in full bloom make a very pretty scene.

The Sparrow Hawks (*F. Sparerius*) are used to illustrate the Hawks that nest in a hole in a tree.

There are many other groups in cases, some of which have been mentioned, and it will not be long before the museum is built over on the group plan.

J. FOSTER.

Diary of an Arctic-Horned Owl.

ABIB *I; B. C., 2348.

Today I received the latest MUSEUM. In it was the following "ad.":

WANTED.—Seven live and first class specimens of each species of clean beasts and the fowls of the air, ALSO a pair each of all unclean beasts. This is positively our last call. All who wish to be saved must be aboard the barque ARK by April 17. PROF. NOAH, A. B., M. A., L. L. D., M. D., etc.

I knew what it meant. All the papers have been full of Prof. Noah's prophecy. Many don't believe it, but I do, and I am going to be on deck. Will start tomorrow.

This diary was lately found on Mt. Ararat, along with it was a copy of Lattin's pink catalogue and an O. and O. Manual. It dates back to the time of the flood. Thus, all the modern scientific researches go to substantiate the Biblical account of the creation.

NEAR THE ARK, ABIB 10.

Yes, here I am. Just got here this morning. There is an awful crowd—

* The Hebrew month about corresponding to March. The other months used here are—Jan. (May) and Adai (Feb.)

birds and animals of all kinds. I found that Mr. Shem Noah is at the lead of the ornithological department, and to him I applied for admission. I only saw his clerk, however, who told me that they were taking the birds according to the A. O. U. check list, and they would not want me for a couple of days, as they were at present busy with the Loons and Grebe. Though I was the first Horned Owl there, as I said before, there are thousands of other species. The place was covered with them. They settled on the roof of the Ark in such numbers, as to threaten to break it in, and Prof. Noah himself, had to come out to order them off, before they would go. Even then some spoke back rather sharply to him; but had a very strong and convincing argument in his favor, which prevailed in the end, viz:—a double-barreled ten gauge breech loader.

After all, in spite of crowding and the noise and the heat, it is very pleasant here. I believe I fed better today than I ever did before. One has to go carefully though, for the professor has prohibited any indiscriminate slaughter. But he can't have his eye on us all the time, and Oh! those Ortolans and little Egyptian Quail are good.

ABIB 11.

What a noise! I can hardly hear myself think. Poor Shem has his work cut out for him. Only seven of a species can be admitted, and every kind is represented by a score at least of excited individuals—each one demanding to be admitted. He checks off the last lot as it goes aboard and calls up the next, and in a minute there is a rush and a flight to see who will get there soonest. I was the first of my species, but today there are a lot more just arrived, but I suppose I am safe, I got here first; still I can hardly help worrying a little.

ABIB 12.

Who-o- who-o-o—who-o. Who said Owls were stupid birds? I am an Owl, and a living proof of the falsity of the statement. A stupid bird could not of gotten ahead of Mr. Shem in the way I did. Did you see me? am right in it—in the Ark I mean.

The Owls were reached at last this morning, and I tried to get in line, but found nine or ten ahead of me. I told them I was first on the ground and I should have first place. The first six were willing enough, but those behind utterly refused. I was horrified. Force was out of the question, so I argued and begged and stormed, but to no avail. No, seven in the line hooted at me. If he hadn't been so big I should of made him sorry for it. I was half crazy over my dilemma, when I observed a flour barrel that the careless commissary department, under Mr. Ham had dropped and burst, a brilliant idea struck me. I flew over and rolled in the spilt flour, and came back and presented myself to the clerk, just as my unnatural brethren were going up the gang plank. The clerk said:

"We have enough of your kind, there are several on board now."

I effected great astonishment at this, and said:

"Don't you "recognize" me, I am not the ordinary Horned Owl, I am the Artic Horned Owl—a new species."

The clerk was puzzled and hummed and hawed, but I was firm, so he called Mr. Shem over and stated the case to him. Then they got out a tape line and Coue's Key, and called a meeting of the A. O. U. As sure as the latter was done, I was confident of my case, and sure enough, I was admitted; together with six more of my friends, who had followed my example. Well, we got in any way, and that was all we cared about. In fact, all the Horned Owls did also by various devices. Some rolled in a coal bin, and the rest used the same flour I did, but shook themselves a couple of times after it. That's how I fooled them. They are dead easy.

It is awful crowded inside here. We Owls are all together in a little bit of

a room, where there is hardly space enough to turn around in. When I first came, I looked around for a perch - they were all taken. However, a little Saw-whet was calmly enjoying a comfortable place near me. Quite by accident, of course, in spreading my wings to stretch, I knocked him off his perch, and before he recovered himself, I jumped up on it. He objected to the proceedings, and was about to call an attendant, when I explained to him, with one of my fierce looks, that, seeing that he and I were going to live together for some time, he would find it more comfortable on the whole, to let me enjoy my little jokes. So here I am, snugly enscoused on board at last, and a very easy seat too. The Saw-whet is trying to sit on the sharp end of a spike, he looks funny.

ABIB 13.

Another day has passed; nothing of importance, however, has happened. The Finches are coming aboard now. They are not slow either. The Red Polls worked the Orical in great shape; some of the tricks they played are worthy of my example. They used the flour scheme until they were refused admittance, and then one went and ground his bill down on a grindstone a little sharper, and palmed himself as a *Hoary* Red Poll, and it worked too.

ABIB 17.

Nothing worth recording happened today. Everybody is aboard, but not settled. The elephant cannot find his trunk, and is now screaming at the carelessness that put it in the hold, when he wanted it in his state room. These cramped quarters are very try-upon one's temper. The Saw-whet has a most beastly one, and grumbles (as much as he dare) whenever I take his share of the food. It stands to reason, that a small bird like him requires less food than I do. He is most unreasonable.

ABIB 18.

Whew! how it rains. I am glad I am not outside. Things have quieted down a little now; though every now and then an angry dispute breaks out somewhere, over food, or room, or a some such cause. I wish the crows in the next room wouldn't annoy me so. I gently remonstrated with one, whose head came close to a crack in the partition—before he died, he said he "had caws to annoy me." Punning is so vulgar; it quite spoilt his flavor.

ABIB 28.

Haven't had a moment's peace lately. Those confounded crows next door, have behaved most shockingly. They hurl the most abusive epitaphs at me. They keep away from the crack though, so I can't do a thing in defense. Salt meat is tiresome as a diet. The Saw-whet is becoming most impertinent, I will have to teach him a lesson. Today I stepped on him, and he had the nerve to ask me to move my foot. If he keeps on he will get hurt; I cannot stand his whims much longer.

JAN. 14.

The rain is abating, but it will be some time before the water goes down. I am stiff with this confinement, my wings fairly ache for exercise, and I am sick and tired with that salt meat we are served with. I wonder how the Saw-whet would taste?

JAN. 20.

The Saw-whet was very tender indeed. Nobody saw me take him, but that Barred Owl. I wonder if he could make much of a fight?

SHEBETH 10.

I hear some of the mountain tops are in sight. The water there is falling very fast. The Barred Owl was rather tough, but far better than salted stuff.

We have been hard and fast aground for some time now. The Professor

can not tell where we are at, for, one of the monkeys stole his case of instruments, and gave them to the ostrich, who swallowed them, without anyone seeing him but me. I know enough to keep still though, for that same ostrich saw me eat the Barred Owl.

SHEBETH 12.

The chronometer and an alarm clock were missing. It went the same way as the instruments. But when the alarm went off, it gave the gag away. The Ostrich looked foolish when the Veterinary Surgeon gave him an emetic and made him disgorge.

ADAI 1.

Lately the Professor has been sending out Doves and Ravens to report the height of the water. The Dove brought back a sprig of olive—a little one too, to make all that fuss about. I am just aching for a good fly, and if I had been sent I would of brought back a whole limb of the William Henry. The ostrich informed on me about the Barred Owl, and I am so closely watched I cannot get any fresh meat.

ABILE 27.

At last we are let out. The first thing I did was to make a raid on a Ruffed Grouse, and my! wasn't it good—well now. There is an awful stench though—worse than when the two skunks got quarreling over the bone on the Ark last month. The Professor is using a patent disinfector, and I guess there is no danger of disease. Everybody is tickled to death at getting out, and are quite foolish over it and all hungry too. A Western Horned Owl shook his feathers, and remarked to me of the mountain we were on: "Is that Ar a rat?"

Tomorrow I am going back to my old grounds. I suppose things will look peculiar, but the Ducks all say it is just perfect. There is no accounting for tastes.

P. A. TAVERNIER,
Toronto, Ont.

THE MUSEUM.

A Monthly Magazine devoted to Ornithology, Oology, Mollusca, Echinodermata, Mineralogy and Allied Sciences.

Walter F. Webb, Editor and Manager

Albion, N. Y.

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Collecting About Chicago.

My companion and myself left the house at 6 o'clock a. m. and took the electric cars for the city, arriving there half an hour later, says Prof. F. C. Baker in "Sports Afield." We then walked four blocks to the depot of the Illinois Central, where we took a train, after waiting half an hour, for 104th street, situated near Calumet Lake, our destination; where we arrived at 8 o'clock. We were now about fifteen miles from our starting point. These traveling facts are given to show how how far the collector has to go in this region before finding a good collecting locality.

After leaving the train we crossed a field and soon reached a little ridge overlooking Lake Calumet. Upon this ridge, under the roots of a rotten tree, we found several dozen *Conulus fulvus*, *Vitrea arborea*, *V. indentata* and *Pupa contracta*; strange to relate, however, not a shell could be found

anywhere else upon the ridge. From the top of this elevation, an old lake beach of Lake Michigan, we could look out over Calumet Lake. Between our point of observation and the lake was a level stretch of country fully three-quarters of a mile wide, and apparently perfectly dry. At the base of the ridge we found a number of fresh water forms in a little ditch. *Limnea palustris*, *L. Caperata*, *L. Cubensis*, *Planorbis parvus* and *Segmentina armigera* were very abundant, and also very large and fine. From this point our troubles began and did not cease for over two hours. As I stated before, the level stretch of country between the ridge and the lake appeared to be perfectly dry when viewed from the former place. Such, however, was not the case; it was covered with water from a few inches to several feet in depth. Here and there were a number of dry places, and we concluded to try to reach the lake by following these dry spots.

All went well for a short time and distance; but soon we came to a place where these dry spots were entirely absent. We hesitated here and hardly knew what to do. Looking back we saw that we had accomplished about half the distance, and it seemed a shame to walk over the same ground and lose the time so carefully spent in reaching our present position. We therefore decided to go on even at the risk of getting our feet wet. Among these small bodies of water, snakes were common. As we were crossing one of these lakelets, my companion shouted "snakes" and I saw a large specimen of the garter snake (*Eutænia sjrtalis*) rapidly making his way through the grass. I quickly placed my foot on him and reached down to pick him up. As I did so he made a vicious spring and fastened himself to my index finger. Shaking him off, I made a sudden "grab" and succeeded in catching him just behind the head. After catching him, the next problem was where to put him, for we were out for snails and not for larger forms of life. I finally discovered a good-sized tobacco box in my collecting bag, and we placed him in this. We now waded through, at one time only wetting the soles of our feet, and at another, sinking knee deep in mud and water, and finally reached the shore of the lake.

