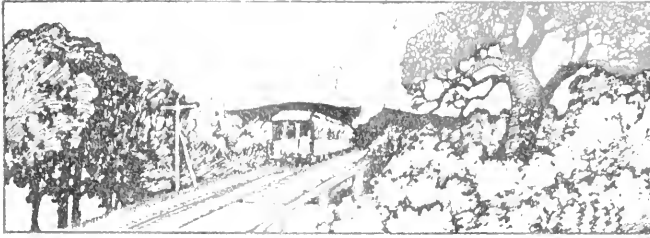
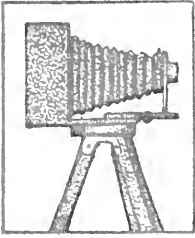


RETURN TO
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The Guide to Nature

Sound Beach, Conn.

“THE MINERAL COLLECTOR”

THE GUIDE TO NATURE

Another advance. A department, "Aquarium," begins with this number. It is under the auspices of The Aquarium Society at Philadelphia. Cooperation of other aquarists will be cordially welcomed. See page 16.

AN ILLUSTRATED MONTHLY MAGAZINE FOR ADULTS DEVOTED TO COMMON INTEREST IN NATURE WITH UNCOMMON INTEREST.

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Subscription, \$1.00 Per Year. Single Copies 10 Cents

Entered as second-class matter, April 6, 1908, at the Post Office at Stamford, Conn. under the Act of March 3, 1879

THE PHOTOGRAPHIC TIMES

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Address after April 1st

EDWARD F. BIGELOW

ARCADIA

SOUND BEACH, CONNECTICUT

PUBLISHER'S NOTICES

Most Indispensable.

Here we are showing an azelia in a Jardinier being sprayed underneath the leaves with the Lenox Plant Sprayer, manufactured by the G. N. Lenox Sprayer Company of New York, 165 West 23d Street. It shows how thoroughly the underside of a plant can be covered with tobacco



Spraying Under the Leaves.

water or any other liquid insecticide or clear water by the misty spray ejected from the sprayer, it is unlike the old fashioned rubber bottle, which is clumsy and unhandy for amateur flowering, or the common sprinkling pot from which water can only be poured out but one way, over the leaves. The Lenox is certainly better than any that we know of on the market. Most plants to be healthful and thrifty should be sprayed underneath the foliage, thereby removing all accumulations of dust and all breeding insects, and refreshing the plants as nature intended for them. The spray reaches every part of the plant and directly into the flowers as is seen in the above cut. For our part we do not see how it is possible to keep plants successfully without having one of the Lenox Sprayers handy, and since the price is rather low for a thing as good as that, we should think every lover of plants should have one. It will come handy to keep the rose bugs off from the rose bushes too, and that is not so far away.—Reader, you need one of these sprayers if you have any plants.

Nature and Science FOR YOUNG FOLKS

(A Department of

The St. Nicholas Magazine

PUBLISHED BY

THE CENTURY COMPANY

New York City)

Edited by

EDWARD F. BIGELOW

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PERSONAL.

I desire to continue and increase this co-operation. Photographs, contributions, drawings and suggestions are cordially solicited. Those accepted will be paid for. Descriptive circular of Nature and Science upon application. Correspondence invited.

EDWARD F. BIGELOW.

Sound Beach, Connecticut.

Allow me to congratulate you upon the continued improvement and the general educational value of "The Guide to Nature."—Dr. Robert T. Morris.

BEE-KEEPING FOR SEDENTARY FOLK

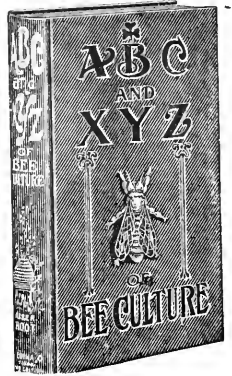
Some years ago our attention was drawn to the fact that many sedentary folks were taking up bee-keeping; some for study, some for honey, and some for money. The number has increased and to inform those who are inquiring we have prepared various pamphlets. (Send for list).

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BUT WE KNOW THAT A REAL, ORDINARY, YET A MARVELOUS WORLD DOES EXIST, AND RIGHT AT HAND. THE PRESENT GREAT NATURE MOVEMENT IS AN OUTGOING TO DISCOVER IT—ITS TREES, BIRDS, FLOWERS, ITS MYRIAD FORMS. THIS IS THE MEANING OF THE COUNTLESS MANUALS, THE "KNOW-TO-HOW" BOOKS, AND THE NATURE STUDY OF THE PUBLIC SCHOOLS. AND THIS DESIRE TO KNOW NATURE IS THE REASONABLE, NATURAL PREPARATION FOR THE DEEPER INSIGHT THAT LEADS TO COMMUNION WITH HER—A DESIRE TO BE TRACED MORE DIRECTLY TO AGASSIZ, AND THE HOSTS OF TEACHERS HE INSPIRED, PERHAPS, THAN THE POET-ESSAYISTS LIKE EMERSON AND THOREAU AND BURROUGHS.—*Dallas Lore Sharp in "They Lay of the Land"*



THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

APRIL, 1909

No. 1



A Visit to a Western Ranch

BY EARL DOUGLASS, PITTSBURG, PA.



FOR months we had been living in a stone cabin in a land of sage-brush, cactus, and prairie-dogs. We had long wished to explore the more broken country to the eastward, and, at last, we found the opportunity. Though we started in good season in the morning, before we reached the high hills the sun was pouring its heat on the sandy waste which reflected it back with added intensity.

We stopped to eat our lunch at a "wash," or ravine, cut deep into a red sandy flat. Here the sage-brush and other shrubs were more rank, and a little pool furnished a drink for the thirsty horses.

Soon after lunch we reached the eastern border of the Uinta Basin, where the rocks form a ridge several miles in width. They slope steeply to the westward, so, as we travelled to the eastward, we came to older and

older formations. The first beds were fine light green slate-like rocks many hundreds of feet in thickness composed of many hundreds of thousands of thin layers. In these, a few miles away, we had found hosts of insects, such as ants, mosquitoes, bugs, beetles, etc., that had fallen into the water and had been buried in the mud ages ago. But as Kipling says, "That is another story." Then we passed a formation that in Wyoming and New Mexico had yielded bones of little horses not bigger than a fox, small animals very distantly related to the tapirs and rhinoceroses and many beasts more strange than those of fairy tales. Next we came to a bed where ancient forests had decayed and left layers of coal and impressions of leaves in the rocks.

At last we descended a steep slope into a large valley, which, by the action of the running water, had been carved out of the shales which had been formed from mud that had ac-



SPRINGY PLACES FULL OF CAT-TAILS AND WATER-CRESS.

cumulated to a great thickness in an old Cretaceous sea. The basin was surrounded on three sides by bluffs of clay and shale, and its bottom was so furrowed by water from rains and melting snow that it had been difficult to find a wagon-way through it. It was still very hot and the scene was almost as desolate as that of a desert.

About the only signs of animal life that we noticed were conical mounds of sand surrounded by circular patches kept clear of vegetation. These were the dwelling places of the agricultural ants, one of the few kinds of insects whose interesting lives, habits, and ingenious dwelling-places have been studied and described.

At last we saw an oil-derrick, some cabins, and oil-tanks. This we found was the partially explored oil-region of which we had heard. In every fresh exposure of the shales that we examined we had found impressions of scales and bones of fishes. This, perhaps, had originated the theory that the oil came from the fishes that had lived in the sea.

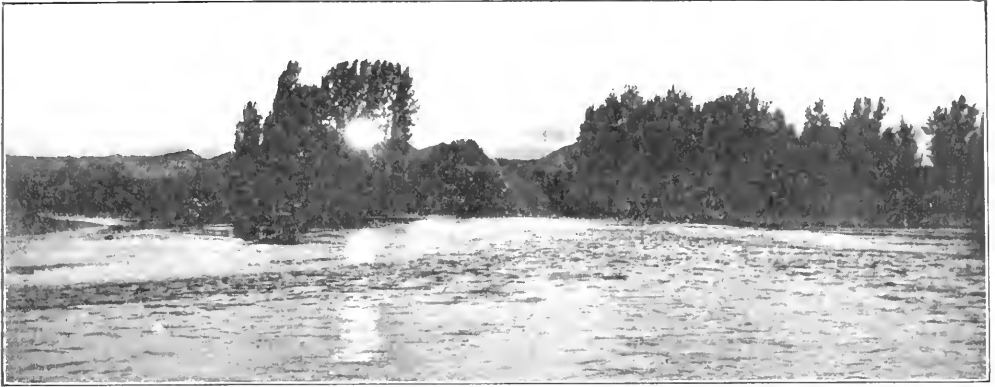
After traveling several weary miles, we saw, to the southward, green trees peeping from behind barren hills; and then we came to the White River flat. We entered a gate through a barbed-wire fence and were on a ranch, the first we had seen for weeks. We

soon found that we were in a pasture for a man was driving the cows home to be milked.

In this pasture, above the irrigating ditch, the sage-brush grew more rank than on the higher land and the greasewood gave a greener tint to the landscape; but when we came to the ditch the scene was suddenly transformed. It was only a step from comparative desolation to a paradise of vegetable luxuriance. The ditch was almost hidden among green willows, grasses, wild sunflowers, and numerous other plants.

On the west side of the road was a field of oats that had just been harvested and shocked. In a more distant field we could see and hear a harvesting-machine cutting the grain. On the east side of the lane was a field of wheat, and beyond that was a pretty farm-house, half hidden in a cotton-wood grove. Between the field of wheat and the grove was a garden and an orchard. In the garden were beets, carrots, onions, beans pumpkins, melons and other vegetables. In front of the large brick barn were wagons and farm machinery, and on the south side was the barnyard where the cows were standing chewing their cuds and waiting to be milked.

All the sights, sounds, and odors brought to my mind as by magic.



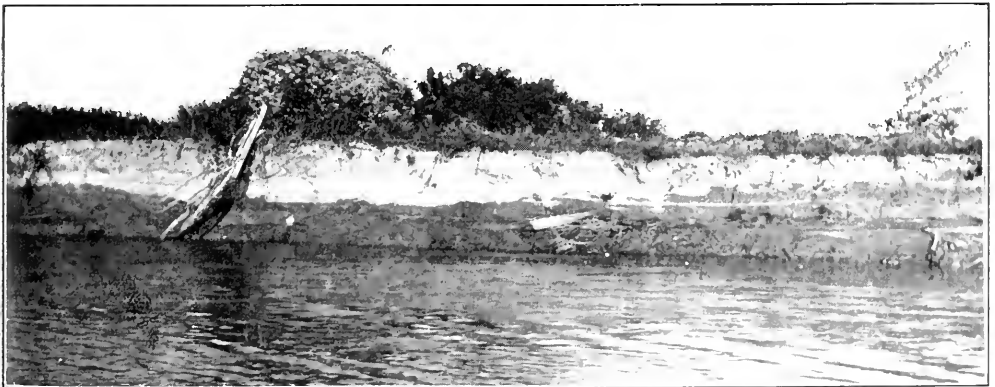
THE SUN WAS SHINING THROUGH THE GROVE IN WHICH THE FARMHOUSE
STOOD

scenes of former days, and prolonged absence from such scenes in a large city and in an arid treeless wilderness, redoubled the interest and pleasure which I felt, and I was seized with an irresistible desire to get pictures of nearly everything that I saw. I often pity those who have not spent a part of childhood's days on a farm, for it seems that they have lost something that they can never get anywhere else or at any other time. It is one of our natural rights to spend part of our time with Nature, the oldest, yet the best and most up-to-date teacher. I know by experience that there is much hard drudgery on a farm, but I believe that one is fully paid for it in later years, no matter what profession he may follow. The happy hours that I spent on this western ranch, paid me

for many days of hard labor in former years.

We stopped at the barn and inquired of the good-natured foreman of the ranch, where we could find a good camping-place. We were told that the best place was just across the river. We then drove through an avenue of tall shade-trees in front of the enclosure in which stood the fine cottage which was occupied by the owner of the ranch. Between the house and the river was an open spot, part of which was low and wet. Here cat-tails and watercress grew in abundance. I jumped out of the wagon and pulled up a large bunch of the latter which furnished a fine relish for our evening meal by the camp-fire.

When crossing the ford we stopped in the middle of the stream to let the



ON THE OPPOSITE SIDE OF THE RIVER THE BLOOMING CLEMATIS SEEMED TO
FORM A FAIRY BOWER INDEED

horses drink. The sun was shining through the grove in which the farmhouse stood, and it made a trembling streak of light in the broad, rippling band of shadows, the reflection of the grove in the running waters. The few clouds in the western sky, and the nearer trees were fringed by the light of the setting sun. "What a picture it would make!" I thought, so I took



BY THE DITCH THE WILD SUNFLOWER AND THE PLUME GRASS GREW HIGHER THAN MY HEAD.

three snap-shots, all of which were good.

Our camping-place was on a green grassy plot of ground between the river and a little strip of tangled thicket of brush, vines and trees. We hobbled our horses, turned them loose and prepared our evening meal by a camp-fire of dry willows. The trees and shrubs near our camp were draped in clematis, or virgin bower, and across

the river this plant formed a fairy bower indeed.

I resolved that I would not leave this place without making an excursion over the more attractive part of the ranch and taking pictures of what pleased my fancy; so, in the morning, with my camera, I recrossed the river. Mr. Rector, the owner of the ranch, was not at home; but his intelligent wife and her bright little children were there. Mrs. Rector welcomed me in the free, hospitable spirit of the West, and, from her, I learned many interesting things about the country. The house and its surroundings were beautiful. There was not another such a dwelling for scores of miles. In the garden all kinds of vegetables seemed to thrive. When we were there the corn was in tassel and the pumpkins and melons were still in bloom. I started for a walk over a part of the ranch. By the irrigating ditch, the wild sunflower and the grasses grew higher than my head, forming a miniature jungle. Between the ditch and the river were many green, grassy glades hidden among dense thickets of willows. I wondered what insects lived in the thickets and visited the flowers and what birds lived and nested here. A little farther up the river were long, crooked lakes, or bayous, the former courses of the river. In some portions of these, there was open water, while, in other portions, were dense growths of rank vegetation such as cat-tails, grasses, the giant bulrush, and other sedges. These reedy places swarmed with blackbirds. As I approached, I could hear them puddling in the water and they flew out in ones twos and scattered groups like bees from a hive. They sometimes collected in thousands and it made me think of boyhood scenes in Minnesota when they used to fly by in large flocks neither end of which could be seen for a long time. This was an ideal nesting place for blackbirds and waterfowls. I wished to know what beautiful and strange forms of minute life existed in these reedy bayous but I had not a microscope with me or time to investigate.

In one place, a crescent-shaped

THE OUTDOOR WORLD



THESE WERE LONG, CROOKED LAKES OR BAYOUS

bayou, an abandoned channel of the river, was open for a long distance, and both sides were thickly fringed with shrubs and other vegetation. I saw that there were wild ducks in the pond and this aroused my instinct for hunting. I had not a gun but something better. I crept along the border of the new mown field close to the thick fringe of willows, grasses and weeds. I made my way not without some noise, through the dense thicket to the edge of the pond, and saw the ducks quietly reposing on the mud of the farther end, or swimming about on the water. I snapped at them several times with my camera, once when a couple were flying toward me. After

others arose, I got a picture of them on the wing.

I next went to a field where a man was cutting grain, and took several pictures. I spent a few short hours here and saw many interesting things, but one might stay a life time studying and photographing the plants and animals and then make only a beginning. We sometimes think we would like to go to Africa and study the wild beasts there but in these tangled thickets of weeds, shrubs and flowers are animals far less known than the large beasts of Africa. The insects with most interesting and varied habits are little known and nobody knows anything of the microscopic life, the beau-



WILD DUCKS ON THE WING

tiful little plants and animals that live in the bayous. Here many interesting plants grow and birds build their nests, lay their beautiful eggs, the sight of which so thrills the heart of a boy, yes, and we never get over it. Then in the barren rocks that surround the valley are remains of animals and plants that lived in the ages that are gone. Doubtless many of them never yet seen by man.

Soon after noon, we started down White River for the strange beasts of the past, the remains of which we had been collecting seemed calling me from the desert and we returned to our work with renewed interest.

The Personality of Flowers

BY WILLIAM WHITMAN BAILEY, LL. D.
BROWN UNIVERSITY, PROVIDENCE, R. I.

That to flowers we attribute certain human characteristics is a fact as old, probably, as observation itself. Thus we speak of the pompous and aristocratic tulip, the stately lily, the trembling, shy anemone, the coy violet, the modest rose. Even trees come in for this featural description, as the robust oak, the tough, and subtle hickory, the weeping willow, the aspiring pine and the clinging ivy.

Some of these attributes have become fixed in our literature and are the general property of all writers. Others have a more personal character and are applied by the particular essayist or poet. By his use of terms we guess something of his own nature.

To the writer of this article, the terms laughing and frolicksome have ever seemed to belong of right and unchallenged to the liverwort or hepatica. As these blue eyed flowers revel down a hillside, they appear to be engaged in a wild but innocent romp now hiding behind rocks, now peeping out from a cover of brown leaves or gaily whispering in some sunny corner. It is no use saying they are unconscious; their every glance shows that they are enjoying a holiday. For this were they created.

Never, for a moment, does hepatica claim to be other than it is to assume a livery other than its own, or to feign

a sobriety it does not feel. If there be a genuine flower it is this. As innocent as lily of the valley, it is somehow more lovable, more loving. One is quite sure that it reciprocates his affection.

The bloodroot, which is equally common, robed in pure white as it is, is involved in mystery. What is the tragedy that attends it? Why this ensanguined root which it tries in vain to conceal? Must its dread secret always remain unknown?

That quaker ladies or blunets have a strong personality every one must have observed. Note first their gregariousness, how they at first gather in little chatty groups and then, as at a given signal, all run into a vast throng. It is as if they had caucuses and primary meetings and then a general convention where, let us hope, they do not quarrel.

According to one's mood, skunk cabbages appear either as solemn, hooded monks or as uncanny kobolds or goblins dire. Their robes are too rich for actual hermits. Jack-in-the-pulpit is, of course, an accepted priest. Observe his tonsured poll. I have fancies sometimes that I could even follow his sermon and profit thereby.

Even botanists, who are by no means all poets, though old Linnaeus and others have had a lively fancy, have conceded to the pond lily a mystic origin. Is our common one not, in older manuals at least, known as *Nymphaea*? Do we not all feel jarred to have that name transferred to the coarse and evil-smelling spatter-dock? It was an accident, some say, that bestowed the name *Euryale*, "queen of the furies" on the superb water lily of the Amazons, and a fortunate chance which transfers it to *Victoria*, "our late most gracious queen and lady."

It was not their gorgeous scarlet alone, surely, which suggested the name of cardinal flower to our splendid American lobelia. It always wears the stately pose of a prince of the church. When a number are together, we feel that they are concerned in an important conclave and that whatever they vote or for whomsoever their function, is heaven-directed. There can be no

chance of mistake with such sober, erect, thoughtful persons.

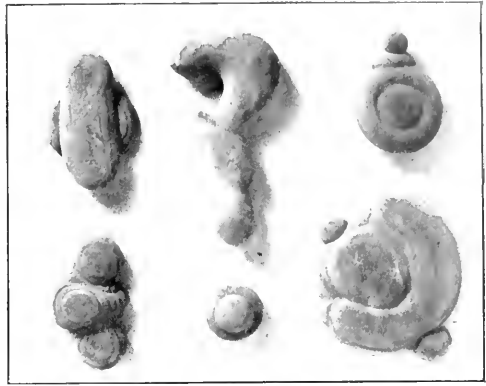
I have no desire to extend my thought to tenuity although the subject is alluring. Those who have flowers and know them will recall many that possess marked human features. To feel this is to add a joy to a spring or summer walk, where all the companions of a lifetime come again to welcome us.

Prehistoric Mud Pies.

BY MILO LEON NORTON, BRISTOL, CONN.

Many misguided people, including some geographers, persist in calling the Tunxis, Farmington river, whereas it was named by the Indians, hundreds of years before a white man ever saw it, Tunxis Sepus, or the Little river, in contradistinction to the Great river, or the Connecticut. By this name it is known in the early records. By all means let the rivers, lakes and mountains bear, as much as possible, the names of the original proprietors, the red men. Poetic justice demands it. These natural objects so intimately associated with the aborigines should be their monuments, and perpetuate their memory, especially when named by the Indians themselves. It would be just as appropriate to call the Connecticut, Hartford river, as to name the Tunxis for a single town of the many that it traverses.

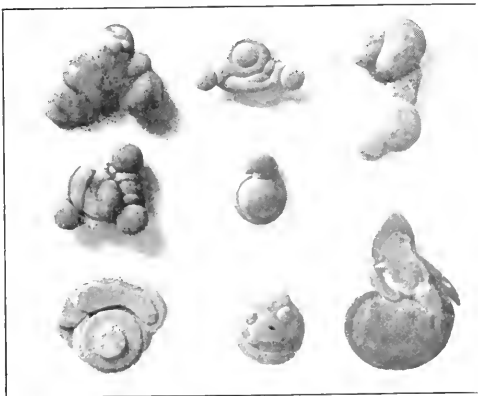
About two miles above Old Point Comfort, at the mouth of the Tunxis, in the Historic old town of Windsor,



EASILY IMAGINED TO BE UNIQUE
"HARDWARE"

where the first house in Connecticut was built in 1633, upon the north bank of the Tunxis, accessible by canoe or motorboat, is a large, sloping clay-bank, rising from the water's edge to a considerable height. It is bare of vegetation as it is subject to continual wearing away by the current of the river, this displacement causing the gradual subsidence of the entire hill-side, and bringing to light many thousand curious pebbles, generally known as clay-stones, but technically known to brick-makers as "clay-dogs," and as much appreciated by them as daisies are by the average farmer. If prevalent they render the clay unfit for brick-making purposes.

At first sight they have the appearance of being water-worn, like the pebbles in streams or on the sea-shore, but their fantastic shapes, and the fact that many of them are clusters, cemented together, render some other explanation of their origin necessary. Scientists tell us that they are concretions, and that they consist of particles of clay and sand cemented together by carbonate of lime. The lime was originally deposited with the clay in the shape of minute particles, which, by being acted upon by the carbon dioxide in the water, were dissolved and carried along through the most porous layers of the clay formation, till they became supersaturated, when precipitation took place, and the minerals in solution were attracted together by the same law that attracts particles of dust



CURIOUS FORMS OF "MUD PIES."

together on the sidewalk, forming branching ferns and palm-like designs; or, the fantastic crystalization of frost rime upon the window pane. The normal shape of these concretions is globular, but owing to variations in the thickness of the layers in which they are deposited, and the direction from which the lime is supplied, many modifications result. The regularity and accuracy of some of the worms are astonishing. Some of the stones are as accurately turned, beaded and grooved, as could be done in a lathe. They vary in size from a half inch to three inches in diameter, most of them not exceeding two inches. They are of a generally uniform clay color, quite hard, and well preserved. The fact that some present a fresher appearance than others is accounted for by the supposition that they are still forming.

While other clay banks have their specimens of these curious freaks, it is in this bank that they are found in the greatest variety and profusion. While the scientific explanation of their origin is undoubtedly correct, I have another theory much more satisfactory from a poetic standpoint, which I have embodied in the following lines:

Early in the planet's morning,
Nymphs there were without adorning
Save their purity and tresses,

Needed they no other dresses.
Playful sprites, these naiad daughters,
Sporting in the fluvial waters,
Plunging in the flood before them,
Splashing crystal waters o'er them,
Then upon the bank reclining,
Where the sun was brightly shining,
Fashioned they with merry laughter,
Dreaming not what might come after,
Curious, weird and strange devices;
Nor have winter's snows and ices,
Nor the Frost King's fancy sketching,
O'er the northern window stretching,
E'er produced shapes more fantastic
Than these nymphs did from the plastic
Clay-mud of the river's silting —
Prototypes of crazy-quilting.
Circles, ovals, clustered, single,
Rounded like the sea-washed shingle;
Squatty idols, Asiatic,
Fit for Hindu priests fanatic;
Reptiles, fowls and curious creatures;
Monkeys with distorted features;
Watches, charms and pretty lockets,
Maids might wear in dainty pockets;
Dangles, bracelets, buttons funny;
Medals and unminted money;
And ten thousand shapes, defying
All attempts at classifying.
Then these nymphs, their play forsaking,
Left them in the sunshine baking,
while they drifted down stream singing,
Joy unto waste places bringing.
Then the floods came, and the waters
Southward bore these guileless daughters,
The forsaken mud-pies, curious,
By the torrents fast and furious,
In the clay-bank deep were hidden,
Ages passed, and then, unbidden,
And the captives have arisen.
Broke the waves into their prison,
Scattered on the bank we find them
Where the nymphs left them behind them.



The Heavens in April.

BY GARRETT P. SERVISS, BROOKLYN, N. Y.

The chart represents the aspect of the evening sky at 9 P. M. on the first of the month, 8 P. M. on the 15th and 7 P. M. on the 30th. The drawing shows the appearance of Halley's Comet at its last return previous to that now awaited, viz. in 1835. On that occasion it was in perihelion, i. e., nearest to the sun, on the 16th of

November. This time it is expected to pass the same point in its orbit on April 13, 1910. The reason why it does not come to perihelion on the same day at each return is because its period of revolution about the sun is not a fixed number of years precisely, but a certain number of years and a fraction of another year. Moreover its period is variable owing to the attractions of the planets, particularly Saturn and Jupiter, which some-

times delay it, and sometimes hurry it onward in its orbit. This explains the difficulty that astronomers find in fixing on the exact date of its arrival, for the amount of the disturbance that it suffers from the attraction of the planets depends on the mass of those planets that affect its motions and also on its varying distances from them. Now, the masses of Jupiter and Saturn are not even yet absolutely known, so that a certain limit of error must always be allowed in calculating the movements of the comet under their influence. This has been strikingly illustrated since our last article on the comet. At that time Messrs. Cowell and Crommelin, whose calculations of the movements of Halley's Comet are generally regarded as the most trustworthy fixed April 8th as the most likely time of the perihelion passage, but later they have revised their figures, and now they designate April 13th as the proper date, with a leeway of a day or two. But this is not all, and the fact again demonstrates the difficulty of the calculations, for in a recent number of the great German astronomical periodical, the *Astronomische Nachrichten*, another computer, working for a prize, but whose name is not given, fixes the date on June 18th, at least two months later than the time selected by the English computers. Mr. Crommelin says of this discrepancy that it is a little disquieting, both because it shows how widely apart the results found by two independent calculations based on similar data may be, and because it introduces much uncertainty for those who are trying to be the first to detect the comet in the heavens, coming toward the sun. If it does not arrive at perihelion until June it will be seen in quite a different part of the sky from that which it would occupy in April. Only the event can prove which calculation is the correct one. But the great divergence is somewhat astonishing, considering that in 1835 the computers, who did not have as correct data as those now available, hit the day of perihelion passage within two days of the actual time, and none of the

calculations were as much as one month in error. However, let the perihelion be in April or in June, the comet is sure to come somewhere near the expected time, and is equally sure to make a reputation for the first man who succeeds in describing it. Together with the opposition of Mars in September, this return of Halley's Comet will go down in history as one of the most interesting astronomical events of the Twentieth Century. What the comet will look like nobody can say. As our picture shows, it was a formidable looking object in 1835, although not comparable in that respect with its appearance at some previous returns, when it absolutely frightened all Europe. Every time it returns it shows some change of form in tail and head. On this occasion it may blaze with terrifying splendor or it may be comparatively inconspicuous. But one thing bearing on this question may be said: all comets that return frequently to the neighborhood of the sun gradually lose some of their substance, because they are all undergoing a slow process of disintegration and this may be happening with Halley's Comet, although to a less degree than to comets like Encke's which come to perihelion every three or four years.

Jupiter continues to be the great planetary ornament of the evening sky, rising in the middle of the month between 2 and 3 P. M., and setting about 3 A. M. For the telescopic observer nothing can exceed in interest his vast colored belts and swiftly moving moons. The great planet, as far as we can see, is only an immense ball of clouds. If it has a solid nucleus it lies deep beneath the surface of the planet as it is presented to our eyes.

Saturn can no longer be observed in the evening. In the middle of the month it rises about 5 A. M. After April 3rd Saturn is a morning star.

Venus becomes an evening star on April 28th, but, of course, is too near the sun to be seen. Her glories are reserved for late in the year.

Mercury is an evening star after April 21st, reaching its greatest elong-

ation east of the sun in the latter part of May, when it may be well seen.

Uranus is a morning star, and consequently unobservable, while Neptune, although an evening star, in Gemini, is only a telescopic object at the best.

It remains to speak of Mars, which rises soon after midnight on the 30th of April, and which will become a conspicuous evening star as the summer advances. Its opposition this year, which occurs on Sept. 24th, will be more important than that of 1907.

the end of April, to take a glance at Mars, low in the east, and gleaming with the peculiar ruddy light which characterizes him, and which a few months later will make him the cynosure of all eyes. Such studies of the planets in their aspects as they approach or recede from, the earth, are exceedingly instructive as well as interesting.

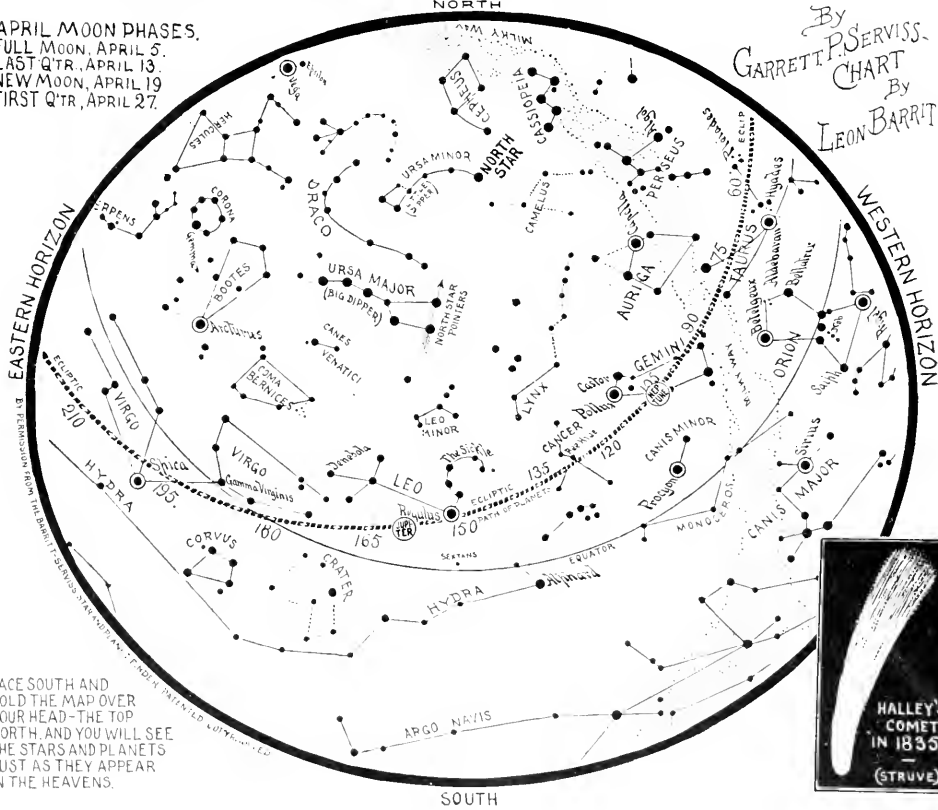
THE STARS AND CONSTELLATIONS.

At the hour represented in the chart the great constellations of winter,

EVENING SKY MAP FOR APRIL

APRIL MOON PHASES.
FULL MOON, APRIL 5.
LAST Q'TR., APRIL 13.
NEW MOON, APRIL 19.
FIRST Q'TR., APRIL 27.

By GARRETT P. SERVISS.
CHART
By LEON BARRITT



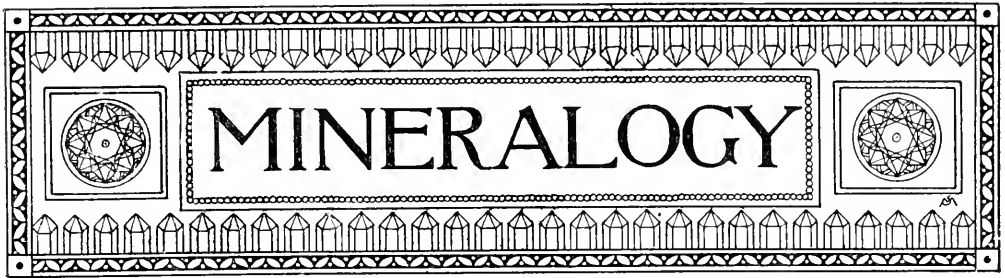
FACE SOUTH AND HOLD THE MAP OVER YOUR HEAD—THE TOP NORTH, AND YOU WILL SEE THE STARS AND PLANETS JUST AS THEY APPEAR IN THE HEAVENS.

because the planet will not only be nearer the earth, but will also be much farther north in the sky, so that it can be well seen from northern as well as southern latitudes. About the 10th of September it will be only about 30,000,000 miles from the earth. It will be distinctly worth the while of anybody who happens to be up in the small hours of the morning, toward

under the captainship of Orion, are seen as it were in flight, and just about to sink behind the western horizon. Their line stretches from Argo Navis, in the south-west around through the east to Cassiopeia, far in the north-west. And behind them, from one end of the vast column to the other, hangs, like a cloud of sunlit dust above the retreating host, the gauzy scarf of the

Milky Way. Over in the east, as if in pursuit, come the great summer stars and constellations, led by Spica in the Virgin, Arcturus in the Bear-Driver (Bootes), and Vega in the Lyre. Between the two hosts the central part of the sky is relatively barren, Leo high in the south, and the Great Dipper nearly overhead, being the only constellations to attract much attention there. The huge serpent, Hydra, with his diamond-shaped head under the Beehive cluster in Cancer, stretches eastward beneath Leo, Crater, Corvus and Virgo, but with the exception of Alpherat he has no bright star. Coma Berenices, above Virgo and between

Leo and Arcturus, gleams with a silvery lustre derived from its multitude of small stars, and presents an admirable object for the opera-glass. A little later in the evening, as Sirius sinks behind the western horizon, Vega begins to glitter with diamond brightness above the north-eastern horizon. Spica, in the meantime, advances from the east, and proclaims herself the queen-star of the Spring, for while she is less brilliant than Arcturus above her, she possesses a singularly pure white ray, which is hardly matched in beauty by that of any other star in the heavens.



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

The Mineral Collector Company.

PRINTERS AND PUBLISHERS, 56 HAMILTON PLACE.

New York, March 22, 1909.

TO THE PATRONS OF "THE MINERAL COLLECTOR:"

It is with pleasure I announce that I have arranged with Mr. Edward F. Bigelow, editor of THE GUIDE TO NATURE, to introduce a department, to be edited by myself, and thus make that publication the successor of *The Mineral Collector*. All unexpired subscriptions are to be filled out by that publication. We hope all persons whose subscriptions have expired will send in their renewals to me without delay. As the subscription of THE GUIDE TO NATURE has been reduced (beginning April 1909, from \$1.50 to \$1.00 and is a much larger and better publication than *The Mineral Collector*.) we hope all our subscribers will use their best endeavors to aid in securing additional subscriptions. We would also like to secure notes, origi-

nal papers and descriptions of trips, accompanied with photographs, where possible for this department. I thank my subscribers for their support in the past, and request a continuance of the same for THE GUIDE TO NATURE, as successor to *The Mineral Collector*.

Very truly,

ARTHUR CHAMBERLAIN,

Editor and publisher of "The Mineral Collector."

P. S.—Volume two of THE GUIDE TO NATURE starts with the April, 1909, number. Every subscriber sending \$1.75 can secure the first two volumes.