At this point another disappointment met us. The shore was choked up with dead cane stalks, and not a mollusk could be found. After searching in vain for some time, we concluded to walk around the head of the lake to a big ditch which connects Lake Calumet with Calumet River. The fields which we were obliged to cross were swampy, and before very long we were pretty badly wetted. At one point we encountered a patch of water almost waist deep, and concluded to wade through rather than go around. Here am amusing incident occurred. My companion discovered a Wilson's snipe (*Gallinago delicata*) in the middle of a small patch of water, which seemed to be hurt in some manner as if did not fly when approached, but simply swam and ran. Thinking to catch it alive, he ran (or jumped) after it, and, when he made his last jump, he landed right on top of the bird, at the same time sinking almost up to his waist in mud and water, and completely burying the Snipe from sight. Ten or fifteen minutes were spent in hunting for the bird, but without avail. As my companion remarked: "He must have gone through to China." This small patch of water was filled with very fine specimens of *Limnea palustris*, and the eggs of this mollusk were seen on almost every water plant. Several additional garter snakes were also seen at this locality.

About noon we reached a fine grove of elm trees, situated on an elevated piece of land, very dry, and I proposed that we rest here and eat our lunches, to which proposition my companion readily agreed. It was certainly delightful, sitting beneath the trees eating our lunch, our appetites whetted

by hard labor, listening to the notes of the birds and seeing their brilliant forms flit from tree to tree. The little grove seemed to be fairly alive with birds of several different kinds: Red-headed Woodpeckers, Scarlet Tanagers, Flycatchers, Warblers, Creepers, and other birds too numerous to mention. The Blue Jays made the air "squeak" with their note, which resembles nothing so much as the squeaking of a rusty hinge.

From this point we walked (part of the way, waded) to the big ditch which connects the Calumet River with Lake Calumet. The north side of the ditch was banked up high with debris dredged from the canal, and on this slope the dead shells of mollusks are very plentiful. We picked up a large number of the following species: *Anondonta footiana*, *Unio lutcolus*, *U. pustulosus*, *U. gibbosus*, *Limnea reflexa*, *L. stagualis*, *Planorbis trivolvis*, *P. campanulatus*, *Vivipara contectoides*, *Campeloma decisum*, *C. subsolidum*, *and Sphærium striatinum.*

From this ditch we walked three miles to Wolf Lake. This locality is a very good one. The shores are sloping, in some places sandy and at others muddy, thus affording a good habitat for a variety of forms of mollusks. On the muddy bottoms we found *Vivapara contectoides* in vast numbers, and a few good specimens of *Campeloma decisum*, *Unio lutcolus* and *Unio gibbosus*. On the sandy bottoms *Pleurocera subulare* was found by thousands. The shores of the lake are wooded here and there and after a rain many species of pulmonate mollusks may be found about the dead stumps and fallen trees. As it was getting late, we were not able to explore these groves, but were content to return with what we had already obtained. These were, to sum up: two snakes, two field mice, and about 200 living and a like number of dead mollusks of thirty species. Thus ended our day's collecting.

FRANK C. BAKER,
Curator Chicago Academy of Sciences,
Chicago, Ills.

A Pre-Historic Tomb.

About four miles west of Barnesville, O., is a ridge, known as the "High Ridge," so called from its great height over the surrounding country. A burial place is situated at the very verge of the south end of the ridge, and to the northward for over 300 yards, is a moraine of small limestone, the top being almost as level as a floor. This leveling has evidently been done by human hands.

In building this tomb, the ground seems to have been excavated to the depth of three feet, the cavity being ten feet east and west, and fifteen feet north and south. Around this entire hollow space, was a wall fully three feet in height, built of small limestone. At the south side of this was found the remains of a tremendous human being of long ago. The body had been placed directly east and west, with the head to the east. A large, flat stone, of peculiar shape, had been placed just back of the head.

The distance from where the heel bones (Calcarreum), were lying, to the point where the top of the skull was found, was eight feet three inches. In examining the fragments of the bones, one is fully convinced of the great stature of the person. There was a large piece of the skull well preserved, and about two-thirds of the jaw bone was in good state preservation with four back teeth firmly set in their sockets. This bone is half as long again as that of the ordinary person. The crowns of the teeth are worn flat, but are well kept. The wear of the teeth, the porosity of the bones, and the obliteration of the sutures of the skull, show that the subject was well up in years. From the shape of the crania, high forehead, large teeth, and long

nasal bones, it belonged to the long head Dolicocephalic type.

A careful examination disclosed no instruments or tools of peace or war, or trinkets of any kind.

The most interesting fact was that, nearly all the stones composing the vault, were splattered with a white substance hard as stone. It was no doubt an oblation to the dead, made by some grim, grand, old priest, amid solemn chant and song.

WILLARD B. DOBBINS.

Washington, D. C., Notes.

Messrs. Colburn and Potter at Schmidts Studio of Taxidermy are working up a quantity of African specimens, chiefly ruminants; both heads and full mounted mammals.

The collections at the National Museum are depleted by the Nashville Exposition. This travelling show business makes work and ruins any quantity of good specimens.

Mr. Wm. Palmer, Chief Taxidermist of the National Museum, left Washington on the 5th inst. for a two weeks' leave of absence, which will be spent in the Dismal Swamp country. To ascertain the varieties of warblers breeding there is one object of the excursion. Dr. Fisher, of the Agricultural Department visited the Dismal Swamp some time since and found it an interesting place for the naturalist.

A specimen of Bachmans Sparrow was recently taken in Virginia not far from Washington.

Camei.

The word cameo has been derived in several ways, and as some of these derivations give an insight into the original use of camei, they may as well be stated at the outset. It is said by some authorities to be derived from the Arabic camaa, an amulet, for which purpose engraved gems were worn in the middle ages. Camilo Leonardo, in 1502, speaks of "gemmæ chaminæ" in the sense of camei. He speaks of a stone called kaman, derived from the Greek kauma, "heat," as being found in hot places; others derive it from chama, the shell sometimes made use of for this kind of work, just as porcelain is derived from the porcelain shell which was formerly used for the Italian Faenza ware. The peasants at Rome, in the time of Benvenuto Cellini, used the term camei as a name for the onyx stones they found or dug up, and the word appears only to denote a color—paintings on *camacin*—gray objects on a white ground. The word is probably of Italian formation, the Latin word *gemmeus* being converted into *gamahu* by the old writers. *Gamahu* easily becomes cameo, as the letters c and g are interchangeable in Italian. The term cameo applies only to minute bas-reliefs cut on a hard stone or gem, or on an imitation of the same.

Nearly all the antique camei were too large to be set in rings, and were used to decorate armor. Rings, as is well known, were formerly used merely as signets, and not for personal adornment, and it has been stated that the ancient artists did not engrave their small works with sufficient delicacy to be worn on their fingers. The cutting seems to have been done by a tool made in the shape of a chisel, which, of course, left a series of uneven surfaces that were afterwards polished down. The design was never undercut, as it is in modern cameos, but faded away into the field of the stone; and nearly all the ancient cameos were intended to be viewed from a distance, as they generally appear rough on a close inspection. The modern camoes are engraved at relatively small cost, as the dealers in Rome pay the cameo cutters about 75 cents each for the portraits on onyx of the poets and philosophers, which are purchased by tourists at a much higher price, to be set in rings, studs and pins. A great number of the modern cameos are engraved upon shells, in which the natural colors imitate the

colors of the sardonyx, the Indian conch being much used, as it has diverse and beautiful strata. The sardonyx itself consists of a white layer superimposed upon a red one of sard (the sard being a semi-transparent quartz of a dull red color). The imitation of the sardonyx is made by placing a red-hot iron on a red sard, which renders it white to the depth required. The common onyx has two opaque layers of different colors, usually in strong contrast to each other, black and white, dark red and white, green and white, and other varieties. The oriental onyx, the most valuable of all, has three layers, the top one being red, blue or brown; the middle layer white, and sometimes of a pearly hue, and the base a jet black or deep brown. The onyx and the agate are the same substance, but the layers in the agate are wavy and often eccentric, whilst in the other they are parallel.

There are other materials upon which cameos are engraved. A green one is sometimes met with, which is chalcedony, colored by some metallic oxide. The tourmaline is a dark, olive green stone, sometimes used, and there is a blue and a bright green variety also. However, apart from the shell cameos, nearly seven-eights are engraved upon the sards. There are paste cameos, and these are sometimes so skillfully executed as to defy detection, except by the file. A cameo of a Greek warrior on horsback, executed by Pistrucci, was adopted in 1816 as the reverse of the British sovereigns and crowns. It is seen in an improved copy in the later British coinage, and is probably the finest work that has ever appeared upon modern currency.

The Passenger Pigeon in Connecticut.

The first time I saw a Passenger Pigeon in Connecticut I was taken rather aback for so far as I have been able to find out it was very rare as a migrant. It was on April 6th I first saw one and on the 18th I took a fresh set of two eggs and I tell you I felt good, two days after I took two more fresh sets in about the same locality. After that I took no more until May 12th, when I took two more sets of two eggs each. I have tried hard to get a shot at the birds but all my efforts were fruitless, the birds being very shy and timid. Although I have been able to observe them through an opera glass the minute I would raise my gun they would be off like a shot. My next luck was on June 5th rather late I think for this species to be breeding. On that day I took one set of incubated eggs. The birds seemed to have entirely disappeared by the first of July and I saw no more of them until this year. They are not so plentiful this year as last, I have only taken two sets altogether. One on May 1st and one on May 5th. All the eggs and nests have been in hickory trees with the exception of one which was in a maple. The nests have all been exactly alike composed of a few sticks very frailly put together and as a rule placed on a horizontal branch well towards the end. By the end of June they had all disappeared and I had not seen one up to the time I left. A. G. HOWES.

BARGAINS FOR AUGUST.

All of the fine specimens below listed are in stock at present, but of some kinds we only have a very few. All will be sent prepaid where orders amount to $1 or over, except skins that measure one foot or over, which will be sent at purchasers expense packed as lightly as possible. Send your orders at once. Any specimens will be sent on approval or selection. In other words we expect to please you. All orders are filled in regular order and on same day as received if possible.

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	Per Egg
American Eared Grebe 1-7 1-8	$ 05
Royal Tern 1-2	15
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Sooty Tern 1-1 1-2	10
Great Auk, cast	1 00
Moa, cast, New Zealand	2 00
Æpinornis, cast, Madagascar	3 00
California Gull 1-4	12
Ring-bill Gull 1-3	12
American Herring Gull 1-3	10
Cassins Auk 1-1	35
American White Pelican 1-2	20
Pintail Duck 1-6 1-8 1-11	12
Ruddy Duck 1-6	15
Mallard 1-6 1-10	10
Gadwell 1-11	20
Red-head 1-6 1-12	10
White Ibis 1-3	12
Little Blue Heron 1-4	06
Prairie Sharp-tail Grouse 1-6	15
Mountain Quail 1-7	20
Florida Gallinule 1-7 1-8	04
American Coot 1-5 1-6 1-7	04
Chachalaca 1-3 1-4	15
Ferruginous Rough-leg 1-2 1-3	75
Short eared Owl 1-4 1-5	30
Road Runner 1-5	05
Groove-bill Ani 1-5	25
Snowy Plover 1-3	15
St. Domingo Grebe 1-4	15
Spotted Sandpiper 1-4	07
Cassin's Purple Finch 1-4	25
Prairie Warbler 1-4	12
Sage Thrasher 1-4	20
Abert's Towhee 1-3	20
Lark Bunting 1-5	10
Great-tail Grackle 1-4	06
Curve-bill Thrasher 1-4	07
Bendire's Thrasher 1-4	20
Sennetts Thrasher 1-4	07
California Thrasher 1-3	10
California Shrike 1-5	06
Starling 1-5	04
White-wing Dove 1-2	08
Warbling Vireo 1-4	07
Inca Dove 1-2	25
Ground Dove 1-2	15
Mexican Ground Dove 1-2	20
Orchard Oriole 1-5	03
Bullock's Oriole 1-4 1-5	05
House Finch 1-4 1-5	03
Western Lark Sparrow 1-4 1-5	02
Bronzed Grackle 1-4 1-5	02
Brown Thrasher 1-4 1-5	02
Catbird 1-4	02
Red-wing Blackbird 1-4	02
Nighthawk 1-2	12
Western Nighthawk 1-2	12
California Towhee 1-3 1-4	01
Towhee 1-3	01
Herrman Song Sparrow 1-3 1-4	01
Yellow Warbler 1-4	02
Yellowbreast Chat 1-4	02
Long-tail Chat 1-4	05
Cardinal 1-3	03
Grey-tail Cardinal 1-3	25
Russet-back Thrush 1-3	04
American Robin 1-4	02
Swamp Sparrow 1-5	05
Mexican Horned Lark 1-4	10
So. Hairy Woodpecker 1-4	20
Indigo Bunting 1-4	04
Baltimore Oriole 1-5	04
Scissor-tail Flycatcher 1-4 1-5	04
Vermillion Flycatcher 1-3	25
Texan Nighthawk 1-2	12
Phœbe 1-5	03
Yellow-bill Cuckoo 1-5	06
Chickadee 1-6	06
Traill's Flycatcher 1-3	08
Acadian Flycatcher 1-3	07
Crow 1-5	03
American Magpie 1-5 1-6	04
Black Tern 1-3	05
Blue-wing Teal 1-6 1-10	08
Shoveler 1-9	12
Cooper's Hawk 1-4 1-5	10
Harris' Hawk 1-3 1-4	15
Virginia Rail 1-5	06
California Screech Owl 1-4	12
Screech Owl 1-4	12
Texan Quail 1-12	04
Ruby-throat Hummer 1-2	25
Rusty Song Sparrow 1-3	10
Golden-front Woodpecker 1-4 1-5	10
Baird's Woodpecker 1-4	15
Mexican-crested Flycatcher 1-4	10
Red-bill Pigeon 1-1	25
Blackhead Grosbeak 1-4	07
Rose-breasted Grosbeak 1-3	07
Black-throated Sparrow 1-4	10
White-eyed Vireo 1-4	06
Warbling Vireo 1-4	06
Loggerhead Shrike 1-5	04
Western Meadowlark 1-5	04
Bewick's Wren 1-5	08
Baird's Wren 1-5	08
Brown-head Nuthatch 1-5	06
Blue Jay 1-4	03
Tufted Titmouse 1-6	10
Cactus Wren 1-4	08
House Wren 1-6 1-7	03
Mocker 1-4	04
Wood Thrush 1-4	05
Wilson's Thrush 1-4	05
Lawrence Goldfinch 1-5	10
Arkansas Goldfinch 1-5	06
Meadowlark 1-3	03

Some nice sets with nests. Price is for the clutch and nest together.

Carolina Junco 1-4	$1 00
Chestnut-sided Warbler 1-4	60
Indigo Bunting 1-4	50
Red-eyed Vireo 1-4	45
Yellow Warbler 1-4	25
American Redstart 1-3	25
Least Vireo 1-3	1 00
Least Flycatcher 1-3	25
Phœbe 1-5	50
Traill's Flycatcher 1-3	35
Red-wing Blackbird 1-4	40
Cedar Waxwing 1-4	35
Yellow-breast Chat 1-4	35
Wood Thrush 1-4	40

We have a great number of the following large showy European Eggs. We offer same at less than they can be bought in Europe for cash. Price per egg

Partridge 1-13	06
Capercaillie 1-6	20
Magpie 1-5	04
Moorhen 1-6 1-7 1-8	05
Pin-tail Sand Grouse 1-3	25
Carrion Crow 1-4 1-5	07
Red-legged Partridge 1-10	10
Sandpiper 1-4	05

We can offer over 200 species, if only one of a kind is desired.

NICE BIRD SKINS VERY CHEAP.

We have received some fine lots of skins this season and have more on the way. We list here some on hand and solicit your order. We do not list the sexes, as our stock is quite largely males, still we have pairs of a great many species.

	Price per skin
2 Carolina Paroquet	$3 50
2 Marbled Murrelet	2 00
2 Carolina Dove	25
3 Black Duck	75
2 Florida Crow	40
3 Ruddy Ducks	40
2 Florida Gallinule	30
1 Mexican Cormorant	1 00
1 American Osprey, immature	50
2 Short-eared Owl	40
2 Chachalaca, not A 1	40
4 Florida Ducks	75
1 Old Squaw	60
2 Wood Ducks	75
1 Bufflehead	35
1 Shoveler	45
2 Yellow-legs	20
1 Willet	40
1 Wilson's Snipe	30
1 Greater Yellow-legs	30
1 Dotterel, foreign	25
2 Texas Screech Owl	40
1 American Coot	35
1 Northern Eiders, males	1 75
3 Red-bill Pigeon	40
6 American Bitterns	30
1 Long-bill Curlew	50
3 White-tail Hawk	75
1 Florida Barred Owl	50
6 Great Blue Herons	1 00
1 White fronted Goose	1 50
2 Mallard	80
2 Mergansers	60
4 Pintail	50
2 Goldeneyes, females	40
2 Grebes	20
1 Coot	30
2 Least Sandpiper	10
2 Spotted Sandpiper	12
1 Solitary Sandpiper	15
1 Killdeer	20
2 Sharp-shined Hawk	40
2 American Quail	40
1 California Quail	40
3 Louisiana Heron	50
1 Green-wing Teal	35
4 Yellow-crown Herons	50
3 Marsh Hawks, reddish	40
1 Caracara, male	80
3 Caracara female	50
4 White Egrets	75
1 Chestnut side Warbler	10
1 Western Wood Pewee	12
6 Ruby-crowned Kinglets	10
2 Scarlet Tanagers, fem	20
2 Red-eye Vireos	15
4 Maryland Yellowthroat	10
1 Myrtle Warbler	10
2 Palm Warblers	15
2 Mexican Ground Doves	30
1 Black-crested Tit	15
1 Kingfisher	30
2 Yellow Warbler	10
1 Pine Warbler	20
1 Western House Wren	10
2 White-breasted Nuthatch	15
1 Plain Tit	20
4 Chickadee	10
3 Sora Rail	20
2 Florida Quail	40
1 Little Blue Heron	50
4 ditto, blue and white and pure white	50
5 Fla. Red-shoulderd Hawk fair	35
1 American Herring Gull	80
1 Black Brant	1 50
1 Sandhill Crane	3 50
1 Anhinga, bill damaged	95
1 Black-throated Blue Warbler	15
3 Scissors tailed Flycateher	50

1 Scarlet Tanger, male 25
4 Western Yellowthroat 10
2 Yellow throat Vireo 12
1 Cedar Bird 15
1 Texas Wren 10
1 Parula Warbler 15
2 White-crown Sparrow 15
2 Tennessee Warbler 30
1 Ovenbird 15
1 Crimson House Finch 15
1 Bewick's Wren 15
1 Pallid Wren-Tit 25
3 Red-breasted Nuthatch 15
3 Robins 15
10 Redpolls 10
1 Red-wing Blackbird 15
2 Purple Finch 10
1 Brewer's Blackbird 15
2 Audubon's Warbler 12
1 Least Flycatcher 12
3 Western Flycatcher 12
1 Arkansas Kingbird 20
4 Downy Woodpecker 12
1 Great-crested Flycatcher 12
1 Red-headed Woodpecker 15
1 Ani and 2 young, each 20
1 Indigo Bird 15
1 Catbird 12
1 Oregon Towhee 20
1 Abert's Towhee 50
1 Wren-Tit 25
1 Vesper Sparrow 12
4 White throated Sparrow 10
1 Western Vesper Sparrow 12
1 Rusty Song Sparrow 15
1 Field Sparrow 12
4 Snow Bunting 20
3 Western Savannah Sparrow 10
1 Russet-back Thrush 20
10 Horned Larks 10
2 Cowbirds 12
1 Kingbird 15
4 Prairie Horned Lark 15
1 Buff-bellied Hummer 30
1 Little Flycatcher 20
4 Yellow-bellied Sapsucker 20
4 Hairy Woodpecker 15
2 Pine Siskin 15
1 Flicker 15
2 Savannah Sparrow 10
1 Barn Swallow 15
2 White-eye Towhee 20
1 Samuel's Song Sparrow 15
1 Towhee 15
6 Song Sparrow 10
1 Golden-crowned Sparrow 15
1 Swamp Sparrow 12
2 Chipping Sparrows 10

2 Tree Sparrow 10
10 Canaries, house 10
1 Peacock 1 00
1 Wild Cat and Skull, large, from Texas 2 50

LAND AND MARINE CURIOS.

We have the following fine curios on hand and in most cases in large quantities. Of many we will sell to parties who have an opportunity to sell again, at a very close figure. Write us, giving an idea of how many you could use. All of the following prices are prepaid if order is $1 00 or over. Under that amount enclose 10c for postage and packing. For a few dollars, one can get a collection from the following list, that is both showy and highly instructive, when thoroughly studied. All specimens are labelled plainly with locality where found.

Cassia seed pod .... $ 05
Long red sea bean 02
Liver bean, diameter 2 inches 05
Betel nut, such as all East India natives chew 06
Package cassia seeds 08
Sea bean pod 05
"Crab tail" used for penholder 05
Tarpon scale 03
Brown-banded sea bean 02
Chinese horn nut, curious 03
Package miamosa seeds 08
Package coralline, Africa 10
Sabre bean pods 15
Acorn barnacle, cleaned 03
Ditto, in pairs 05
Shark tooth, Florida 05
Alligator tooth, Florida 05
Ditto, series 12, all different 35
Sperm whale tooth 30
Goose barnacle 02
Package Job's tears 08
Red, yellow, black and gray sea beans, each 01
Sea fan 10
Shark egg 05
Devil fish egg 05
Skate egg 05
Nurse shark egg 25
Leopard shark egg 08
Mammoth Bahama beaver 50
Large Bahama sea biscuit 25
Hermit Crab in shell 15
Lucky tooth from cod 05

Atlantic sea urchin, small 05
Ditto, large 15
Mammoth purple urchin 25
Club-spinned urchin, fine 25
Sand dollar, small 04
Sand dollar, large 15
California starfish 15
Chinese starfish 15
Brittle star, deep seas 15
Serpent star, imperfect 10
Black starfish 10
Keyhole urchin 15
Gorgonia root 10
Sea moss, on cards each 08
Cactus wood cane 30
Mexican pottery, piece 10
Trap door spider nest in pail 40
Trap door spider, mounted in a box 35
Scorpion, ditto 35
Horned toad, ditto 40
Purple sea fern, fine 20
Orange gorgonia 25
Purple gorgonia 20
Brown gorgonia 20
Curio sponges, many species, each 15
Branch coral, nice pieces 25
Choice branch coral, from Torres Straits, rare 25
6 all different of above 1 00
Cup sponge, fine 25
Organpipe coral 20
Pink Coral, fine 15
Rose Coral 10
20 nice pieces of corals, all different, prepaid for 2 00
Indian water basket 2 50
Gun flints, perfect, fine 10
Indian arrows, tipped, fine 20
Botanical collection of 54 specimens scientifically labelled 1 00
Book of Black Hills wild flowers, finely made, labeled 25
A larger size, with double number of specimens, all labeled 50
Big tree bark, 4 by 4 25
Sword fish sword, 28 inch 75
Entire piece of Pueblo pottery 1 00
Mounted lobster, a rare species from Key West, Florida, very fine 2 00
Cow fish, mounted, fine 1 00
Toad fish, stuffed 1 00
Porcupine fish, stuffed 50
A large variety of Crabs, finely prepared, many very beautiful, each 25

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..... 1897.