To the Constituency of *The Mineral Collector*:

THE GUIDE TO NATURE and The Agassiz Association, represented by it, cordially welcome you to our fellowship in the study and love of nature. We realize that minerals are of intense interest to the careful student, and are

very attractive to lovers of the beautiful. Minerals seem especially available for those who desire to make collections, and we agree with Dana that, "every one who desires to really learn mineralogy must have a collection of his own to examine and experiment upon." We further agree with that talented scientist that, "no subject is better fitted to cultivate the powers of observation and at the same time to excite active interest than that of mineralogy."

No subject is also better adapted to the work of the Chapters of The Agassiz Association, to which we call the attention of all our new friends. We have Chapters of all ages and all degrees of proficiency. No efforts will be spared to make "Mineralogy" one of our best features.

Cordially yours,

EDWARD F. BIGELOW.

Introductory.

In beginning this department, let me say that I shall endeavor to make it both attractive and instructive, and that I shall do my best to make the magazine itself even more successful than it is. To do these things I must have the cooperation of all interested in minerals. Let me know what you would like to have described. Send me notes of your trips or of collecting fields in your vicinity. If you are puzzled about anything on this subject, write to me. If you have the leisure write a short article on some mineralogical subject that interests you and send it to me. If you come across any interesting items in print send them, with name and date of the paper in which they appeared. We want every subscriber to feel that he is part owner of this magazine and to take just as much pleasure as I shall in making it successful. Let us all be like one happy family, each striving to do the most to help the others. Hoping that I may be the means of adding many new subscribers to THE GUIDE TO NATURE, and of adding many new students to my beloved study of the mineral world, I am,

Your humble servant,

ARTHUR CHAMBERLAIN.

How Sluice Mining Originated.

Colonel Eddy, of Nevada, claims the credit of having originally introduced the sluice-box for mining purposes: the invention owing its origin to an accidental discovery.

He gives the following account of his connection with this important discovery. In the spring of 1850, when all operations were being carried on by the aid of "long tom" and the "rocker," he located a claim in the ravine just above the Catholic Church in Eureka. There were several claims below him, the holders of which refused to permit him to run tailings on their grounds. So he made a trough leading from his location through theirs and to a point below. On the bottom of the sluice, wherever the different sections joined, he nailed wooden cleats to keep the water and gravel from leaking through.

At the lower end of the sluice he placed a rocker and for one day manipulated the dirt that came down it. At the end of the day he found that the rocker had saved very little gold. Going along up the sluice he found behind each of the cleats numerous sparkling particles of gold that had lodged there. He abandoned the use of the rocker, increased the number of cleats and then commenced what he said was the first sluice mining ever carried on, so far as he knows.

The sluice and riffles soon became popular, causing the price of lumber to advance rapidly. The colonel says the only thing he regrets about his discovery is that he did not have it patented and thus win fame and fortune.

Stones That Will Swim in the Human Eye.

Eyestones are really portions of the covering of certain shellfish. They are found at the opening of the shell and serve to close the entrance when the animal draws itself within. They are of various kinds, but those used as eyestones are hard, stony bodies about the size of split peas, one-third to one-sixth of an inch in diameter, a little longer than broad, having one surface plane and the other convex.

When they have been worn by the action of the sea they are very smooth and shining. Like other shells they are composed of carbonate of lime. When placed in a weak acid such as vinegar, a chemical change takes place, carbonic acid gas is given off and in its escape produces the movements which are popularly supposed to show that the stone is "alive."

When one of the stones is placed under the eyelid, at the outer corner, the natural movements of the lid in winking push it gradually towards the inner side, and when it comes in contact with the mote which is causing the irritation this is carried along and finally expelled with it.

The belief that such stones have a peculiar detective power and move about in the eye until they find and remove the substance for which they are sent, has no foundation in fact.

It is interesting to know that in the lining membrane of the stomach of the crawfish there are found small bodies which go under the name of "crab's eyes," and look not unlike the true eyestones. They have sometimes been mistaken for them and presumably would serve a similar purpose.

Collecting Interesting Minerals.

BY HORACE R. GOODWIN, PHILADELPHIA,
PENNSYLVANIA.

Let those of your readers who have not visited the home of an enthusiastic collector of minerals do so at the first opportunity offered and they will be treated to a new experience, spend a pleasant hour, and in many cases become interested in every stone and rock encountered in their rambles afield, with the result that the mineral department of *THE GUIDE TO NATURE* will soon be in a flourishing condition. I have been an active collector of minerals for over a quarter of a century and, while not advanced in the science, have used my eyes to some purpose in the field.

One of my most enjoyable and profitable experiences was the meeting with the Student's Mineralogical Club, now the Philadelphia Mineralogical Club, on Thanksgiving Day, 1894, in Fair-

mount Park. The friendships there formed have been of lasting benefit.

While searching for specimens in a large quarry at Moores Station near Trenton, New Jersey, some time ago, I discovered a large cavity in the rock which was lined with beautiful, snow-



SMOKY QUARTZ

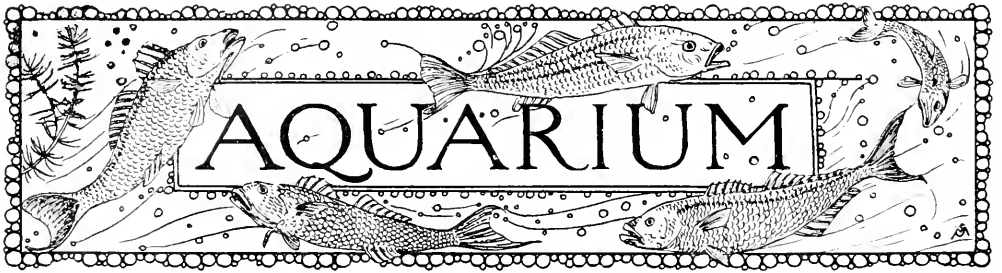
white crystals of natrolite, a mineral consisting of silica, alumina, soda and water, belonging to the zeolite group and named from natron, soda. Associated with the acicular crystals of natrolite were rhombic crystals of yellow calcite (carbonate of lime) from one half to one inch in diameter, the combination of the two minerals being very attractive. Although the material is very fragile a number of fine specimens were secured and are now safely housed in my cabinet.

Numerous other minerals occur at this locality, among them being stilbite, both white and honey colored, sometimes coated with iridescent pyrite; calcite of various forms, chalcopyrite, prehnite, galena, chalcedony and several others that I cannot now recall.

On another occasion while digging for quartz in a sand pit at Lansdowne, Delaware County, Pennsylvania, I unearthed a fine large crystal of smoky quartz that weighs thirteen and three-quarters pounds and is as fine a speci-

men as ever came out of Japan or Switzerland, the latter place being noted for the magnificent quartz found there. The quartz occurred in a large pocket of pegmatite which had undergone decomposition leaving the crystal of quartz free. Many crystals were found, some of very curious form, but most of them were broken by the laborers who knew nothing and cared nothing about them.

Those who wish to find specimens for themselves should investigate quarries, railroad cuts and fills, outcrops of rocks and excavations of all kinds, select pieces that appear odd in composition or form and apply to the nearest collector or museum for information. It is important that the locality of specimens be known as this is often of great assistance in making determinations.



Under the Auspices of The Aquarium Society of Philadelphia

HERMAN T. WOLF, Editor

The Eyes of Chinese Goldfish.

BY HERMAN T. WOLF.

Among the highly developed toy varieties of the Chinese goldfishes there are a number of breeds characterized by abnormal eye development. These are known as telescopic-eyed or "Telescopes" to American and European breeders and fanciers, though the Chinese designation Dragon-eyes would better describe these species.

With these fishes the eyes have had the principal attention of the Oriental goldfish culturists, who by careful selection and continued breeding have produced monstrosities that would seem incredible to those unfamiliar with these highly developed fishes.

The eyes of the common goldfish, like those of the carp and other cyprinidae are placed at the sides of the head, separated by a wide interorbital space, with the eye-balls nearly round and the slightly convex cornea flattened and directed somewhat forward, so that the angle of vision is both in front and to the sides. They are enveloped in a gelatinous layer in the cavity of the orbits, which permits of a considerable movement

of the bulbus, and have brilliant dark pupils and white, yellow or red irides. In every respect, the eyes do not differ from those of the other fishes of the same order.

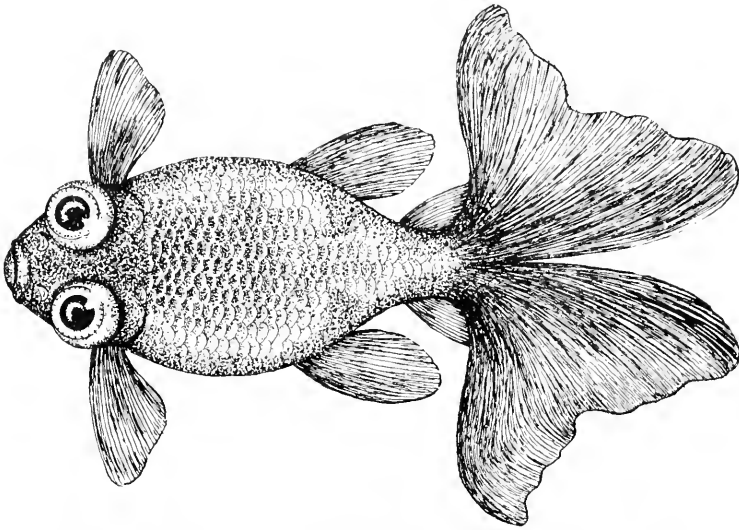
Beginning with this flat form of eye the Chinese breeders have produced enormously large protruding eye-balls which in the different breeds assume the form of spheroids, segmented spheres, ovoids and truncated cones almost entirely projected beyond their orbits.

The cornea and crystalline lens form a smaller segment or superimposed hemisphere, so that the eyes of the finest specimens of the Dragon-eyed goldfish protrude one-half to five-eighths inch from the sockets.

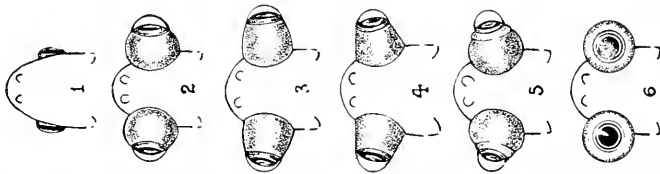
Investigations have shown that the eye-ball becomes greatly elongated in the direction of its optic axis, the difference between axial and equatorial diameters is as much as three millimeters in the spheroidal, and five to six millimeters in the conical form of eyes, constituting an extremely myopic form of eye-ball, while that of the common goldfish is flat and hypermetropic.

The shape of the globular lens is not materially different from that of the natural form, which indicates that it is impossible for the image of a distant object formed by the lens to be thrown on the retina at all, and so necessarily producing a condition of extreme near-sightedness, an optical

This near-sightedness may be of benefit to the fishes under the conditions in which they are bred and reared, as in the confines of the aquarium and smaller breeding tank distance sight is of less value than an optical adjustment that will clearly define nearby objects.



DORSAL VIEW OF THE CHINESE CELESTIAL GOLDFISH



EYE-FORMATIONS OF CHINESE AND COREAN GOLDFISHES.

1. Eyes of the common goldfishes
2. Eyes of the Dragon-eyed goldfish as spheres
3. Eyes of the Dragon-eyed goldfishes, as ovoids
4. Eyes of the Dragon-eyed goldfishes, as truncated cones
5. Eyes of the Dragon-eyed goldfishes, as segmented spheres
5. Eyes of the Dragon-eyed goldfishes, the Celestial pupils turned upward

adjustment for very near objects. Therefore, the name "Telescope" is a misnomer; the eye is distinctly myopic and short-sighted and not hypermetropic or far-sighted, as required of an optical organ having telescopic capacity.

These highly developed goldfishes all have defective eyesight, but others less abnormally developed have a considerable range of vision and an eye formation of some magnifying power as compared with the human sight. They distinguish objects in the water that

the fancier can scarcely discern with the use of a reading glass.

Expert judges distinguish between these forms of protruding eyes, considering the globular or spheroidal form of less merit than the segmented sphere; the ovoid form as next meritorious, and the truncated cone as the highest developed and most desirable form of eye-ball. The greater their size and their relative uniformity, together with perfection of development, colors and distinct outlining of the pupils and irides, the more highly prized the specimens, the more rarely they are to be obtained, and the greater their monetary value.

How considerable this may be it is not of purpose here to state, but one fancier in Philadelphia at one time had over five hundred dollars invested in goldfish marvels, not more than twenty in number. These were not fanciful or fictitious valuations, but actual commercial values, governed as much by supply and demand as the values of other highly developed and greatly desired household pets. The illustration, a fine Chinese Celestial Goldfish taken with permission from "Goldfish Breeds and Other Aquarium Fishes" is an exact portrait of one of these fishes, in the writers opinion, not the gem of the collection.

The globular is the general eye form of the scaled Telescope goldfish, common in China, introduced into Japan subsequent to the Chinese-Japanese War, and now quite generally bred in the United States. The segmented sphere and the ovoid forms of protruding eyes are the desired characteristics of the transparently-scaled Telescope goldfish, derived directly from China. The truncated cone form of eye is the distinguishing characteristic of the finest-breed Moor, or Black Chinese Telescope goldfish, of which some remarkable specimens have been owned in Philadelphia. Captain Mayer, of the Imperial German Navy, informed the writer that a Chinese Prince at Amoy, China, had thousands of these fishes in his parks, but with all the influence that could be brought to bear through the German consul

at that Port, he could not obtain permission to inspect them.

Still another form of highly-developed eye-ball is that of the Celestial Telescope goldfish. Almost entirely protruding from the orbit this eye is larger in its equatorial than in its axial diameter and has an extremely small pupil directed upward, so that the gaze of the fish is always to the surface of the water. Protruding almost at right-angles from the sockets, the eyes are nearly rigid and the muscular control of the bulbous scarcely perceptible. In these monstrosities the eye development is so extremely abnormal as to have produced an almost blinded fish.

Early travelers mention that this form of eye was produced by hatching Dragon-eyed goldfishes in a jar having a lid in which there is a slit, and that the upward trend of the eye is due to the fixed upward gaze of the fish, for both light and food.

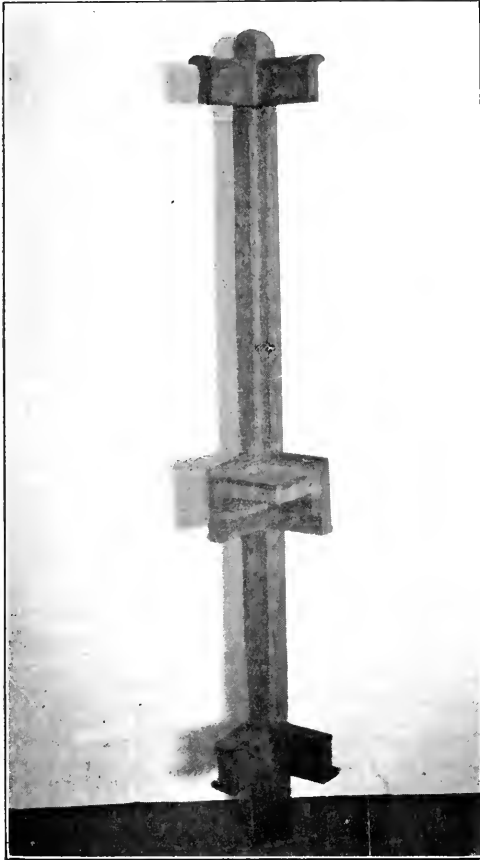
This assertion lacks positive confirmation by recent travelers in China and Corea and like much else stated of the Orient may only be based on tradition or hearsay evidence. Experts in goldfish culture are not willing to believe that goldfishes can be reared in basins from which abundant daylight is excluded, or in which the water is not aerated by a plentiful growth of aquatic plants; which latter cannot be done except in the presence of both daylight and sunlight.

Wooden-Framed Household Aquaria.

BY H. R. LIPPINCOTT, COLLINGSWOOD, N. J.

In advocating wooden-framed aquaria, the writer wishes to prove that, notwithstanding the many statements to the contrary, it is not only possible but practicable to construct large-sized aquarium frames of wood. He does not wish to detract from the prestige of the metal framed slate bottomed kind, but there are times when it is desirable to have an aquarium more nearly conforming with the furnishings of the room in which it stands, especially when one wishes to have his "fishy world" in the parlor, and has the esthetic objections of the gentler sex to overcome. This will be

much easier if he can show his fair critics an object that will be an orna-



A CORNER POST OF THE WOODEN
AQUARIUM

ment instead of an unsightly iron-framed affair painted any of the various hues of the rainbow and supported on a sewing stand or on an angular frame of gas-pipe; either sufficient for a green house but hardly conformable with oil paintings, Oriental rugs and a piano.

Just as an appropriate frame enhances the beauty of a picture so the character of an aquarium affects the beauty of its contents. We sometimes see aquaria that are beautiful in regard to their contained plant and animal life, but do not display them to advantage because of a shabby metal frame and inappropriate stand.

There are exceptions even in metal-

framed aquaria; nickel and brass frames are very neat and handsome, and tables make satisfactory supports. The writer has one, recently seen, in mind, which is constructed of four copper posts bolted to a slate base with the top and bottom rails eliminated, and which has an exceedingly handsome appearance.

The cost of constructing wooden-framed aquaria, with the exception of the time consumed, is no greater than the cost of constructing the iron-framed type; nor is its construction more difficult.

Any one who is sufficient mechanic to make the exact measurements and the neat corner miters required in a metal frame, will find the construction of a wooden frame no more difficult. Any of the cabinet woods may be utilized, although owing to their hardness quartered-oak and Cuban mahogany are preferable. In the method of construction used by the writer, the



THE WOODEN FRAMED AQUARIUM
IN USE

aquarium stands upon its own base, made in one piece. The corner posts

are one and one-half by forty-three inches; the length thirty-two inches and the breadth eighteen inches. The framing is comparatively simple yet strong; all the end and side rails being halved, glued and screwed together with two number nine, one-half inch screws, inserted from each direction. A projection the width of the corner post is allowed at each corner on both the end and side rails. These projections are in turn mortised into the corner post and secured with glue and two other screws inserted into the post from the opposite direction. Therefore, each corner is secured with glue and four screws, making a joint of great strength. The top and middle rails and the posts between these points are grooved for the reception of the glass. The bottom of the aquarium is made of seven-eight inch wood and is supported by four cross pieces beneath, giving a firm foundation for the weight it has to sustain.

The manner of cementing and setting the glass is identical with the process when metal frames are employed. After the side and end pieces of glass are placed in position, a piece of plate glass is set into the bottom, thus locking the four side pieces into position and keeping the water from coming into contact with the frame at any point.

The space between the middle and bottom frames under the aquarium proper may be enclosed and fitted with doors to serve as a cabinet for foods, utensils, etc; or it may be left open or fitted with a shelf.

The style of finish may be determined by the nature of the wood and the furniture it is desired to match. Aquaria so constructed are strong and have been satisfactory to the writer in every way. One, of the above dimensions, will hold about thirty-three gallons of water, which means a weight of about two hundred and seventy-five pounds, not including about fifty pounds of sand and pebbles, having a pressure on the bottom of about seven and three quarters pounds per square inch. It will probably take a little longer time to make an aquarium with a wooden than

with a metal frame, but it is just as easily constructed and the finished product, from an artistic point of view, is far superior to the metal forms usually to be had at the aquarium dealers' shops. In every way it is a beautiful household ornament, a constantly varying animated picture, in an appropriate, handsome and artistic frame.

At Cold Spring Harbor, Long Island.

The annual announcement of the summer session of the Biological Laboratory has just been received. It calls attention to the excellent Board of Instruction and the facilities for studying plant and animal life.

The real student of nature, especially from a technical point of view, will find the Laboratory a good place at which to spend a vacation. For further particulars, address Dr. Charles B. Davenport, Cold Spring Harbor, Long Island, New York.

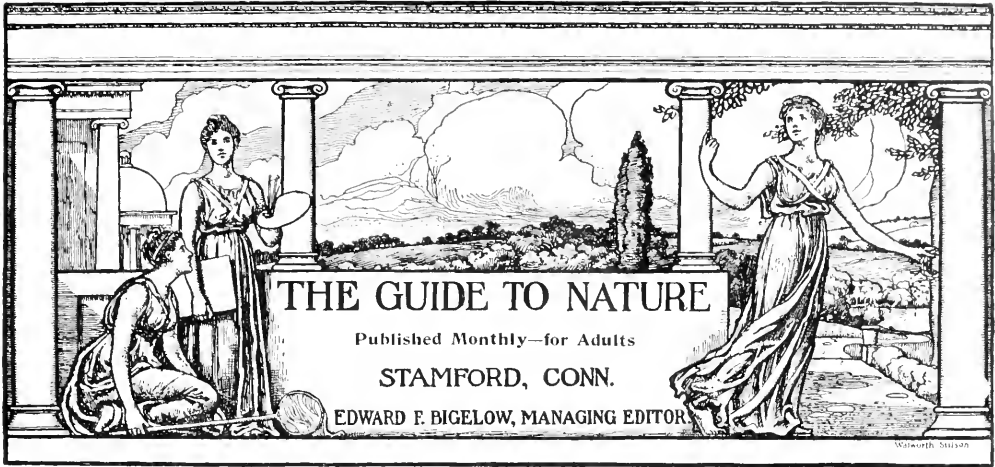
Lack of Knowledge of Common Things.

The following letter has been received:

"A strange animal has made its appearance in the — Department of the City Hall. The head of the Bureau thinks a large spider has changed by metamorphosis into a large green moth. I know this to be impossible, but I am anxious that an expert shall investigate the matter, as I am no authority on such subjects. The moth is undoubtedly a very strange one, and is entirely unfamiliar to me.

"If you can call and look at it, I think you will be interested."

There are so many things to know these days that considerable discrimination should be used in making a selection for school children. They are probably taught some things less useful than an elementary knowledge of Entomology and other branches of natural history. There may be some excuse for the grown people of to-day who know nothing about the transformation of insects, but the children of the present time should be better taught. The large spider mentioned in the letter was *Argiope riparia* and the moth *Pholus pandorus*.—*Entomological Notes*.



To Contributors.

THE GUIDE TO NATURE pays for contributions only in the satisfaction that comes to every contributor in having his best work well published for the benefit of other workers. There can be no better remuneration. Therefore your best work in this great "labor of love" is solicited and expected.

You are invited to share in the liberal pay received by the editor and the members of the family who assist him, and that is the joy of doing faithful work in a cause than which there is none better on this earth.

Every cent of income from THE GUIDE TO NATURE and from The Agassiz Association is placed on the "Received" side of our cash book. On the "Paid" side are only actual expenses—paper, printing, engraving, mailing. This book is audited once a year by members of The Agassiz Association incorporation and is open at all times to inspection by any contributor or AA member.

Label the Trees.

One of our subscribers called attention to the fact that the trees in Central Park of New York City are not labelled as in most other parks. The letter was referred to the Department of Parks, New York City. The following is the astonishing explanation of the Commissioner:

Your letter of the 22nd received. An effort was made, some time ago,

to label the trees in Central Park, but was found impracticable. Mischievous people changed the signs and others, destructively inclined, mutilated and broke them and on the whole it was found impossible to maintain them. A police force of sufficient number could not be maintained to protect the signs and they were therefore discontinued."

HENRY SMITH,

Commissioner of Parks,
Boroughs of Manhattan and Richmond.

This letter was referred to our subscriber with the result that the following sensible arguments were advanced:

"I am so glad you are to take up the matter of the park trees and wish you all success in it. Many nature students will be grateful to you beside myself. That Commissioner evidently does not appreciate the fact that 'Difficulties are meant to rouse, not discourage.' I hope the way will be opened speedily for it, without making you too much trouble."

The following extracts from the correspondence of our subscriber nicely state a nature student's "reason why" trees in a public park should be labelled:

"I have often felt the total lack of any information concerning trees or any growing things in the park. In Boston, Washington and other places the trees are named for the would be learner and so it ought always to be

in a public park I think. It is a great help to those who are studying and an incentive to others to 'take notice.'"

"If the tree is marked, the stroller will stop and read the name, then will glance upward into the tree to see what it is like, will do so with others and so unconsciously begin his nature study. If not marked, the chances are ten to one that he will not even see it."

Many New Friends.

We celebrate our moving into Arcadia (at Sound Beach, Connecticut) by the acquisition of many new friends. First, we welcome the entire constituency of "The Mineral Collector" which has been merged in THE GUIDE TO NATURE. Our new department, "Mineralogy," is to be edited by Mr. Arthur Chamberlain, for fifteen years editor of "The Mineral Collector."

Second, the Aquarium Society of Philadelphia, and many of its friends who are interested in aquaria, join our work. The new department, "Aquarium" will be under the charge of Mr. Herman T. Wolf. This addition of a large number of persons who are experts with aquaria will undoubtedly add much of interest to those who have hitherto had only a general or an aesthetic interest in the subject.

And last but not least we welcome the many more who have come to us through the efforts of our friends of the first year, largely those who have accepted our offer of subscription at seventy-five (75c.) cents a year when sent in addition to one at the new and reduced price of one (\$1.00) dollar. A cordial welcome is extended to all these friends and we, in return, offer them the facility for cultivating one of the greatest joys of life, the opportunity to study and love nature and the natural objects that surround us everywhere.

I am wonderfully pleased with "The Guide to Nature" in every way. It is what we have needed and I hope it will get into the hands of all who would most appreciate it. This would give you as large a subscription list as you would want.—Silas H. Berry.

A Magnificent Gift.

About six years ago Mr. Zenas Crane of Dalton, Massachusetts, founded a museum at Pittsfield, Massachusetts, devoted chiefly to natural history, at a cost of something like \$100,000. This museum is well equipped and specimens are quite frequently added. I have heard it stated that the equipment has cost more than \$50,000.

This last month Mr. Crane announced that he would build an addition to the museum costing about \$35,000. And it is to be presumed that he contemplates adding more specimens. From what I have been able to learn, he could not have made a gift more acceptable to the people of Pittsfield and vicinity. It speaks well for the increasing interest in nature that about \$200,000 can thus be used to good advantage in one small locality.

Every naturalist will be glad to learn of these magnificent gifts to the cause of nature study. Our Agassiz Association especially rejoices and congratulates the donor because he is a Life Member, and was a Trustee from 1892 to January of this year (when the incorporation was changed to Stamford.) There is no greater mission on earth than to lead others to know more of the earth, and through that knowledge, its Maker.

Eating Eggs Several Years Old.

The Pekin ducks are domestic birds and are bred in large numbers in this country for the markets. Good specimens sometimes attain a weight of nine or ten pounds. In color they are pure white with orange bills and feet. Like all other domestic ducks they are a direct descendant of the Wild Mallard. The breed originated in China, where they are raised in great numbers.

In their native country the eggs of these birds are very much prized. They are gathered from the nests and packed in crates containing black mud; after which they are stored away to "ripen." A fresh egg is not considered fit to eat by a Chinaman. Eggs packed in this fashion are often kept for several years before using.

—G. D. T.
This statement as to age of "edible" eggs, seems incredible, but it comes from a reliable and well informed breeder of water-fowl.

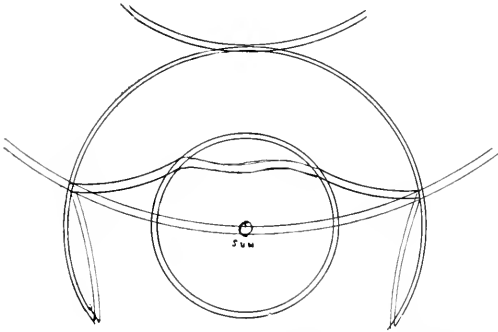
CORRESPONDENCE AND INFORMATION

An Unique Sun Halo.

London, Ontario, Canada,

To THE EDITOR:

One of graduates, Mr. D. J. Lonsberry, teaching at Bullocksville in the Province of Alberta, has sent me a sketch and description of a halo which he and his pupils observed. The halo was distinctly visible for a period of forty-five minutes, central shortly before 9 A. M.



Mr. Lonsberry writes to the effect that on the morning of the halo he had the children observing it for a few minutes before school. After the opening exercises he and they spent about twenty minutes drawing the design both on paper and on the blackboard. Each child was required to represent it as he saw it. They had permission to leave the room to observe the halo and make sure of the size and position of the arcs and circle. The bands resembled rainbows but the red was always on the side next the sun. The color was most brilliant at the points of intersections of the light grey band and the double curved band. The inner circle was very brilliant; next in brilliancy came the double-curved band and the large circle. The highest arc was the least brilliant. The long band passing through the sun was a bright grey.

Mr. Lonsberry assures me of the correctness of the arcs and circles. He says he is less certain of the arrangement of the color bands except that it was common remark that the red was on the side towards the sun. I can rely on any report Mr. Lonsberry makes. I envied him his opportunity of studying that remarkable and beautiful halo.

JOHN DEARNESS.

Two Good Suggestions.

Kutztown, Pennsylvania.

To THE EDITOR:

I have never had experience in raising plants from coleus leaves, but we have often done so with begonia leaves. Place the petiole up to the blade in a bottle kept filled with water. After several weeks a number of rootlets will appear at the top of the petiole; and in time a new plant will appear, growing out of the summit of the petiole on the upper side of the blade. By the time this plant appears the blade of the leaf usually has withered and dropped off. After the new plant has two or three small leaves it is ready to transplant.

Several years ago we saved the linen threads which Mrs. Gruber drew out of a piece of linen used in making drawn work. After the orioles had come in May we hung large bunches of these threads on the trees and grape arbors in the yard. These birds eagerly seized upon them, and, on a cherry tree in front of the house, a pair built a nest composed almost entirely of these linen threads. A chipping sparrow also used a few threads, and the upper part of the nest of a least fly-catcher was completely covered with them. Since that time we regularly hang out strings, cords, and threads

for the birds; and we derive great pleasure in watching the orioles, chipping sparrows, robins, and the other birds appropriate them for building material.

Yours sincerely,
C. L. GRUBER.

Where the Trouble Is.

Wellesley, Massachusetts.

TO THE EDITOR:

We have been talking over at home your editorial on why people consider *THE GUIDE TO NATURE* of interest only to children. Of course some people do not care anything for nature study any way. It doesn't happen to interest them just as others do not care for music or books. But I think most of those who are not interested have not been educated up to it. They have to learn to appreciate it just as one learns to appreciate art, and real nature study is just beginning to be introduced to the world at large. Until recently it has been only those who were born with a love for nature who have taken the trouble to make themselves acquainted with it.

The trouble lies, not in *THE GUIDE TO NATURE*, but in those people themselves, and I think this magazine and *Arcadia* can and will do a great deal to make nature study more widespread.

Wishing you all manner of success in *Arcadia*, I am

Very sincerely yours,
DOROTHY A. BALDWIN.

An Albino Redpoll.

Goodwin, S. D.

TO THE EDITOR:

One day late in autumn when the chill winds swept across the prairies of Dakota, driving the last clinging leaves to earth and urging birds that loitered still, on their southward migration, I chanced upon a flock of about fifty redpolls. These birds are infrequent visitors in eastern South Dakota and but few save this one flock have ever come under my observation. With a thrill of joyous anticipation I cautiously approached the sweet voiced throng which to me was so rare a sight. But a rarer sight than all the other birds,

was one member of their flock, an albino redpoll.

The albino's plumage, except the primaries and tail, which were a deep yellow, and the characteristic red cap, was snowy white. One might fancy that Nature had designed the markings of that beautiful bird with the utmost care, as though for an entire race and not an individual. There was none of the freakishness usually shown in the markings of albino birds. The perfect cap contrasting so beautifully with the pure white, seemed of a deeper red than did the caps of its companions. The rich yellow markings of the wings and tail were without a flaw and lent tone and grandeur to the beauty of the rare bird.

I might have found it difficult to believe the albino was a redpoll, had I not seen him with his kin, observed him gathering seeds in the characteristic manner of the finches and heard him answer the sweet, canary-like notes of his companions. With abandonment he joined in the happy play, the erratic movements and undulating flights of his flock, unmindful of the fact that his plumage made him an object of rare beauty even among the pretty redpolls.

After that memorable autumn day, I did not see the albino redpoll though I observed stray members of his flock. A few remained and sometimes broke the winter silence of our grove with their sweet calls, even when the thermometer registered a temperature of twenty degrees below zero, but the greater portion of the flock, and with them the albino, had flitted on their way.

HATTIE WASHBURN.

Crossbills in Prospect Park.

Brooklyn, New York.

TO THE EDITOR:

I was assured several times during the past winter that there were red crossbills in Prospect Park, but I failed to find them. On March eighth red birds and olive birds were eating on the ground, almost as tame as tame as could be. My first thought was that they were crossbills, but as I had always looked for them in the pines,

feeding from the cones, I feared I was mistaken. You see I had overlooked the statement of the bird books that later in the season they may be seen picking up seeds from the ground.

The problem was soon solved for they were very willing to be inspected, letting one come within a foot or two of them, when it was easy to see the crossed bills. One hopped upon a park seat with a man sitting upon the other end, and all showed themselves very companionable. At least two of them have died and I fear it was a case of "killed by kindness." They ate greedily a mixture of fat and birdseed such as had furnished food all winter for other birds but which may have been too rich for them.

On March 14 I saw an albino robin in the same park. He had a big patch of white on the breast and many smaller patches on the back, these showing more plainly when he flew. He gave the impression of being about half white. I have heard of a robin with even more white, but this is the most decided albino I have ever seen.

CAROLINE M. HARTWELL.

The Cup Lichens.

PEEKSKILL, N. Y.

To the Editor:

The cup lichen is beautiful in color, I think, with the pale pastel colors blending into each other.

It is of a species of rubbery substance and shaped like a tiny cup with a long slender stem. This cup tends to deepen as the plant grows larger around. It usually grows in moss of different kinds. These form a sort of bed for the roots. The roots are *in* the moss roots and when the lichen commences to grow it is just like the moss. It has no real roots, only a sort of cup arrangement at the bottom. Although the cup part is not open to the bottom of the plant, the stem below the cup is hollow and if one pricked the bottom of the cup it would make a continuous open tube from one end of the plant to the other.

One of the largest specimens that I have seen grew from a piece of wood and had only a very thin coating of

moss to grow in but instead of having a very short root it was quite long. This shows that it does not absolutely need moss to grow in; any kind of rich earth seems to do.

Sincerely yours,

LULIAN BEATTY.

The cup lichens, so well shown in the photographs, are of special interest as being among the most highly developed members of the group. So far as I can judge it is the form known to botanists as *Cladonia pyxidata*, which is distinguished from other *Cladonias* by having brown fruit borne on the rim of a more or less scaly or granular cup which is ashy-green and of the form shown in the pictures. Other well-known *Cladonias* are the "reindeer moss" (*Cladonia rangiferina*) an important food of the reindeer, and various "coral lichens" with brown, flesh-colored, or scarlet fruit, and the "red cup-moss" which differs from *Cladonia pyxidata* mainly in having the fruit bright red. It is of this that Mrs. Hemans wrote in the following stanza:—

"Oh! green is the turf where my brothers
play

Through the long bright hours of the
summer day;

They find the red cup-moss where they
climb,

And they chase the bee o'er the scented
thyme."

The *Cladonias* are a numerous company differing from one another often a good deal in appearance but readily distinguished from other lichens though the peculiarities observed by your correspondent; that is to say mainly as possessing an upright fruit-bearing part which is always hollow and usually arises from or is accompanied by horizontal somewhat leaf-like parts which may be attached to the ground or may grow out from the sides of the upright parts like little shelves or leaves.

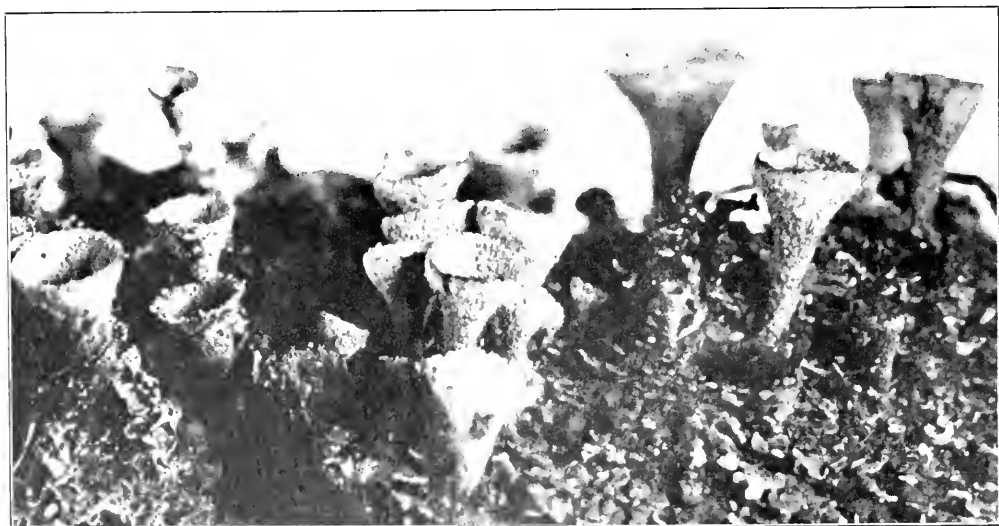
One of the strangest things about lichens is that they are not so simple as they look. If we examine a very thin slice of a leaf-like part under a microscope magnifying one or two hundred diameters, we find in the slice

numerous bright green globular bodies surrounded by slender colorless threads. Many facts go to show that the green globules are tiny algae or seaweeds such as ordinarily grow on moist rocks or bark, while the threads surrounding them belong to a sort of fungus somewhat like a mushroom which being unable to make any food for itself, because of its lack of the necessary green coloring matter, feeds upon the green algae it has imprisoned. But for the food it takes from the algae the fungus makes good return by affording them protection, keeping them moist, screening them from too much light, and providing them with all the materials they need for making more food than they require for their own use. Hence we find the algae within the lichen often growing more vigorously than the same kind does when living free. The result is that these cooperative communities we call lichens are able to thrive in situations where no other plants can live. When bare rock is exposed on a mountain side lichens are the first forms of life to gain a foothold. Particles of dust caught by them accumulate as a slight soil which may support true mosses that in turn may catch more soil and so in time prepare for the coming of little herbs or shrubs or, finally, a mighty

forest. Thus lichens are Nature's pioneers. They do not need any soil to grow upon although they are often found upon soil of various kinds. Clean air, sunlight, moisture, and a place to cling to are about their only requirements. Accordingly, in the case of these cup lichens found with the moss suspect that it was the lichens which arrived first, and that the moss came to live with them.

I dare say the moss was perfectly welcome. Cup lichens are used to such neighbors. Indeed, it may not be too much to say that long association with mosses perhaps brought about the making of cups whereby the lichens are enabled to catch some extra moisture and at the same time to hold their fruits sufficiently high for letting breezes carry off the minute spores by means of which the plant is spread abroad. As for the mosses growing over them—two can play at that game; and we often find little lichens clinging to mosses as if they could stand the arrangement as long as the moss could.

The exceptionally lovely coloring of lichens to which your correspondent refers and well compares to a pastel, is I believe too seldom appreciated. Her remark recalls some of the delightful surprises I have had in ex-



A CLUSTER OF CUP LICHENS ON A ROCK

amining these lowly plants under different conditions of moisture and light. I am reminded also of the wide range of often brilliant dyes which are obtainable from lichens. Some of these



THE CUP LICHENS AMONG THE MOSSES

were used by the Scotch for their plaids. Nowadays about the only lichen dye much used is the blue litmus of the chemical laboratory; but perhaps it may interest some of your readers to know of a simple way of obtaining a variety of colors from our common lichens. To some water in a small bottle add enough ammonia to give it a rather strong pungent odor, then introduce into this some of the lichen which has been powdered or broken into small bits. Cork the bottle tightly, and allow it to stand for a few hours or days, shaking it occasionally. In some cases a strong color will appear immediately. I can especially recommend for trial the scarlet-fruited *Cladonias*, and some of the flat lichens growing upon rocks; but any form is worth trying and may yield quite unexpected results.

FREDERICK LEROY SARGENT.

A Reply to "It Interests Children."

Washington, Connecticut.

TO THE EDITOR:

The apparently popular belief that nature study is only interesting to children and the unreasonableness of otherwise intelligent individuals of what nature study for adults consists are two big difficulties, which other teacher naturalists, as well as the Editor of *THE GUIDE TO NATURE*, have had to contend with and perhaps a few words from a reader, who is also a contributor to the columns of this worthy magazine, may throw a little light on this dark subject.

I firmly believe there is no line in nature study where the child's interest ends and the adult's begins. Of course there is something in the manner of presenting material, but to write about the outdoor world for "grown ups," in so clear a manner that the intelligent child may comprehend and be interested, is indeed a rare art. The man who declared "*THE GUIDE TO NATURE* too childish," unwittingly paid the magazine in question a fine compliment.

I well remember my disgust as a young girl when I remarked to an intelligent, gray haired friend that I should like to write articles for the magazines about the things which interested me and she replied, "Why perhaps you could just for children!" Now I have no happier experience than when I have successfully written a nature article just for a child, for it is a far more difficult task than to write for "grown ups." Many a successful author of children's tales will agree with me on this point. An intelligent child is an honest and unsparing critic and nature fake study does not appeal to him. The child, "who is father of the man," is nearer to the heart of nature and knows what he wants. Surely there is something wrong with our foundations when we cannot enjoy a good periodical like *THE GUIDE TO NATURE*. A continued diet of chocolate creams will destroy one's appetite for a sound meal. We have had so many dollar magazines, which only deal with our money

making, money spending interests of great cities we no longer cared for "the common things of uncommon interest" which, as an old school friend has just written me, make all the difference between plain ordinary existence and living.

A great part of this national failing is due to our educational system. The average child is early taught that he must imbibe just enough knowledge of certain subjects to safely carry him from one grade of the grammar school to the next until he reaches the safe harbor of the high school, where the teacher's chief duty is to pilot him into college, treatment which many scientists but few naturalists survive. Once established in University Halls, the taking of certain courses, the cramming for examinations, the straining for coveted honors occupy all his working hours and he walks blindly across the college campus, to the end of his course.

For example on a certain New England campus is a fine specimen of a "witches' broom." I have reason to believe not five in this year's graduating class have seen this curiosity and probably not more than one in the five observed it without having his attention called to it by a professor who has a love for outdoor things. As to the fondness of certain scientists for articles which "bristle with gigantic words," I have often noted that the untaught are much impressed by the unintelligible terms of science and those to whom these terms are actually familiar rarely trouble the reader or printer except when necessary, for there is no trade, art or profession which we can successfully learn or teach without the use of a few technical terms; but the naturalist is one who has learned to dispense with much of the dry-as-dust nomenclature in order to interest the public.

I remember attending a certain botanical field day and after spending a hard forenoon burdening poor little grasses and weeds with jaw breaking names we came upon a poor sarsaparilla plant. The leading spirit of the club failed to recall the scientific name and none of the group could

think of the common name. Suddenly a younger member of the party shouted, "I have it; it's that stuff advertised for a tired feeling." The good natured laugh which followed showed that interest in dry-as-dust nomenclature was at an ebb.

We wish success to the *THE GUIDE TO NATURE* with its articles about commonplace nature written in an uncommonly good way.

W. C. KNOWLES.

Children, Adults and Chipmunks.

TO THE EDITOR:

Answering the query as to why *THE GUIDE TO NATURE* should be considered "of interest to children" only, is it not simply "force of habit?" The last question, what is there about a tree, a dog, etc. that does not or should not interest an adult, is rather begging the question, as there is a wide difference between "does not" and "should not." That which *usually* pertains only to children might fairly be spoken of as "childish;" and certain it is that the average adult does lose interest in the wonderful world of Nature—new and strange to the child, but grown superficially familiar to the adult, and few grown people retain their early love for pets. The lady who took no interest in the story of Owney would probably have taken no interest in Owney himself, as many grown people do not care for dogs, and some dislike them intensely.

Whether this *should be* so is another matter, but that it *is* so, *THE GUIDE TO NATURE* is a substantial admission,—being published for the avowed purpose of teaching grown people that which most of them do not now know, i. e., that there is real pleasure to be had from an intimate acquaintance with the world around us; so the attitude complained of was to be expected, and only to be evercome partially and by degrees. The student of *Daphnia* and *Cyclops* might regard rabbits as childish because they were the companions of his own childhood and the pets of his own children; whereas no one ever thought of making a pet of a *Cyclops*, and aside from the "Oh's" and "Ah's" of the dilettante microscopist they are

never heard of except as the work of a serious student; hence, as they have no connection with child life, no one would class them as a childish amusement, though the average adult would consider them not worthy of notice.

On the other hand, the difference between a child's interest and an adult's is often one of degree rather than of kind. The child will pick up pretty pebbles and stones on the shore, merely because they are pretty, while the scientist may pick up similar stones for the story they tell of the formation of continents. Both are interested in the stones, but with a difference; while between the child and the scientist is the average adult who has lost the power of seeing any beauty in the pebbles and has not acquired the knowledge which enables him to read the story of the strataed rocks. To many people the absence of long words raises the presumption that the subject has been treated in a simple and elementary manner, suitable to the comprehension of the child, and dealing only with things they knew and ceased to care for long ago. *They do not know of the existence* of a middle plane wherein one lives in an intimate, friendly relation with the world of Nature, seeing and feeling ever clearer and deeper into the wondrous beauty and sweetness of it all, without needing to know all the formidable technicalities of the laboratory.

Regarding Mr. Beecher's chipmunk on his lap, I can say "me too"—only mine did not have a string to him. Had taken a book and lunch one summer day, for a quiet afternoon "by the shores of Gitchee Gumee, by the shining Big Sea Water," and had chosen a spot under shelter of a low bank. Toward evening, after I had eaten my lunch, a chipmunk suddenly sprang down over the bank, alighting a few feet from me, evidently on his way to the water. He stopped in surprise at sight of me, stared for a few minutes, and then took a little jump toward me; stopped again to look me over, picked up a large crumb that happened to lie at his feet, looked at me intently a few seconds longer, and then gave a long jump and alighted

squarely on my lap, with his crumb held firmly in his mouth. I believe he intended to sit there and eat it, but as I sat in breathless delight at the charming confidence of the friendly little soul, a group of rather noisy young people further along the beach suddenly became still more noisy, and frightened the tiny creature, who sprang up the bank and disappeared, carrying his precious crumb. Am afraid I wished that crowd—well, never mind where. The noticeable point was that his friendly overtures were not prompted by hunger, for he already had the food without coming to me, and there was none on my lap for him to see or smell.

The fly-catching mouse of Detroit is not alone in that propensity, as on two occasions one of our office mice, which I had tamed so he would climb up and sit on my lap to eat lunch, caught and ate flies which came too near in an attempt to get a share of the good things.

How could one procure copies of Mr. Bentley's snow crystal books, published by the Weather Bureau? Would also like to get a print of Mr. Norton's photo of birches bending over the river. His address is not given with the article. Would you care for an "ice storm" photo taken near enough to show detail of branches?

Truly the program for the Arcadia Summer School sounds delightful. I shall be there in spirit, and perhaps some time in more tangible form.

If in this long epistle there is anything available as fodder for the "Elephant," do not hesitate to extract it and "blue pencil" the rest. The reading of the magazine left me with a desire to "talk things over," but doubtless you have a large and capable waste basket.

Sincerely yours,

NELLIE B. PENDERGAST.

For Mr. Bentley's snow crystal books or for his photographs, address him at Jericho, Vermont.

For Mr. Norton's photographs, address him at Bristol, Connecticut.

THE GUIDE TO NATURE desires to

have submitted photographs on all forms of outdoor interests.

Your comment that the reading of the magazine leaves a desire to talk things over is one of the best that we have received. The editor is thoroughly desirous not to have abstract articles but to have a close personal relation among students and lovers of nature.

How I Became Interested in Nature.

BY C. A. CLARK, LYNN, MASSACHUSETTS.

When I was between three and four years of age, I lived in West Lynn, close to the salt marshes where birds and insects were abundant, but being very young, I didn't know a crow from a sandpiper. Nearly every day I used to roam over the marshes near my house and always avoided the streams

they did not seriously attract my attention.

During the warm summer days insect life is the chief attraction on the



STUDYING THE GYPSY MOTHS

and pools of water that are frequently seen in such a locality, never getting near enough to fall into one of them. The streams were full of minnows but



RED MAPLE WITH TWO TRUNKS

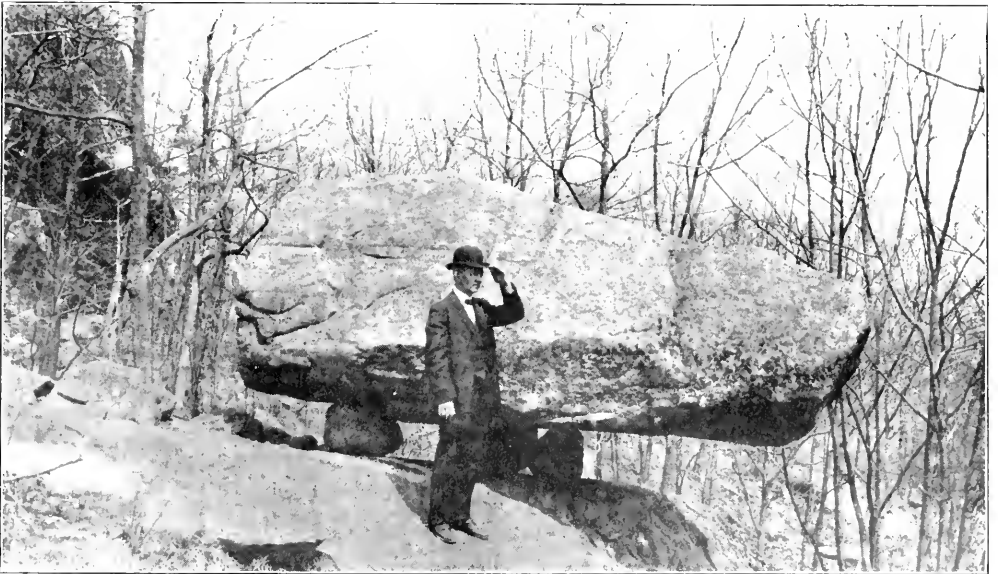
marshes, and butterflies, bees, wasps and the like are seen flying from flower to flower extracting the nectar found in most of the blossoms and supplying hundreds of insects with food. On the ground and all over the tall grass blades I saw hundreds of grasshoppers jumping here and there as I walked through the herbage and they seemed to be my chief attraction. Every chance I could get I roamed over the marshes in search of grasshoppers and no other insect seemed to be in my mind. I took a large-necked bottle, and went out on the marsh, catching grasshoppers in my hands and placing them in the bottle. I stayed on the marsh until my bottle was solidly packed with them and then returned home. My father kept several hens, ducks and geese and he gave the grasshoppers to the hens. It was

great fun to see the fowls devour them.

One day when I was out after grasshoppers I noticed an insect which had just alighted on a flower and I immediately gave up the grasshopper business and went after the insect, which was new to me, and captured it. Its color was velvety black and golden yellow, a handsome insect. No sooner had I caught it in my bare hand than something happened for which I was not prepared. It was a bumblebee and as soon as I captured him I was stung. I ran home crying and told my father that I had caught a new insect which had hot feet. Then my father explained to me what it was and told me not to catch any more. If there is anybody who does not

fields and forests on a nature study trip making observations on animal life. I collected insects and preserved them for winter study when the snow was so deep I could not get into the forests. During the summer I collected caterpillars and fed with the plant foliage that I found them eating, and carried them through their different stages which I found very interesting. I have raised various species of insects from the egg to the adult and while making observations of this kind I learned the life histories of the species.

From my early boyhood I was never afraid of snakes and during my life I have captured and handled alive every species of snake found in Essex



MR. C. A. CLARK AT THE CANNON BOULDER
Photograph by L. A. Wentworth.

know the difference between a bumblebee and a grasshopper, let him hold a grasshopper in his right hand and a bumblebee in his left hand and he will quickly learn. About the time when I discovered what a bumblebee is we moved to the northern part of the city near the great Lynn woods reservation and I then had a large tract of forest land for nature study. During my early school days in this locality I had two half holidays each week, and then I went out into the

County, including the deadly rattlesnake. During my early school days I captured snakes without harming them and brought them home in small bags made of heavy duck cloth which I carried with me for that purpose. I placed them in large boxes covered with wire screening which made suitable places for studying them. But as I was very young and as my parents did not like the idea of my catching snakes and bringing them home alive for study, thinking I might get bitten,

the snakes were killed and I was told that I had better not catch any more because it was dangerous. Having the right idea of catching snakes alive and not being afraid of them, I continued to catch them and finally my parents gave up the idea of interfering. I have at times gone on a nature trip without a snake bag and have captured black racers five feet long and carried them in my hands for two and three miles before reaching home. As I studied deeper into the snake family I learned that the banded rattlesnake will usually give us warning by shaking his rattles when we are near him. It is safe for people to roam the woods of Essex County. I go into the fields and forests with a field glass and notebook and at the end of each year I have several interesting notes of true facts of nature. This is the only way to obtain the truth.

I have delved deep into nature study and have received many encomiums from scientific men which I highly appreciate. At present I am conducting a "Nature Experiment Station," the only one of its kind in Essex County, in which I learn many interesting points regarding insects and reptiles. I would advise all who can to take as many nature walks as possible at all seasons of the year. Such walks will give health and scientific knowledge.

During my early school days I also became interested in the fur bearing animals, birds and reptiles of Essex County and have studied them during every season of the year. When I see squirrels stripping off cedar bark I follow them and by doing so I learn whether that species of squirrel builds in the ground or in a tree and also what kind of a tree and the location. These observations also give me correctly the time of year when squirrels build their nests and also the kind of material used by each species. Whenever I see a fur bearing animal or a bird walking in the snow I always study the tracks and by learning the different tracks get an idea what birds and animals are seen in the locality. I have seen all the fur bearing animals in Essex County and have studied their habits.

I watch the birds every year. I have seen a redstart place the first mouthful of nesting material in a fork of a tree. Naturalists are seldom lucky enough to see a bird begin her nest. I have witnessed it only once. When we see things of that kind it always makes us more anxious to make other observations of a similar nature. I have seen birds destroy hundreds of injurious insects in my locality and the feathered tribe needs all the protection it can get for it helps greatly to save our orchards and forests.



Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

Some Recent Chapters.

St. John's Boys' Club Chapter, Stamford, Connecticut. Officers: E. Buchanan, president; C. Cohen, vice-president; T. Mathews, recording sec-

retary; W. Means, corresponding secretary; J. Lenord, treasurer. Twenty members.

Glenbrook Chapter, Glenbrook, Connecticut. Officers: C. Lawrence, pres-

ident; C. Murphy, vice-president; C. Lewis, secretary; R. Sayre, treasurer. Twenty-three members.

Friends' Academy Chapter, Locust Valley, Long Island, New York. Officers: George Waymouth, president; Annie Hart, vice-president; Louise Paine, secretary; Douglas Beyea, treasurer. Seventeen members.

Springfield Chapter, International Y. M. C. A. Training School, Springfield, Massachusetts. Officers: S. Fred Wright, president; John D. Brook, vice-president; E. W. Benson Malcomson, secretary; H. E. Volley, treasurer. Nineteen members.

Mount Bluff Chapter, Island Pond, Vermont. Officers: Mrs. M. T. Saddleir, president; Mrs. F. A. Elkins, vice-



THE ARBUTUS AS IT WAS IN BUD LAST NOVEMBER



THE ARBUTUS BUDS AND LEAVES
LAST NOVEMBER

president; Miss Sadie M. King, recording secretary and treasurer; Miss Leta J. Eaton, corresponding secretary.

Have Been Ready Several Months.

CONTRIBUTION FROM ST. GABRIEL'S
CHAPTER (NO. 1013), PEESKILL,
NEW YORK.

November 20th, 1908. "We are mailing to you to-day the specimens which you asked us to find. We hope they will serve your purpose."

The specimens accompanying that letter are illustrated herewith and show that the leaves and the flower buds of arbutus were in readiness last November for blooming this spring. It takes only a few warm days now for them to unfold in all their beauty.

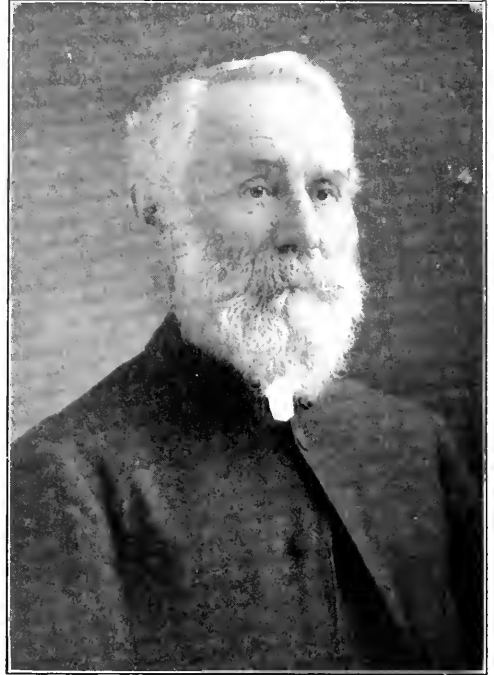
From Eleven to Seventy-seven.

CHAPTER ACTON VALE A. NO. 15.

In opening our report, we would acknowledge how much we have prized *THE GUIDE TO NATURE*. It was a great opener of the eyes of our members. We all appreciate it greatly and it has increased our knowledge on very many points.

On our roll we have twenty-one members, the youngest being eleven years old and the oldest seventy-seven.

Although not so much has been accomplished as was expected, yet a fair amount of work has been done as attested by the following list of subjects touched upon; and not the least benefit was from the discussion which followed the lectures. There was a little dabbling done in entomology. Interesting papers were read on the Polyphemus moth, the *Calosoma calidum*, the honey and the bumble bee and the house fly. In zoology the peculiarities of frogs and dogs were brought before us. In ornithology we had an account of the indigo-bird. In botany interesting accounts of the banana and the cork oak of Spain occupied our attention. Now beside these we listened to a description of the Isle of Madeira; also an instructive paper on banking and the clearing house and one



"TO SEVENTY-SEVEN"

The Reverend Louis C. Wurtele, Acton Vale, Quebec, Canada.

on the history of the Ruthelian Christians of Manitoba entertained us; we also were pleased with a short elucidation of the first principles of electricity, and last but not least was a dissertation on the Protozoa with the Amoeba taken as an illustration.

Thus the year has passed away and we hope to do better in 1909. We all unite in extending our heartfelt thanks to our President, Edward F. Bigelow, for his untiring devotion to the benefit of The Agassiz Association in general.

LOUIS C. WURTELE, PRESIDENT.

Acton Vale, Province of Quebec, Canada.



"FROM ELEVEN"

Arthur L. Moore.

I have been reading the numbers of "The Guide to Nature" so far issued with a great deal of interest and I am glad that you have started such a work and hope you will succeed with it. I have nearly every number of the old "Observer" and that with a complete file of "Science Gossip" furnishes me with a nature library often consulted. I am only too glad to be able to subscribe for a journal that will keep the work along up to date. —F. S. Morton.

Peculiar Rose Bloom.

BY SUSAN TUCKER, CHENEY, WASHINGTON. CORRESPONDING MEMBER NO. 2047.

Several years ago I found a rose growing near a swamp at the base of a high cliff. The flowers were much larger than any I had found before. I brought a few plants home the next spring and they have always attracted much attention. They have had no cultivation except to be thinned out and sometimes cut back just enough to keep them in bounds.

For at least three seasons I have noticed some freak flowers on one bush that prove an interesting study in teratology.

As I cannot draw well enough to make illustrations I enclose pressed flowers to show you what I have seen.

You will see that some sepals have been transformed into petals. I have never found a flower with all five sepals changed but frequently found four. You will see also that one specimen shows more buds in a cluster than is usual with this rose. And one specimen may show a stipule that looks like a petal. My best specimen showing this dropped the stipules in drying. One specimen has sharply pointed leaflets while other leaflets on same stem are rounder than usual.

I enclosed a few petals to show you how large they are. This is probably a form of *Rosa Nutkani*.

The plant from which these branches were gathered are ten feet high forming perfect trees with well rounded heads, if a little care is given in pruning in the spring.

Ant-Hills: An Informal Investigation.

BY NORBERT WIENER, CORRESPONDING MEMBER NO. 2073.

The nests of different varieties of ants show interesting and instructive variations among themselves. As a matter of fact, no two ant-hills are precisely alike, either in structure or material. The massive heap of decayed wood forming the home of the large ants, both red and black, is incomparably different from the home of the most minute species under some protecting rock.

Probably the primitive ancestors of our present ants did live under rocks. This seems to be the most elementary kind of a dwelling found in all antdom. There is no plan at all to the complex ramification of interlacing passages and the pupa compartments are distributed irregularly throughout the nest. We merely have a highly complicated labyrinth of tubes and cells with no order whatsoever. It seems to be fitted to the most undifferentiated type of ant, which, I believe, is the case.

The next advance in architecture consists in the building of the tunnels without the protection of a rock, and the formation of small mounds of waste earth at the mouth of the tunnels opening directly to the outer air. Here we have, first, the utilization of the waste earth (this was not necessary in the previous stages, on account of the easy excavation just under the stone); second, the formation of definite entrance to the nest and, third, the uniformly deep and protected situation of the pupa compartments. The safety of the nest is thus greatly in excess of that in the previous case and it is therefore the more common type of dwelling.

The highest and most interesting type is the ant-hill proper. This consists of a pile of earth and rotten wood about a foot in height, carefully cemented together by some secretion of the ants themselves. The openings to the outside are well marked apertures on the walls of the pile, while in no case do the tunnels extend to the ground beneath. The nest is quite free from all intruders that may tunnel in and the colony gains greatly in its unity. The pupae are far more safe than in the other forms, owing to their situation near the axis of the conical hillock, and its elevated position makes it a good place from which its masters may swoop in expeditions to plunder another nest. In short, this nest is to the primitive burrow under a stone as the hive of the honeybee is to that of the bumblebee. All is indicative of a high degree of *specialized instinct*, if not of intelligence, and shows that the ants who build this nest must be at the culmination of the formican line. Correlated with specialization in instinct

goes specialization in structure, and in this case what do we find? While in the first case slave making habits are early developed and the nest making habit is in its most primitive form, we find ants with jaws equally fit for fighting and working, and a short pupa period. In the second case, the jaws, although still a useful pair of forceps for working, are much better instruments for fighting. The pupa period, although short as compared with that of the next stage, is somewhat lengthened over that of the first in correspondence with the decreased labor it has to undergo and the decreased danger it is under. In the extremest cases of the third division, the jaws are utterly useless for eating, not to speak of working. Everything in the nest is done by slaves. The period of pupation is elongated to its utmost, as there is no need for speed in attaining the self-protecting age or for working.

The intelligence, however, would seem to be greatest in the first variety of ant, as there is more need for the capacity of being able to modify actions by conditions. The idiocy of the highly developed ant who will die of starvation in the midst of plenty is to be contrasted with the easy way in which the more primitive ants will surmount the obstacle. While the colonies of the lowest ants are absolutely self-sufficient, this self-sufficiency is practically entirely lost in the highest species. In short, ants vary in their architecture, structure and habits to an almost inconceivable extent, considering the fact that they are among the last of insects to appear, *and these variations are all correlated with one another.*

Observations in Delaware Peninsula.

BY S. FRANK YARON, CORRESPONDING MEMBER NO. 2085 OF THE AGASSIZ ASSOCIATION, REDDEN, DEL.

I am down here in the Delaware Peninsula for a short time and have been much interested in making observations of bird life. The pine and deciduous woods here are very dense, the large timber mostly cut out and small trees, largely sweet gum, coming up very thickly and the undergrowth

is everywhere crowded with smilax or greenbrier. This makes a splendid bird cover both in winter and summer, the densest portions rarely knowing intrusion by man and offering ready means of escape from hawks and owls. Only the abundant black snake interferes with the bird life considerably. Many birds that winter here also breed here, as distinguished sometimes by peculiar songs and notes or by habits. Of course the juncos, the winter wrens, the kinglets and the fox and white-throated sparrows disappear to the North with the coming spring, the juncos being the last to leave. But individual black-capped titmice, crested-titmice, chewinks, (called here swamp robins) song sparrows and cardinal red birds remain here throughout the year as, of course, do the bob whites. Within almost a stone's throw from our house a cardinal makes his home and I am reasonably sure that his more modestly clothed wife does also; within a pine and brush thicket of several acres in extent and I think they do not range two hundred yards away from it. The male has a peculiar song, the last line of which having two distinct syllables, both of falling inflection. The cardinal's song is always of two lines, the utterances of the first having notes of rising inflection, the latter utterances of falling inflection, often of two syllables, but I have never before heard, though familiar with the bird almost ever since I knew what birds are, the notes uttered like this. The ordinary song may be expressed:

"What? what? what? what?"

"Cheer' cheer' cheer' cheer'."

or varied to:

"What? what? what? what?"

Some cheer', some cheer',

some cheer'."

but this bird sings very clearly:

"What? what? what? what?"

Stair door', stair door', stair door'."

All last summer he sang this, in late fall he thus saluted a particularly fine day. In early February during the warm days of a big thaw he let out a few of the same notes and now, in March, he is at it every day.

Though not domestic and caring nothing for the haunts of man yet there are few birds more friendly and less suspicious than the chewink. Certain of these birds in our thickets have certain individual traits, others will act quite differently and by making a close observation of this I can as easily discern the individuals as I can the various hens in the poultry yard and almost as well as to pick out Jones, Smith or Brown from across the town street. Several of my chewink friends have inhabited a thicket along a creek-way all last year, are there now and they will breed there. Of the tomtits, black-capped and crested, I cannot feel so sure but I have tried to get evidence of the migrating of these birds and I cannot. They go back and forth in the great woods in winter and except on bitter, stormy days, are always hunting and they, with the downy woodpeckers, another species that nests here and probably the same individuals, are always in company, typical bird waves but not migratory. In fact, two or three pairs of crested-titmouse with their high-pitched "tweeter, tweeter, tweeter," frequent more than elsewhere certain high woods and roost in the neighboring thickets winter and summer and may be always found there; They also nest in the immediate vicinity.

Inflates Caterpillars.

REPORT OF WILLIAM ENGELHART, CORRESPONDING MEMBER 2078. 2121 WEST 42ND, STREET, CLEVELAND, OHIO.

I am twenty years old and have rheumatism and have not been able to walk for about five years, and have not been able to use my right hand for a year. The only thing I find I have any pleasure in, is in raising caterpillars and watching the chrysalids and cocoons "hatch" out and putting the butterflies and moths in mounts, and selling sometimes a mount, to get some money to get some other cocoons or butterflies. Sometime in 1907 I received some printed matter from The Agassiz Association which told about being a member and I have been wanting to join.

I enclose you a picture of myself which will tell you more about me than I can tell you. This is the way I am all day. At night my parents put me



CRIPPLED BY RHEUMATISM, HE STUDIES NATURE

to bed, where I am till morning. I am getting a little better and am satisfied if I only have some cocoons or butterflies or the nice caterpillars.

I will do all I can for the association. I think this coming spring I will be able to inflate caterpillars perfect, and I think a great many of the Members will be glad if they can get one or two inflated caterpillars of each kind of butterfly and moth they have in their collection for a few caterpillars that they can find plentiful in their locality, and also by helping me by adding that same kind to my collection. Just now I have not much of anything to do, and in reply to your question of helping me I must say you can do nothing only let me know if I can exchange some minerals for chrysalids and cocoons and caterpillars when there are any, as I have a great deal of minerals and they are of no use to me as I do not collect minerals.

Roll Call by Observations.

REPORT BY GLADYS D. SANBORN OF CHAPTER
NO. 1016, FRIENDS' ACADEMY, LOCUST
VALLEY, LONG ISLAND.

Although our Chapter of the Association is a new one, we know that you will be interested to hear of our meetings.

We have been trying to follow your suggestion that the programmes should be less literary and more from our personal observations, so at the last two meetings, the roll call has been answered with observations.

Mr. Jackson offered a first and second prize for the two best compositions which were to be judged not so

much from the English used as from the originality and the closeness of the observations. The best composition among those handed in was "A Peculiar Nest" by Irving Heyl, which was a very interesting description of a woodpecker's nest. Another entertaining article was "An Agassiz Diary," giving the account of the daily observations of one of the members. This paper gave rise to the idea of having the roll call answered by extracts in the form of a diary. This proposition was received favorably by the members and a motion was passed to have this our next programme.

The La Rue Holmes Nature Lovers League

BY GEORGE KLINGLE, SUMMIT, NEW JERSEY

Explanation:—The aims of this League are in many respects the same as those of The Agassiz Association. Therefore it has been proposed that the adult interests be represented by "The Guide to Nature" and that the League co-operate, or possibly be affiliated, with The Agassiz Association.—E. F. B.

The first lecture in the interest of the movement for the protection of nature, known as The La Rue Holmes Nature Lovers League, was given in Summit, New Jersey, in May 1906, by Mr. William Dutcher, president of the National Audubon Societies.

The movement originated with a young naturalist whose life was shadowed through regret over desecrated nature, and whose name was given the organization, by the Board of Directors, after his premature death.

The La Rue Holmes Nature League is a federated body consisting of a central organization, located at Summit, New Jersey, composed of an executive board and Directors chosen from various cities, empowered to create chapters located in any State. The League is unique in that its chief aim is the propagation of protective sentiment in behalf of nature; its kindred, and secondary object being the fostering of interest in nature study—its introduction into places where hitherto it has not existed. The League cornerstone is the sentiment of kindness to-

ward all things having life; its plea for existence is found in the propositions that the present is the guardian of nature's riches in the future; that we owe it to generations yet to come that our guardianship be conscientious, that wealth in forests, birds, and wild flowers, together with other forms of nature's bounty, be unimpaired through our guardianship, as far as may be; and again, that through self restraint, sacrifice for another, the fabric of highest moral nature is built up. In the belief that sentiment in behalf of nature protection is largely to be won through influence with children and youth, League efforts have been largely directed toward the formation of chapters in schools public, parochial, and private. Home and neighborhood chapters may be organized by any four children or adults.

The means employed in creating sentiment is found in the distribution of leaflets and pictures; in lectures given monthly, or annually, as desired by school principals; in holding monthly, semi-monthly, or annual meetings;

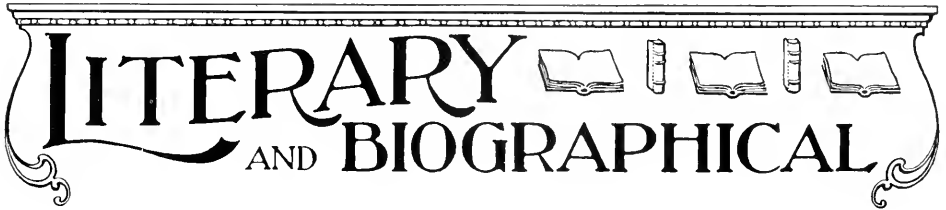
in the writing and reading at meetings by all children doing such language-work, of brief papers on natural history subjects thereby inducing friendship for forest, bird and wild flower preservation.

A bureau of information, through whom questions regarding nature may be answered, is composed of men and women, familiar with various branches of science, who, like all others connect-

ed in any manner with conducting the work give their services without return apart from the joy which comes to every giver who sacrifices self for a cause.

For the courtesy permitting this department representing The La Rue Holmes League work the directors owe a debt of appreciation to THE GUIDE TO NATURE.

LITERARY AND BIOGRAPHICAL



Quailology. The Domestication, Propagation, Care and Treatment of Wild Quail in Confinement. Together with Natural History Notes, Letters from Breeders and a Digest of Game Laws. By Harry Wallas Kerr. Little Sioux, Iowa: The Taxiderm Company. (For sale by Wenz & Mackensen, Yardley, Pennsylvania.)