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SEPTEMBER, 1897.

THE MUSEUM

A Journal Devoted to Research in Natural Science.

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BE YOUR OWN TAXIDERMIST.—Send 65 cents and receive one package of K & P Preservative and "Taxidermy Made Easy," giving full instructions. Satisfaction guaranteed or money refunded. KERR & PERHAM, Blencoe, 20th & Sandwich Sts., Ills.

FOR SALE.—Good books as follows: "Indians—Letters and Notes on the Manners, Customs and Conditions of the N. A. Indians," by Geo. Catlin, with 400 engraved illustrations, 2 vols, large 8vo, cloth, uncut, 1892, $9.00 "A History of the Rarer British Birds," by Eyton, 8vo, ½ morocco, London, 1836, $4.00. GEO W. DIXON, Watertown, S. D. Large list of books on application.

What Have You to Exchange?

I want new or second hand copies of books on any branch of Natural History, especially the following—In *Botany* any of Gray's, Wood's, Lesquereaux, Goodale's or Hough's works. In *Geology*, *Mineralogy* and *Palaeontology* any of Dana's, Winchell's, Miller's and Geiker's works. In *Conchology* any of Tryon's, Sowerby's, Gill's or Woodward's works. In *Entomology* any of Packard's, Comstock's Maynard's, Edward's or Scudder's works. In *Ornithology*, *Oology* and *Taxidermy* any of Baird's, Bendire's' Brewer's, Brewster's, Cassin's, Chapman's Cory's, Coues', Davie's, DeKay's, Fisher's, Gentry's, Goss', Hornaday's, McIlwraith's, Maynard's. Minot's, Nuttall's, Nehrling's, Raine's, Ridgeway's Shufeldt's, Samuels', Studer's, Warren's or Wilson's works. Also back Nos. of the Auk, Ibis. Ornithologist and Oologist, Nidiologist or any other Natural Science Journal printed in last 50 years.

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We also desire nice *fossils* from all sections, nice showy crystalized minerals, anything in the curio line.

We have a special call for Helix and Unionidae from all parts of the U. S. Fine modern Indian Relics, such as beaded tobacco pouches, war clubs, etc, ancient stone and flint relics or all kinds desired. Do not particularly care for points but want drills, axes, celts, hammer stones, pipes, pottery, discoidals, gorgets, banner stones, bird annulets, etc, any copper of bone implements, iron axe or tomahawks. Rare clutches of birds eggs and the rarer skins always desired.

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WANTED.—Any collector who has any duplicates in fine Helix, to send us a list of what he has to offer. Parties in remote corners of the U. S., as South Texas, along southern border to Lower California, and other sections, who can collect Helix (Land Snails) for us, to write at once. We will give good exchange, but do not care to buy for cash at present. WALTER F. WEBB, Mgr., Albion, N. Y.

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I HAVE a few sets and papers, also Davies' "Nests and Eggs" (cloth bound), O. & O. Manual (leather) to exchange for offers. Write. J. D JORDAAN, P. O. Box 264, Larned, Ks.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

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Wa-kan-da-pa-she Devil's Path.

Several miles north of Decatur, Neb., among the stately hills that guard the waters of the Old Muddy (Missouri) lies what was known in Indian legends as the Wa-kan-da-pa-she or Devil's Path.

Here the visitors, lovers of nature's wondrous productions or not, will find themselves lost in the realms of silent thought. Words have little power to describe the scene.

Here is a relic of what once was a large hill now a large ravine, having been worn down by rains. The stately trees and "The Singing Gaily" remind us of "Home Sweet Home" of which Nature is the Home. High walls composed of sandstone rise high on either side of the recess filled with ancient Indian writing. Some suppose the Wa-kan-da-pa-she to be the outlet of a river, but a plain geological observation will easily contradict the somewhat complicated theory.

Quaint signs fill the rocks, being interesting even to look at, also affording a few links in the general study of Biology. Curious hieroglyphics dating back as far as a hundred years or more. A picture of the Wa-kan-da-pa-she himself is carved in bold relief upon one of the high walls. There also, crawling, is a huge serpent, while behind him is a Medicine man waving his hand. One of the most ancient figures is the back part of a hand.

A great many of the carvings are almost completely obliterated by moss and it is next to impossible fo recognize any trace of them. The traditional story as it is told is this:

A long time ago an evil spirit in the form of a huge serpent infested the ravine. One of the eastern tribes sent a Medicine man there to drive the monster away. The Wa-ka nu or medicine man never returned and it is said he was destroyed by the Evil God. The Indians never went near since the unfortunate day.

Of the picture of the Wa-kan-da-pa-she, the huge serpent and the medicine man waving his hand, it is said the waving hand served to command the intruder to leave the retreat. In olden times this formed the strongest and most formidable place in the country in times of war.

The ancient carving of the back part of the hand served to signify in time of war that it was safe to advance for the foe was behind them. There is also a faint outline of the front part of a hand, this signifying that the enemy was ahead and it would not be safe to venture in that direction.

The "Handwriting on the wall" tells the story just the same that here the Indian lived in peace and war long before the advance guards of civilization took up their march across the plains that is now the land of prosperity.

Lewis and Clark mention the place in, as it is now called, their American Epos. These daring explorers landed at the foot of the famous Blackbird's grave sometime in July 1804, several years after Blackbird's death.

The creek which flows through the traditional gully was then called Wa-kan-ka-pa-she, known now as the Blackbird. "BUZZARD."

Blackbird Hill.

Along the banks of the "Big Muddy" about ten miles north of Decatur, Neb., is a large mound known as Blackbird Hill. Here the world-wide famous Indian sachem Blackbird lies

sleeping in that long and eternal rest. The ascent of the mound is long and tiresome and the highest point in northwestern Nebraska. From the top, on a clear day, one may see miles of the beautiful surrounding country. The original mound which contained the remains of the great chief has washed away. When he was buried the body was placed in a sitting position facing the river, at the request of Blackbird, himself selecting this spot as his last resting place, "For," as he told his friends surrounding his deathbed, "there I may be able to see my white friends coming up or down the river." His attachment for the white man was as wonderful as it was strange, being in those days the only friend the pioneer had.

In an early day here stood an immense mound 30 feet high and 15 feet in diameter at the base. Here after the funeral ceremonies had been completed an immense carnival took place, wild and tumultuous singing, warriors dressed in their war costumes, artistically painted. The rich men of the tribe gave to the poor both horses, buffalo robes and many useful articles. Then as the darkness came, also came the mourners' low sad chant, the Indian death song of serras. All this really occurred in 1800 on one of the most beautiful table lands of Nebraska's fair hills. As for the mound hardly a vestige is left to mark the rest, the grave of the great Indian Sachem. A few bones lay bleached in the sun, also a few teeth, both molar and canine, undoubtedly the last links of some of his relatives. Wild oat grass covers the hills, here and there are some of nature's own flower-gardens and birds of many varieties which gladden Nebraskans' hearts with their song and presence. Civilized man and nature are strangers now and this is the last chord between God and man. Blackbird died in the year 1800 during a seige of smallpox which infested his tribe.

It is said the great chief learned the use of strychinne from the white man and used it with barbarous results upon his willful subjects, annonncing to his medicine men that such a warrior would die upon a certain day. Then treacherously did he seek to poison the warrior's food. Thus he became a holy horror in the sight of his subjects. His prophesies always came true. So also he fell as many of his subjects had fallen, by a dose of strychnine given by the hand of one of his subjects, the secret of the horrible practice being divulged by the man who gave the deadly poison.

So stands Blackbird Hill with many legends connected with it and the great Sachem Blackbird.

"BUZZARD."

Capture of the Loon.

For years it had been my desire to secure a Great Northern Diver and its nest and eggs for the purpose of making a group illustrative of their nesting habits and after discovering several nests and finding difficulty in securing one that could be removed without destruction had very nearly given up making any further attempt to find a nest partly on land and partly on sea with slide complete.

It was about the first of June when one of my friends who was on the watch, sent me word that he had made a find of just the kind of a nest that I had been looking for. So without much preparation I at once secured a platform wagon and a few tools such as spades, etc., and made a start 28 miles overland. Upon my arrival I found that some sportsmen had been hunting in the vicinity of the nest and consequently taken the eggs but left the Loon unmolested. After this bit of news I was more determined than before to secure this identical bird, nest and eggs and started to explore the vicinity thoroughly so as to leave instructions with my friends in case the Loon should again visit the nest and lay. I found the locality to be made up of

several small inland lakes and ponds with the lands between them covered with flags and rushes, the whole covering several miles in area. We came at last upon the nest and found the mother bird just making the slide and had I not wished to secure a clutch of her identical eggs I could easily have shot her, however we let her pass and made straight for the nest and I found that she had laid one egg. I made notes on the nest and found that it was most beautifully built out of flags and rushes, partly on land and partly on the water, the nest proper being about 3½ feet in diameter and nearly one and one half feet high and being built up over one foot or more from the water. Upon my friend's promise to send me word when the full clutch was in the nest I left for home.

In a very short time my friend, according to his promise, informed me that it was time to visit him again, and now knowing what I would need in the way of tools equipped myself with a sod cutter and hay knife to cut the tough marsh grass roots and found these tools very useful indeed. I met my friend as soon as I could after my start and immediately set out for the nest in a small flat bottom boat. Arriving near the nest the mother bird made the slide into the water and finally took wing and quickly disappeared from sight. Coming upon the nest I found two eggs which were taken and made secure and quickly placed two turkey's eggs instead and then placed three common new home steel traps about the nest and secured them or at least two of them. One being far from the nest in the water was not securely fastened as we afterward learned to our disappointment. We next left the nest and went under cover at a reasonable distance from it to await developments.

In about three hours she came and went straight to the nest. We kept close watch and not hearing any noise or seeing anything, concluded we were successful in the capture. We had started for the nest when we saw her rising at intervals near the vicinity of the nest but soon saw her no more and were puzzled upon coming near the nest to find her gone. We soon discovered that one of the traps was not properly fastened, and that this was the only one sprung and that she must have it upon her leg. We also found that she had rolled the turkey eggs out of the nest, apparently in a rough manner.

A search revealed to us that she was somewhere in the rushes and flags but as night was nearly upon us there was little hope of securing her; however we set out and after fully one hour's work came upon her with the trap attached to the left leg. She showed fight and it was only after quite a little exertion that we were able to subdue her.

The next day by hard work we detached the nest and thus secured bird, nest and eggs at last.

Fernand.

The Cliff Dwellings.

A Night Amid the Homes of an Unwritten Race.

Of all Arizonia's vast treasure house of wonders probably the most interesting contribution are the ancient cliff dwellings, whose rockbound walls, voiceless and hushed through all the resistless flood of years, still offer mute and melancholy testimony of the existence of the strange people that dwelt in them before American history begins. They will ever be a source of wonder and never-failing interest to the sight-seer, who finds his imagination slipping back through the centuries in his contemplation of them, and the antiquarian and archaeologist have found them a profitable field of research and speculation.