The author makes this remarkable statement:

"The quail is easily raised, costs very little to feed, is the healthiest, hardiest, cleanliest, and most prolific bird of the poultry yard, free from contagious diseases and brings a good price on any market."

If this is true, it is a wonder that the quail has not become a common domesticated bird. The book contains many illustrations, good descriptions and contributions of experiences from various breeders.

One Hundred Lessons in Elementary Agriculture. A Manual and Text of Elementary Agriculture for Rural Schools. By Aretas W. Nolan, A. B., Professor of Horticulture, Forestry and Economic Entomology, West Virginia University, Morgantown, West Virginia: The Acme Publishing Company.

The author is an efficient teacher and horticulturist. He has the right spirit. Therefore he has made a success of his work in simplifying in this book the subject matter, materials and methods usually presented in text-books of agriculture. The author is of the opinion that elementary agriculture should not be taught below the sixth grade.

An entire chapter with three illustrations is devoted to the Sachs nutrient tablets as supplied by "The Guide to Nature." The book contains much of interest to the general naturalist.

Pheasants. Their Natural History and Practical Management. By W. B. Tegetmeier. London: Horace Cox. "The Field" Office Bream's Buildings, E. C. (For sale by Wenz & Mackensen, Yardley, Pennsylvania.)

The natural history of the pheasants, their food, habits, nesting, etc., are well presented. The illustrations are attractive and expressive. One important merit of the book is that it combines ornithological research with practical experience. Then, too, it is readable and interesting to any lover of birds.

Window Gardening. With illustrations from photographs. By Herman B. Dörner. Indianapolis, Indiana: The Bobbs-Merrill Company.

In this book such cultural directions are given as will enable the inexperienced to overcome most of the difficulties which arise in the growing of plants in the window garden. The directions are equally applicable to the small conservatory. In fact, about the only criticism that can be made is that the directions apply too much to the general and not enough specifically to the scope indicated by the title of the book. The illustrations are chiefly of ordinary plants in pots. It is to be regretted that more was not shown of special fixtures for window gardening. For example, why didn't the author work out and show an attached outside window conservatory? There is need of some one to provide such plans and some one to put them on the market in various styles at popular prices. Who will supply "window greenhouses?" The amateur should have a source of supply for such fixtures just as readily as can be purchased bird houses or chicken coops for the back yard.

The Efficient Life. By Luther Gulick, M. D. New York: Doubleday, Page & Company.

The chapters of this book were originally lectures delivered at the School of Pedagogy, New York University. They contained some excellent suggestions for making life count to the very most in any line of activity. Most certainly the diligent naturalist needs to conserve his energy as much as does any other person, and we are confident this book contains much of interest to our readers.

Trees of the Northern United States. Their Study, Description and Determination for the Use of Schools and Private Students. By Austin C. Apgar. New York: American Book Company.

"The difficulty in tree study by the aid of the usual botanies lies mainly in the fact that in using them the first essential parts to be examined are the blossoms and their organs. These remain on the trees a very short time, are often entirely unnoticed on account of their small size or obscure color, and are usually inaccessible even if seen. In this book the leaves, the wood, the bark, and, in an elementary way, the fruit are the parts to which the attention is directed; these all can be found and studied throughout the greater part of the year, and are just the parts that must be thoroughly known by all who wish to learn to recognize trees."

Out-of-Doors in The Holy Land. Impressions of Travel in Body and Spirit. By Henry Van Dyke. Illustrated. New York City: Charles Scribner's Sons.

The author of "Little Rivers" has made many phases of commonplace out-of-doors a holy land, by the charming manner in which he has portrayed and idealized the beauty and interest of nature. Probably that fact is accountable for his statement, "For a long time, with hopefulness and confidence of youth, I dreamed of going to Palestine."

The two following paragraphs from the preface, are well worth careful reading and re-reading. They were written by a naturalist who believes in reality, who recognizes a God in His Works, and yet, the author delicately cautions and suggests that one may be "rudely shaken" by reality, may not see aright and thus be disappointed.

"Then, for a long time, in the hardening strain of early manhood, I was afraid to go to Palestine, lest the journey should prove a disenchantment, and some of my religious beliefs be rudely shaken, perhaps destroyed. But that fear was removed by a little voyage to the gates of death, where it was made clear to me that no belief is worth keeping unless it can bear the touch of reality."

"If what you read here makes you wish to go to the Holy Land, I shall be glad; and if you go in the right way, you surely will not be disappointed."

The Haunts of the Golden-winged Warbler. With notes on migration, nest building, song, food, young, eggs, etc. By J. Warren Jacobs. Waynesburg, Pennsylvania: Independent Printing Company.

This is No. III of a series of pamphlets by the author on his researches in ornithology and oology. The plates are from photographs by the author and are accompanied by proper explanations. The pamphlet shows the spirit of a true ornithologist.

How much better to study one subject in this manner than to write yards of eulogies, emotions and observations on everything in the heavens above, the earth beneath and the waters under the earth.

The Freshwater Aquarium and its Inhabitants. By Otto Eggeling and Frederick Ehrenberg. New York: Henry Holt and Company.

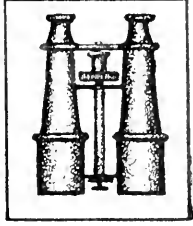
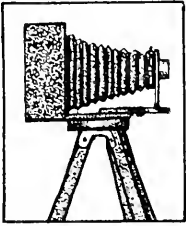
The present book is the result of the careful collaboration of a professional aquarist and a very enthusiastic amateur. While the professional aquarist gives his experiences collected through a quarter of a century in an extensive business, offering the best opportunity for observing fishes, amphibians and aquatic plants, both as to their habits and their merits for the aquarium, the amateur adds the result of his observation in forest and glen, and his experience under the often trying home conditions which prevail with the average amateur aquarist.

The Ministry of Beauty. By Stanton Davis Kirkham. New York: Paul Elder and Company.

"Over and above all common necessity is the divine necessity of beauty: beauty encircling all, back of all, in all, and its purpose moral, its perception joy; hence, if for no other reason, its bearing upon life and the problem of happiness. As with a glass we focus the sun's rays, so do the laws of the universe converge in our daily thought. We are here under the sway of the grandest laws and inseparably linked with the sublime and unutterable, as every drop of water is hitched to the moon and every grain of sand tied to the center of the earth.

"To be wise and kind is to enlist the universe in our behalf, to focus cosmic rays of love here in our hearts. Witness then the Ministry of Beauty drawing us ever from circumference to center; from bluebirds and violets and the blossoming apple, from snowy range and midnight sky and the expanse of moonlit ocean, to the love of these to the ultimate recognition of the nature and purpose of beauty itself, the perception that beauty is within, that only to an inner loveliness is the landscape fair, that to an inner sublimity alone is any outward grandeur.

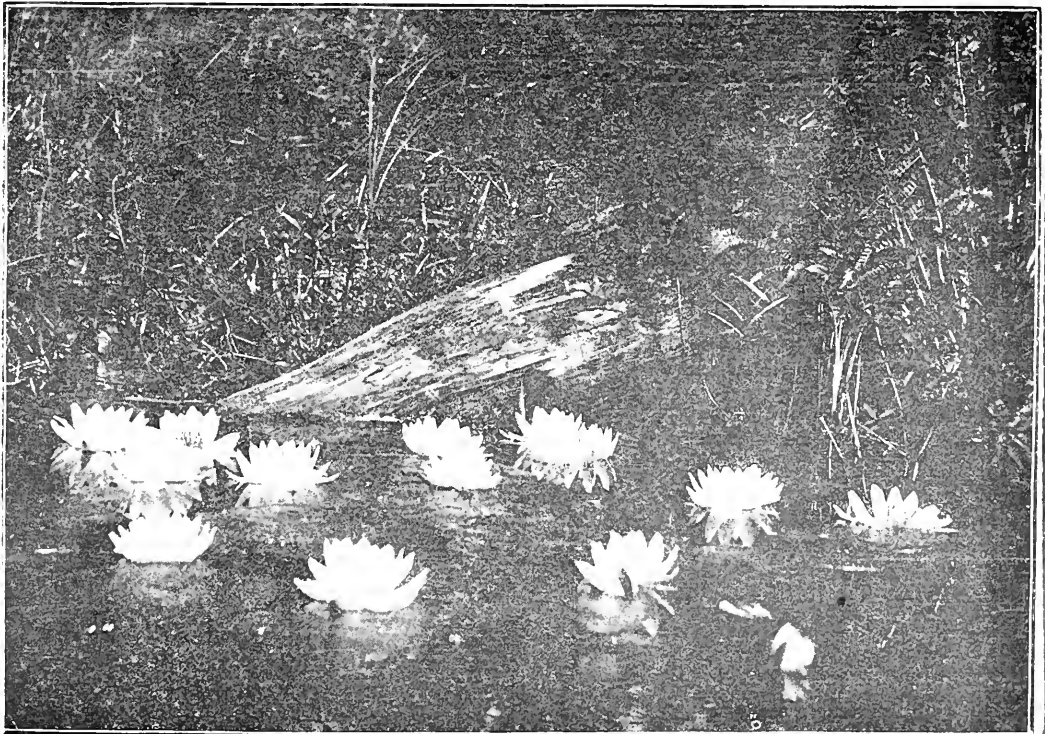
"From the self-same source have we the elixir of love divine and the milk of human kindness, from thence beauty forever flows to refresh the worlds and to stimulate man to its recognition."



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Sound Beach, Conn.

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PUBLISHER'S NOTICES

Do You Know "Children's Gardens?"

You have heard of children's gardens, and perhaps have thought that they are any sort of gardens made by any kind of children in any haphazard way but there is a right way and a wrong way; there is art in it. Write Henry Griscom Parsons, 29 West Fifty-sixth Street, New York City, for particulars of the road to the right way.

For High Grade Collies.

If there is a more graceful, good-natured and attractive breed of dogs than the right strain of collie, then I do not know what it is. If there is a better place to buy it than of William C. Hunter, Chambersburg, Pennsylvania, then I don't know where it is. Send to him for particulars—and get the puppy.

The Price of Subscription.

At the beginning of Vol. II the subscription price of *THE GUIDE TO NATURE* was reduced from one dollar and fifty (\$1.50) cents to one (\$1.00) dollar; the charge was made to bring in more money, not less; to reach more people, not the same number. The magazine cannot be produced, even at the mere cost of mechanical work, for one (\$1.00) dollar a year unless the subscription list is, as was stated, more than doubled. It was taken for granted from the many complimentary letters that were received that all our subscribers were pleased and would renew at one dollar and fifty (\$1.50) cents. To make it easy to secure another subscription, the price for two sent at the same time was only twenty-five cents (25c) cents additional; that is, two volumes for one dollar and seventy-five (\$1.75) cents and additional subscriptions at seventy-five (75c) cents each per volume. Most of our subscribers have understood this arrangement but some have sent only

the dollar. On that basis the magazine cannot keep its present high standard. Please secure and send additional subscriptions. Only a little effort means much for the good of the cause.

Delay in Publication.

We admit that we are one month behind time. It should be the June number that is now published. This delay is due primarily to complications in the printing office that we are promised will be remedied soon, and secondarily to the great disadvantages under which the editorial work has been done since preparations to move working buildings and contents were commenced about the middle of February.

With the printing office blocked—in troubles of their own—at several intervals, on all work, on *THE GUIDE TO NATURE*; with books and apparatus stored in a barn and other places for the past two months; with editorial and stenographic work done in a small temporary office; with, well, but what is the use of reciting to you further troubles! We think enough has been said to merit your kind forbearance in the delays.

Hope is dawning. The printers have promised to remove obstacles and information comes, as these lines are written, that the new, portable, office building has been shipped from the factory.

The working laboratory and other buildings have gradually evolved order out of chaos.

Cheer up! The sun will shine yet and we will forget that it was cloudy.

We like your magazine very much indeed.—F. G. Kenesson.

"The Guide to Nature" is a pleasure and an inspiration.—Sister M. Berenice.

Every paragraph in your monthly will be read with enthusiasm.—Amelia H. Benjamin.

Successful Student of Pigeons.

A thing that is worth doing at all is worth not only doing well but for a prolonged time. Since he was a boy, several years ago, Mr. William E. Butler of Glenbrook, Connecticut, has well devoted attention to fantail pigeons. He loves them and he studies them; therefore he has excelled. He does not keep the "two for a cent" kind nor even the "one dollar and fifty cents each;" but if you want fantails really worth having, he can supply you. Darwin set all students of nature a good example in his studies of pigeons. They afford good "available ornithology."

Air of Quiet Dignity and Comfort.

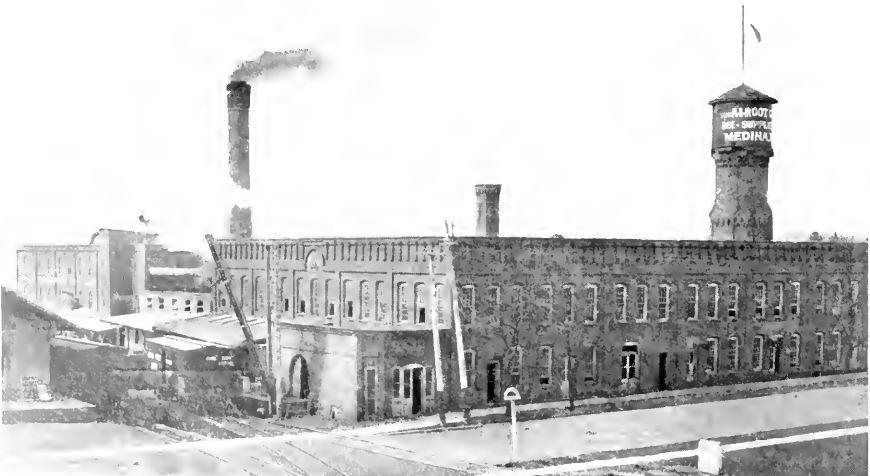
It would be difficult to find in all New York City a hotel that can equal the Hotel Cumberland in good location (southwest corner of Broadway and Fifty-fourth Street) and in quiet, dignified, comfortable attractiveness. It is up to date in every respect and decidedly pleases those who like a hotel that is popular and yet not filled with a boisterous rabble. Just step within the door and it is difficult to realize that the location is near the theatre district of Times Square. One feels as if he were on a quiet, luxurious estate in the country. To my mind none of the other much more pretentious hotels can equal it, surely not in the estimation of any one who goes to a hotel for food and rest—for home.

A Bee Keepers' Mecca.

Very few subjects are better adapted to the modern nature study idea than bee keeping. For one thing it can be pursued with the greatest possible intensity of interest at home and, in the case of an invalid, right inside the house if necessary. Moreover, it has a rich and interesting literature surpassing that of any other animal—the horse or dog not excepted. The requirements for study are not expensive: in fact, the cost of an experimental apiary is well within the means of an ordinary laborer or mechanic.

In Europe, more particularly in Germany, teachers are supposed to possess a knowledge of bees and their ways. The reason is obvious. The teacher who possesses an actual working knowledge of bees has an insight into the life history of insects in general which is difficult to secure in any other way. For him (or her) the words, larva, pupa, imago, have a true and definite meaning such as a person who depends on books alone cannot aspire to. Not only so, but the habits of bees are far better understood than those of any other insect and a working knowledge of their transformations is sufficient to give the one who has it a general idea of the habits and mode of life of many other insects, as the bee is the most highly organized of all.

Every cult has its Mecca and bee culturists are no exception to the general rule. At present their Mecca is



FACTORY OF THE A. I. ROOT COMPANY, MEDINA, OHIO

Medina, Ohio, where are situated the workshops and apiaries of the A. I. Root Company, which has fitted out many an aspiring bee student. Not far away from Medina is the old Mecca of bee keepers, Oxford, Ohio, where lived

vention which greatly simplified the whole problem of handling and keeping bees in a captive state. Bee keepers the world over are indebted to old Father Langstroth, as he is lovingly termed by bee keepers. His book on



SOME STORAGE AND WORKING BUILDINGS

and dwelt the sage of apiculture, the late Reverend L. L. Langstroth who by a careful study of bees evolved a system of bee keeping that has created an important industry out of what was formerly a fascinating hobby and nothing more.

Mr. Langstroth was a true nature study man, a real companion to such men as Alexander Wilson, Thoreau, John James Audubon and John Burroughs. He studied bees simply because he had to. Nature would not let him do anything else though, like Jan Swammerdam, his great predecessor, he had to give something to the claims of theology. Unconsciously he gave to the whole race of bee keepers an in-

vention which greatly simplified the whole problem of handling and keeping bees in a captive state. Bee keepers the world over are indebted to old Father Langstroth, as he is lovingly termed by bee keepers. His book on

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EDWARD F. BIGELOW INSTRUCTING CLASS AT MEDINA



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BY IRVING

A CAT NURSING GREY SQUIRRELS
Photograph by Geo. W. Irving, Waterville, New York
See "A Cat Mothers Squirrels" on page 70

A SOBER LOVE OF NATURE UNDERLIES AND REINFORCES LOVE TO GOD AND LOVE TO MAN; THESE SENTIMENTS BELONG TOGETHER; DISSOCIATED THEY ARE IMPAIRED. NO RELIGIOUS TEACHER CAN AVOID DEALING SOMETIMES WITH THE RELATIONS OF MAN AND GOD TO NATURE; FOR THESE SUBJECTS ARE INTENSELY INTERESTING ALIKE TO SIMPLE AND TO CULTIVATED MINDS.—*Charles William Eliot, LL. D., President of Harvard University.*



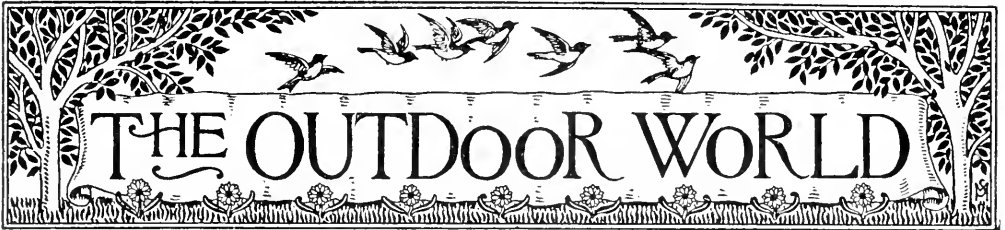
THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

MAY, 1909

No. 2



Nature at Coronado Beach

BY JESSIE PORTER WHITAKER, PASADENA, CALIFORNIA



BEAUTIFUL for situation, a joy to the lover of natural scenery, is Coronado with her picturesque hotel embowered in tropical foliage; Point Loma, thrusting forth a massive bulwark against the sunset sky; with the tent city on the Silver Strand, stretching away southward, washed on one side by beating surf while on the other lies the still blue bay and beyond are the mountain peaks of Old Mexico, gleaming red in the rays of the setting sun. In spite of her beauty, Coronado could scarcely be compared, as a field for nature study, with La Jolla, so charmingly described in an issue of *THE GUIDE TO NATURE* as "The Nature Lover's Beach."

The observant eye finds here, however, much in "common-place nature of uncommon interest." There are no fascinating rock pools in which to search for sea anemones but low tide

reveals some of the huge rocks of the breakwater plastered with masses of tiny bits of shell and pebbles which, when touched, show by a quick contractile movement that these are nurseries of baby anemones snugly hidden underneath their concealing blanket.

On the sand lies an object which suggests by its shape a blue lotus blossom set in a large finger bowl. Its semi-transparent substance shows it to be a jellyfish—an inappropriate name for it belongs to the Zoophytes or animal plants and resembles a fish only in the fact that it can swim. The central organ, called the manubrium, is, in this species, a fluted mass, something like petals, standing upright in the bowl-shaped disk which curves over at the edge giving the whole the appearance of a semi-transparent flower. We posed one of these on the breakwater and attempted to take its photograph but it was too small in comparison with its surroundings and



"POINT LOMA, THRUSTING FORTH A MASSIVE BULWARK AGAINST A SUNSET SKY

we succeeded only in getting an excellent likeness of the rocks of the breakwater.

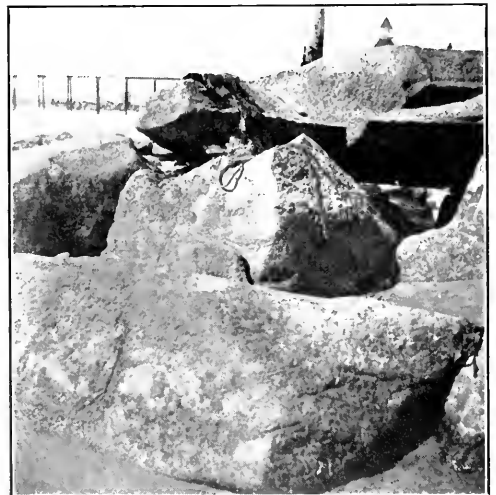
As we stroll along the beach its smooth surface is broken by a long curved row of little projections suggestive of ruins—of a ship or of some marine animal? Examination proves them part of a long curved spinal column; we counted fourteen vertebrae on the portion protruding from the sand. What strange, prehistoric creature has lain buried beneath these sands to be uncovered by the raging, tearing surf? Development of our photograph developed also the fact that during the preceding summer a whale was washed ashore on this coast and its bones still lie there to be uncovered and buried again by the ever shifting sands.

At times the beach, hard as a floor and glittering with a substance that looked like flakes of gold, seemed absolutely bare of shells but we followed the receding tide far out where the sands were wet and there, thrusting up wedge-shaped ends, were multitudes of the little *Donax*. When the shell is dead it lies open like a pair of dainty wings upon the sand but these were alive, tightly closed and standing upright with the small point of the wedge thrust into the sand while the little animal within sent out tiny feel-

ers, seeking its recurrent cold bath in those tumbling waves. It almost seemed a cruelty to gather the little things and take them home to be plunged into a bath of scalding water but such is the fate of the beautiful. These rainbow colored, dainty marked jewels, suggestive of moss agate, can be formed into a beautiful mosaic to frame a picture.

The Floridian and Californian species of this shell are so similar that Augusta Foote Arnold says, "The increasing number of similar species being found on the Atlantic and Pacific sides of Central America points to the existence of a water way between the two oceans at no very remote geological period."

Coronado is not considered an especially good beach for shells, yet we always find the dainty pearl-white wings of *Macoma seeta*, so thin and frail that they must be handled like eggshells. Large specimens of the Trochidae, "turban" or "topshells," are gathered here; of pyramidal shape their rough, brown epidermis makes them appear unattractive at first but they are lined with mother-of-pearl and capable of taking exquisite polish. Those we gather often show little projecting knobs—already polished by the rough treatment of the surf—gleaming with pearly hues.



"AN EXCELLENT LIKENESS OF THE ROCKS OF THE BREAKWATER"



"A LONG CURVED ROW OF LITTLE PROJECTIONS"

Most interesting among shells are the *Pholas* or "angels'-wings" of which a number of species are found on the Atlantic Coast and one on this beach. The sculpturing, like pinions, on these white, winged-shaped shells is quite suggestive. A furrow divides the valve into two areas, only the upper, or pointed one, being sculptured. *Pholas* is characterized by a reflex curve on the upper margin of the valve and by a long, rib-like tooth inside which curves out almost to the center of the valve.

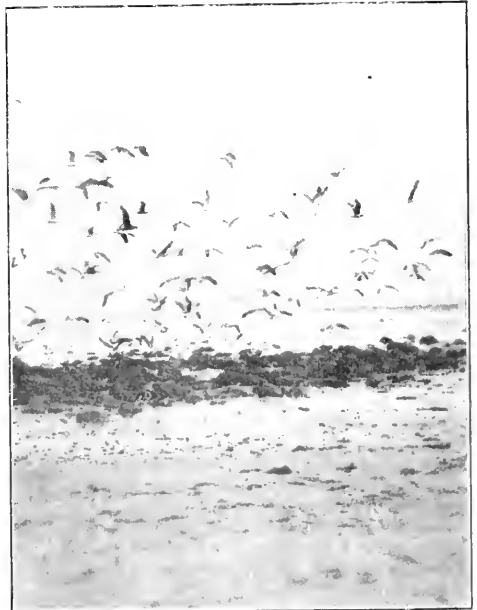
In spite of our portrait attachment the kodak did not bring out clearly these details, but the horned toad that slipped unawares into the foreground while waiting his turn to have his "pieter took" furnishes a suggestive contrast to "angels'-wings." As for the cribbage board, it is not an object in commonplace nor uncommonplace nature but serving a useful purpose as a pedestal.

The horned toad is a most interesting and intelligent little creature. Our first encounter with him was on a dusty path bordered with vegetation brown and sere. Of a sudden a cluster of dry twigs proceeded to perambulate across the path in a manner which so astonished us that we stood still. Whereupon the bunch of dry grass also stood still, having reached

surroundings which it matched. We felt compelled to do violence to the evident wishes of this strange creature by investigating it, when it proved to be a toad resembling a lizard thatched with dry chips and furnished with sticks for horns.

From toads to cats is a far cry, yet when we encountered a cat with a short, crooked tail on the streets of Coronado, we promptly accepted his owner's offer to hold him while we took his picture, for a rabbit-tailed cat struck us as an uncommon object. This cat is descended from a line of ancestors with similar caudal appendages.

This is not a bird article, Mr. Editor, but an account of nature life on Coronado Beach would be incomplete with no mention of the many interesting varieties of sea birds. The sands are ploughed in spots by the long, sickle-shaped bills of the curlews; over the brown masses of kelp trip the black turnstones, probing with their shovel-shaped bills for food; flocks of sand-erlings, their tiny feet flying with a precision suggestive of mechanical toys, chase the tide and run back in a



"THE GULLS AND TERNS ARE SOARING AND DIVING"



THE SPANISH BIGHT

"The marsh which fringes it is interesting"

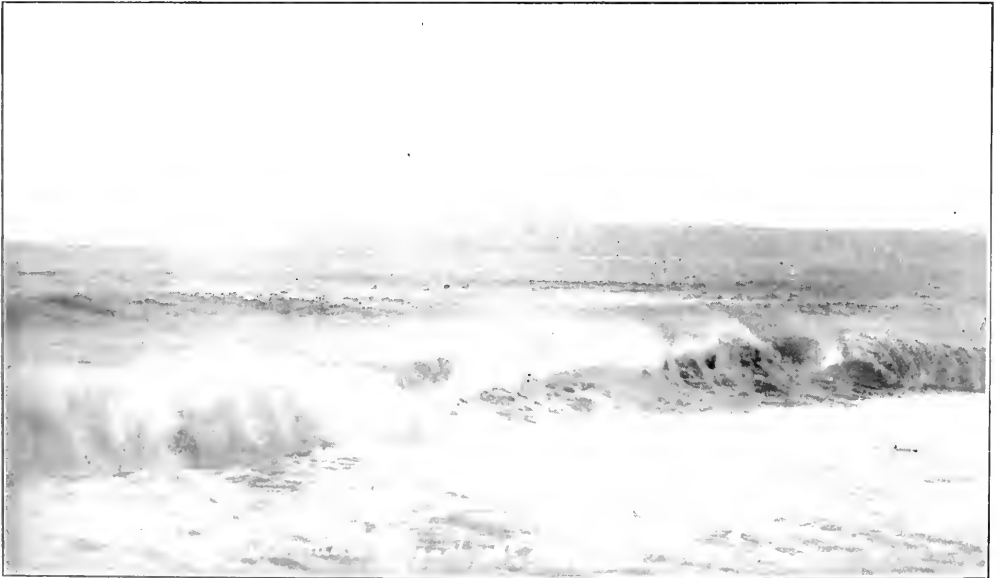
game of tag with the waves as if for the pure fun of the race.

Out at sea the gulls and terns are soaring and diving, the latter easily distinguished by the bill pointing downward "like a huge mosquito," as Coues says, while that of the gull points forward on the plane of his body. The terns, with long, slender wings and graceful, circling flight,

deserve their title of "sea swallows." The black cormorant or "shag," with long neck and snake-like head, flies low over the water. The brown pelicans are usually in companies like soldiers, soaring or flapping their great wings in unison with military precision. When they break ranks and indulge in fishing, there is a great splash as the huge beak strikes the water. The enormous bulk disappears beneath the surface to rise and sail away triumphant, if a thieving gull be not at hand to relieve him of the catch.

The wild dance of the spray as the surf dashes against the rough rocks of the breakwater tempts to a walk along the boulevard to the Spanish bight. The marsh which fringes it is interesting as the home of a lone fisherman who stalks in slow dignity along its borders, keeping a watchful eye for poachers on his preserves. Now and then he wades out into deeper water and stands motionless, his convenient spear poised in readiness for unwary fish. At the approach of an intruder he lifts his great gray wings and sails away.

A contrast to the sand-hill crane is a tiny dweller in the marsh who makes known her presence in a sharp scold-



"WATCH THE HUGE GREEN WALL RISE WITH SLOW, MAJESTIC SWELL"

ing voice, characteristic of her family. There she is—the tule wren climbing that dry brown reed with saucy tail perked up and bright eye peering with open curiosity and disapproval of our presence.

The long beach between the sea and the Spanish bight, lying clear and calm in the sunlight, stretches to North Island beyond which is the entrance to San Diego harbor. The crash of the breakers upon the cobblestones is followed by a volley of detonations ri-

valling the echoes from the target practice at Fort Rosecrans on the sunny slopes of Point Loma across the bay. Stand upon this beach, watch the huge green wall rise with slow, majestic swell and sweep smoothly forward to break with the thundering roar of a cataract and exclaim with the Psalmist: "Let the sea roar and the fullness thereof—Let the floods clap their hands—For the sea is His and He made it."

THE CAMERA



A Gorgeous Display of Nature's Tinsel.
Remarkable photographic studies of foliage of frozen fog or cloud.

BY WM. M. HEINEY, CROMWELL, INDIANA.

As the clouds pile and bank one above the other against the sky it requires some stretch of the imagination on the part of the average person

to realize that they are only masses of fog floating far above the earth. Proof of this fact is not easily found, but some persons living high in the mountains occasionally have opportunities to see fogs that reach up into the sky and become clouds.

If one were to ascend from the sea level straight up for one and one quar-



"ALL IN BLOOM IN FEBRUARY."

This is "snapped" on the morning of the sixth day, just as the sun is breaking through the clouds in the southeast. The clouds have lifted but are still clinging to the mountain top to the northwest while lower down in the canon beyond and to the right they are still resting on the lowlands.



AN ELM BEFORE THE WHITE FOLIAGE
HAD ATTAINED ITS GREATEST
DENSITY

ter miles on a cloudy February day, he would pass through the clouds much as we move about through the fog of a very foggy day and would ex-

perience much of the same atmospheric conditions as are in the pictures herewith shown.

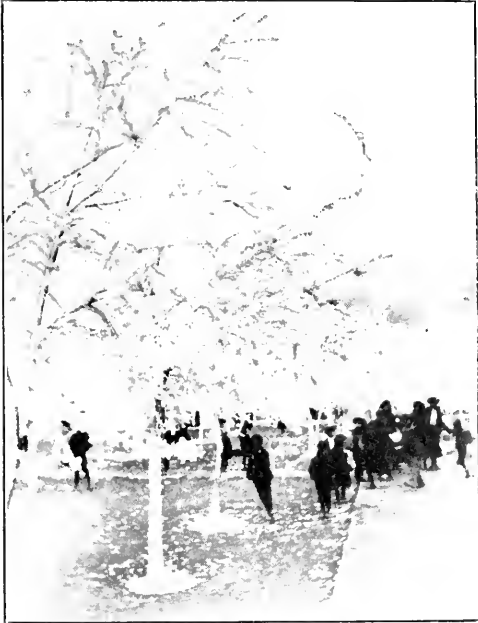
While from the lower earth regions clouds have the appearances of dense masses, when one is moving through them they are but a dismal smoky mist. It is not an uncommon sight in the high mountain valleys to look off on the distant foot hills and see the fleecy clouds above dragging their feathery tails over the hillsides and tree tops, much as we see the shadows of clouds noiselessly sweeping along over the meadows and grainfields of the lowlands. This is when the evidence becomes conclusive—when the dragging tail of fog is identical with the cloud.

It is the sight of this mist on the mountain side becoming the ordinary white cloud as we observe it continuing higher up until the blue sky above instead of the green mountain slope beyond becomes its background, that convinces us that clouds and fogs are like conditions of the atmosphere, only viewed with different settings.

As it is not often that atmospheric conditions remain constant for several days, so it is unusual for clouds to continue at the same height for any con-



ON THE PLAYGROUND UNDER THE FROST BURDENED TREES



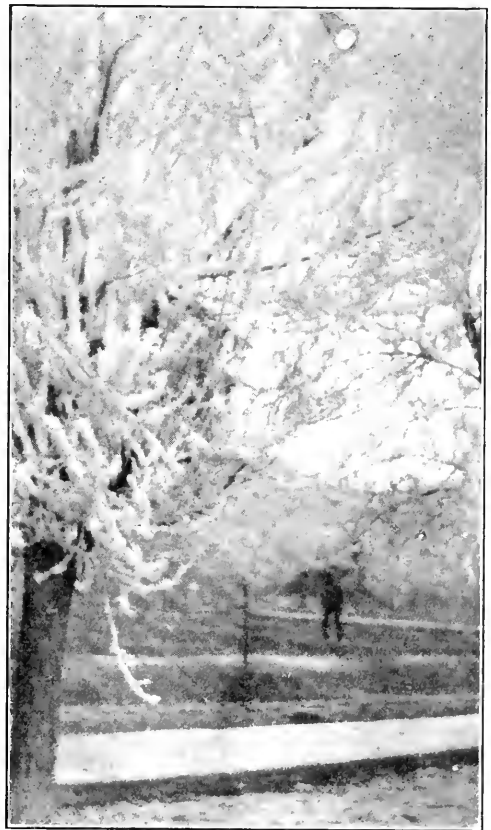
POSING FOR THEIR PICTURE

The white spots on the ground are pebbles covered with frost.

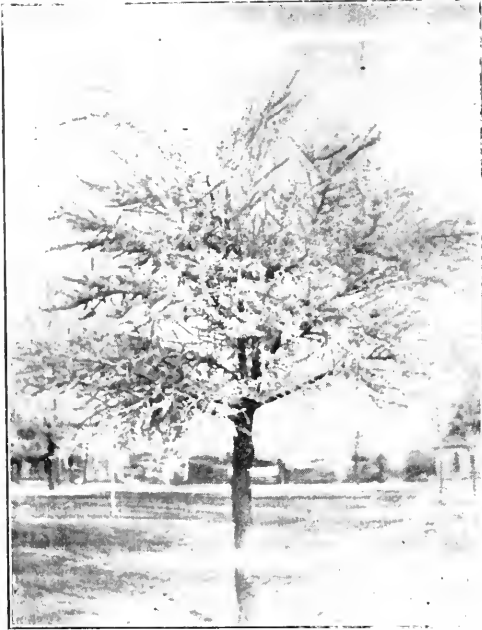
siderable time. Persons living in the mountains even do not often experience such conditions as will clothe the branches of trees in such a foliage of frost as the accompanying photographs show. These pictures were secured in Northern New Mexico at an elevation of sixty-six hundred feet in the month of February, after the town had been bathed in the northward drifting clouds for five days. It will be observed that the limbs of these trees appear much like those of some common evergreens, with the spiny leaves one and one-half to two inches long—frost crystals two inches long! A foliage the heaviest they ever bore and white as snow can be—everywhere and on everything! No work of art could have been so pretty and all the artists of all the ages could not have delved a decoration so vast, so universal. It would not shake off, and we lived there day after day for five days, retiring on the evening of the first day feeling that we had never experienced such beauty of nature. But the second day was better. The third it had intensified and the fourth and fifth days grew in beauty as the frost crystals

extended themselves, and we wondered when the glory of God in this mountain retreat would cease—when this sacred white verdure could grow no denser. But on the sixth day it had attained its maturity. It was one of those unusual developments of nature that abhors the sunshine. An hour of golden beams of a bright morning and the crystal leaflets had spent their freezing summer and had found their autumn. They lay as drabbed snow beneath the now blackened limbs that had borne them. Another hour and they had mingled with the dust; they had done their part to make mud.

In less than a week even the memory of this marvelous beauty had faded and but for the few "snap shots"—memory's archive the most gorgeous display of nature's tinsel that I ever beheld would have been forgotten.



WHEN THE CLOUDS OF FOG WERE STILL LOW, SLIGHTLY OBSCURING DISTANT OBJECTS



A COTTONWOOD BEARING ITS BURDEN OF THE BEAUTIFUL

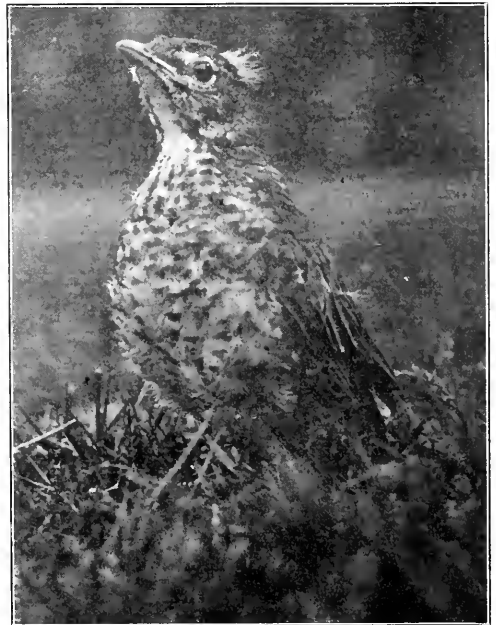
This was a strange phenomenon—a temperature to continue in a mountain region for five days just cold enough to reduce the atmospheric moisture to frost and still warm enough to prevent the clearing of the atmosphere. It must have been about the condition as when snow forms in the clouds. It may be explained, however, by several conditions of topography. Our location was on the south-east slope of the mountain near where a canon from the north-west opened out into a valley sloping to the southeast. Up this valley came the winds, warmed and saturated, from the warmer regions below. As these winds crept up our slope they found a temperature just right to reduce the moisture to precipitation and after the first frosty night the limbs of the trees remained slightly colder—merely freezing—than the newly and constantly arriving, saturated atmosphere from the southeast. On the sixth night the temperature went low enough to clear the air of the water particles and the following morning the sun poured over the eastern mesa on to one eastern sloping mountain side and the disaster to the

previously described grandeur resulted.

The unfortunate feature of these pictures—darkness in all but one—is the result of exposure having been made when the fog was too dense for proper light. The light picture was taken from a north window just as the sun appeared in the southeast; but before the cloud or fog had yet been dissipated. It is seen clinging to the mountain top to the northwest and lower down in the mouth of the canon to the right and beyond the mountain that penetrates the retreating mist.

Amateur Snap of a Young Robin.

The camera was a 5 x 7 Kodak; the lens, a Zeiss Tessar, to which was fitted a specially made portrait attachment; and this combination was used wide open. From the original negative there was made a positive on glass. From this positive another negative was made on a 5 x 7 plate with the robin enlarged to about two thirds life size, and the useless foreground and back ground cut off.



A GOOD SNAP SHOT OF A YOUNG ROBIN



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

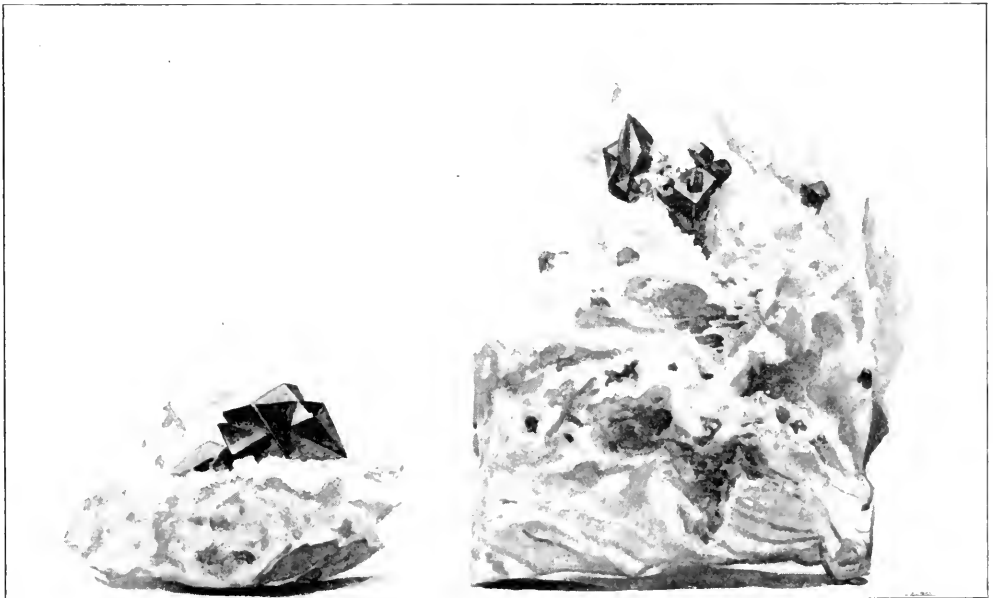
On a New Cinnabar.

The illustration given below shows two examples of the most beautiful and remarkable cinnabar ever discovered. Strange to say it is a heathen; that is, it is what Mark Twain would call a "heathen Chinese." It was discovered in Wanshanchang (Hamlet of Ten Thousand Hills,) Tungyen Prefecture, Province of Kweichow, China. Rather a lengthy locality for this beautiful mineral but it is deserving of it.

The crystals are a bright, ruby-red color, from translucent to transparent, and in form are ordinary and interpenetrating twins. The matrix is a pure white quartz, and as these crystals occur in cavities with quartz crystals, you can imagine the beauty of these speci-

mens. Like all good things they are scarce, probably two dozen all told. With the exception of a half-dozen which are on exhibition at the office of Mr. A. H. Petereit, 81 and 83 Fulton Street, New York City, they are scattered among the leading universities and mineral collectors.

Cinnabar is found in other localities in China, in Spain and at two localities in California, but in no instance has it ever approached the rare beauty of these crystals. The illustration gives the exact size. A cordial invitation is extended to all readers of this magazine to call on Mr. Petereit and see these remarkable specimens. As the mines from which these were taken are now filled with water and no more can



THE NEW CINNABAR
From A. H. Petereit, New York City.

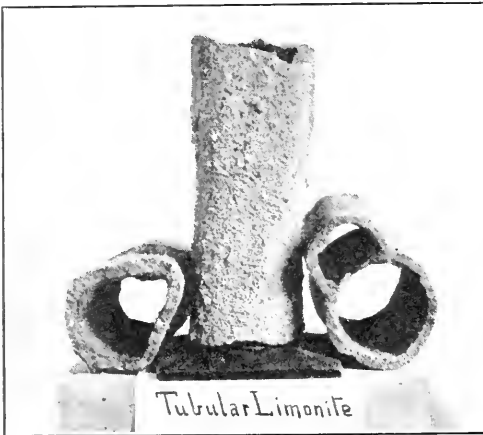
be secured, it would be well to take advantage of this opportunity to see these and other rare things seldom seen even in museums.

Tubular Concretions of Iron.

BY HOWARD R. GOODWIN, PHILADELPHIA, PENNSYLVANIA.

On the west bank of the Pensauken Creek, near North Pennsville, New Jersey, is a large hill of sand which contains considerable iron ore of the variety known as limonite. This ore has formed a conglomerate of small pebbles and sand which takes some curious forms.

Part of the formation consists of sheets or strata more or less contorted, and part of tubes or pipes of various length and thickness.



The specimens illustrated average seven inches in length by three inches in diameter, the double tubes being of common occurrence. Some of the tubes taken out at the time of my visit to the locality were over three feet long and fully ten inches in diameter, with walls one inch in thickness.

After getting out the tubes, the sand in the interior, which is much lighter in color than the material surrounding them, is easily removed with a sharpened stick.

The curious specimens are rust brown in color and make an interesting, if not beautiful, addition to the cabinet.

In Clinton Township, Vinton

County, Ohio, is a sandstone that contains spherical concretions which, released by the decomposition of the sandstone, roll down to the foot of the hill where they resemble a lot of rusty cannon balls.

Limonite, or brown hematite, is an abundant ore in the United States and contains, when pure, about two thirds its weight of iron.

The varieties known as brown and yellow ochre are common materials for paint while bog ore, an earthy variety usually containing considerable phosphorus derived from organic sources, is said to afford a good iron for castings.

Gothite, turgite and melanosiderite are other varieties recognised by mineralogists.

Three Bronx Localities for Stilbite.

BY EDWIN W. HUMPHREYS.

A recent examination of the rock in an excavation back of the Museum Building in the Botanical Gardens, Bronx Park, New York City, revealed some good specimens of straw-colored, though in parts it was white or nearly white, stilbite. The crystals occur in more or less perfect sheaf-like aggregations. The mineral is somewhat weathered and crumbles easily.

The finding of stilbite here recalled to mind two other localities in the Borough of the Bronx at which stilbite has been found. They are Third Ave., near 170th St., and Bryant Ave., near 170th St. At the former place, the stilbite was similar in color and form to that found in Bronx Park. In some parts it was coated with iron. Some of it, moreover, was more translucent and of a darker yellow color. This darker stilbite was not arranged in sheaf-like groups, the crystals, though crowded together, rose from the enclosing rock as individuals. At the Bryant Ave. locality the stilbite was of a reddish brown color and occurred in flat rosettes. It must have been very abundant here, for a teamster said that he had carted away and dumped loads of that "stuff." At all three localities the rock in which it was found was the schist.

The Passing of the Drawer Cabinet Case.

BY CHAS. H. PENNYPACKER, WEST
CHESTER, PA.

A half a century ago, when my interest in mineralogy began, the approved method of housing a collection was a cabinet of drawers and the trimming and adjusting of the specimens was made with the design of placing them in such drawers. Many a good crystal, many a fine specimen, were sacrificed to the drawer habit.

When George J. Brush of New Haven was assembling his collection of crystals some of the best to be had were turned over by him to the Yale College collection because they were too large for his purposes. As his collection increased he saw the mistake he had made in not providing a large open case for his large specimens.

When Clarence S. Bement of Philadelphia concluded to sell his collection the drawer specimens were magnificent and exceedingly choice; but the large open-case specimens, as they brilliantly shone through the glass fronts, were decisive factors in the disposition of that remarkable cabinet.

Dr. Spencer of Tarrytown, New York, lined a room with open cases containing large specimens of quartz crystals from the Ellenville Copper Mine in Ulster County, New York. The effect was dazzling, and his friends and neighbors called it "The diamond room."

In the early sixties there was a boarding school at Newburgh, New York, kept by Mr. Reed. His collection of minerals was contained in two glass show-cases located in his parlor. They were all large specimens, showy and brilliant, and produced a marked impression upon his callers, who happened to be there placing their daughters at school. Mr. Reed was certainly a gentleman of wonderful attainments and such excellent taste, all of which comment was produced by the sight of these brilliant specimens.

In self defence of the distemper of natural science the collector of mineralogical specimens will surely exhibit his treasures in open cases. The

observers will not consult the label unless they have exactitude allied with curiosity. In such event the assemblage of mineral specimens will adorn the reception room of the household and contribute to the gayety and delight of visiting friends. They will not be consigned to the limbo of a third story back room but will have the post of honor and the public station in the parlor.

After the mortuary exercises of the collector have been concluded and his family turn about to dispose of his collections they will find that the large, showy crystals and the attractive masses of crystallization will favorably impress the trustees of a college, which may desire to strengthen its examples in natural science. Though the collector may have a scientific mind yet it should always be on business bent. We must look forward as well as backward. We must consider the changed and changing conditions as they are about us.

A few weeks ago H. D. Miller of Plainville, Conn., was surprised because I had shipped him several specimens of Calcite of Museum size and I cheerfully explained to him that tastes in the arrangement of a Cabinet had decidedly changed within a score of years and that it was our duty to keep pace with the ideas of improvement and the improvement of ideas.

Tourmalines can be extracted from a matrix by soaking in cold water and tapping the crystals lightly with a hammer.

The cataracts of the Nile are due to granite veins which the river, while working a way through the sandstone, has been unable to destroy or remove.

The various colors in turquoise are due to copper oxide while the presence of iron tends to give a greenish tint to the mineral.

From one ton of ordinary gas coal may be produced fifteen hundred pounds of coke, twenty gallons of ammonia water and one hundred and forty pounds of coal tar.

Mineralogical Review.

BY C. ROE GARDINER, 167 HOOPER ST.,
BROOKLYN, N. Y.

ON CHLORMANGANOKALITE, A NEW
VESUVIAN MINERAL, with notes on
Some of the Associated Minerals.
By H. J. Johnston-Davis, M.D., B.
Sc., M. R. C. S., F. G. S.; and
L. J. Spencer, M. A., F. G. S. *Min.*
Mag., XV, 54.

This new Vesuvian mineral, found
amongst the products of eruption, was
previously described in "Nature" of
May 31, 1906. A large amount of
Chlormanganokalite was discovered on
breaking up two large masses of material
that had been ejected from this volcano
during an eruption.

An analysis on some of this new
mineral gave the following results:

K	Mn	Cl	Mg	Na	SO ₄	H ₂ O	Insoluble
36.34	11.52	40.13	.04	0.38	0.81	1.52	0.71 = 96.4

The calculated percentage compo-
sition in which allowance is made for
the presence of admixed sylvite corre-
sponds to the probable formula 4KCl.
MnCl₂.

$(RO_3R_2O_3)_2SiO_3 + 2H_2O$ and $(MgO.HO) + MgO.SiO_3$

Hypothetical Constituents	Silica	Alumina	Ferric Oxide	Ferrous Oxide	Magnesia	Potassa	Soda	Water	Total
Phlogopite (residual)	41.93	4.04	0.66	1.40	37.29	1.06	1.54	11.62	= 99.54
Antigorite	11.79	4.04	0.66		8.85	1.66	1.54	2.72	= 30.66
Hyalite	29.82			1.40	28.44			8.90	= 68.56
	0.32								0.32

In association with this mineral were
found sylvite, halite and hematite.

ON STRÜVERITE AND ITS RELATION TO IL-
MENORITILE. By G. T. Prior, M.
A., D. Sc., F. G. S.; and Dr. F.
Zambonini. *Mix. Mag.*, XV, 78.

Struverite occurs on the Prano dei
Lavonchi and in other localities on the
Eastern slope of the mountain across
which runs the road from Vasco to the
Alp Marco. The mineral is found in
pegmatite as a rare accessory consti-
tuent.

Ilmenorutile, a mineral recently re-
cognized by Brogger as a definite
species, was discovered on the Ilmen
Mountains, Urals, in 1854.

The formula deduced from analyses
for struverite F_2O , $(Ta Nb)_2O_5$, $5TiO_2$
and for ilmenorutile FeO , $(NbTa)_2O_5$,
 $5TiO_2$ indicate the close chemical re-
lationship of these two minerals.

ON DETERMINATION OF MINERAL CONSTI-
TUTION THROUGH RECASTING OF
ANALYSIS. By Alexis A. Julien, Ph.
D., *ANNALS N. Y. ACAD. SCI.*, XVIII,
129; April, 1908.

This interesting paper gives food
for thought in regard to the chemical
composition and formulas assigned to
many of the minerals in our text-books
on mineralogy. All who are familiar
with minerals as viewed through a
polarizing microscope know that
homogeneity in crystals is rarely if
ever seen, and in probably a great
many cases where analyses of min-
erals have been printed in literature
these specimens were never examined
by the microscope and consequently
it was nearly impossible to allow prop-
erly for foreign impurities.

The following is an example of the
method used in recasting the analysis
of a mineral:

"Thermophyllite."

From Hopansuo, Finland. Average
of three analysis by Arppi, Hermann
and Northcote, with the formulas.

TWO NEW BORON MINERALS OF CONTACT
METAMORPHIC ORIGIN. By A.
Knope and W. T. Schaller. *AMER.*
JOUR. SCI., XXV, 323.

On the northwest flank of Brooks
Mountain on the Seward Peninsula,
Alaska, was discovered a new boron
mineral for which the name hulsite
has been proposed.

The other mineral for which has
been proposed the name paigeite was
found at Brooks Mountain and also
forty miles northeast at Ear Mountain.

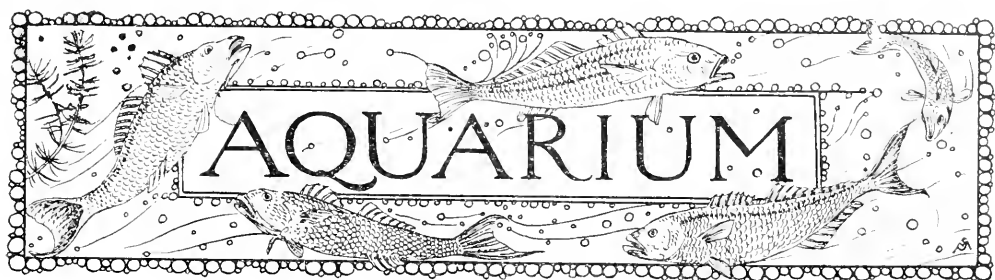
The formula calculated from an-
alysis for hulsite is $9FeO$, $5MgO$,
 $2Fe_2O_3$, $2H_2O$, $8B_2O_3$.

The formula assigned to paigeite is
 $6(FeMg)O$, Fe_2O_3 , H_2O , $3B_2O_3$.

NOTE: At a lecture delivered before
The Brooklyn Institute of Arts and
Sciences by Dr. Schaller on February
2nd, he suggested that due to the fact

that it was impossible to separate these new minerals from the magnetite present at the time of the first analysis

that it might be found later that hulsite and paigeite have the same composition.



Under the Auspices of The Aquarium Society of Philadelphia, Herman T. Wolf, Editor

Sand, Soil, Grit or Pebbles?

Considerable discussion has been evoked at meetings of the Aquarium Society of Philadelphia by the important query, "What is the best planting medium in the freshwater aquarium, sand, soil, grit or pebbles?" At first a divergence of opinion was expressed but later experimentation led to an almost unanimous concurrence in what was since adopted as the best practice.

Some desirable aquatic plants, sagittaria, vallisneria, anacharis, cabomba and nitella will thrive and exhibit paler green leaves when set directly in the sand; but other plants, ludwigia, potamogeton, moneywort and water-popy, require soil to continue their growth and to survive under the changed conditions.

The best practice, it has been found, is to place a two to two and a half inch layer of thoroughly washed bar or beach sand in the aquarium, into which shallow dishes or pots containing clean turf and the last mentioned plants are arranged, then those to be planted directly in the sand introduced, and the whole surface covered with a half-inch layer of small beach pebbles, known as grit. A few larger pebbles or brookworm stones may be scattered over the surface to produce a natural effect.

For the marine aquarium mixed sand and grit is preferable, as it offers the best medium in which some of the animals may follow their natural habit of burrowing and hiding.

Grit permits the finer particles of humus to sift through to the sand layer, to serve as nourishment for the plants, presents a neat and tidy surface appearance, and a firmer layer for the siphoning of the excess accumulations.

Nonsense Writing about Aquaria.

The longer or shorter articles of popular scientific nature which from time to time appear in newspapers are often unreliable, but those concerning the aquarium and its inmates are usually even worse, either altogether untruthful, absurdly impossible, or misleading and disastrous when believed in and applied, all due to faulty observations or the writing on a subject with which the writers are not conversant.

It is probably the gentle lady society reporter, the sporting editor, or the space writer momentarily devoid of a theme that produce these often grotesque absurdities that may do much unintentional harm.

The editor of this section of THE GUIDE TO NATURE would be greatly obliged if the readers would send in clippings of this nature, stating in what paper they were published, so that they may be answered, corrections made and the ghost of ignorance laid. It is to be regretted, however, that newspapers seldom publish corrections of their printed articles.

It is proposed here to publish extracts from such articles to correct

errors and misstatements. One recently appeared in a Philadelphia newspaper and was extensively copied by others. It stated that the city supply water was so pure that fishes are dying, and goes on to say as follows:

"The report of the Director of Public Works to the effect that the water supplied to the citizens of Philadelphia is ninety-nine and fifty-five one hundredths pure is verified by those dealers that sell fish—not those who dispose of them to eat, but the dealers who have for sale golden-sided little fellows that are kept in glass jars.

In filtered water the fancy goldfish found death. Thousands of them died from mere inanition after the completion of the immense filtration plant.

It did not strike the dealers at first that aqua pura was not just the right thing for a fancy fish to swim in. Water is water and logically the purer it is the better. But not for a fish which feeds upon animal matter contained therein. It is well enough to feed a fancy prize winner with flakey fish food if there is enough substance of a fattening nature in the water to be absorbed.

They could not find enough in the remaining forty-five one hundredths to keep them going and flopped over by thousands in the stores of the city and died.

Of course, every one knows that a fish cannot live out of water, but here was an added page to natural history. These fish could not live in the pure unadulterated water which Philadelphia has for her citizens to drink.

But there was a serious side to this matter. Actually thousands of fishes died from lack of nourishment until the dealers realized that the animal matter and microbes had been filtered from the water. The fishes needed the river dirt and the dealers found it necessary to send down in the Neck and dig dirt from the riverbanks and swamp lands."

What really is the cause of death of many aquarium fishes is that Delaware river water is largely supplied in the city mains, and it is known that a minute quantity of alum is necessary for its coagulation before the mechanical sand and gravel filters will yield perfectly clear water. An equally minute quantity of sulphate of copper is also used in the storage basins of many filtering plants, to prevent the excessive growth of algae, that produce a greenish color. These quantities are so small that they have no effect on mankind in the drinking water, but do effect the survival of fishes in the aquarium.

This is the real cause of recent in-

creased mortality among aquarium fishes in Philadelphia and not the absurd reason given by the newspaper writer.

Nutrition carried by the water is so little at any time that the removal of the minute fauna and flora of river water by filtration has no effect whatever upon the survival of the fishes, while the chemicals used cause the deaths. This has been proven by recent happenings. Aquaria in good condition until refilled with water taken from the mains have been partly or completely depleted of their fishes in a few days.

The Propagation of Aquarium Fishes.

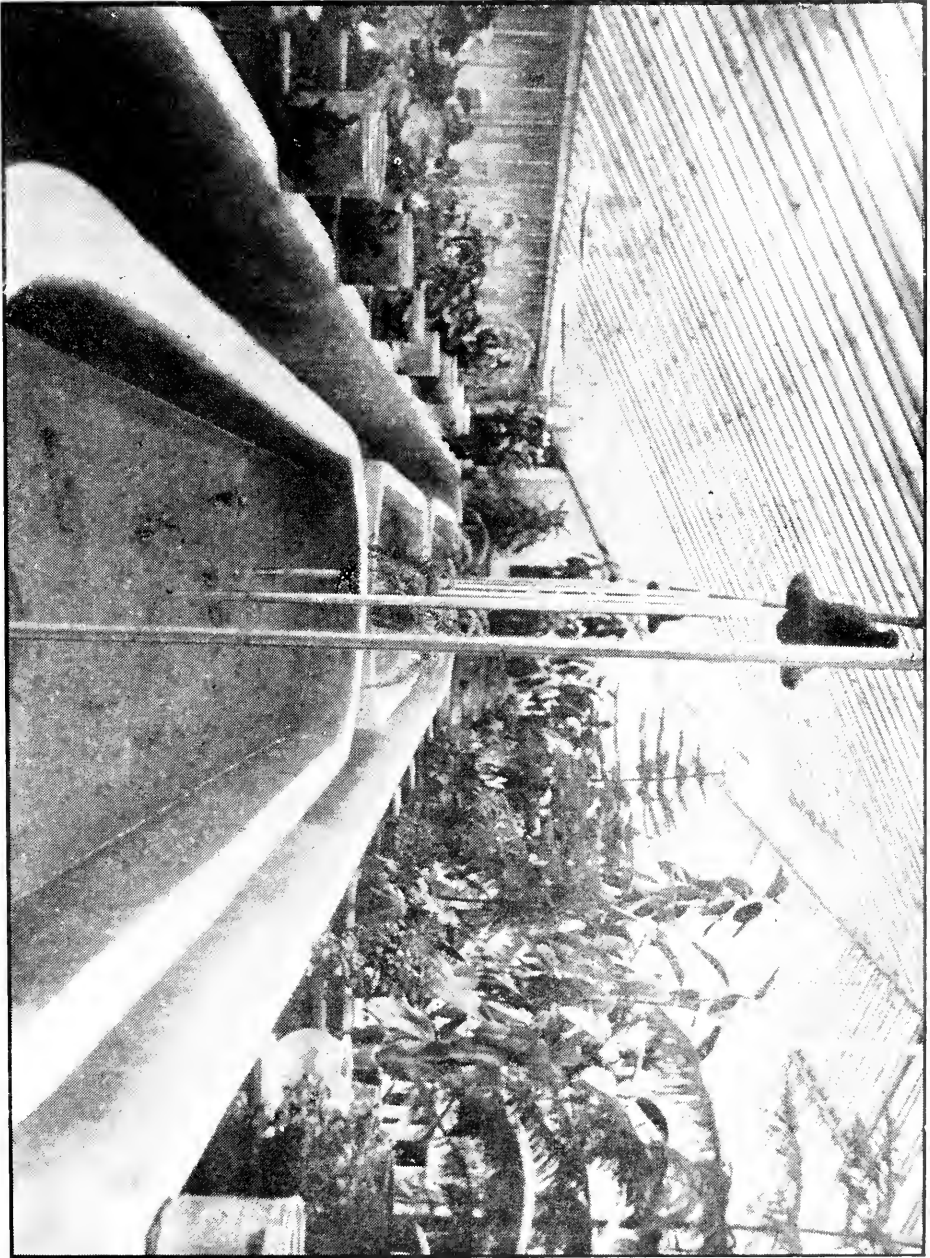
The constantly growing demand for the highly developed breeds of Chinese and Japanese goldfishes, as well as the paradise fish, gourami, chanchito, climbing perch, archer perch, fighting fish and other labyrinthine or air-breathing fishes; and the golden ide, green and golden tench, bitterling, carausche, zebra fish and other beautiful indigeneous, exotic and tropical forms, that may be domesticated and kept in household aquaria, has opened a field of industry in the United States which promises profitable returns to the culturist, who, with an understanding of needs and requirements and adequate facilities, will devote himself to their propagation.

There are some few fish breeders who have been successful in rearing the common goldfish on the larger commercial scale, and who also breed the scaled varieties of the Japanese comet and fringetail and Chinese telescope goldfishes; and a number of expert amateurs who have succeeded in breeding the very highly developed transparently-scaled Chinese and Korean breeds, from whom they may be purchased at certain seasons; but there are so few of these, that with the growing demand there is opportunity for larger business enterprise on these lines.

The present equipment of the commercial breeder is a number of basins and tanks in a greenhouse, for the winter storage of brood fishes, and

ponds in which they may propagate during the spring and summer months. That of the expert amateur is usually

ing the winter, which are removed to the yard or garden in the springtime for out of door culture. Some very



NO. 1. THE GREENHOUSE OF MR. S. C. SELAK, READING, PENNSYLVANIA
ARRANGED FOR GOLDFISH CULTURE

tanks, tubs and other containers in an otherwise unoccupied room in the household, for brood fish storage dur-

fine blue-ribbon goldfishes that command high prices are raised in Philadelphia by these smaller breeders.

Sometimes the semi-amateurs go one step further. These are usually florists, who arrange a part of the greenhouse for goldfish propagation. The illustration No. 1 is the greenhouse of Mr. S. C. Selak, of Reading, Pa., a recent recruit in this industry and a successful goldfish breeder. It is located in that city while his breeding ponds are some miles distant at his country residence.

The arrangement of the cement tanks is good, the conditions favorable, and the returns satisfactory; but in the writer's opinion, this method is not ideal and could be greatly improved upon.

With the toy-varieties of the goldfish, and it is these that promise the high returns on the investment, it has been proven beyond doubt that fishes raised in smaller containers than a pond are superior, and that a greater number exhibit the desired perfection of body, fin and eye development which characterize the fine breeds.

An article recently published in *THE GUIDE TO NATURE* states that only a small proportion of young fishes inherit the desired peculiarities of the artificially produced varieties. When these are selected as soon as hatched they escape the cannibalistic tendencies of their inferior but more active brethren, which latter are usually not preserved.

In small tanks perfect supervision is possible and feeding may be so regulated that the young fishes need make no effort to procure food; which largely tends to short bodies, elegance of form and exaggerated fin development. In the pond no such supervision is possible. Those fishes nearest like the ancestral type, the common goldfish, are best able to care for themselves, are most likely to escape enemies and will prey upon the finer double-tailed, short-bodied fishes. Furthermore, efforts to obtain sufficient food tend to produce long bodies at the expense of large fins, and much activity will result in a general coarseness of appearance different from the fine forms of the selected tank-bred goldfishes, which command prices,

three to ten times as great as those of the pond.

It is also noteworthy that the young of different broods should be isolated until they have reached such size as not to fall victims to the older or more robust fishes, either of earlier hatchings or those which evince a more rapid growth, again those which are less perfect in development and not desirable to the expert aquarist and goldfish fancier.

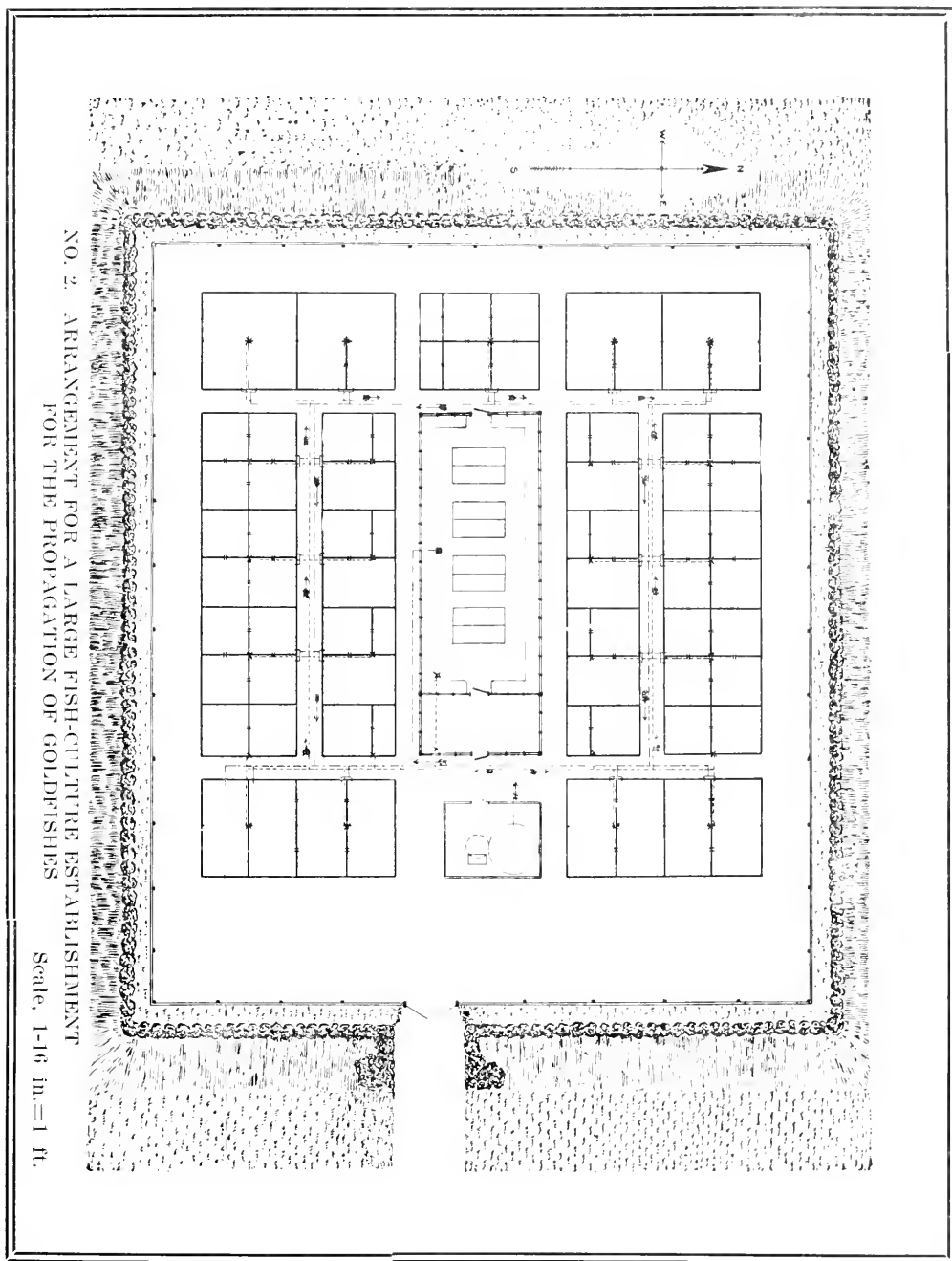
The illustration Fig. 2 is a suggestion for a large breeding establishment in the open air, which presents many advantages over the pond for the cultivation of all the fishes which may be kept in aquaria. Its location should be in the country, near a constant supply of moderately cold water. Surrounding a central greenhouse, spawning and breeding tanks and larger rearing and storage tanks should be arranged with the necessary water supply and drainage pipes; and a large water collecting tank and pump installed, to insure uniform condition and temperature of the water. This arrangement will permit of perfect supervision, the rearing of the fishes out of doors in favorable weather; and furnish ample storage facilities in the greenhouse for the brood fishes, the keeping of very fine specimens for special prices, and the holding over of a considerable number of others until times of greatest demand, usually during the winter; and in the spring, when good breeding fishes are sought and usually not to be obtained.

All the tanks should be based upon a factor of 4 or 5 feet; which means, either 4 by 4, 4 by 8, or 5 by 5, 5 by 10 feet; so that wire screens, to protect the fishes from enemies, may be interchangeable. These tanks should be constructed of cement concrete, either altogether or only partly above the level of the foot paths, and should be entirely drained in winter to protect them from the action of frost.

A less expensive construction is wooden tanks for out of door use. These need only be water tight, of 1-inch rough lumber, which answers all purposes as well or better than

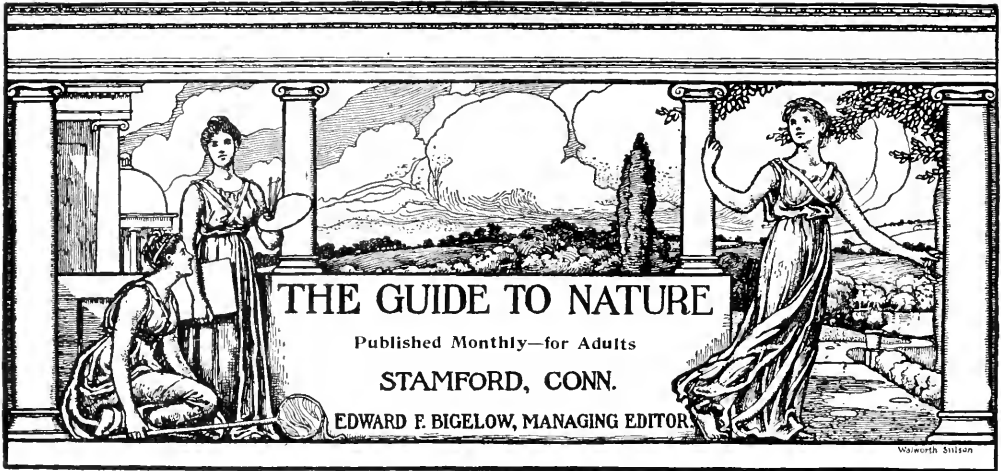
elaborately built basins of planed and doweled construction, though lumber of this dimension would not resist the

the aquarium fishes and for experimentation with this new and promising industry.



pressure in tanks larger than 3 or 3½ feet square. These containers are amply large for the propagation of all

THE GUIDE TO NATURE would be pleased to answer any further inquiries on this subject.



Research Work!