The cliff dwellings in Walnut Canyon, nine miles southeast of Flagstaff, form one of the rare scienic enticements of that corner of wonderland. A delightful drive through a park-like

OLIVER W. GIBBS

Who presided over this year's meeting of the American Association for the Advancement of Science.

forest brings you to them. Riding through the dense pines and cedars, in the coolest and most invigorating of summer atmospheres, the visitor is abruptly confronted with a great white-walled canyon that looms suddenly upon the vision as the conveyance emerges from the canopy of trees to a sort of picnic and refreshment ground. Though it would occupy an infinitesimal space in the world's mightiest natural wonder the Grand Canyon of the Colorado—this canyon is itself quite a pretentious hole in the ground, being of 800 feet in depth and of sufficient length and breadth to give the spectator an idea of immensity. A trail, well beaten some places but scarcely discernable in others, leads to the choicest of the dwellings in this part of the canyon, the picturesque sides of which are honeycombed with these interesting evidences of a prehistoric race. People unacquainted with the location of the trail have made the descent in an impracticable, haphazard way that carries with it an element of peril and is decidedly a venturesome experience to the inexpert or unwieldy mountaineer. The sides of the canyon are in many places as sheer almost as the walls of a house, and a misstep or a flimsy foothold is very apt to let the unfortunate into eternity without advance notice of an eleventh-hour preparation. Not far from the brink, by way of the regular trail, you will traverse a declivitous promenade to a series of Aztec homes that are comparatively well preserved. The cliff dwellings are all of the same general formation. The overhanging bluffs of rock lap over cave-like recesses that were divided into apartments by walls of lime and stone, which were also used in the construction of the front part of the dwellings. Most of these walls are now shattered and tottering, though enough of them remain to show commendable workmanship, considering the indifferent material at hand.

The popular presumption is that the population of the cliff dwellings was considerable, for the industrious relic-hunter may still unearth the pottery and battle-axes of the inhabitants, and discoveries of this kind are treasured as priceless possessions. The pottery is of the same general design as that of the Pueblo Indians, the study of whose racial characteristics, customs and manner of living form an always absorbing theme. The Pueblos are

believed to have been direct descendants of the Aztecs Their architecture is analagous in many respects to that of the Aztecs of Mexico, and there is nothing unnatural in the supposition that an offshot from the Aztecs, during one of the periods of migration of a moving nation, stopped at places that suited their convenience or fancy and settled there.

The most generally accepted theory as to why the cliff dwellers selected such rugged and inaccessible places in which to live is that they were constantly harrassed by enemies, whose persecutions forced them to throw up these fortress-like retreats. It would have been a difficult matter to have dislodged them from the rear and they could easily have vanquished a whole army coming from the opposite direction.

THEODORE N. GILL.

Who succeeded to the presidency of the American Association through the death of Prof. E. D. Cope.

That person who yearns for solitude should spend a night in a cliff dwelling. An uncanny fascination attaches to the ghostly hours that drives sleep away and brings the imagination into active play. The night wind moaning fretfully up and down the long sweep of the canyon, seems to protest in the name of a long dead people against the intrusion of strangers, and one drops into perplexed speculations as to their origin, habits of life and final dissolution. Who were they, and why did they live in the rocks of barren canyons when there was so much natural wealth and glory on top? Haggard superstitions come dancing along through the blackness of the night to thrust the night-mare-producing visages into a pleasant dream, and when at last the sun's rays stream down into the canyon the modern cliff dweller rubs his eyes to find himself blinking across the gulf at a great stone face, which he at once concludes is an Aztec god, sitting up aloft there forever waiting for the world to die.

C. N. STARK.

"The Plant World" is a new monthly magazine to be published Oct. 1 by W. N. Clute of Binghamton, N. Y. With such an editorial staff as Prof. F. H. Knowlton, Chas. L. Pollard, Miss C. E. Cummings, Walter Hough and others it is sure to find a hearty welcome among plant lovers throughout the world. We note its aim is to present the facts in simple popular style rather than technical.

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Notes.

Bulletin No. 3 of the University of Maine, Department of Natural History, treating on "The Birds of Maine," has been kindly sent us by the author, Ora W. Knight, B. S. Mr. Knight of the class of 1895 has risen rapidly and he is main assistant in the Natural History Department of the University. This Bulletin of 184 pages reflects great credit on the author and cannot fail to be of great value to the ornithologists of Maine as well as throughout the country. A summary of its contents will be of interest: The number ol species given in the list as positively occurring within the state is 320. Of these some 26 species are included among the permanent residents, two being introduced and naturalized, viz: the Domestic Pigeon and English Sparrow. The summer residents number 114. The species which occur chiefly or entirely as migrants are 74 in number. The winter residents and winter visitors of fairly regular occurrence include 39 species. The accidental or casual visitants and stragglers include 65 species. while the remaining two species formerly occurring within the limits of Maine are now extinct in that state, viz: the Great Auk and Wild Turkey, the latter being at one time probably a permanent resident but has not been seen in many years. We note among the summer residents a large quota of Warblers, viz: Black and White, Nashville, Tennessee, Parula, Cape May, Yellow, Black-throated Blue, Myrtle, Magnolia, Chestnut-sided, Bay-breasted, Blackburnian, Pine, Yellow Palm, Mourning, Maryland Yellow-throat, Wilson's, Canadian, etc. The list as a whole is very interesting and valuable.

We call attention to the ad. of The Osprey in another column. The editors of this enterprising journal are doing everything in their power to give ornithologists and oologists full value for their money. We trust it may continue to thrive for many years.

In this connection we regret somewhat to report the suspension of publication of The Nidiologist of Alameda, Calif., the May number being the last. It was started in August, 1893, and has been fairly regular ever since, has contained many valuable notes and contributions on ornithology as well as illustrations. While we have heard no reason assigned for suspension we surmise it must be from lack of support, due we believe to the evident desire on the part of the management to cater to the whims of a few rather than the majority. Its attempt to expose frauds won it some popularity for a time, but after the efferescence had passed off, it was plainly seen that it had been too hasty and of course it had to repent as best it could at leisure. We believe in exposing frauds and have done so to some extent in the past, but before we do so

we require unquestionable evidence of malicious intent. If there is any doubt it's best to publish both sides or nothing.

Recent Publications.

Circular No. 12, issued by the Division of Botany of the United States Department of Agriculture, says *Garden and Forest*, describes the conditions of successful cultivation of the Camphor-tree, *Cinnamomum camphora*, the uses of the tree and its products, and contains other interesting particulars. This broad-leaved evergreen is related to the Red Bay and to the Sassafras in the United States, and in general habits resembles the Basswood. In the coast countries of eastern Asia it attains a height of from sixty to one hundred feet and a trunk measurement of from twenty to forty inches in diameter. In Japan the law requires that a new tree be set out for every one cut. It is stated that the northern limits in the United States where this tree has been grown successfully out-of-doors are Charleston and Sommerville in South Carolina; Augusta, Georgia; and Oakland, California. In the southern cities named the trees have withstood a temperature of fifteen degrees, Fahrenheit, but they were protected by surrounding trees and buildings. At Mobile, Alabama, they have grown and fruited in protected situations, while in exposed places they have been repeatedly destroyed by frosts. They will grow in almost any soil that is not too wet, but do best on a well-drained sandy or loamy soil, and respond to fertilizers. While of comparatively slow growth on sterile soil, the trees grow very rapidly under favorable conditions. An exceptional instance is recorded of a Camphor-tree in Italy which in eight years from the seed measured one foot in diameter at the base and thirty feet in height may be expected in trees ten years from the seed under favorable conditions. Besides the familiar use of camphor gum to protect furs and woolens against insects, this gum is used extensively in medicine. Camphor oil, which is somewhat similar to turpentine, in Japan enters into lacquer work, and it is also used in the manufacture of toilet soaps. The yellow wood is of close grain and is susceptible of polish, taking a satin-like finish; this is particularly valuable in cabinet-work, especially for drawers, chests and cupboards, being proof against insects. The tree produces an abundance of berry-like fruits, which in China and Japan are used to make a kind of tallow; these are also a favorite food of chickens and birds. Besides these commercial uses, the tree has value for ornamental planting, and has been extensively introduced into southern Europe and South America for this purpose. For successful cultivation the minimum temperature must not be lower than twenty degrees, Fahrenheit, and this interesting circular suggests that it is hoped by continued selection of seeds from the most hardy trees plants may be bred up to endure more cold. Camphor of good quality has been produced in Florida from the leaves and twigs of trees less than twenty years old, one pound of crude gum being obtained from seventy-seven pounds of leaves and twigs. One-third of the leaves and young shoots may be removed at one time without materially checking the growth of the tree. The older and larger roots yield the largest proportion of camphor; the trunk, limbs, twigs and leaves contain successively a decreasing proportion. Present methods of distillation are here described and improvements suggested.

Within the past ten years there has been an increase in importations of refined camphor in the United States and a decrease in importations of the crude product, notwithstanding the former is dutiable while the latter is admitted free. Improved methods of refining and packing in Japan and a reduced tariff rate account for this change. In 1887 there were imported 2,873,184 pounds of crude camphor, valued at $352,861, and in 1896 but 943,205 pounds, valued at $328,457. In 1887 only 307 pounds of refined camphor, valued at $45, came into this country, while in 1896 153,912 pounds were admitted, worth $68,785. These figures show that the price of the refined and the unrefined product has increased three-fold in this period, and that the consumption of camphor in this country as measured by importations, has been decreasing. This decrease is attributed to exhaustion of the supply of available Camphor-trees near the shipping posts, governmental restrictions on the trade in camphor in Formosa, disturbances in the camphor-producing district of China, the China Japan war, and attempts by speculators to corner the market. The increase in the price of camphor has led to the introduction of substitutes, and camphor has been manufactured artificially at a cost which leaves a margin of profit at present prices. The conclusion is that if the production of camphor from trees is to be carried on with profit in this country and the industry increased to any considerable extent the price of camphor must be reduced to compete with the prices of substitutes now taking its place.

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THE MUSEUM.

A Monthly Magazine Devoted to Research in Natural Science.

VOL. III. ALBION, N. Y., OCTOBER 15, 1897. No. 12

The British Association for the Advancement of Science.

BY MARCUS BENJAMIN, PH. D.

In the jubilee year of the British Empire, and for the second time in its history, the British Association for the Advancement of Science met on this side of the Atlantic. From Aug. 18 to Aug. 25 the sixty-seventh annual meeting of this organization was held in the Queen City of Toronto, Canada. A brief account of this most important event in the history of science will be gladly received by our readers. It will be necessary, therefore, to treat the meeting chiefly in chronological order.

The first gathering was held in the pavilion of the Horticultural Garden on the afternoon of Aug. 18. At the hour appointed Mayor shaw appeared on the platform, followed by Lord Aberdeen, Governor General of Canada; Lord Lister, the president of the association; Sir John Evans, the president-elect; Lord Kelven, a past-president, and other eminent scientists, including George F. Barker, Edward S. Morse and Theodore Gill, past presidents of the American Association for the Advancement of Science. The meeting was opened by Mayor Shaw, who introduced the Governor-General. In a few well-chosen words Lord Aberdeen welcomed the association to Canada, and the Mayor followed with a warm greeting from the municipality. Replies were made by Lord Lister, Sir John Evans and Lord Kelvin. Other addresses followed, and the meeting closed with the singing of the national anthem.

The opening meeting of the association was held in Massey Hall on the evening of Aug. 18. It was a parliament of science in evening dress, and graced with the presence of many of Toronto's fairest dames. The beautiful assembly hall with its Moorish arches, was an ideal setting for the brilliant scene—Lord Lister presiding at the opening meeting. At his right sat Lord and Lady Aberdeen, and about them were grouped nearly a hundred distinguished members of the association, including President-elect Putnam of the American association. Lord Lister introduced his successor as "a man who had won world-wide distinction as a geologist and an antiquarian." Sir John Evans then delivered his address on the theme of "The Antiquity of Man." The usual vote of thanks was made by Lord Aberdeen and seconded by Lord Kelvin. With the singing of "God Save the Queen" the meeting closed.