One of my friends, a teacher, was telling the pupils, "Mr. Bigelow has been supplied with a laboratory in the new Arcadia for research work!" One pupil, whose ideas of the ordinary meaning of the word, "research," were evidently not quite clear, exclaimed, "A whole new building for research work! Why what has he lost that it takes so much to find it?"

If that pupil will call, I will gladly explain how my household furniture is stored in various parts of two towns, how some pieces of my apparatus are in Sound Beach and others in various parts of Stamford, and how I am doing editorial and scientific work at a table in a small, temporary office. She surely will think that it will take many *another* hunt to find things—literally a re-search! I realize that she was not so very far from a correct idea of the situation after all!

The Audubon Societies.

President William Dutcher and his associated officers and workers of the Audubon Societies are to be congratulated on their remarkable achievements and growth in the few years since the founding in 1901 and the incorporation in 1905.

They have been enabled to do wonderful work in the study and protection of birds because they have been liberally supplied with funds for that purpose.

The total amount of dues received up to April, 1909, since incorporation four years ago, amount to \$21,725. The total amount of contributions received since incorporation and up to the same date amount to \$13,110.25; the endowment fund received through the legacy of the late Albert Wilcox, and a small legacy of some \$400.00 from another individual, and life memberships amount to the astonishing sum of \$340,012; expenditure for legal services and legislation amounts to \$2,034.91.

So there has been given in four years a grand total of \$374,847.25, over a third of a million dollars, for the study and protection of birds. No wonder our sister Audubonites have been enabled to do good work; and they have done it, are doing it, and The Agassiz Association congratulates them and all their sustainers for it.

THE AGASSIZ ASSOCIATION.

In the light of such extensive aid and achievements *in four years*, one can but dream of what inconceivably great things might have been accomplished by The Agassiz Association if it had had in its thirty-four years of existence even one tenth of the aid that the Audubon Societies have had. We point with no little pride to the fact that AA has not been limited to national work but has encircled the globe with hundreds and hundreds of Chapters and thousands and thousands of members, that it was the pioneer of all the

great movements in the study of nature, that for more than a quarter of a century it included (almost exclusively) the great popular interest not only in birds but in plants, animals, minerals, stars—everything in nature. Probably more than half the scientists of the world have had their stimulus and training in its Chapters.

In view of all our great work and achievements, it is a most astonishing fact of all nature interests that the total direct gifts in over a third of a century have been less than \$7,000! No officer or worker has ever received salary. It has been a labor of love. It has by prolonged and faithful work, in intense self-sacrifice and, more than all, *by great achievements most certainly demonstrated that it is worthy of liberal support.*

Now just as we are entering on a greater era of usefulness, friends of the AA, life long students in the AA, let us have the support and that, too, liberally.

Every dollar will be used to good advantage.

Words! Words! Words!

This magazine stands for one fundamental purpose in nature study. It is for the study of nature, not for the mere reading about nature. We do not care to receive long discussions about nature in the abstract, with elaborate descriptions of nature in general. We want things that will arouse an interest and tend to incite direct personal relations between the student and the studied. We want every subscriber to feel that the editor is a personal friend, who is more eager to give help, where help is needed, than he is to receive pages of flowery descriptions. The editor believes in studying nature not in writing words, words, words about nature.

This does not include profound technical investigation nor does it necessarily exclude that kind of study. The person who sits in the shade of an apple tree and watches a robin build her nest in another apple tree is a close student of nature, and is as truly and carefully studying as is one

who makes sections of bumblebees in parafine and for hours pores over those sections and makes elaborate drawings of them in his notebook by the aid of the camera lucida. I believe that both are right. One prefers one kind of work, the other another kind. One prefers the informal, the other the strictly formal, and this magazine is in sympathy with both, although it prefers the informal.

But it is not in sympathy with articles self-evidently taken from nature-study books or from encyclopedias, nor is it in sympathy with mere explanations of emotion excited by a general view of nature as of a landscape, all of which might be condensed in the assertion, "I love nature," "I love nature," "I love nature." Let us understand one another. We want to avoid the necessity of returning manuscripts and photographs, because that takes the time of the editor and of the office clerk and is withal annoying to the contributor. We welcome as cordially and as promptly the original observations of the novice as those of the veteran. The question is, Have you seen something of the interest or beauty of nature that really means something definite to you, and will mean something definite to those for whom you describe your observations? We frequently receive letters intended to be commendatory, which tell us how interesting the magazine is and how much the subscriber enjoyed reading it. All this is of course pleasing. We should not be true to human nature if we attempted to convey any other impression. All of us like appreciative words, regardless of the form in which they come. So while we do not say that we dislike such communications, we do say that the only thing for which we are working is to incite in both reader and contributor a direct, personal interest in nature. It is the editor's firm belief that the multiplicity of books and magazines on nature study tends, in a certain and positive sense, to lessen any real active interest that the reader of such literature might otherwise have been led to exhibit toward his immediate surroundings, which means "that state

of life unto which it shall please God to call" him. The great American reading public seems to be contented to take everything for granted on the authority of some one else who has developed and nourished a real interest in that part of nature in the midst of which he exists. We shall be glad to know that something has been said in the magazine which has brought some one back to nature, or in the words of our beloved Agassiz that the reader has learned to "study nature not books."

Difficulties in Early Days of a Great Movement.

"I suppose no great effort has ever been made for the improvement of conditions, for the advancement of the human race, that has not been met with bitter opposition, ridicule, and abuse from the people at large; but when the heroic reformer with a spark of Christ-like patience says: "Father forgive them, for they know not what they do," and holding steadily, unswervingly to his course, reaches the goal, and, though weary and exhausted, establishes firmly the new and better condition of affairs, the people are apt to accept the benefits accruing, as a mere matter of course, and give no thought to the price paid by the reformer for his success.

"To-day the Society for the Prevention of Cruelty to Animals is a recognized power for good throughout the land. The most prominent, the most powerful men, the most gracious and influential women are proud to serve it; while the bright-eyed, observant babies of the entire country are its eager little agents and flying messengers.

"It has offices everywhere, paid officials, agents, lawyers, doctors, workmen, ambulances, shelters, machinery for rescue, and the merciful lifting and lowering of fallen beasts of burden. To-day all such work is done before approving and admiring eyes, but once it was a different story. For this society came into existence amid a very storm of disapprobation, with rumbling jeers and imprecations from

the vulgar and debased, flashing with the sarcastic and malicious mockeries of the thoughtlessly indifferent. Infamous cruelty stalked rampant through the city. The brutalities familiarly witnessed on every hand were coarsening the fibre and hardening the hearts of the people, and thus lowering their spiritual standard. For so closely interwoven are the interests of man—made in God's image—and the gentle dumb creatures given to his service and his care, that cruelty and brutality to the patient beast of burden result in the debasing of the guilty man himself. Therefore this Society, in constituting itself the defence of the defenceless, truly served man as well as beast, in teaching him to control if not to conquer his savage instincts—his senseless furies."—"The Life of a Star" (by Clara Morris) in chapter on Henry Bergh.

The Myth of the Gulf Stream.

Benjamin Franklin on returning from Europe about 1730 measured the temperature of the Gulf Stream with a thermometer, undoubtedly a Fahrenheit mercurial thermometer, so that he and Dr. Lining of Charleston, S. C., were the first to bring such thermometers to America. Ever since that day English, French and German writers have lauded the Gulf Stream as the great regulator of the climates of Europe and America. But how is it possible for this warm stream a few miles wide off the Florida coast to affect the climate of Europe 3,000 miles away, or the climate of the United States where westerly winds prevail. Elaborate measurements of the temperature of the surface water of the Atlantic ocean have abundantly demonstrated that there is no special warm Gulf Stream north or east of Cape Cod, Mass., so that from that coast eastward to Europe the westerly winds may carry moisture and mild rainy weather, but no warm Gulf Stream temperatures.

In the Pacific Ocean the Japan Current is observable as far northward as latitude 40 degrees North, off the coast of Japan, but beyond this, again, the ocean temperatures become uniform

and the warm stream is not recognisable. Therefore the west winds of the Pacific bring to the American coast the general temperature and moisture of that immense body of water, but not any special influence from the Japan Current. These matters are so plain that every reasonable man should give up the old errors regarding the influences of these warm currents on distant coasts.—C. A.

In Springtime.

BY FRANK M. VAN SCHLAACK, HARRISBURG,
PENNSYLVANIA.

The bluff March winds have whispered to
each tree
And sleeping plant their words of timely
cheer;
They said, "The land from winter's power is
free,
Awake! the time to rise is surely here."

The pussy-willows burst their prison cells,
And thrust themselves into the light of
day:
Hepatica upturns its purple bells,
And bids the April sunshine longer stay.

The dainty blooms of maples hastening out,
Imparting nectar to the hungry bees,
The flower-lined twigs of cherries tossed
about,
All lend their fragrance to the western
breeze.

The bloodroot rears its snow-white, cup-
like flowers
Along the southern slopes of wooded hills,
To catch the crystal drops that April
showers
To quench their thirst and feed the moun-
tain rills.

Above the leaves of many a woodside dell
The windflowers lift their gentle, smiling
faces
With nodding heads the trilliums to tell
That March's storms are won by April's
graces.

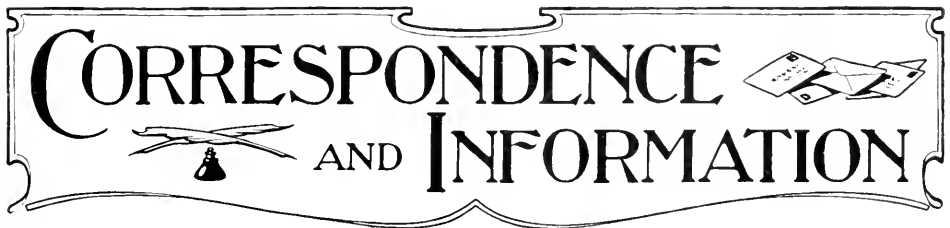
The pulpit Jack stands up beside the way,
As if us to instruct in wood-folk lore;
But not one word of wisdom can he say
About the secrets wood-folk have in store.

Gay dandelion dons his gorgeous coat
Of fine spun gold all trimmed in laurel
green,
He stilly bows to passing winds; to dote,
He seems, on dress and strives to have
his seen.

And now the daisies knit the waving fields
In tapestries of green and white and gold.
Fair eglantine the call of summer feels,
And wafts its perfume o'er the wayside
wold.

While swiftly fly the happy days of May,
The meadow lands with buttercups are
strewn.
The flowers of spring begin to fade away,
To yield their place to those of sunny
June.

CORRESPONDENCE AND INFORMATION



Aquariist not Aquarist.

Philadelphia, Pa.

TO THE EDITOR:

You will notice that in the manuscript I use the word aquariist, which in two issues you changed to a aquarist.

The word aquarist has been taken by artists to designate a water-color painter; the fancier of an aquarium is an aquariist, the difference being that one word is made from *aqua*, water, the other from *aquarium*, a container of fluvial life.

I merely mention this that your readers may not think a deliberate substitution has been made.

Very truly yours,

H. T. WOLF.

Importation of Skylarks.

Victoria, B. C., Canada.

TO THE EDITOR:

Five or six years ago the Natural History Society of Victoria, British Columbia, decided to import a number of song birds from England. Quite a large sum of money was subscribed

and skylarks, bulfinches, and English robins were brought out and liberated. The robins and goldfinches soon disappeared, but the larks lived and are increasing at a good rate. They may now be heard any morning in the fields surrounding the city, as they soar almost to the clouds. Recently they have been found to be scattering somewhat and it is hoped that they will eventually spread over the whole of Vancouver Island.

It would certainly be of interest to the readers of *THE GUIDE TO NATURE* to know what other importations of skylarks have been made to this continent. There is no other place in Canada where they have been imported. The birds in the neighborhood of Victoria do not migrate, but may be heard singing all through the winter months.

HENRY F. PULLEN.

Quick Growth of Rodent's Teeth.

Portland, Me.

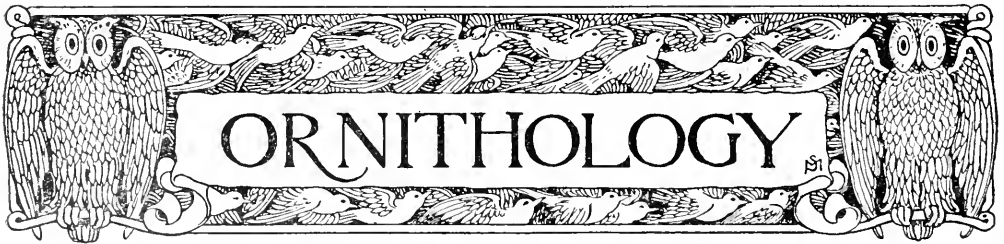
TO THE EDITOR:

Regarding the interesting facts told of the teeth of woodchucks in the

March number: it may not be generally known that the teeth of rodents when accidentally broken off grow very quickly again. I noticed one day that the chipmunk whose photograph appeared in the February number made very awkward work of taking things into his mouth and pouches. Examination revealed that one of his lower teeth was broken off over half of it being gone and so care was taken that soft food was furnished him. But in a very short time—less than a month—the tooth was grown to the original length. It is quite necessary that captive members of this family be given nuts uncracked in order that their teeth be kept worn down by use. The illustration shown by Miss Knowles gives a fine idea of what happens when a rodent is not able to keep his teeth in practice.

F. S. MORTON.

I have read the first ten numbers with interest. They appeal to me as "just right" and contain a whole lot of the information we are all looking for.—Raymond L. Ditmars.



The Varied Repertoire of the Mockingbird.

BY HARRIET WILLIAMS MYERS, 306 AVENUE 66, LOS ANGELES, CALIFORNIA.

It was a glorious winter's morning. A perfect day, it seemed to me, as I sat in my yard and revelled in nature's beauties. A recent rain had cleared the atmosphere, washed the dust off the vegetation, and made the air pure and sweet. The warm sun proclaimed it a spring day albeit the calendar said it was still winter.

No wonder that the hens were cackling noisily, proclaiming eggs to their credit, or squawking in a satisfied, if

unmusical, way; the bees hummed drowsily as they gathered honey from the pepper blossoms above my head, and the mockingbirds sang.

The season had been a dry one,—too dry the wiseacres said—for the country's good, and it seemed as if the mockers, feeling this lack of moisture, had withheld their songs for a more propitious time. And so this medley going on above my head was doubly welcome. California, with all its wonders, would lose half its charm should the mockingbirds cease to sing.

As I listened to this wondrous song floating down upon me, I marvelled at the varied repertoire, and smiled as I



YOUNG VALLEY QUAIL

recognized the notes of other feathered friends whom I knew were nowhere about. "Ja-cob, ja-cob, ja-cob," called the bird, mimicking to perfection the large California woodpecker who dwells in the *Arroyo Seco* not far away. The "ja-cob" note was followed by trills and warbles all the mocker's own, but not long could he keep to an original song. A shrill note of the California shrike followed and I was reminded of a morning when, hearing the sweet song of one of these birds, I rushed to the door only to find it was "my" mockingbird trying his voice. Most people think of the shrike as only having a shrill, most uncanny call, but in reality he has many notes and a song that is a low warble which is often sweeter than that of the famous songster whom in color he resembles. Not often do I hear the real song of the shrike. Hence my anxiety to catch every note of it, and my disgust to find that I had again been "fooled." However, there is consolation in knowing that I am not the only one who has been tricked by this wiley bird. More than one sleepy mortal has been aroused in the dead of night and gone out to see what was disturbing the chickens, only to find it was the saucy mockingbird, who, having inveigled his victim out of bed, pealed forth his song in sardonic glee at his deceit. Verily, I believe that this "mocker" is also a "joker." could we understand his language we would

find his enjoyment of pranks played on other birds, and mortals, very keen.

There were still other notes of the shrike, this versatile singer used as his song rippled forth, and another call of California woodpecker he also gave. It was a guttural, rasping sound that I have often heard them make as they hammered acorns into a rotten tree.

But the shrike and the woodpecker were not the only birds that my song-



CALIFORNIA VALLEY QUAIL



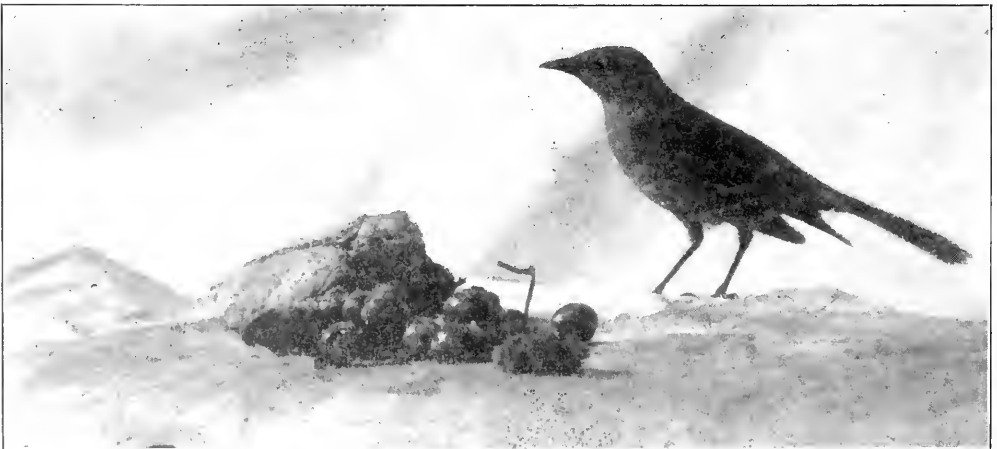
CALIFORNIA WOODPECKER

ster mocked. Far from it. I have sometimes thought that it would be easier to name the birds that this vocalist does not mock than those he does.

The call of the California jay was shouted forth even as that blue tyrant shouts it; also another, longer, note of the same bird was given. The "Pip, pip," in imitation of the purple finch who was foraging in the yard and also giving the note, reminded me what an indication the song of the mocking-

bird is of presence of certain birds in the neighborhood. I have sometimes thought that a keen observer could almost tell when the summer birds have arrived by listening to this bird's song. It would seem that out of sight was out of mind with this mimic, since through the winter months the notes of the winter birds and those that are more commonly about are heard. But no sooner has the black-headed grosbeak returned from his southern sojourn, and commenced his beautiful song, than a portion of it is taken up and woven into his own effort by this versatile bird. "Whit-we-a, whit-we-a, Sweet Marie," he shouts from the tree top that the passer by may fully appreciate his wonderful ability. The orioles with their noisy chatter come in for their share of attention as does also the Arkansas kingbird with his rapidly given, "Whita, whita, whita." Many birds having single notes that would not be noticed by any save one very familiar with bird music, are used by the mocking-bird, being woven into his song as if they were his very own. The nasal twanging note of the western gnatcatcher is a notable one, the shrill whistle of the brewer blackbird, the "Pheb" of the black phoebe, the liquid note of the phainopepla, and the wierd note of the wood pewee are others.

One of the most triumphant vocalistic feats of the mockingbird in my



MOCKING BIRD AT BIRD TABLE

estimation, is his ability to imitate the three-note falsetto call of the valley quail. When I first heard the quail give his note I thought that he plainly said, "Whip-poor-Will," but this call has been variously interpreted. To some he seems to say, "Get-right-out" while others are so unkind as to make this jaunty beauty impolitely say, "Shut-right-up!" Just how the mockingbird means to interpret it I would not venture to say, but that he succeeds in imitating it perfectly, I know.

Not so well does he succeed when he tries his voice on the song of the western meadow lark. Attempt it, however, he does and although there is no doubt as to what he is undertaking, he is unable to carry the refrain long. In fact, I have not often heard him undertake it but I believe it is because he does not frequently hear the song rather than his unwillingness to undertake it.

Sancy, inquisitive, sulky, fun-loving, scolding mockingbird, bird of as many moods as notes—long may you continue to be our yard pet, and may your matchless voice ever ring clear in your varied repertoire.

Field Lillies.

BY EMMA PEIRCE, NEW YORK CITY.

All the bells of the lilies are ringing,
Keeping time with the neighbor-birds singing,

With the joy that the summer is bringing.

Matin bells! of the sunshine's own tinting,
With the pure morning light on them glinting,

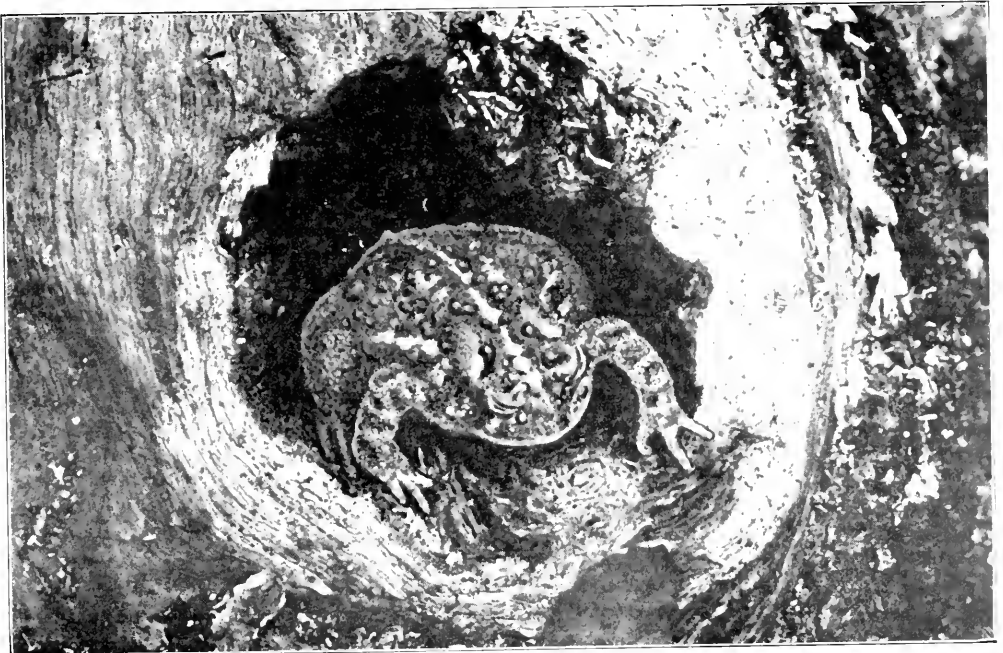
Of glory ineffable hinting.

Vesper bells! with the sunset hues glowing,
From their fair golden chalices throwing
A halo round all 'neath them growing.

"The Guide to Nature" continues to improve. I did not think you could do it. The money you have put into the magazine warrants a big subscription list and I trust you are getting it. It is the best publication of the kind that I know of and deserves to succeed.—Willard N. Clute.

I have read with great pleasure the issues of "The Guide to Nature." I wish you all success in the future of this splendid journal.—A. W. Nolan, A. B.

I think "The Guide to Nature" is decidedly improving and I believe will get better and better.—Earl Douglass.



A QUEER "BIRD" IN ITS NEST IN A HOLLOW TREE



The Heavens in May.

BY GARRETT P. SERVISS, BROOKLYN, N. Y.

The Chart shows the sky as it appears at 9 P. M. on the 1st of the month, 8 P. M. in the middle and 7 P. M. at the end.

The historic comet represented this month is that of 1861, one of the most celebrated in the annals of astronomy. The Chart shows its position on June 30th, nineteen days after its perihelion passage. Few comets have made a greater sensation, for its appearance was altogether unexpected, and it came up into the northern hemisphere after passing perihelion, in the full blaze of its splendor, with a great divided tail, some of whose streamers were more than a hundred degrees in length.

THE PLANETS.

Jupiter remains the planetary king of the evening sky, although the earth is now drawing away from him. He is seen west of the meridian, near the Sickle in Leo, and in brightness he far excels the brightest of the fixed stars. His steady planetary light is a pleasure to the eye, and no object can be more interesting for the possessor of even the smallest telescope. His great colored belts are always in evidence, their appearance changing from hour to hour, while the motions of his four principal satellites, with their eclipses, and occultations, are an unending delight for the observer. Even without a telescope, or any other instrument, Jupiter is a fascinating object to look upon, especially when we reflect that he is the greatest planet in our solar system, almost 1400 times larger in bulk than the earth we live on. His distance from the earth is now, in round numbers, about 400,000,000 miles. Neptune in Gemini is,

of course, invisible to the naked eye. He can never be seen without a telescope. Mercury, however, is now, visible, reaching his greatest elongation east of the sun on May 20th. He is quite brilliant seen in the twilight after sunset. Venus has been east of the sun, and consequently an evening star, since April 28th, but she will not become a conspicuous object until later in the year. The other planets are not now in the evening sky.

THE STARS AND CONSTELLATIONS.

The whole length of the enormous Hydra can now be seen, stretching across the southern sky, starting with the diamond-shaped head under the Beehive cluster in Cancer, and running under Leo, Crater, Corvus, and Virgo, nearly to the eastern horizon. His brightest star, the lone Alphard, exhibits a reddish color. Below the central and fore parts of his elongated body may be seen some of the stars in the rigging of the ship Argo, and below his tail some of the stars of Centaurus. Virgo is very conspicuous in the south-east, especially on account of the beauty of its chief star, the pure white Spica. The situation of the celebrated binary, Gamma Virginis, is indicated on the Chart. This is well worth looking at with a telescope. The two stars composing it are each of about the third magnitude, and their distance apart is a little less than six seconds of arc. They revolve about their common center of gravity in a little less than 200 years. A 3-inch telescope shows them beautifully. Above Virgo the glimmering cluster in Coma Berenices is conspicuous, and east of it glows great Arcturus, one of the most brilliant of the fixed stars, and the brightest in the constellation Boötes,

the Bear-Driver, who seems to be pursuing the Great Bear, Ursa Major (the Great Dipper) around the pole. Among other constellations particularly beautiful at the present time is Corona Borealis, which may be seen, with its almost perfect circle of stars, northeast of Arcturus. Away over in the northeast Lyra is seen rising with the glittering Vega, which is as bright as Arcturus, but

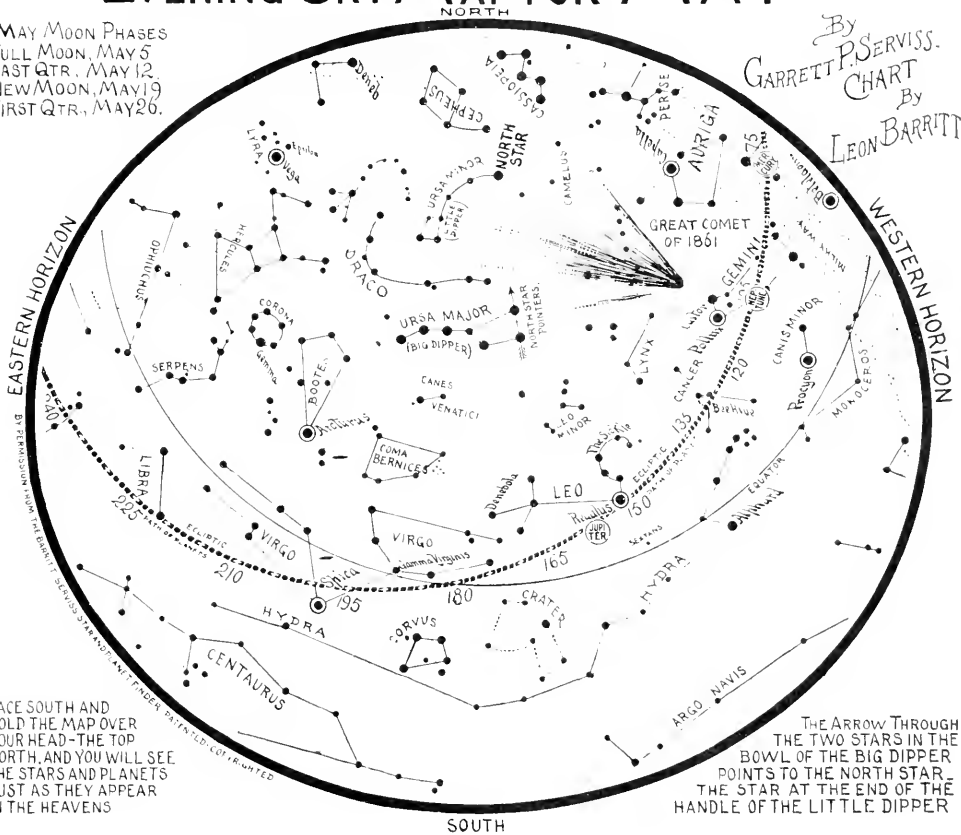
Herschel's discovery that it lies ahead of us in the path which the Solar System is pursuing straight toward the north, at the rate of more than 300,000,000 miles per year. Later studies have shown that the real direction of this vast flight is rather nearer to Vega than to the central part of Hercules.

Leo, in mid-heaven, is well placed for observation, the figure of the Sickie

EVENING SKY MAP FOR MAY

MAY MOON PHASES
 FULL MOON, MAY 5
 LAST QTR., MAY 12
 NEW MOON, MAY 19
 FIRST QTR., MAY 26.

By GARRETT P. SERVIS.
 CHART
 By LEON BARRITT



strikingly different in color, its rays being blue-white while Arcturus is orange, or at times almost red. Both of these stars are of immense actual magnitude. Arcturus probably exceeding our sun at least 1000 times in brightness while Vega is hardly less enormous. But Vega is apparently young in the order of evolution, and Arcturus is old, older than the sun. Between Corona Borealis and Vega appears the constellation Hercules, forever memorable from Sir William

is clearly marked and the leading star Regulus, at the lower end of the handle, is not only bright but it is important being one of the "nautical stars" employed by sailors in finding their longitude at sea.

There is a well-known meteor shower in May, known as the Aquarids, because they radiate from the constellation Aquarius. As that constellation does not rise before midnight these meteors, if any are seen in the evening, will appear shooting

up from the horizon in the northeast. They are visible from the 1st to the 6th of the month. They move swiftly, making streaks in the sky, which usually vanish almost instantly. Bolides, or fire-balls, not belonging to

any meteor shower may make their appearance at any time. A most wonderful one was seen in England on the evening of February 22nd last. It left a glowing trail which remained visible more than two hours.



A Cat Mothers Squirrels.

BY GEO. W. IRVING, PHOTOGRAPHER,
WATERVILLE, N. Y.

(For remarkable illustration, see frontispiece.)

On the farm of Albert Fisher in Waterville, N. Y., in June, 1908, a cat was the happy mother of several kittens. As there were too many cats already on the farm it was necessary to kill the playful little ones, and after that the grief of the mother cat was most pathetic to see. She refused to eat and took absolutely no interest in anything but her ceaseless search for the missing offspring. One day a young squirrel was taken from its nest in a tree some distance from the house and offered to the cat as a tempting morsel. Instead of toying with and torturing the baby squirrel and eventually eating it, as is the nature of a cat, she promptly transferred the love and affection she had for her kittens to the young squirrel. She gave it all the attention and kindness that her warm mother heart could suggest, and the young squirrel was happy. The next day the mother cat sought out the squirrel nest in the tree and took all the young squirrels to the box where her kittens had been. There she reared her odd family, giving them the same nourishment and in the same manner that she would her own kittens. The squirrels grew up and when big enough returned to their native haunts in the trees.

The Last of the Purple Martins in Stamford.

BY ELIZABETH L. SMITH, STAMFORD, CONN.,

The beginning of our martins was that they came to our pigeon houses. After boxes were put up for them, they came to us regularly so that in the course of a year or two, when getting ready to migrate south (which they always did on the eighth of August), they would number a hundred or more.

They would arrive on or near the ninth of April, and, in proof that birds return to their old haunts, one ninth of April our man looked abroad in the sky many times, being finally rewarded by seeing one come at five o'clock in the afternoon and make a tour of three boxes (which, however, were closed to prevent the English sparrows from taking possession). The fourth box was on the barn floor, ready to go up. The ladder being in place, the house was immediately raised and while it was being fastened the bird came in at the rear and remained for the night. After being rested, apparently, the bird left to return again in a day or two with several others.

All went well for several years until the cold, wet June of 1903 or 1904 when there were no insects in the air for them to feed upon, either for themselves or their young and the old ones dropped dead around the place (the taxidermist saying they were only skin and bone), starved to death, and of course the little ones in the nests

died from cold and starvation. Of the two birds stuffed one was a male with jet black, glossy feathers; the other a female with grey breast.

They would fight valiantly for possession of their homes against the English sparrows, having been seen in two instances to drag the sparrow out and dash him to the ground. But few lived through that inclement June and they never came again to my knowledge to Hubbard's, Noroton, or Clark's Hill boxes.

Experiences with Pet Bats.

BY EVELYN GROESBEECK MITCHELL
WASHINGTON, D. C.

Bats, by most people, are hardly considered in the light of possible pets, but, as a matter of fact, I know of none more cunning and interesting. They are not hard to keep, either, but there is one thing that must be kept in mind—they will not live in a cage. They want the liberty of a room, and the attic or cellar will answer very well.

I have had several bats at different times; three brown, two black, one red and one hoary. They stayed in my care from three months to over a year when I let them go, with the exception of the hoary, which, through neglect in my absence, died in a few weeks from the time he was caught.

My first bat was a little black fellow, brought me by a highly excited Irish lad, who had found the "quare mouse" in his cellar. I turned the furious, scuffling, wee beastie loose in a box with glass sides and wire top, where he hung himself upside down. There he hissed and squeaked to his heart's content, raising a terrific fuss at my near approach. If his body had been as large as his temper, I have no doubt that I should have been swallowed at one gulp. For a whole day the obstinate little scamp starved himself, snappishly refusing flies offered on a straw. Thinking that the way to his heart would best be found through his appetite, I finally popped flies into the wide-open mouth. The first two or three he spat out angrily, but soon shut his jaws on one by mistake. Then he concluded that eating was a

far pleasanter and more profitable occupation than scolding, though for some time he continued to give me a piece of his mind in the intervals between flies. Within a couple of days, however, we were on the best of terms, and he would lift his queer little square nose at me with a pleased twitter very different from his first angry, shrill squeaks. Then I let him loose in my room, where he hung up on a bunch of sea-weed, but shut him up when the lights were on.

All the bats, except the red one, were very easily tamed, soon learning who fed them and snuggling cosily down in my hand to eat or take a nap. Dear, cuddly things they were, like soft floss silk, with such bright beads of black eyes. As for their wings—well, dead bat's wings may be leathery, but these live ones were like the most delicate Japanese silk crêpe. The membrane is very sensitive, but after a while my pets would allow me to gently spread their wings.

Their tiny teeth were needle-like, but although they occasionally flew into a ridiculous rage and treated some one to a nip, their puggy jaws were too small to allow of serious damage. The little red bat had a frightful temper, screaming as if he were possessed and nipping at the slightest provocation. The hoary was very gentle and even affectionate, loving to have his head and back scratched with a bit of stick, as did most of the others. Had he lived he would have been the nicest pet of all, since he was large enough to be easily handled and had very beautiful dark brown fur with snowy frostings. He seemed the most intelligent, though none of them were stupid. Most of them objected to strangers.

The bats used to begin to get hungry and fly about any time after two in the afternoon, generally late when it was bright or hot, and quite early on cloudy days. They would swoop low, catch on my skirt near my knees and come scrambling and chattering up to be fed. As they proved to have storage room for as many as 80 or 90 flies during the day, I soon gave up that method of feeding, since



THE PET BAT IN ITS FAVORITE POSITION

it would have taken most of the family time for the occupation of fly-trap. Raw beef, in very small scraps, and milk, which they greedily lapped from a doll's spoon, proved to be satisfactory substitutes for insects. In chewing they opened their mouths wide, in the most unmannerly way, at every bite. They would come down to drink from a saucer of water arranged so they could get at it. They always made a great scrambling and flapping to take wing again from the flat surface on which they had alighted. One of them occasionally dipped to the water while circling about the room. Sometimes during the fight, a fly struck the membrane near the tail. Instantly the tail doubled up, the insect was "bagged" and the bat, duck-

ing his head, devoured the fly without ceasing his circling.

Although they would hang on our clothes and fingers, I never knew them to take to any one's hair. They were very clean and washed a great deal, hanging up by their hind feet during the process. They licked themselves all over, scrubbing their heads and ears with their wrists and twisting 'way around to reach their backs.

Our Mary did not like their uncanny appearance. "Och," she exclaimed, when she saw the first, "'tis a little young divil and 'tis. Oi-in not shtayin' in the house wid a little young divil." She did stay, however, but never would she set foot alone in the room with a bat.

On warm spring nights, my little rovers of the dark would be apt to hang on the window screens and favor me with a serenade of high-pitched, cricket-like squeaks, to which there was sometimes a response from the pine tree outside. With my first bat, the duet grew so furious and insistent that, after flinging everything available, for several nights, at the bat in the tree, with no effect save to cause him to shift his position, I turned my own serenader out of doors. He stayed about the place for some time.

Summer before last I tamed a bat that used to fly in through my open window. I shut the window and whenever he grew tired of flying about the room, approached him gently. In about an hour he ceased to fly away, and soon allowed me to touch him. A night or two afterward, he came in again. That time I had some beef scraps for him, and finally persuaded him to take one. It was funny to see him licking his jaws with his red little tongue. The upshot was, that I fed that bat several times a week, until he went away, to hibernate. I think. Speaking of hibernating, if you try to keep them all winter, be sure they have a cold place to hibernate in. And don't ever shut them up, or they will sulk and fret and grieve to death for freedom. But if they are kept as I had them, their elfin ways will make them some of the most lovable pets that can be desired.

How a Spider Saved Her Cocoon.

BY W. C. KNOWLES, WASHINGTON,
CONNECTICUT.

Out in the garden a green tip had poked its way through a decaying mat of leaves, and to my delight I found a bunch of daffodils had dared the spring sunshine. Taking a spade, I decided to divide the clump of bulbs, since they were already crowding the hardy border. As a portion of the soil crumbled back into the spot I was digging, I saw a round white object move frantically back and forth in the bottom of the hole, and I soon discovered that I had taken captive a female spider with her cocoon attached to her spinneret.

I stopped my work and watched to see if the little creature could climb out of the pitfall. She was one of the *Lycoside* and so nearly the color of her surroundings that without her white burden, she doubtless would have been buried in the sand. Each time the spider tumbled back from the edge of her prison, she grasped her cocoon beneath her body using the mandibles and a pair of her sturdy legs to securely hold the burden.

When she had gained her freedom I watched her course over the lawn where a tiny forest of grass blades had sprung up after the rain. As soon as the careful little mother found that

the thread, which fastened the precious burden to her body was being entangled among the stiff grass blades, she did not rush blindly ahead but turned back and untangled her load as deftly as human fingers unwind a snarl in a string.

At last I picked up the spider to examine her markings and the slender thread, which still fastened the cocoon to the spinneret, broke in two and the round cocoon rolled over the board walk. Wondering how I could undo the mischief which careless fingers had wrought I placed the cocoon and spider in a small paper box.

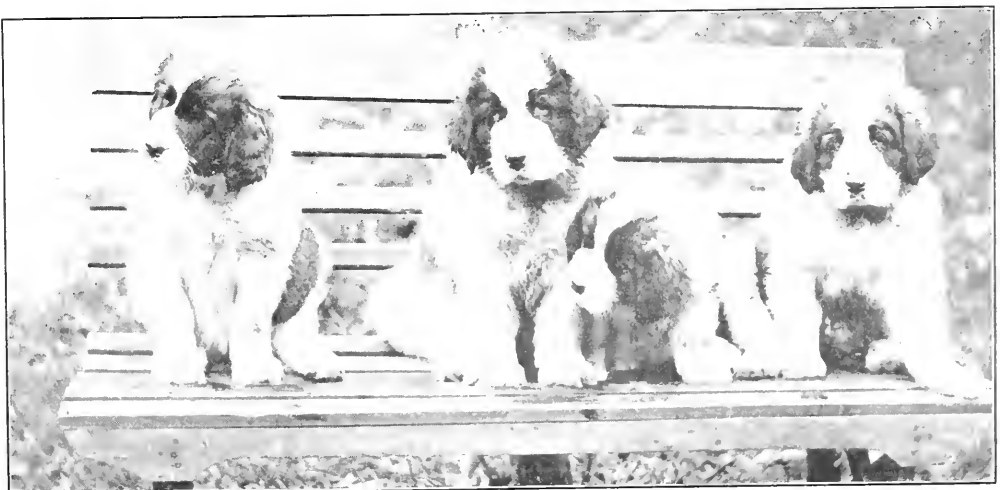
To my great surprise and pleasure when I opened the box next day I found that the spider had reattached the cocoon to her spinneret.

Out in the garden a happy spider soon hurried away to the hardy border where spring had already touched the green things.

This little magazine fills a long felt want and is a credit to its maker.—George A. King.

I am glad that "The Guide to Nature" is rapidly taking the place it ought to take.—Earl Douglass.

This (September), your last issue, is indeed a most splendid and attractive issue.—R. Menger, M. D.



"NOW LET'S SIT DOWN AND THINK ABOUT IT"



THE AGASSIZ ASSOCIATION

Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

"How to Adapt the Society to the Need."

When Dr. E. F. Bigelow recently took the presidency of the Agassiz Association everybody felt that the development of that institution would not proceed along conventional lines and they have not been mistaken. Dr. Bigelow bristles with unique ideas that are likely to make people interested in nature-study sit up and take notice. His latest venture is "Arcadia" a collection of portable buildings in Sound Beach, Conn., in which he purposes carrying on various experiments connected with the work of the Agassiz Association. The fund for this purpose have been furnished by a philanthropist too modest to give his name, but the aid is none the less substantial because of this. When the Agassiz Association was first started, there were practically no books of a popular nature by which a student, working alone, could get an insight into the phase of natural history that attracted him, but with the increase of science-teaching in the schools and the issuing of a vast number of books on every conceivable phase of nature, the need for a society like the Agassiz Association was less urgent and there was a general falling off in membership. We are of the opinion, however, that there is still, a decided need for something of the kind and that Dr. Bigelow will find out how to adapt the society to the need. If "Arcadia" proves to be a success after two years trial, it will become a permanent feature; if not, we may expect Dr. Bigelow to originate something else as novel. More than twenty thousand boys and girls have been helped over hard places by the Agassiz Association. Among them was the editor of this magazine who remembers with pleasure and gratitude his connection with it and he could wish no better fortune for the rising generation than that it, too, may discover the delights of membership. The American Fern Society, the Sullivant Moss Chapter, and the Gray Memorial Botanical Chapter, all had their origin in the old Agassiz Association.—"The American Botanist."

I am sincerely grateful for this notice which is evidently designed to be complimentary. But it is not wholly a joy, because it expresses a common yet

erroneous idea of The Agassiz Association. It is the mission of the AA to advance a knowledge and increase a love of nature that is in cooperation and sympathy with the systematic science of the schools (of all grades from kindergarten to university) yet is entirely distinct from their methods.

Again, and even more important, the AA is the more needed as the books on nature are increased in number. If our knowledge of nature has been limited to the nature of the books, the more do we need to follow Louis Agassiz's advice, "Study nature, not books."

Further, on the supposition that a knowledge and love of nature has been increased by "science-teaching in the schools" and "the issuing of a vast number of books," then more than ever is the AA needed to teach the pupil how to observe when unaided by the teacher's presence, how to compare two closely similar objects, how to make his own decisions unaided except by his own mentality and cerebral acuteness, how, in a word, to stand upright on his own feet and to help himself. A book can do none of these things. A book may help, as a sharp axe in the hands of a skillful woodsman may help to build a city by felling a tree in a primeval forest, but one axe and one man will not build the town.

To illustrate:—The wider the dissemination and demand for religious books, the greater the number of successful evangelists and the greater the interest and efficiency of churches. Or, to change the comparison, the more music books and music teachers, the more effective our musical societies will become.

To come back to the main argument. The AA is not a stepping-stone; it is not merely a tool, it is not merely a help, it is a fellowship of feeling and purpose between one lover and student of nature and all other students and lovers of nature. The more of such study and love that we have, the greater our zeal in the AA. "A fellow feeling makes us wondrous kind," or something to that effect, you remember.

All honor to the important work of the AA in the past. Great as was the success of "the old Agassiz Association," the demand for similar work in the future is even more urgent.

The methods, the needs, the points of view may change slightly as the years go by; but for one fact let us strive—never, Oh! never to be merely a "has-been."

How Nature Comes to Me.

SUSAN TUCKER, CHENEY, WASHINGTON.
CORRESPONDING MEMBER NO. 2047, OF
AA.

We were asked in the prospectus of THE GUIDE TO NATURE how we came in contact with nature; "Do you travel to nature by aid of a railroad train, a steamboat, automobile, carriage or bicycle, or on foot? It makes no difference how you go; the question "Do you go?"

"Do you use any tool in getting near to the heart of nature,—any camera, cage, hatch, hoe, dibble, hive, hammer, plane, field-glass, microscope, collecting case, net, etc.?"

Well suppose you do not go anywhere, and suppose you cannot use any tool for any purpose that is no reason why you would not find pleasure in nature study.

When you cannot go to nature if you can see and will look you may find nature come to you. And if you love nature it will be near your heart even if you are shut within four walls.

I have thought of this lately as I have been closely confined in the house all winter, and could only study the outdoor world from my window or from the door steps.

From my window I can see pine trees and I know that there are more

trees just beyond those I can see, and sometimes I think it would be delightful to take a walk in the woods to see the beasts and birds of the woods. Having always lived on the prairie the woods are always a novelty.

I have a few fruit trees, and bushes of small fruit currants, gooseberries, raspberry and blackberry bushes; and some flowering shrubs two large beds of asparagus and numerous perennial plants that keep more or less foliage through the winter. It has always been interesting to note the number of woodland birds that will stop for rest or food in my yard.

This winter we have had few bird visitors until recently. For several days a large flock of birds have been finding food among the apple trees, especially on a tree not far from the house where there are apples still hanging on the tree.

The bird is as large or larger than a bluebird, so far as I can see it seems to be gray with light bars on the wing and a crest that looks red. I tried to look at the birds with the field-glass but from some cause that glass is of little use. It makes things look larger but you cannot even guess at the color as everything is edged with rainbow colors. I will keep a close lookout for the birds may come close to the window by and by.

Two weeks ago I chanced to glance out of the window and saw a prairie chicken flying directly toward me. It lit by the doorstep, walked deliberately to a nearby rose bush, picked about it then went to the asparagus bed where it made a meal on the berries. It then flew on top of the house, and after a few minutes we heard it fly away.

One morning when I stepped out of the back door I heard a quail calling "Where are you, where are you?" The voice seemed to come from a raspberry patch not far away. I peered at the bushes hoping to get a sight of the birds which continued to call and I fancied they were getting impatient. I was quite startled to hear a quail answer quite near me and there in the open yard, on the closely cut lawn-grass not twenty feet from me was a quail with head erect and it walked

with stately step until near the bushes where it ran swiftly and hid with its mates. They must have concluded that they were safe there as they did not leave while I watched for them.

Seven quail had been seen frequently about the barn. One ventures in and scratches in the hay with the hens, but always flies down into the cow stable or among the horses when anyone goes into the hay mow.

They had also been seen at the wood pile near the house, and a few days after I saw the one in the back yard I stepped out of the living room door to shake a rug, and frightened the whole flock of seven quail from the asparagus bed not ten feet from the door.

A cotton-tail made its home in the yard for a long time. I saw it frequently after the middle of August. Our cat chased it. She evidently did not think she could or should kill it, so she simply tried to frighten it away. It ran and hid, but did not leave the yard for a short time afterward I saw some chickens chase it and I thought no wonder the little creature was so timid if every other creature tried to frighten it. After snow came we saw the rabbit tracks and cat tracks together and supposed that the cats would soon kill the rabbit. But it was not until the middle of December that they came together.

My husband saw a cat watching along the pathway to the gate and as the path skirted an outbuilding he supposed the cat was watching a mouse hole. When he came back to the house another cat came out as he opened the

door. A minute later, Daffodil, the first cat mewed to be let in, and as soon as it had its saucer of milk it mewed to be let out again.

Half an hour later when breakfast was over my husband started to the barn but returned to tell us that we might see something if we would keep very quiet. We went out and saw the two cats watching a little cotton-tail which they had cornered. We saw blood on the snow and some rabbit fur also, and supposed the little fellow was badly hurt. My little daughter went up to the rabbit and picked it up. It gave several cries but did not try to get away. She brought it in the house. I then took it to examine its injuries. There was no blood on it and no scratches that I could see but a wound at the back of the neck. While I was looking it over, Daffodil came and putting his paws on my lap began to lick the rabbit, washing it carefully and not acting in the least as if he thought the rabbit was meat for cats. The rabbit's ears were wet and in fact it was damp all over. My sister who was with us decided as we also did that the cats had played with the rabbit and when it had tried to get away they had bit it as they do a mouse to make it keep quiet.

Supposing the rabbit was badly hurt my husband killed it; but when it was dressed the wound on the back of the neck was found to be not very deep, and it would in all probability have lived. That is if the cats had not played with it too often.

The La Rue Holmes Nature Lovers League

BY GEORGE KLINGLE, SUMMIT, NEW JERSEY

Explanation:—The aims of this League are in many respects the same as those of The Agassiz Association. Therefore it has been proposed that the adult interests be represented by "The Guide to Nature" and that the League co-operate, or possibly be affiliated, with The Agassiz Association.—E. F. B.

The annual L. H. Nature Lovers' League celebration was held at the Summit, New Jersey, High School, on Arbor Day, May 7th, when many ex-

cellent essays on nature themes were read and appropriate musical numbers were rendered by the pupils.

The members of the Geological Chapter, and others, accompanied Doctor Henry Kummel, New Jersey State Geologist, on a tramp of some miles on Saturday, May 8th, for the purpose of interpreting landscape in the neighborhood of New Providence and Chatham, New Jersey.

I want to offer a copy of Professor Forebush's book, entitled "Useful Birds and Their Protection," for the best, concise essay, submitted by members under the age of twenty, on the subject of "Starch: Nature's Starch Factories." Contest closed on June 30th.

We would appreciate the favor if our secretaries would report, not later than June 5th, as to success in the germination of garden seeds distributed. Reports of competition in developing best plants or of individual successes in plant culture this season should reach us not later than October 5th.

Early Migrations.

The mild days of February seemed to somewhat delude the birds this season. Many little wings were fluttering by unusually early. On March 4th, just beyond the writer's window, during the bitter snow and ice storm, an ovenbird was calling and a phoebe was making its way over the conservatory roof. Many little mistaken ones must have perished.

We want records of these early migrations, as well as those of summer and autumn. Throughout our Chapters notice was given of desire for these records, and many have been kept. Will our secretaries please see to it that the early records reach us not later than June 5th; otherwise they fail in full utility.

This appeal for migration records is extended to bird lovers who are not members of the L. H. Nature League.

Printed schedules will be given upon application, provided the records are to be faithfully kept and the schedules returned to the giver at the close of the season.

The Fullness of Life.

All the enthusiasm of God given force in nature is now dominant; the birds are speeding toward their breeding ground, choosing sites and twining nests; the trees and plants are manufacturing material with all rapidity to weave into flower structures, fruit cells, woody fibre.

Go to the woods, the garden; sit down somewhere and look closely at what is going on around you. It is probable you will see something which you have never before observed or which you do not understand. Find out about it and write us that we may share your knowledge and pleasure or perhaps assist you in solving your problem. We cannot all go to the same gardens and woods but we can, in a measure, share around the pleasure we find just where we are.

Census of Wild Flowers.

Who is keeping the census of the wild flowers? The request for this census was passed along the line of our Chapters, and our secretaries have given encouraging promises. Please make returns of records of spring not later than June 5th; summer and autumn records not later than November 5th.

In asking for the census of the wild flowers, a shadow seems to pass over one—there are chiefly only the remnants to be found now; the vast wealth of our flora is passing.

If you love the wild flower, love it truly—wisely; leave it where it grew that it may cast down its seeds or multiply its bulbs and that you may come again next year to find joy in a richer harvest.

There are many among us who are refraining from plucking blooms and uprooting these wild things which when gone will never come to the same habitat again; many of us who are trying to induce others to use this self-restraint that our ways along the wild may be flower gardens. We would appreciate the favor of the names of all interested in this movement.

The Art Faculty in Birds.

That birds discriminate as to color apart from fabric is obvious. No human artist ever proved more conclusively his appreciation of masses and combination of colors than the little artists of the air.

It would seem that soft grasses, of whatever tone of coloring, might serve any little bird mother in weaving her cradle, where grasses were the favorite material; but the critical eye of the little weaver selects an acceptable tone and this alone satisfies her. If the first strands of the nest are tawny, or straw colored, so are the rest. If she chooses a more serious and darker hue, mark how the whole coincides with the beginning. If brown be the favorite color then the cradle is a brown cradle and no mixture though perhaps with some horsehair for lining, which does not interfere at all with the external color scheme so closely and deftly is it twined within. If the superstructure is of twigs mark you how the twigs must all be of a kind: there is no mistake, no accepting anything else which may be obtained more easily; the eye of the weaver must be able to correctly discriminate between colors—shades of coloring—when on the hunt for twigs and grasses. If grey is the accepted color scheme, note how paper and flax, scraps of cotton or wool, are blended with wasp spun tissue; there is nothing straw colored or brown about it; the whole structure shows one motive; the whole selection of material is directed toward an ideal in grey.

The wood peewee's cradles, coated with cobwebs and lichens, are fabrics of beauty in tones of coloring only an idealist could frame.

Observe nests woven of cotton and shreds of hemp from untwisted rope. What a mass of hemp is sometimes required to build into shape such a strong, soft nest; it is hemp and cotton twined in artistic companionship; there are no discordant or varying colors. The style of material once chosen is clung to with persistency, no matter what effort is required in obtaining it.

If moss is the decorative coat of the structure, note the perfection of the color combination; and there are nests, too, twined of twigs in shades of red, dark and rich in color, that lead one to wonder just where the little builders located their building supply.

Find an ovenbird's nest hidden in the grass—that nest with its sheltering dome—and think up, if you can, any more clever color combination of grasses and leaves than the structure within which, though tides of rain may sweep by, the little mother and the baby brood are securely protected. Observe how the drooping masses of leaf stems, all of a color, are made to fall over the opening, creating a fairy-like bower.

When a nest is to be bound to twigs for support, observe the consideration given to harmony in color as well as in fabric. The wood fibre, lichens or whatever be chosen for external weaving, and decoration of the whole, will extend up and wind around the supporting twigs, forming a fitting and decorative nest rim which no human artist could ever hope to improve upon. In this art the vireos are experts, and indeed what could be more captivating to the eye than some of the fancies of these same little builders whose work is art itself, and whose cradles are sometimes strung with atoms of paper banners that chime in with wood fibre and grasses as they flutter on threads of cobwebs.

There are birds who go beyond their fellows in determination to develop the ornamental. A little nest known to the writer is twined with string and edged with a row of mottled feathers—a couple of dozen or more—that stand up straight like a ruff on the nest rim. Another is decorated on one side with a sprig of white pine, with all its array of needles, fastened on tightly with a bit of dark string. One where the beauty of leaves seems to have been appreciated presents something of the appearance of a wreath of brown in perfect unison with the color scheme of the nest—a thing of beauty no human hand could fashion to lovelier outline.

Perhaps the oddest fancy is that of

a mother who must have been content to sacrifice the comfort of her family to her ambition to produce a unique setting for her eggs, her very flat nest of coarse brown twigs being ornamentally lined with clumps of cedar set apart from each other, the spaces between being filled with pieces of white birch bark, altogether a rather unfriendly suggestion in connection with the little breasts of unfledged birds, however unique and ornamental.

Perhaps the naturalist, in his enthu-

siasm concerning nature, may be rightfully accused of sometimes elevating certain interesting forms of humble life to imaginary planes of intelligence, but no observer of the work of the nest builders, whose tasks are completed often beneath our eye, can fail to attribute to the birds powers of discrimination in color marvelous indeed and displaying an art spirit, an appreciation of color tones, which approaches the best of its kind in human thought.

LITERARY AND BIOGRAPHICAL

The American Annual of Photography, 1909. Volume XXIII. Edited by John A. Tennant. New York City: Tennant and Ward.

The "Annual" improves as the years go by. This is replete with good material. We congratulate the editor and the publishers. It has brought much pleasure to our studio.

The Biography of a Silver-Fox: or, Domino Reynard of Goldur Town. By Ernest Thompson Seton. New York: The Century Co.

The purpose is to show the man-world how the fox-world lives—and above all to advertise and emphasize the beautiful monogamy of the better-class Fox.—Author's foreword.

And so the author tells the story from his cub-hood to his splendid prime of that aristocrat of foxes, Domino Reynard, and of his wild, free, happy life among the Goldur hills. Domino was a silver fox:

"Only those wise in the woodlore of the North can fully know the magic in the name. The silver fox is not of different kind, but a glorified freak of the red race. His parents may have been the commonest of red foxes, yet nature in extravagant mood may have showered all her gifts on this favored one of the offspring, and not only clad him in a marvelous coat, but gifted him with speed and wind and brains above his kind, to guard his perilous wealth. And need he has of all such power, for this exquisite robe is so mellow rich, so wonderful in style, with its glossy black and delicate frosting, that it is the most desirable, the most precious of all furs, worth many times its weight in gold, the noblest peltry known



ERNEST THOMPSON SETON

to man. It is the proper robe of kings, the appanage of great imperial thrones to-day as was the Tyrian purple in the days of Rome. This is indeed the hunter's highest prize, but so guarded by the cunning brain and the wind and limb of the beast himself, that it is through rare good luck more than hunter skill that a few of these fur jewels are taken each year in the woods."

So Domino had good need of all his cunning, and his life was an adventurous one. The story of his adventures and his cunning is one to hold and thrill from the first page to the last. It is the story of Snowyruff as well as of Domino, too:

"For ages the beasts have been groping for an ideal form of marriage. All the

schemes of human reverts they have tried, and all found wanting but one. The only plan that has satisfied the highest requirements is pure monogamy. This is the wed-law of all the highest kinds. The love-time fever passes, but another bond remains. The love-fire of the foxes had paled a little with the waning of the hunger moon, but a more abiding sense had supervened, even as the sunset red on the hills may seem more generous fire than the soft red of the granite; but one is there a splendid moment, the other forever and evermore. Love and friendship men call them; and though the flickering red light blazed so bright at times, it was the pale rock red that gave its color to their lives. Domino and Snowy-

From Talk to Text: or, A Likely Story!—Likely Enough. By Addison Ballard. New York City: Longmans, Green and Company.

Here are two quotations that give a summary of the spirit of the author and the relation of the book, in its religious point of view, to the study of nature:

"In the world-making realm the preacher begins with God and ends with the heavens and the earth; the philosopher begins with the heavens and the earth and ends with God."

"If 'On to Revelation' is the foreshadowing command of Nature; 'Back to Nature' is the confirming word of Revelation."



AN INTERESTING FOX FAMILY

From Ernest Thompson Seton's "The Biography of a Silver-Fox:"

Copyright 1909 by The Century Company.

ruff were not only mates, but were friends for life; for such is the way of the noblest beasts, such is the way of foxes."

The telling and the illustrations are Thompson Seton's best.

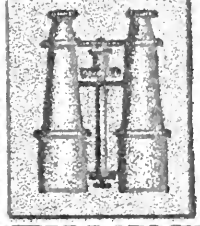
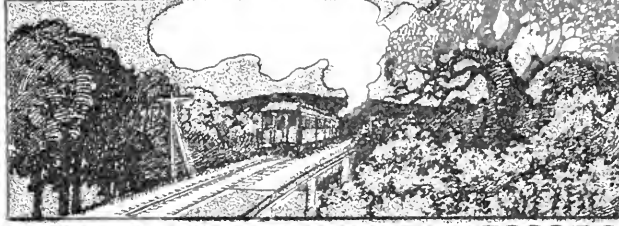
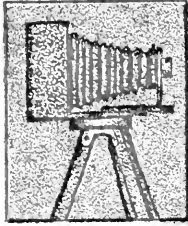
Schnell Astronomy. Being a Treatise on the Origin of the Planets and Daylight by Vibration. What Planets, Moons and Comets Exist For, Also Explaining the Working Method of the Entire Solar System, the Object and the Use of All the Heavenly Bodies that Hitherto Have Been Unexplained. New York and San Francisco, California: Albert Frederick Schnell.

The author makes some "startling" claims with which most of us will not agree. Nevertheless, one can but admire his enthusiasm in his curious theories and explanations.

The Gospel in the Stars: or, Primeval Astronomy. By Joseph A. Seiss, D. D., LL. D. Fourth Edition. New York City: Charles C. Cook. Price \$1.50.

This book seems to me misnamed. From the title I supposed it to be the good news, the inspiration, etc., of the stars. Some one should write a book from that point of view for the stars themselves have a gospel, an uplifting effect upon those who read aright.

Dr. Seiss has attempted a task that he in the opening line refers to as one that may "seem adventurous"—to read the Gospel of Christ from the stars from what Herschel calls "those uncouth figures and outlines of men and monsters usually scribbled over celestial globes and maps." He makes a good argument and shows not a little ingenuity in working out this attempt.



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Sound Beach, Conn.

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PUBLISHER'S NOTICES

New Home and Enlarged Work.

We have now moved the office of *THE GUIDE TO NATURE* from No. 47 Willow Street, Stamford, Connecticut, (where it has been for a little more than two months) to Arcadia, Sound Beach, Connecticut. This number is mailed at the post office in Sound Beach and is, so far as we know, the first magazine ever published in this place.

WHAT IS ARCADIA?

Arcadia is the nature institution (supplied by a philanthropist as was announced in the January number of *THE GUIDE TO NATURE*) consisting of several portable buildings on more than a half acre of land situated in the business center of Sound Beach, next door to the post office and near the railroad station. The Stamford trolley cars (Glenbrook and Shippan) pass the doors and directly or by transfer take passengers to all parts of Sound Beach, Stamford and Greenwich.

Arcadia has two distinct purposes:

1. It is the home of The Agassiz Association, an international incorporation. The charter says:

"The purpose for which the corporation is constituted is the promotion of scientific education; the advancement of science; the collection in museums of natural and scientific specimens; the employment of observers and teachers in the different departments of science, and the general diffusion of knowledge."

This was established in 1875 and incorporated in 1892. It is the oldest and largest institution in existence for encouraging popular nature study. It has no help nor sympathy for miserly hoarding of knowledge, gathered at enormous expense, but it desires to make every dollar count to the best advantage and for the benefit of those who most need it. The income of the AA is derived from the usual magazine income of the *THE GUIDE TO*

NATURE, from the tenancy of E. F. Bigelow (see 2 below) and from membership fees, direct gifts, etc. The officers are as follows:

Edward F. Bigelow, Sound Beach, Connecticut: President.

Harlan H. Ballard, Originator and for thirty-three years President, Pittsfield, Massachusetts; Ex-President; Personal Adviser.

Hiram E. Deats, "Founder" of AA Incorporation, 1892, by gift of \$5,000, Flemington, New Jersey; Business Adviser.

Honorable Homer S. Cummings, Stamford, Connecticut; Secretary.

Walter D. Daskam, Stamford, Connecticut; Treasurer.

Dr. David Starr Jordan, President Leland Stanford Junior University, Palo Alto, California; Dean of AA Council.

Dr. Leland O. Howard, Chief of Bureau of Entomology of the United States Department of Agriculture, Washington, D. C.; Naturalist Adviser.

Reverend Charles Morris Addison, Stamford, Connecticut.

Dr. George Sherrill, Stamford, Connecticut.

No officer of the AA receives a salary. The association is purely a philanthropic, "missionary" nature-work so far as it aids those who need aid and cannot pay for it. Every cent of income is placed on the "Received" side of our cash book. On the "Paid" side are only actual expenses—paper, printing, engraving, mailing. This book is audited once a year by members of the incorporation and is open at all times to inspection of any contributor or AA member.

2. Arcadia contains the residence and is the personal, working headquarters of Edward F. Bigelow in the preparation of "Nature and Science" of "St. Nicholas" and other nature-study work for which pay is received. From that fact the question might be asked (although up to the present time it has not been asked), "If I aid Arcadia, am I not to an extent aiding you in earning a living for yourself and family? If so, then there is no more reason in my aiding Arcadia by gifts or membership fees, than thus to

aid a blacksmith or a grocer in his business, for their work as well as yours is a benefit to humanity."

This possible objection may be disposed of in advance. Three of the buildings of Arcadia were moved from my personal equipment in Stamford. In these I do much of my work and the AA gets full benefit free of expense, thus offsetting to a small degree some of the other personal facilities that I use. For my home and certain other conveniences I purpose to pay into the treasury of the AA exactly the same rental that I formerly paid in the city of Stamford for similar accommodations.

Therefore your gifts are asked not to aid me personally but for the great organization, the AA, of which I am president, without salary. The members of my family and others as well as I contribute labor, time and money to that organization and its work, without pecuniary remuneration but only for the joy of doing. In that meritorious work I appeal to your philanthropy.

An especial appeal is made to residents of Sound Beach. Arcadia will be open to all visitors from 4.00 to 6.00 P. M. on Wednesdays and from 2.00 to 6.00 P. M. on Sundays. To members and contributors it is open at all times.

Will you aid us in making it more interesting and beneficial to all? We anticipate a need of \$5,000 a year for publishing, for assistants, and for the live stock, with their care and food. There are also other expenses impossible to be mentioned here in detail. But the entire plant, its workings, and its needs are freely open to all who are interested, and especially to those disposed to help.

A Study in Cotton.

Mrs. A. G. Helmer, 11 Arthur Street, Atlanta, Georgia, supplies for one (\$1.00) dollar an ideal outfit for studying cotton as follows:

Minature Bale,
Box of Seed,
Box of Seed Hulls,
Box of Seed Meal,
Cotton Flower Photograph,
Cotton Leaf and Green Boll Photograph.

Vial of Crude Oil,
Vial of Refined Oil,
Natural Ripe Boll and Some Loose Locks.

She also gives the following interesting data as to cotton statistics:

"The census report shows amount cotton ginned to January 16, 1909, to have been 9,998,000 bales.

"The South last year exported 41 per cent. of the value of the exports of the whole country—a total of \$614,900,000.

"Of course, the greatest commodity was cotton. Cotton to the value of \$379,965,014 was sent to other countries; cotton seed oil, \$15,125,082; cotton seed cake and meal, \$13,897,178.

"'Cotton Seed and Its Products,' issued by Department of Agriculture under title of Farmers Bulletin No. 36, is very helpful in connection with this study. A postal card addressed to that department, Washington, D. C., will obtain it."

WANTED—Photographs and articles of interest to children for my Nature and Science of St. Nicholas Magazine or for adults for the Guide to Nature. Please send for examination whatever you may have, or submit lists and outlines, of what you can supply Edward F. Bigelow, Sound Beach, Ct.

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Santa Monica, California.



"Auch Ich war in Arcadia geboren."—*"Travels in Italy"* by Goethe.

The monogram of the AA weaves into Arcadia.



ARCADIA

Our beloved AA is the beginning and center, the center and end, and the beginning and end of the new nature Arcadia. In fact, the principle of The Agassiz Association, "study nature, not books," was the foundation of Arcadia: it is our constant aim, and it permeates all our work.





AN ENTHUSIASTIC STUDENT OF ASTRONOMY
EDGAR LUCIEN LARKIN

Director Lowe Observatory, Echo Mountain, Cal.
Author "Radiant Energy"

A MODERN FABLE.

And the Minister preached and became eloquent about all the Glories, Manifestations and Inspirations of God's Universe. He told Parables and drew Arguments from the Natural World. He sang in Stanzas of the Magnitude of the Stars and of the Exquisite Perfections of the Flower. And the Entire Congregation heartily said, "Amen!"

And, Behold! A Listener went forth to Test the Truth, to Realize all these Sayings. Then Humanity passed along and said, "He has a Bug House; there are Wheels in his Head; he Delves in Things Uncanny." And even the Minister passed by and remarked, "Why you Thought I Actually Meant all I Said!"



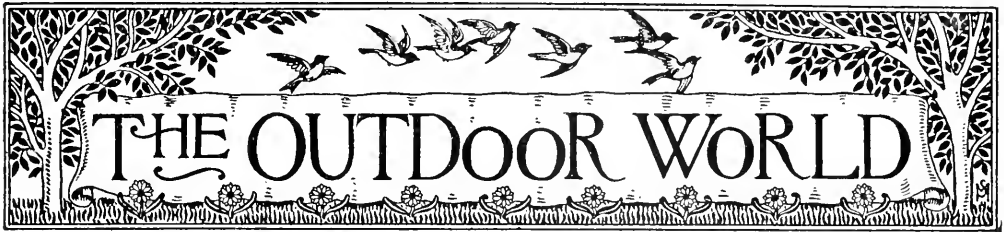
THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

JUNE, 1909

No. 3



The Delights of Cruising

BY BURNHAM W. KING, NEW YORK



THE Captain had planned the whole winter through to take the Fat One who could not help it and seemed contented with his lot, and his Charming Wife, who, bless her heart, had put in a long, hard winter trying to keep the Fat One good-natured and happy, on a cruise in his sailboat equipped with a gasoline engine in case the wind should play false, also a small cabin large enough for Fat One and Charming Wife while the Captain and Old Bill slept ashore in a tent. Old Bill was so called because he was still young and of sufficient size to handle three square meals every day, a capacity that was forever a source of envy to the Fat One during the entire cruise. Then there was Cousin Joe, the Indian guide and cook, so called because he and the Captain had taken many cruises together and the Captain's friends said they both looked like In-

dians, hence they must be cousins.

Cousin Joe always answered to his new name and spoke of the others as his cousins. On occasions when passing other Indians the Captain, first asking Joe what to say in Objibway, would call out a salute in their native tongue, so he got the credit of being able to speak the vernacular with very little knowledge of his own of Objibway.

What a list of supplies were loaded into the boat! Such an amount of baggage! It looked like preparations for a trip around the world. Georgian Bay is a charming spot for campers. Everything one could wish can be found in these waters—small mouth black bass, muscullonge, pike, perch. And such blueberries, large as—well, not quite the size of walnuts, but large enough and delicious and to be found everywhere. For variety there were raspberries, blackberries, gooseberries, currants, juneberries, partridge berries,



"BE IT EVER SO HUMBLE"

THE INVITATION: "ALL ABOARD."

wintergreen and finally mint, which while being neither fish nor fowl was a very necessary adjunct to—well, ask any man south of the Mason and Dixon line. Such memories that haunt me! Old Bill was in his element. Had he not lived many years in the south, and do not the young learn by absorption? Anyway Old Bill shall never be forgotten while mint grows. Our camp fires were built of all sizes according to our moods. We had the little cheerful friendship fire—just to light up the kindly faces that gathered around it, each face giving back its reflected light of friendship and warmth that is always reserved for such occasions. Then there was the comfort fire—logs of yellow and white birch added to the blaze by their resinous vapors bright tongues of blue and white flame. Sometimes one would add a chestnut log to the fire. What a shower of sparks and crackling it made! It was soon removed. Was not this a comfort fire and who wants to be dolging sparks all the evening?

The cooking fire was the most important event of the day; dry limbs from fallen trees or branches make a good hot fire and a few of them at the right spot soon have the meal under way. What more can you ask of any fire? The Captain had a folding baker, and, speaking of folding, everything he had was folding—cot, chairs, ax, knife, table, cooking kit and even the blankets came under this category. The baker was a wonder, to hear the Captain explain it to Charming Wife.

She, poor, confiding girl, became enthusiastic. "I'll stir up the best Johnny cake you boys ever tasted," she said.

"Well, why don't you?" said Fat One; and she did but you shall judge.

Charming Wife seemed to the boys to be one of those natural born mixers—perhaps cooks is a better word. Chicken feed, no, I mean corn meal, seemed to be the chief article used. With awe we watched her deft fingers adding butter, salt, pepper, baking powder. Old Bill said afterward she put in chili sauce but I'll not stand for such blasphemy. She stirred up the mess and put it in the baker and the Captain carefully placed the baker in front of the fire where the reflected heat was to do the rest. Now fifteen minutes was to do the trick. Fat One held the watch while Charming Wife was the center of a group of anxious watchers.