The regular session of the association began promptly on the morning of Aug. 19, when the presidents of the sections delivered their addresses. That before Section A. the Mathematical and Physical section, was by Prof. A. R. Forsyth, who described some of the relations of pure mathematics to other sciences, and made the claim that the unrestricted cultivation of pure mathematics was desirable in itself and for its own sake, and deplored the fact that English thought had had relatively so small an influence upon its vast modern developments. Section B, on Chemistry, was presided over by Prof. William Ramsay, the discoverer of argon, who made a brilliant argument in favor of "An Undiscovered Gas," which, for theoretical reasons, should exist in the Mendeleeff classification between argon and helium. Dr. Geo. M. Dawson of the Canadian Geological Survey presided over Section C, on Geology, and discussed with more than

an expert's knowledge the ancient rocks of the Canadian region. Prof. L. C. Miall presided over the Zoological Section, and his address was devoted chiefly to the elucidation of mooted points in zoology and to a general summary of the progress of his chosen science. Section E, which is devoted to Geography, is always a popular section, and thisyear the well-known editor of the "Statesman's Year Book," Dr. J. Scott Keltie, was its president. He spoke of the function and field of geography, and then took up the various geographical problems still unsolved, discussing in detail the regions yet to be explored. Prof. E. C. K. Gonner of the University College in Liverpool presided over the Section on Economic Science and Statistics. His address was presented by a substitute, and dealt chiefly with the labor question. Section G is devoted to Mechanical Science, and its president was G. F. Deacon. He discussed how to prevent the unnecessary waste of energy which may occur in the process of mental development of the men who are to succeed us in the great work of the future. The Section on Anthropology was presided over by Prof. Sir William Turner, whose subject was: "Some Distinctive Characters on Human Structure." Section I, on Physiology, was presided over by Prof. Michael Foster, who reviewed the developments in physiological science since the meeting in Montreal in 1884. The Section on Botany was presided over by Prof. H. Marshall Ward of Cambridge. His address dealt chiefly with the recent advances in physiological botany.

After the delivery of the addresses the sections settled down to tho reading of papers, reception of reports and other routine business. An early adjournment was had, and in the afternoon the visitors and their friends were entertained at a garden party given by the Royal Canadian Yacht Club at the Island clubhouse, opposite the city. The exercises of the day culminated in the brilliant reception given by their Excellencies Lord and Lady Aberdeen in the Council Chamber of the Ontario Parliament Building. The members' desks had been removed for the occasion, and after being presented to the recving party, which also included Lord and Lady Lister, Lord Kelvin and Sir John Evans, the members gathered in groups about the room.

By Friday the sections were well organized, and across the beautiful campus of the University of Toronto might be seen the interested scientists wending their way in search of some special speaker. Lord Kelvin spoke on "The Fuel and Air Supply of the World" before a crowded audience in Section A. Prof. Ramsay told of his discovery of helium in Section B. Prince Kropotin was the "lion" in Section C. Prof Osborn, of Columbia University, New York, was an early speaker in Section D, and others on their respective specialties were heard in their proper sections.

An interesting event on Friday was a special convocation of the Senate of Toronto University in Horticultural Pavillion for the purpose of conferring the degree of L. L. D. on Lord Kelvin, Lord Lister and Sir John Evans, each of whom was inducted to the alumni of the university by appropriate speeches of presentation, followed by equally appropriate remarks of acceptance by the candidates. Prof. Wolcott Gibbs and Lord Rayleigh was also invited to receive the honor, but were absent. Garden parties were the entertainments provided for the late afternoon, and in the evening occurred the brilliant lecture of Prof. W. C. Roberts-Austen on 'Canada's Metals," in the course of which many interesting experiments were performed. including the combustion of gold and other elements in the electric furnace, with the results shown to the audience on the screen.

Saturday was, for the most part, devoted to excursions, the principal trips being across the lake to Niagara Falls and to the Muskoka Lakes. The for-

mer excursion attracted the geologists, who were fortunate in having as their guide Mr. Grove K. Gilbert of the United States Geological Survey, who has known the history of that country from his boyhood. The chemists and mechanical engineers visited the great power works and the adjoining works of carborundum and aluminum.

A popular lecture for the working men of Toronto was delivered in the evening in the Pavilion, Horticultural Garden, on "British New Guinea: The Country, Its People, and the Problems Which the Region Offers to Naturalists and Geographers," and with that event the active operations of the association came to an end for the week.

On Monday the sections resumed their routine work of reading papers. Those before the geographical section included several on the "Geography of North America," and among those who presented the same were Marcus Baker, F. H. Newell and T. C. Underhall, all well known among our American scientists. An interesting feat was the preparation of fluorine gas before the chemical section by Prof. Meslaus, the chief assistant of Prof. Moissan. This was the first time that this element was ever made on the American continent. Members of the section on geology devoted their afternoon to an excursion to Scarboro Heights for the purpose of studying the glacial and inter-glacial deposits at that point. Several garden parties were given during the afternoon, including one by Prof. Goldwin Smith and one by Prof. London of the Toronto University. In the evening Prof. J. Milne delivered the second lecture of the association in Massey Hall. His subject was "Volcanoes and Earthquakes."

The most interesting papers presented on Tuesday included one on "The Economic Geography of Rhodesia by F. C. Selous, the famous hunter and explorer, delivered before the Geographical section, also papers on "The Relation of the Employment of Women and Children to That of Men" by Carroll D. Wright of the United States Department of Labor; "The Theory of Economic Choice" by F. H. Goldings of Columbia University, and "The Trade of the United States With the World" by Worthington C. Ford were read before the section on economics. In the section of physics, Tesla's paper "On a New Electrical Oscillator" attracted more than usual interest. Indeed, Tuesday seems to have been largely devoted to the presentation of papers by scientists from this side of the border. Mention must be made finally of the paper by Prof. Putnam, the president-elect of the American association. He outlined the scientific research now being made among the Indians as to Asiatic contact by the Jesup expedition sent out by the American Museum of Natural History of New York city. In the afternoon the authorities of Trinity University met and conferred the honorary degrees of D. C. L. on Sir John Evons, Lord Lister, Lord Kelvin, Prof. James H. Bryce, Sir William Turner and Sir George Robertson, the hero of Chitral. The exercises were witnessed by a number of the members, and several excellent addresses were made, including one by Lord Aberdeen. A conversazione was held in the university buildings during the evening, and although a slight rain prevailed, nearly 3,000 guests met in the building and passed a pleasant evening in renewing old acquaintances or forming new ones, while excellent programmes of vocal and instrumental music were rendered.

Wednesday was the final day of the association, and the morning was devoted to the papers that had not as yet been read, or in special excursions to places of scientific interest in the vicinity of Toronto; thus the zoologists and botanists made a joint excursion to the Humber Valley. The concluding general meeting was held in the early afternoon in the students' gymnasium,

when the usual vote of thanks were offered and replied to. The treasurer reported that the attendance at the meeting comprised 120 old life members, 8 new life numbers, 286 old annual members and members of the American association, 125 new members, 682 associates, 100 ladies, 41 corresponding honorary members, making a total attendance at the meeting of 1,362 persons. It will be remembered that the British association requires its visitors to pay for admission to its meetings, and the fund thus obtained is devoted to grants for scientific investigation. The sum of £1,356 was available for that purpose this year, and the following grants were made:

To establish a meteorological observatory on Mount Royal, £50; to further investigate the fauna and flora of the Pleistocene beds in Canada, £20; for the collection, preservation and systematic registration of Canadian photographs of geological interest £——; for the biology of Lake Ontario, £75; for the Northwestern tribes of Canada, £75; to organize an ethnographical survey of Canada, £75, and for the establishment of a biological station in the Gulf of St. Lawrence, £——.

The final event in the history of this year's meeting of the British association was the banquet given by the citizens of Toronto to Lord Lister, Lord Kelvin, Sir John Evans and other eminent members of the association. Lord Aberdeen presided, and with him at the same table in addition to the distinguished scientists previously mentioned, were Prof. Simon Newcomb, Prof. F. W. Putnam and Mr. W. J. McGee, the last two of whom responded to toasts. With this at an end, the meeting of the British association passed into history. It remains simply to mention that next year's meeting will be held in Bristol, and for the presidency of that meeting Sir William Crookes, the eminent chemist, has been nominated.

Vanquishing a Whale.

Some time ago a whale that had apparently grown tired of 'a life on the ocean wave and a home in the rolling deep,' wandered into the Strait of Juan de Fuca bent upon a voyage of discovery, and frequently, during the early summer, passengers on the incoming steamers reported having sighted the cetacean at various points on Puget Sound. About the first of last August he had passed the placid watters of Henderson's Bay, about twelve miles southwest of Tacoma. Here he seemed content to rest from his journeyings, and could be seen cavorting about daily, apparently for the sole delectation of the summer residents of Steilacoom, Long Branch, De Lano Beach and other near-by suburban summer resorts. Frequent excursion parties visited the bay in yachts, launches and row-boats, and at a respectful distance, followed in the wake of the whale and watched its maneuvers with the greatest interest.

It was not long before amateur whaling parties were organized and, provided with all manner of weapons, from a revolver to a six-pound cannon, started out to capture the sportive leviathan. But their fusilade did not seem to trouble or worry him in the least; it seemed to be only an amusing diversion, and he carried on a game of hide-and-seek, with the would-be whalers that was exceedingly tantalizing.

On the afternoon of Tuesday, September 1, however, a hustling party, consisting of Harvey H. Allger, Charles H. Allger, Carl Evans and John Purple, all of them experienced oarsmen and fishermen, quietly left the city in a couple of ordinary skiffs, provided with a number of crude lances and harpoons of their own manufacture and several hundred fathoms of rope. Late in the evening they sighted the whale, and after a lively chase of several hours they succeeded in getting near enough to put a harpoon into his side. This quickly brought the creat-

ure to a realization of his danger, and with a great snort of pain he began to dive and spout as he started off through the water at a terrific speed. About two hundred fathoms of the line were passed out and then securely fastened, allowing the whale to trail both boats in his wake. He continued thus to tow the boats throughout the night, circling around and about the islands of the bay—never stopping, and only occasionally slackening his pace.

The bay was brilliant with phosphorescence as the monster darted through the water at a fearful rate, splashing and churning it into foam. In the early morning shortly after daylight, they succeeded in planting another harpoon in his body, a large barrel buoy being attached to the line about one hundred feet from the harpoon. As the noon hour approached they managed to drive a lance into his side. He dived instantly and upon coming to the surface a stream of blood was spouted upward to a height of three or four feet. Shortly afterwards they fell in with a number of fishermen in a couple of row-boats; they were taken in tow also, and for five or six hours the whale drew the four boats along with undiminished speed. Several times during the afternoon, as he doubled on his trail, they thrust the cruel lance deep into his side. The whale seemed to act very cowardly; he never acted on the aggressive, and gave no evidence whatever of a desire to attack his tormentors; on the contrary he would dive out of sight whenever a boat neared him.

A peculiarity that was decidedly unpleasant to his pursuers was the nauseating odor that emanated from the whale every time he spouted. So terrible a stench the men had never experienced before, and they could only account for it upon the theory that the odor was possibly one of the animal's means of defense. This peculiarity was referred to a number of years ago, by Dr. William H. Dall in the *American Naturalist*, volume iii, page 334, where he asked for further information upon the subject from New Bradford whalers.

For five long days and nights these intrepid toilers of the sea were continuously *en voyage*, three hundred feet in the rear of the whale, almost constantly towed hither and thither through the intricacies of the islands of the bay and The Narrows. On Sabbath evening the cetacean was rendered practically helpless by numerous thrusts of lance and harpoon. A little steamer that was near came to the rescue at this time. It was made fast to the huge carcass by one of the lines, and proceeded to tow it to Quartermaster Harbor. This was not done without protest on the part of the dying monster, however. He frequently and vigorously manifested his disapproval, and put out his long flippers and so retarded the progress of the steamer that for a time it was nip and tuck as to which would tow the other. It is estimated that the whale had towed the two boats and their occupants at least two hundred miles before he finally succumbed and was captured.

At Quartermaster Harbor a large barge was sunk upon the beach, and the whale was floated over it at high tide. When the tide receded the monster was left upon the deck. All the water was then pumped out of the barge, and it was floated by the incoming tide—the whale on board! On the day following the barge was towed by a tug to the city dock, where the colossal corpse was viewed by thousands of people.

The total length of the whale was forty-five feet. It was particularly notable for the immense size of its head, which constituted at least one-third the entire length of the body and was quite narrow above, but very broad below, where it consisted chiefly of a large under lip, which completely overlapped the upper lip. The eyes were very small, and they were

situated just above the angles of the mouth. The pectoral fins were each about nine feet in length, and about two feet behind the angles of the mouth. The greatest circumference of the cylindrical body was a little behind the pectoral fins, where the full diameter, or breadth, was about eleven feet. The caudal fin measured thirteen feet across from tip to tip. The tail, which is wielded by muscles of enormous power, constitutes thesole means of offense and defense in the whale; for it has no teeth where with to bite. A single blow of the tail, well delivered, would be sufficient to crush an ordinary row-boat, or send it whirling through the air. The plates of whalebone are the substitutes for teeth in the mouth. They are ranged vertically and transversely in two series that dedescend from the palatal surface of the upper jaw and terminate in a fringe of very coarse hairs on their lower and inner margins, where they come in contact with the upper surface of the bulky tongue, when the mouth is closed. The molluscous and crustaceous animals which constitute its food, are bruised into a pulp between the muscular tongue and the coarse fibres of the whalebone, and swallowed. Many large barnacles were attached to the pectoral fins, to the lower jaw, and to various parts of the body.

After the whale had been on exhibition for about a week, it was taken across the bay and a large amount of oil was extracted from the bladder, the bones being cleaned carefully and prepared for mounting.—*Meriden S. Hill, Sec. Tacoma Academy of Science in Northwestern Magazine.*.

American Osprey approaching nest on San Clemente Island, Pacific.

Washington, D. C. Notes.

A female Wild Turkey was recently shot just outside of the District of Columbia on the Potomic. This native Game bird is still to be found almost within sight of the Capitol and within fifteen miles of the trolley cars.

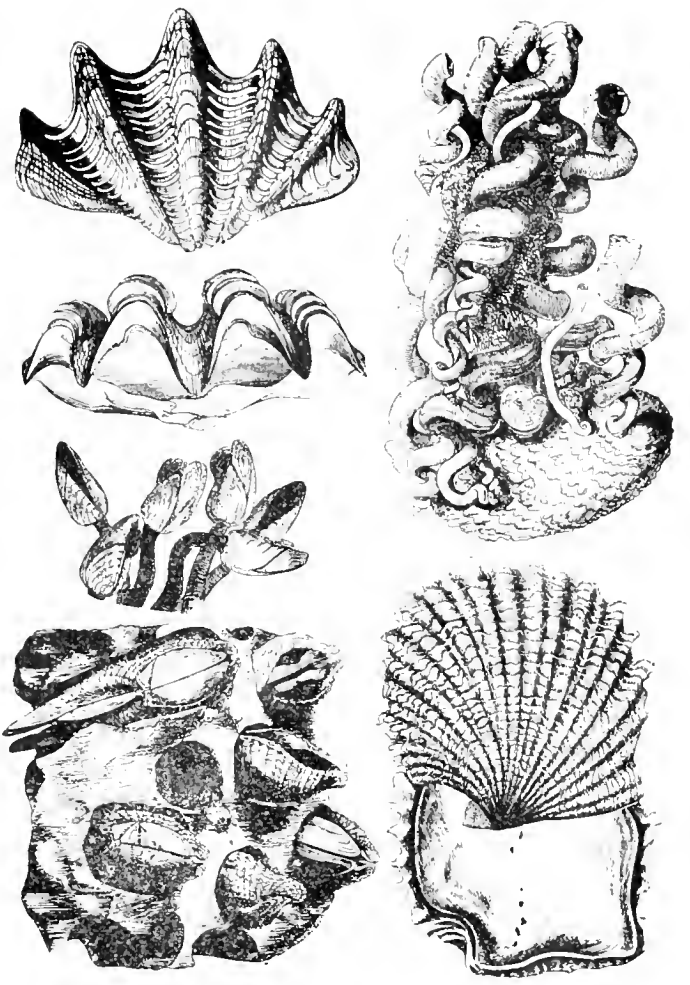
The writer recently sold 6 young Opossums to a Vermont Taxidermist to be used in a group. These toothsome marsupials are very numerous near the Capitol city. One hunter near Tenleytown, D. C., caught four in one evening and says he had 47 on hand at one time last winter.

Mr. Ray Potter leaves Washington, D. C., to connect himself with W. W. Hart, the well known New York Taxidermist.

The National Museum has begun some new work mounting mammals, the first of any consequence since the preparation for the Columbian Exposition.

A. B. FARNUM.

This cut shows some interesting things found in various parts of the world. The upper right hand cut illustrates the *Vermetus lumbricalis* asfrequently found in Florida. The cut opposite is the large *Tridacna*, from Japan, frequently attaining a weight of 300 pounds. The lower right hand cut is the *pearl oyster*, found in various parts of the world. The lower left hand cut is the *Pholes costata*, or Angel wing from Florida. These are beautiful shells, being pearly white and frequently attaining a size of 8 or 9 inches. A piece of rock withthe shells in the holes they have bored, makes a very interesting specimen for a cabinet. The cut above the Angel wings, is the Goose Barnacle found in various seas. They adhere to most everything, such as rocks, other shells, bottoms of ships, etc.



Remarkable Flight of Whip-poor-wills in West Virginia.

The Whip-poor-wills began to flock together for their annual migration to the south this fall, about Sept 3rd They increased in numbers from day to day, until there were thousands of them flying. I regret to report that almost all available guns were brought into action in our vicinity and hundreds of birds were killed in a few hours, and if darkness had not come to their rescue many more would have been killed The flight and killing continued for four days, at slight intervals, when the flocks began to diminish and finally disappeared altogether.

A stop should certainly be put to this wholesale slaughter of these harmless and retiring birds, else in a few years they will be almost extinguished. I would be glad if Ornithologists would interest themselves in the matter.

W. E., Charleston, W. Va.

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Walter F. Webb, Editor and Manager

Albion, N. Y.

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NOTES.

With this number we conclude Volume III of the MUSEUM. We wish first to thank our many subscribers for their continued support and aid, which has at all times been freely given, and has in a large measure helped to make the MUSEUM attain the success it has. We assure you it is fully appreciated. With the November number the beginning of Vol. IV, we shall add some new features, one especially which we hope will meet with your approval. Watch for it. We shall also begin with the next number a description of the mammals of North America and hope to present many illustrations of species that are not at all common in collections. We invite notes from collectors of mammals, especially small mammals, from all parts of the country. All such will be duly credited in the MUSEUM, and to those who will materially aid us in this work we will remunerate more liberally than "thanks." We shall present some good Conchological notes with illustrations of species throughout 1898 and a number of our Archæological friends have promised material of unusual interest. Our next number will describe an immense mound in South Texas, from the pen of a collector living at that point. We invite our ornithological friends to send us notes from their 1897 collecting. It is sure to help you more than us, for the MUSEUM now has a large circulation. Our September number found its way to over 5000 collectors. Let us hear from you frequently. It is needless to add that we hope to hear from the many collectors whose subscriptions expire with this number. You will be duly notified. Stamps are always acceptable for subscriptions or goods. Our Index for Vol. III will appear in the next number.

Nesting Habits of Krider's Hawk

BY R. M. ANDERSON.

The Krider's Hawk (*Buteo borealis kriderii*) is a geographical variety of the Red-tailed Hawk and is the lightest in color of the five sub-divisions of that species known to inhabit North America, occurring in the region from the Rocky Mountains to the Mississippi River, though very seldom found east of the Mississippi. This species is described in Ridgway's Manual of North American Birds as "lighter colored than the Red-tail, with much white on upper parts, tail pale rufous (usually without the dusky sub-terminal bar), the lower parts entirely pure white or pale buffy only on thighs, etc., with little if any spotting on belly. Eggs 2.31 x 1.80. Habitation, Great Plains, Minnesota to Texas; east irregularly or casually to Iowa and Northern Illinois."

The first record of this species on the Atlantic coast was a specimen taken by W. W. Worthington at Supelo Island, Ga., February 16, 1888, identified by Wm. Brewster, (Auk, January, '89). In Southern Minne-

sota, P. B. Peabody found several nests of the species during the spring of 1894. (Auk, January, '95.) My first meeting with Krider's Hawk was on the 14th day of May, 1895, when I went out to visit an old nest which had been known to me for about three years and had been occupied by a pair of Swainson's Hawks the previous year. As I came near the tree, a large Hawk flew silently off the nest and away. She perched on a tree at some distance and occasionally uttered a scream as I was examining the nest, but when I started to climb down, the male Hawk also appeared on the scene, and while he perched on a tree some distance away, the female Hawk circled over my head within easy gun range, screaming angrily, then lit in a tree only two or three rods from the nest and remained there until I had reached terra firma, when she circled once around the tree and alighted again in the same place, only to drop at the report of the double-barrel.

For some time I thought my specimen to be only a light phase of the common Red-tail, but after an inspection of a large series of Hawks at the Smithsonian institution and a conversation with Mr. Robert Ridgway, I concluded that the bird was none other than Krider's Hawk. I afterward sent it to the Smithsonian where the conclusion was verified, the bird being identified as *Buteo borealis kriderii*; —now at the Smithsonian Institution, accession 30869. This Hawk is much lighter than a Red-tail in my possession, the whole under parts being whitish with but a few brown streaks on belly, head streaked with dull light-brown and white, cheeks whitish, back and wings considerably mottled with pale and dark-brown and wnitish. The tail was pale reddish brown, fading to a buff or creamy white near base; upper tail coverts white; Iris, brown; feet, light-yellow; cere, pale greenish-yellow. L. 24, W. $15\frac{3}{4}$, T. $10\frac{3}{4}$.

The nest was a large bulky mass of sticks; the accumulations of years, and was lined with strips of bark and cornhusks; also containing a sprig of cottonwood or poplar with fresh green leaves, evidently just picked, and two other sprigs with leaves somewhat withered; built fifty-feet from the ground on a slanting Burr-oak tree. It contained two eggs advanced in incubation. The eggs resembled eggs of the common Red-tail, one egg being sparsely specked with light-brown, the other with a number of large blotches of clear brown, chiefly around the largely end. Size, 2.44 x 194; 2.43 x 1.91.

May 2, 1896, in Ellington township, Hancock county, in company with Mr. Earl Halvorsen, I again found the species "at home." The nest was in a Barr-oak tree, forty-six feet from the ground. The Hawk remained on the nest until I had rapped on the tree several times with a stick, when she flew off, circled around the tree several times and lit on a branch near the nest, in the same tree, before my companion had climbed up twenty feet. She sat there for nearly a minute, giving ye ornithologists a good view of her. The other Hawk arrived shortly after and they soared overhead uttering shrill screams, both Hawks finally settling in the same tree, about two feet apart, and remaining there some time.

The next, an old one, was about two feet across and built of sticks and one cornstalk. The hollow of the nest was about nine inches across and was lined with strips of bark and a quantitiy of fine stringy bark, such as squirrels' nests are usually lined with. The nest contained a number of White Popular twigs with young green leaves, also a number of bunches of soft white down. The eggs were beautifully marked with umber brown, yellowish brown and lavender and were slightly incubated.

April 26, 1887, I took a set of three slightly incubated eggs, about two miles north of Forest City, from a nest

57½ feet from the ground on an outspreading branch of a Burr-oak tree. The nest was built this spring, of coarse Popular and Oak twigs and lined with strips of bark and cornhusks, the lined part measuring about ten inches across and depressed about two inches. The eggs were whitish with small specks of dull brownish scattered over nearly the whole surface. The Hawk could be seen on the nest as I approached, but flew away when I was several rods from the nest, remaining away until I had climbed up to the nest, when she flew high overhead screaming a few times. For some time both Hawks sat near together on the same tree. Both Hawks were very wary and kept out of reach of the shotgun, which plan was certainly very conductive to longevity.

The following Saturday, May 1st, I went down into the Ellington woods. Passing by an old nest from which I had taken three eggs of the Red-tail, May 3, 1895, and three Great Horned Owl's eggs, February 22, 1896, nothing was visible but a pair of Swainson's Hawks soaring and screaming overhead. However I struck the tree with my climbing irons and was somewhat surprised to see a Hawk dash off, whose pale reddish tail and whitish under parts showed it to belong to the variety *kriderii*. Climbing the forty-eight feet intervening between the ground and the nest, I found it to contain three quite heavily marked eggs. The Hawks both soared high overhead screaming, but were very wary, and after waiting half an hour vainly hoping to obtain a specimen, I left the place, returning about six hours afterward. As I was crawling through a barbed-wire fence about a rod from the tree, the Hawk darted off the nest, and as he soared away I fired both barrels of the gun, and he sailed down at an acute angle, being stone dead when picked up. This Hawk measured: L. 22, W. 15¾, T. 9¼. The stomach was entirely empty. The three eggs were slightly incubated. The nest was lined with hempen fibres, hair, etc., also a green Poplar twig.

On the same day I took another set of their eggs from a nest 35 feet up in a Black Oak tree. The nest was an unusually large one, nearly three feet across and two feet high, composed of sticks and twigs of Oak and Poplar (principally the latter) and lined with bark and cornhusks and some green Poplar sprigs. The hollow of the nest was about five inches deep. The three eggs were pale blush, nearly unmarked and slightly incubated. The Hawk left the nest as I came near, was soon joined by her mate and they flew overhead frequently uttering a shrill "screeeee." They would occasionally light in trees, but I could not come near to them.

A peculiarity of this species is a fondness for having green leafy twigs in the nest (especially twigs of Cottonwood and White Poplar), all nests which I have examined having one or more green sprigs. These sprigs must be renewed almost daily as they almost always appear fresh, withered or dead leaves being rarely found in the nest. This eccentricity seems also to be shared by the Swainson's Hawk. (*Buteo swainsoni.*)—Iowa Ornithologist

BIRDS EGGS AND SKINS

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We offer an unusually nice lot of Skins and Eggs this month and invite your inspection of the entire list. Order promptly. All previous lists are cancelled. All orders for eggs over $1.00 will be sent prepaid and skins from size of Robin down, prepaid; if $1.00 worth or more are ordered. Orders of $10 or over 10 per cent disconnt. Any will be sent on approval to responsible parties. No dealer in U. S. offers any fairer proposition or better inducements.

	Per egg.
Amer. White Pelican 1-2	$ 18
Razor-billed Auk 1 1	12
Murre 1-1	10
Calif. Murre 1-1	10
Calif. Gull 1-4 1-4	12
Chachalaca 1 3 1-3	20
Cabot's Tern 1-3	20
Double-cr ted Cormorant 1 4 1-3	12
Western Gull 1 3 1-2	12
Sooty Tern 1-1 1-2	10
Farralone Cormorant 1-4	15
European Coot 1-7	10
Glaucous Gull 1 2	20
Iceland " 1-3	30
Herring " 1-3	10
American Herring Gull 1-3	10
Eared Grebe 1-5 1-6 1-7	05
White Ibis 1-3 1 3	15
Pintail 1-7	12
Shoveler 1 4	12
Mallard 1-10	10
Redhead 1-10	11
Canvas back 1-5	35
Lesser Scaup Duck 1-11	25
Amer. Goldeneye 1-8	30
Godwell 1-9	20
Bobwhite 1-15	05
Sparrow Hawk 1 5	12
Burrow Owl 1-7	10
Harris Hawk 1 3	18
Spotted Sandpiper 1-4	06
Little Blue Heron 1-4	07
Short-eared Owl 1-5	30
Mt. Quail 1-6	25
Ferrug Rough Leg 1 3 1-3	80
White-winged Dove 1 2	06
Mourning " 1-2	02
Inca " 1 2	25
Red-h'ded Woodpecker 1-5	01
Ruby throated Hummer n 2	25
Black-chinned " n 2	25
Cassins Kingbird 1 1	08
Phoebe 1 1	02
Mex. Horned Lark 1 3 1 4	10
Fla. Blue Jay 1-4 1 5	10
Amer. Crow 1 5	04
Black-headed Grosbeak 1 3 1-4	07
Tricolored Blackbird 1 3	04
Starling 1-1	03
Arizona Hooded Oriole 1-3	18
Orchard Oriole 1-5	03
Bullock's Oriole 1 6	04
Meadow Lark 1-5	03
Ark. Goldfinch 1-5	07
Bronzed Grackle 1-4	03
Brewer's Blackbird 1-6	03
Great-tailed Grackle 1-4	08
Herriman's Song Sparrow 1-5	06
Rusty " " 1-3	12
Abert's Towhee 1 3	25
Calif. " 1-4	06
Brewer's Sparrow 1-3 1-3	18
Bell's Sparrow 1 3 1-4	20
Meadow Pipit 1 1	08
Barn Swallow 1-5	03
Catbird 1-4	02
Bank Swallow 1-5	02
Long-tailed Chat 1 1	05
Sennett's Thrasher 1 4	05
Curve-billed Thrasher 1-1	07
Calif. Thrasher 1 3	09
Western House Wren 1-7	03
Wood Thrush 1 1	03
Long-billed Marsh Wren 1-5	03
Russet back Thrush 1-4	05

SKINS.

Male—m. Female f.

Louisiana Heron m	$ 40
American Bittern m f	30
Florida Crow m f	40
" Gallinule m	25
Sharp shinned Hawk m	40
Amer. Woodcock m	50
Screech Owl m f	40
Red or brown phase.	
Fla. Burrow Owl m f	75
Amer. Quail f	40
Calif. " f	40
Fla. Quail m	50
Sora Rail m f	20
Fla. Barred Owl m	65
Fla. Red shouldered Hawk f	40
Marsh Hawk Red m f	50
Amer. Herring Gull m	75
Yellow crowned Night Heron m	50
Great Horned Owl m f	60
Aud. Caracara m	80
Northern Eider m	1 75
White-fronted Goose m	1 50
Black Brant m	1 50
Sand hill Crane m	3 00
Black Duck m f	50
Great Blue Heron m f	1 00
Man O'War Bird f	2 50
Aud. Caracara f	35
Red breasted Merganser	60
Mallard m	60
Hooded Merganser m	50
European Jay	35
Amer. Goldeneye m	50
Gadwell f	60
Pintail m	60
Old Squaw f	35
Wood Duck m f	75
Black Tern m	25
Western Redtail m	75
Bufflehead f	30
Amer. Coot m	20
Ferrug Rough Leg m	1 50
Shoveler f	35
Spotted Sandpiper m f	12
Killdeer m	18
Bartramian Sandpiper m	30
Wilson's Snipe m	35
Pectoral Sandpiper m	15
Marbled Guillemot f	2 00
Carolina Paroquet m	3 50
Boat tailed Grackle m	30
White-crowned Pigeon m	1 50
Long-billed Dowitcher m	60
Fla Grackle m	20
1 mounted male White crowned Pigeon, fine	2 00
1 Mex. Cormorant m	1 00
Ruddy Duck f	35
1 Willet m	20
1 Long-billed Curlew m	40
1 Lesser Scaup Duck f	50
White-tailed Hawk m	80
Short-eared Owl m	50
Red-breasted Nuthatch m	12
Chickadee m	10
Redpoll m f	10
Robin m f	15
Varied Thrush m	50
Water Ouzel m f	60
Western Wood Pewee m	12
White-breasted Nuthatch m	12
House Wren m	10
Bluebird m	15
Wood Thrush m	15
Calif. Bush Tit f	10
Bohemian Waxwing m	60
Western House Wren m f	10
Grey-crowned Leucosticte m f	60
St. Lucas Thrasher m f	1 00
Crissal " m f	95
Bendire's " m f	95
Scott's Oriole m f	75
St. Lucas Cactus Wren m f	90
Palmer's Thrasher m f	95
Oven Bird m	12
Yellow Warbler m	10
Kingfisher m	20
Maryland Yellow Throat m f	10
Pine Warbler m	20
Hooded Warbler m	20
Parula Warbler m	15
Palm Warbler f	20
Myrtle Warbler m f	10
Ruby-crested Kinglet m f	10
Cedar Bird m f	12
Northern Shrike m f	20
Black-billed Cuckoo m	20
Scarlet Tanager m f	20
Black and White Warbler m	18
Yellow-throated Vireo m	18
Scissor-tailed Flycatcher m	30
Chestnut-sided Warbler m	15
Black-thr'ted Green Warbler m	15
Towhee f	15
Calif. Purple Finch f	12
Snow Bunting m f	18
Amer. Goldfinch m	12
Ark. " f	10
St. Lucas House Finch f	10
Purple Finch f	10
Kingbird m	15
Cowbird m	02
Ivory-billed Woodhewer m	50
Horned Lark m f	15
Mex. Horned Lark m	25
Red-winged Blackbird m	12
P. Horned Lark m	15
Amer. Pipit m	15
Savanna Sparrow m	12
House Canary m	10
Lincoln's Finch m	20
White throated Sparrow m f	12
Tree " m	10
Chipping " m	10
Song " m f	10
Rusty Song " m	20
Oregon Junco m	10
Dickcissal m	15
Vesper Sparrow m	15
Slate-colored Junco m f	15
Western Vesper Sparrow m	12
Amer. Crossbill m. f	18
Indigo Bunting m	16
Rose-breasted Grosbeak m	20
Blue Jay f	20
Flicker m f	20
Paraque m	80
Red-headed Woodpecker m	15
Stellars Jay m	70
Yellow bellied Woodpecker m f	18
Pine Siskin m	20
Downy Woodpecker m f	15
Hairy " m f	20
Great-crested Flycatcher m	12
Cassin's Kingbird m	18
Western Flycatcher m f	15
Ruby-throated Hummer m f	25
Least Flycatcher m	12
Amer. Raven m mounted	3 00

WALTER F. WEBB, Mgr., ALBION, N. Y.

Expires Nov. 20. Expires Nov. 20.

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and Collectors who want to be Subscribers

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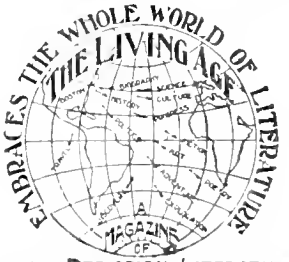

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