"Time's up," said Fat One, but a stick run into the cake showed it needed more heat. Captain put the baker nearer the fire; the cake commenced to burn on the side next the flames; it was left, however, because the other side of the cake needed more cooking. At last it was decided by the council of cooks that it must be ready.

In the meantime, we had such a hot fire that Cousin Joe could not get near it, and the rest of the dinner already prepared, having been withdrawn to a safe distance, had gotten cold; but what do campers care for such trifles! The hot fire and hot sun had warmed

us enough to make up for any shortcomings of the food.

Charming Wife tried to pry up the "Johnny cake" on the burnt side; it was a mass of blackened corn meal. Then she tried the other side; it was half cooked dough. She looked the picture of woe; tears of mortification came to her eyes; she swallowed hard a couple of times, looked at the baker and then turned such a look of scorn at the Captain that he was almost undone. Meantime Fat One came to the rescue—some part between the burned spot and the dough line was edible, pieces of which he actually ate; but much as we loved eating we could not follow his example. The Captain followed Charming Wife's glances with his eyes and the secret was out—the back of the baker was open and the heat which should have been reflected up was allowed to go out. Now the Captain is willing but Charming Wife will not speak to him or listen to any explanation.

Part of our supplies consisted of a crate of eggs, and some of them must have been well seasoned nest eggs. Our party usually had soft boiled eggs for breakfast. One morning every one but Old Bill had eaten their supply! he seemed to be holding off and filling up on other things. Finally he came to the eggs; he reached out, selected a fine looking one and broke it. We

heard a few carelessly selected words and saw an egg flying into the bushes over his head. Not a word was spoken by the rest of us. Old Bill tried again; this time we left the table with the egg, being careful to take the opposite direction. Not being easily discouraged Old Bill looked over the rest of the eggs carefully, broke another one and one of the commandments at the same time and left the table in disgust. It was several days before eggs were served again.

Between being nicely bitten by mosquitoes, which have a way of getting in under nets supposed to keep them out, and well burned by the sun, that shines so hot on the water, we had a fairly good time.

Sometimes we tried to eat one item of the bill of fare so hot we could hardly handle it, and while it was cooling off the rest of the meal got stone cold; but half an hour after the meal was over, who cared for such trifles!

How good our pipes seemed as we lounged in the shade of some tree. How can a thing so delightful taste so bad for a long time afterwards?

On our way home we ran on a reef, and for a while it looked as if we would have to swim for shore but patience and plenty of muscle finally got us free and on our way again.

The last day we ran into a storm.



POSSIBILITIES

THE JOY OF HAVING

How the wind blew; the rain came down in sheets! Charming Wife retired into the cabin where she was soon mixed up with satchels, cots, food and the rain that blew in from a broken porthole. She was game, however, and never murmured; at least, Fat One said he could hear nothing and the Captain and Old Bill were too polite to listen.

We had dressed in our "store clothes" that morning, expecting to take the noon train fifteen miles away, so were not exactly prepared for the storm that broke suddenly upon us.

The waves lifted the stern so high out of the water that the wheel would race and the boat lose headway. We surely had our hands full of boat and our clothing full of water before we reached the dock.

Charming Wife was separated from loose articles in the cabin with difficulty. Fat One tried hard to smother a grin as he saw she needed a few slight repairs, but his smile ceased when she coldly called attention to his own wet clothing. Old Bill busy with unloading the baggage, his face red and covered with perspiration, was asked innocently by Charming Wife, why now that we had arrived he did not wipe the rain off his face. But Old Bill very much occupied at the time, getting her dress suit case off the boat, only gave a glance which should have withered her.

The Captain, hustling the rest of the party on the train, sat down on the edge of the platform, exhausted and wet, while into his brain seemed to come, floating through the air from the train, these words: "We have had such a nice time." But his conscience was seared and the sarcasm never reached him.

Nature and Humanity.

I hope the day will come when it shall be considered as commendable to dissect a lake or brook as a *lativirus* or *brokinoptus*. To climb a mountain and gain a view is as "scientific" as to "shin" a tree and photograph a nest. Get nature—large or small—in your own way and be improved by the getting.

Camping in Bear Canyon, Sandia Mountains, New Mexico.

BY C. E. KELSEY, D.D.S., ALBUQUERQUE,
NEW MEXICO.

The accompanying picture shows an ideal camp, both in location and equipment, and the five weeks that the writer spent in this delightful spot during July and August last year still lingers in pleasant memories.

The altitude of this place is 7000 feet and, on up to "Rim rock" which is shown in the background, being 10000 feet and was a days journey there and back from this camp.

Located near a large spring, the water of which was clear and cold as it came bubbling out of the rocks. A small stream ran close by and its rippling waters seemed like music at night.

On awakening in the early morn could see the sun rise over the distant ridge and the voices of robins and mocking birds filled the air in one grand chorus. Could see squirrels run up the sides of huge boulders from my cot in tent and goats jumping from one ledge to another in search of tender green boughs.

Although alone "dame nature" herself robed in all her grandeur was sufficient company. The fragrance from the pines and the pure mountain air seemed to permeate ones whole being and an appetite for bacon and beans was not lacking.

Large pine cones were easy to gather and made a quick hot fire in a little sheet iron camp stove. There were no flies or mosquitoes to bother and to an old camper this means a great deal.

The nights were rather cool for mid-summer and two army blankets and a comforter felt good towards morning.

A "fly" for a tent is indispensable for it rains in the mountains considerable in the summer season, and one of the hardest hail storms I ever experienced came up suddenly one afternoon about four o'clock and lasted about thirty minutes and left about five inches of hail on the ground; next day however, was bright and warm.

Many people go out to these mountains from Albuquerque during the



A CAMP IN BEAR CANYON, SANDIA MOUNTAINS, NEW MEXICO.

summer and some stay the whole season.

"If thou art worn and hard beset,
With sorrows, that thou wouldst forget;
If thou wouldst read a lesson, that will keep
Thy heart from fainting and thy soul from sleep
Go to the woods and hills! No tears
Dim the sweet look that nature wears."

A Honey Tree and Its Two Guests.

BY OLIVE THORNE MILLER, GARVANZA,
CALIFORNIA.

In front of my home in Southern California stands one of the beautiful trees of the country—a grevillia. It is tall and shapely and green the year around, with graceful, fine-cut foliage, and through May and June it is really splendid with exquisite clusters of blossoms of a dark gold color.

Looked at from below, the clusters with which the tree is loaded appear to be in the shape and about the size of a human hand, held out horizontally

and closely examined they are as wonderful as they are beautiful.

One hand—as I will call it—which I had for close study was composed of three finger-like parts, three or four inches long, held a little away from each other, and literally packed with bloom, one finger in full flower, while the other two were still in bud, promising a long season of blossoming.

The buds—more than seventy on each finger and all of the same rich color of the opened flower—were about the size of the head of a common pin and stood close together upon stems nearly half an inch long.

But the finger containing open flowers was most remarkable and impossible to describe. Being Nature's work it is unnecessary to say that the tiny blossoms were as perfect in form and color as the largest flower that opens to the sun, and, and each one held conspicuously out to view a minute drop of glistening honey in a tiny cup of rich crimson.

To this tree with its myriad treasure cups we owe a great pleasure—the

daily visits of our two orioles, Bullock's oriole, a gorgeous fellow in brilliant gold and black, and the hooded oriole, scarcely less showy. Both these birds are extravagantly fond of sweets and both spend hours every day at the feast spread out for them, so that we learn to know them well.



OLIVE THORNE MILLER

The singing of the western orioles is peculiar and in marked contrast to the loud, clear songs of the Baltimore and orchard orioles of the eastern states. In both species the only songs I have heard in nearly four years' study of them, have been very low, of a strange, weird, "squeaky" character impossible to describe, and delivered in jerky, inconsequent fashion though with all the airs and graces of a stage performance.

One day I caught the hooded, who is the more abundant in this vicinity,

in a queer little display. He was standing in a sort of nook or niche formed by several branches of a live-oak tree, and so hidden that he could be seen only from one point, where fortunately I happened to be sitting, partially concealed by a spreading vine.

He was apparently exerting all his musical powers accompanied by the action of a public performance, turning from side to side, bowing this way and that, posing as if before an audience, opening and closing his beak, evidently a most elaborate performance; and with all this show, he uttered no sound that I could hear twenty feet away, in the perfect stillness of a summer day on a lonely orange ranch. It was the most curious and uncanny exhibition I ever saw.

Another time, being attracted by very low, disconnected bird notes outside my window, I cautiously peeped out and saw an oriole going with great deliberation over a rose vine which covered the end of the piazza, snapping up aphides and whispering his quaint song between the mouthfuls, a sort of soliloquy. It was exactly as a person will sometimes go about his work "humming" a song to himself as he goes.

It is plain to see that these two orioles are "characters" with habits and ways of their own, which I hope some day to know better.

For, Not To.

A pair of quail when first put in the cage went rushing and fluttering around for a few days. Now they really live and grow in the cage. I wonder whether automobilists will ever quiet down after the first years of novelty and really live; will then go *for* something, not merely *to* a place.

An Interesting Crab's Claw.

BY ROBERT GREENLEAF LEAVITT, NEW
JERSEY STATE NORMAL SCHOOL
AT TRENTON.

The editor of this journal has kindly given me a deformed crab's claw in which I became interested through the publication of a brief mention of it in "St. Nicholas" for December, 1907. The claw is interesting because it goes with a number of other things to throw a somewhat new light, or let us say a little light from a new direction, upon the process by which an animal's body is built up. If the principle of the matter is pointed out, readers of *THE GUIDE TO NATURE* will be likely to find other examples; and if they will carefully describe, and especially if they will carefully illustrate, their discoveries and publish them, they may make real contributions to science.

The claw was found at Stonington, Connecticut, and brought to notice by Miss E. P. Loper. The remarkable feature is an addition, in the form of a small pincer, near the extremity of the movable joint or dactyl. This small organ copies each detail of the larger one faithfully as to the shape and relative size of the two parts, as to the teeth and as to the nature and coloration of the hard material composing the extremities of the pincer-arms. Only in one respect is there an essential difference: in the small pincer the dactyl is not movable at the base, as it is in the larger one. The pincer is therefore useless. Indeed it must have been an inconvenience to its possessor.

Such malformations have several times been noted in the claws of lobsters. It seems pretty certain that they arise in the healing of wounds inflicted when the animal is freshly moulted and its limbs are soft.

It is well known that crustaceans have a good deal of the power of regeneration. Whole limbs may be replaced. In a case like the one before us, it was to have been expected that the wound would fill up. It was not to have been expected that the growth from the torn edges would take the form of a nearly perfect claw.

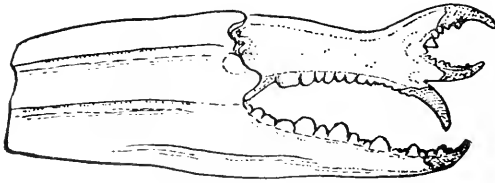
The new member imitates another, previously existent, organ. Such abnormal mimicry, or borrowing of character by one region from another, has been called by William Bateson of England, Homœosis. He detected it in several monstrous formations; for example, in turbot's displaying upon the lower surface features proper to the upper side. Weismann, the German zoologist, has argued that the markings on certain segments of a species of caterpillar originated in a like manner by transference from other segments. The present writer has pointed out (*Botanical Gazette*, January, 1900) the probable derivation of some normal structures in plants by Homœosis, or translocation of characters. In cases noted in plants Homœosis has, apparently, proved to be hereditary.

The special interest of our crab's claw lies, as already suggested, in its relation to the development of form in growing parts, and its bearing on the theory of such development proposed by Weismann.

The evolution of the body with its myriad cells of different kinds—nerve, muscle, bone cells, etc., etc.—and with its numerous and often complex organs, all developed from a minute egg of simple form, in which the features of the adult organization are utterly absent, is a most mysterious process. Why do all the parts develop in their proper sequence and compose a harmonious whole rather than a shapeless mass of cells? No one can as yet answer this question.

The evolution is guided from within, for the growing organism is not run in a mold but assumes its shape without the aid of external formative pressures. The process is supposed to be fundamentally a mechanical one, and theories of the mechanism have been attempted. Most speculators have imagined that small bodies exist in the cells, capable of determining the forms of the bodily members—germinal bodies, gemmules (i.e., little buds) or determinants. Each part of the body is supposed to have its particular germinals. It may be supposed that in the egg all the determinants

for a perfect body are present. Such has been the idea of Darwin and other natural philosophers of the first rank.



THE CRAB'S CLAW

Weismann has constructed the most elaborate of present day theories as to the nature of these germinal particles and the method of their distribution to the proper parts of the developing body. When the organism is completed the determinants are, according to this hypothesis, thoroughly distributed, and each small region of the system has in it only the determinants proper to that region. Yet as some parts of the body are liable to be broken off—such as the appendages of the lobster or the brittle tail of the salamander—nature has here and there provided reserve funds of determinants. The first formed leg or tail being accidentally lost, these reserve determinants come into play and cause the tissues which sprout out to take the right form.

Such theorizing doubtless seems very speculative. Yet just these bold guesses at the invisible factors of the process have led the way to most fruitful researches. This is the reason for thinking that it pays to discuss them.

Let us see how Homoeosis as exhibited by our crab's claw affects the idea of Weismann that the determinants, allowing that such bodies really exist, are thoroughly sorted out and distributed to their appropriate bodily members in development, and so become the means of making the parts take their proper shapes.

If the determinants or governors of form are sorted out into each bodily member according to its kind, then a given piece of a crab's claw should have only the determinants for that particular piece, as, for example, the back of the dactyl. Or, at most, it may have a certain supply over and

above the demands of first growth, to guide a second if that is required by the loss of the original piece of claw. And if that piece is lost, by the theory only that piece can grow again in that place, the determinants of all other bodily parts being absent from this one.

But when our crab gets into a quarrel with a neighbor and the neighbor bites out a portion of his claw, and when the wound edges, irritated by the removal, proceed to build up the breach, behold, the growing tissues take not the form suitable for filling in the gap, but of almost an entire claw, teeth and all! In these growing tissues, therefore, there must be, if we grant that there are any such governing bodies at all, the determinants for a nearly complete claw.

These particles must be in the wound edges; for from these all the growth starts. And we must suppose that they were there before the wound was made. Suppose the wound to have been a very little deeper or less deep or a little to the right or left of the place where it actually occurred. Would the new growth still have been a nearly perfect claw? In all probability it would have been so. Then we must suppose that cells throughout this particular region contain determinants, if any, for a whole or nearly a whole claw.

This conclusion, the reader will see, is much against the idea of the strict distribution and sorting out of form giving particles in the development of the body.

Perhaps there are no such special form governors residing within the cells of the tissues. But if not, how then is the growth and development of the body managed with such precision that not once in hundreds of thousands does any part fail to arise in its proper place or to take on the shape, color, etc., which it should have?

We cannot think of any such thing as *idcas*, apart from substance and structure, transmitted from generation to generation. If we say, "Law," then the law must have something material to execute it. We know nothing of biological law apart from material

structures transmitted in heredity; nor can we clearly imagine such a thing. All experience and knowledge lead us toward the conclusion that the development of the new individual into the likeness of its parent must be brought about by some mechanism existing first in the egg, as the egg of this crab, and passing thence to each cell of the body derived from that cell. It seems necessary to imagine microscopic form determiners in the cells. And how shall we escape thinking that they must be separated out so as to have their due effects, and make in each region of the body only that structure appear which should be there in order that the whole body may do its work?

Yet the few cases of Homoeosis that we know in animals certainly suggest that in some parts more than the local form factors may be present.

Who can bring forward more evidence from nature along this important line of inquiry? Insects should occasionally show a translocation of characters from one part of the body to another. Search in insect collections and in the field for cases of Homoeosis—antennae transformed to legs, wings to legs, legs to antennae—and let us hear about them.

A Bit of Spider Lore.

BY DR. R. W. SHUFELDT, WASHINGTON,
D. C.

When we go as far back into history as we can for all nations, we find that there has been enough written on the subject of spiders to make up thousands of books or fill many a big library.

A large part of this literature is illustrated, yet myriads of spiders in nearly all parts of the world are entirely unknown to science, and enough yet remains to be ascertained with respect to their habits to fill many another score of volumes in the future.

Of all the genera and species of spiders none have attracted wider attention than the famous tarantulas, of which there are many kinds possessing the most diverse habits. We have some great hairy tarantulas in this country but they are confined to the south-western section of it. One is

very common in Texas, a species known to science as *Mygale hentzi*, and here shown in our half-tone illustration, reproduced from a photograph of a specimen collected in that state. It is taken life size, and it is a spider held in the greatest dread by most people in the region where it occurs. The bite of this particular form, however, does not seem ever to be followed by any very dangerous symptoms, and never by death. There are in South America some tarantulas very much larger than ours, one especially called the "bird-spider" which is able to prey upon small birds. Big tarantulas are also found in tropical regions throughout the world, but they belong to very different genera of the group. Most of the large ones are hairy, and some of them are poisonous, as for example the giants of the tribe which we meet with in Java and Sumatra. Many are highly colored and most striking in appearance, quite awe-inspiring to the timid beholder. Others construct very remarkable nests, and the famous "trapdoor spider" belongs to a group of tarantulas, and the singular nest it builds is doubtless well known to many of the readers of this article, as the collectors of such objects frequently bring them away with them from the south



TEXAN TARANTULA
(*M. hentzi*.)

Photographed from life by Mr. S. Emmet Robertson.

of Europe. Indeed as a matter of fact, some very interesting tarantular history has for several generations been associated with that part of the world, if not for a much longer time. For instance, the dance known as "tarentella, which derives its name from Taranto, a city of southern Italy, also called the tarantula dance, is associated with

sufficient ground to indulge in it. This belief only holds among the most superstitious, and as an infallible cure for tarantism, or tarantismus as it was also called, it has long been abandoned to form a part of the history of similar fables.

Texas tarantulas possess a formidable foe in a big wasp, *Pompilus formo-*



PEASANTS DANCING THE TARANTELLA IN ONE OF THE HOTELS IN ITALY

these great spiders. South European tarantulas are different from ours, and belong to another genus, the best known species of which is "Lycosa tarantula." The bite of this creature is dreaded throughout the country where it is found. A person when bitten by one is said to be tarantulated or suffering from "tarantism," and to be saved from this fatal disease the aforesaid dance was invariably resorted to. As we know, the tarentella is a wild, whirling and rapid dance, accompanied by music, in which two take part, and was very prevalent during the sixteenth century. In some localities it was known as the tarantelle, and it actually spread through southern Europe as a species of mania, the mere thought on the part of any person that they had been bitten by a tarantula was quite

sus, that stings and thus paralyze many of these spiders, and afterwards often drag them into their subterranean nest, for food for their larva, which is hatched out in these cavities.

A Curious Grape Gall.

BY W. T. BELL, FRANKLIN, PA

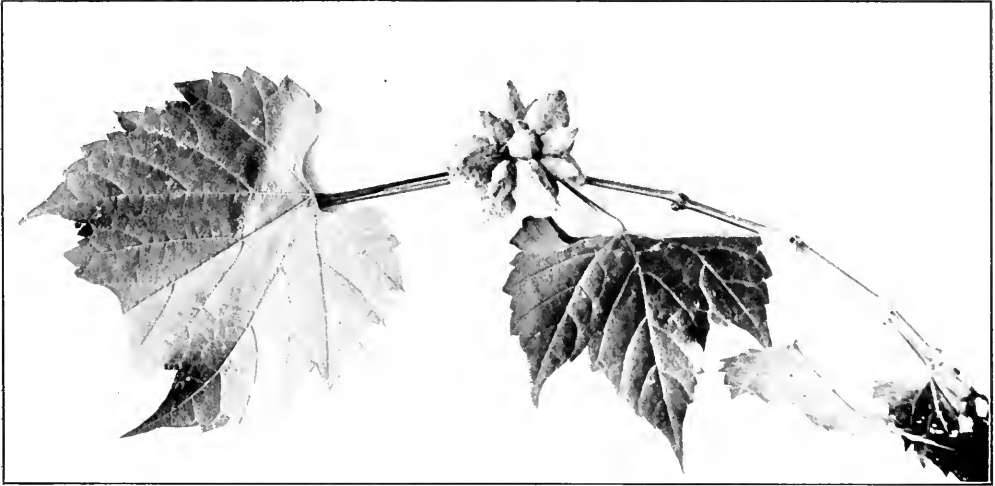
For many years, a grape vine which is trained along the sides and end of a dwelling house here, has produced an abundance of very fragrant flowers, but has never borne any fruit. An examination of the flowers proved, as was expected, that they were all staminate.

Recently, several strange fruitlike clusters were noticed, situated in the axils of the leaves, where the grape clusters should have been; but the several sections of each bunch were all attached to

the branch on which they grew, near the same place; and were not racemed, as grapes are.

An incision across one of these sections

The excrescences are greenish in color, somewhat conical in shape, but truncated or terminating abruptly; and are covered with a soft down, as may be



THE GRAPE-VINE FILBERT GALL
(*Cecidomyia coryloides*.)

disclosed orange-colored larvae encysted in its substance; proving them to be the result of eggs deposited in the flowers of the grape by a species of gall fly.

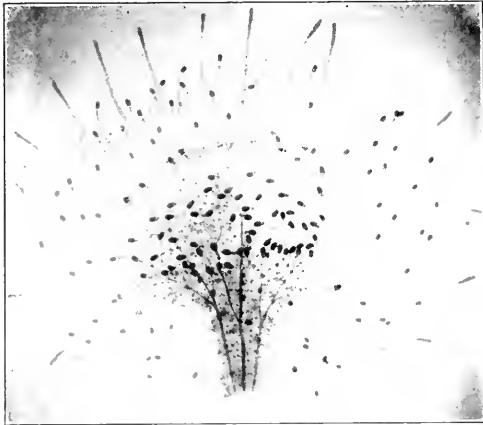
noticed in the illustration; and they seem to be of the same firm substance throughout, and are not spongy inside, as oak galls are.

SEEING BY AID OF THE LENS

A Plant That Catches Insects For Food.

There are several plants that catch insects for food, but perhaps the smallest, prettiest and having the most interesting method is the sundew (*Drosera rotundifolia*). This plant is common in certain sandy and sunny marshes, where it blooms in July and August. It has an open rosette of leaves, near the ground, clothed with

reddish, bristly hairs each tipped with a purple gland. These hairlike tentacles are for catching insects that are attracted by the flower-like color or perhaps by the odor of the leaves. These apparently sensitive bodies close over an insect and hold it down by means of a viscid secretion that exudes from the glands. Even tentacles not touched by the insect curve toward it and ultimately aid in this. How do



THE LEAF OF THE SUNDEW

the tentacles that are not touched know that the object on another part of the leaf is good for food, and exactly which way to bend so as to reach it? It is difficult to deceive the tentacles. They will bend toward nutritious substances, but not much, if any, toward useless material such as a shower of rain or of sand. Even if they do at first bend inward or start to do so.



ONE OF THE TENTACLES MAGNIFIED

they quickly discover the mistake, rise again and in no case secrete the digestive fluid until they have positive knowledge that the thing is good for food.

Darwin experimented extensively with these plants and had some interesting experiences in giving them indigestion by overfeeding.

Peculiar Metamorphosis of the Tobacco Beetle.

BY R. MENGER, M. D., SAN ANTONIO,
TEXAS.

Mr. P. G. Lucas, the proprietor of a fine drug store in San Antonio, in assorting tobacco handed me two samples which had been perforated and otherwise mutilated by very minute insects, one cigar in particular being of much interest as it contained larval vestiges. The latter I gave close attention since I was aware that it was the larval state of the tobacco beetle. The second cigar contained three such larvae lying snugly in furrows they had prepared by their active jaws I subjected part of this cigar with the larvae to a close focus photographic reproduction with extra near focusing lens. The result is seen in the illustration herewith submitted to THE GUIDE TO NATURE (Fig. 1) showing the cigar and the imbedded larvae magnified about three times with outlines of the feet and head (in the upper specimen) about to transform into the pupa state of development.

When under the powerful rays of a bull's-eye reflector in this attempt to photographically reproduce these larvae in situ, they became quite lively and, fearing the result would be spoiled, I dropped some chloroform near the furrows, when they ceased moving at once. The photograph shows the larvae in their natural position as they had not been touched.

Near these larval tobacco beetles are seen some holes and furrows which the mature beetles and afterward these developing larvae had prepared. It seems that during the fall and winter the mature insects perforate the tobacco and also other material such as food stuffs and drugs, producing a



FIG 1.
CIGAR WITH TOBACCO LARVAE
IMBEDDED IN FURROWS OF THE
TOBACCO

round, deep hole not larger than the body of the insect, and then deposit the ova inside the tunneled holes when after a certain length of time the larvae seen on the plug cut tobacco and the cigar specimen develop. This process has been witnessed off and on years ago and again lately by the writer when the furrows of these beetles had been exposed in tobacco and some drugs, either of which they feed upon but with preference for the tobacco and usually for the best brand of tobacco goods.

These minute insects are occasionally and numerous found in dried

vegetable drugs and household goods. But lately my friend, the druggist, happened to find an old package of orris root powder in which numerous round and oval-shaped bodies of granular appearance were present which after mounting and microscopical examination I found to be composed mainly of the cocoons of the minute tobacco beetle and I prepared a photograph of them magnified about three and one half times (Fig. 4). Nearly all of these beetle cocoons were in the breeding cycle; i. e., most of them after opening the minute globular

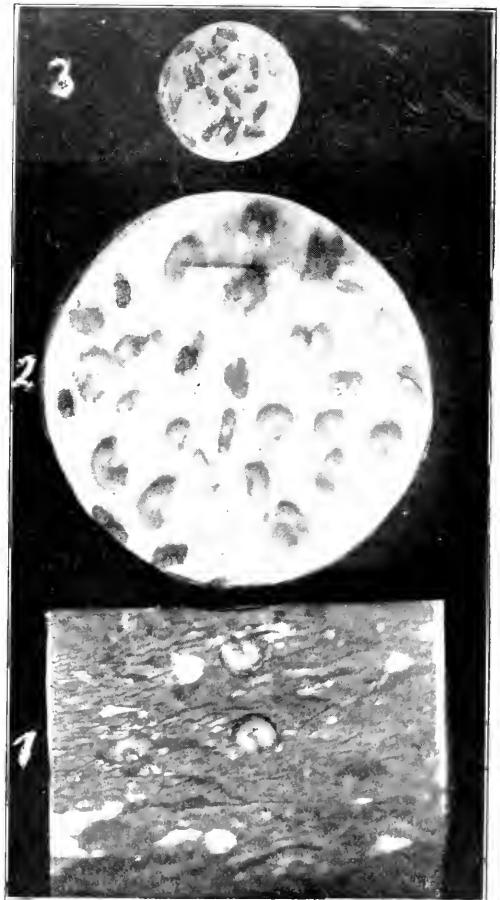


FIG 2.
(1) PLUG TOBACCO INFESTED WITH
THE TOBACCO LARVAE
(Magnified very slightly.)
(2) TOBACCO AND DRUG STORE
BEETLES WITH LARVAE
(3) DRUG STORE BEETLES AT NORMAL
SIZE



FIG. 3.
TWO TOBACCO BEETLES AND ONE
DRUG-STORE BEETLE (LOWER)
AND LARVAE

capsule showed a small live and curved larva. In others the maturing larval beetles could be seen, the larval state being in appearance identically the same as photographed in Figs. 2 and 3. On closer inspection of Fig. 4 several of the whitish larvae of this beetle are seen, for instance at the places marked 1. Some of these larvae were quite disfigured in general appearance from the fine orris root powder adhering to their hairy filaments. In a few artificially opened cocoons the larva is seen quite plainly in the illustration.

It is an interesting fact, also stated by Mr. Lucas, that these tobacco beetles prefer the best brand of tobacco and the more so as they are occasionally found in tobacco which had been sealed air-tight in tin or wooden boxes and therefore the probability presents itself that these pests had been conveyed through tobacco goods in the tobacco factories before being put on the market, it being very difficult to detect the minute ova. How these beetles develop in all sorts of tobacco is seen, as a second example, in the so-called plug

tobacco, Fig. 2 (1), which I also procured from the druggist. I prepared the view with an objective lens applied to the camera, showing the tobacco larvae about one half times magnified; also the second figure of the same photograph, showing some of the larvae of the drug store beetle and the tobacco insect and also the appearance and size (about one half larger) of the tobacco and the drug beetle (the latter being more slender).

In further experimenting with this matter, I succeeded in preparing the view Fig. 3 using an extra strong lens to the camera at quite near focus, showing six of the tobacco larvae, two full grown tobacco beetles and one drug-store beetle (the lowest one in the photograph) magnified considerably.

The third illustration in Fig. 2 shows the closely allied drug-store beetle, named because of its preference of invading drug-store goods and infesting precisely in the same manner as the tobacco beetle. This view shows the beetles in very slightly less than normal size. This drug-store beetle is more slenderly built than the tobacco



FIG. 4.
COCOONS OF THE TOBACCO BEETLE
WITH LARVAE
Magnified three times.

beetle but otherwise is of a similar, reddish brown color and very active in its movements. Both the tobacco and drug-store beetle, it seems, undergo about one and the same cycle of development and when the ova are deposited in favorable media of a powdered nature, such as rhubarb, orris root, slippery elm, linseed meal, tobacco or cayenne pepper powder, the ovum transforming into the larval state is encysted into the globular forms similar to these seen in Fig. 4 and similar to the genesis of other forms of insect life.

The main characteristic features to determine the genus and the difference between the drug-store, and the tobacco beetle, larva are the clawed feet and the jaws of the head parts of the tobacco beetle, the single small claw being sharply outlined on high power examination as shown by the photo-micrograph herewith representing a larva freshly taken from the middle foldings of a cigar and immediately photographed by the writer with particles of tobacco leaf detritus surrounding the larva.

The harm these minute insects are liable to do to tobacco, food stuffs and drugs is often enormous and they are often a great plague to dealers in tobacco and drugs and because of their minute size and rapid movements are difficult to exterminate. Being winged as other beetles, they can fly and migrate to distant places and there perform the same havoc and multiply enormously.

Both these minute beetles above described tally with the observations of Dr. L. O. Howard, (Farmer's Bulletin 120) and Dr. F. H. Chittenden (Bulletin No. 4, Divis. Entom. U. S. Department of Agriculture) but in our case the matter is the more interesting having found and depicted the larvae *situ* and the larva of the drug store beetle encapsulated in the peculiar globular cocoons described and illustrated therein. Dr. Chittenden says in regard to the tobacco beetle, "As a tobacco feeder it outranks that species (the drug store beetle) and also appears to favor certain medicinal

plants not so often affected by the *Sitodrepa* (drug-store beetle).

"Of household supplies it has been found infesting cayenne pepper, ginger, rhubarb, rice, figs, yeast cakes and prepared fish food. It has been reported as destructive to silk and plush

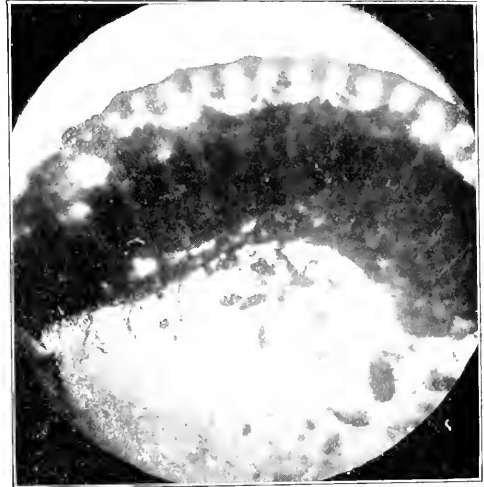


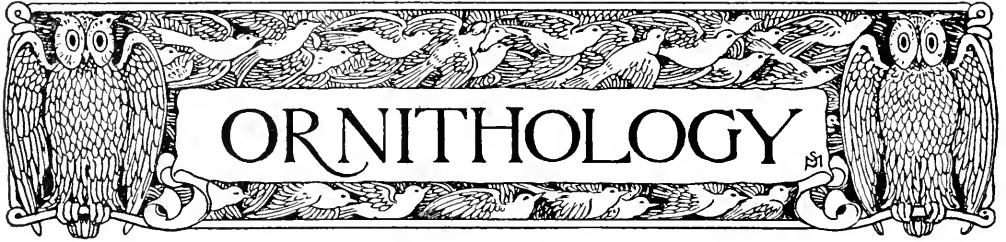
FIG 5.
PHOTO-MICROGRAPH OF LARVAL TOBACCO BEETLE.

In its natural state, surrounded by tobacco leaf remnants. Considerably magnified

upholstery and the past year did considerable damage to dried and preserved herbarium specimens in Washington. Of drugs it is partial to ergot and turmeric and tobacco it devours in every form."

The druggists and tobacco dealers throughout the country undoubtedly are familiar with the above minute pests and these memoranda concerning them, I believe, will be appreciated by readers of *THE GUIDE TO NATURE*.

"A world of wonder lies around us." That saying is so trite that the truth in it is too often not realized. Many people wear eyeglasses because the ordinary newspaper and business matters of life cannot be utilized without this commonplace optical aid. But why not as commonly use a pocket microscope? Rightly applied it will give much pleasure and instruction. It is a life ticket to a wonderful museum and menagerie.



It is not easy to progress far along this road because every bird suggests so many reflections and recollections.—*Richard Jefferies.*

The Wild Drummer.

BY EDMUND J. SAWYER, SCHENECTADY,
N. Y.

What a delightful and inspiring puzzle has been the still wonderful drumming of the ruffed grouse! The bird has now been photographed in the act from almost every conceivable point of view; each feature of the act has been catalogued with painstaking care; the "drum" itself has been seen and described and the last vestige of mystery dispelled from that remarkable habit which has tasked the patience and skill—not to say the imagination—of every bird student from Audubon's day to our own. It is indeed a mystery no longer. But why should the pleasure and inspiration be any the less when at daybreak we hear that "thump, thump, thump, thum, thm' thm'" in the awakening May woods?

Last spring my tent stood nearly surrounded by woods and many an early morning hour I laid awake listening to the muffled drums, for a hundred yards within the woods back of my tent, half a dozen others at various distances and points of the compass. Thus lying in my cot I could guess pretty well where each performer was; for I had searched out the drumming logs for half a mile around. In ten minutes I could be face to face with one or another of the drummers, peering from my blind a few yards from his log, but I was loth to break the enchantment of distance. From one of my blinds I had regularly at least three birds besides the one just before me. One of these, whose well-worn drumming log I knew well, was in a piece

of woods a hundred yards away across a pasture, yet his drumming was almost as distinct as that of the bird only six yards from me. In fact I could not always be sure which of these grouse was drumming without watching the nearest one. If one wishes merely to hear the sound for enjoyment a blind is needless, the natural cover being sufficient. For this purpose a closer approach than two hundred feet is unnecessary. Even at anything like this distance, however, as little noise as possible should be made, and none—the person standing or sitting perfectly still, while the watchful grouse rests between the drumming periods.

For my part I say let the grouse drum on. The sound still thrills me through every fiber. I well remember the first time I heard it, and this spring it fills me with the same enthusiasm. For suggestiveness, association and a certain wildness—the very soul of the wary bird—there is not a wood-note to compare with this. To my ear it expresses, as no other mere natural sound does, that status of the wild mentality which we have so long heard discussed with a warmth equalled by its fruitlessness.

The alert attitude of body, and mind if you will, the earnest purpose and ardor braving with discretion, lurking foes, the robust health of the bird; all this (and so much more!) is expressed with a wildness that makes your heart go thud, thud, thud, in enthusiastic response to the roll of this muffled drum. In power of suggestion and in the fact that it may be heard with unabated regularity in showery weather, more than in tone, it is like distant thunder with which it has been com-

pared. I ask nothing better than to sit on a mossy log, hepaticas at my feet and lispings warblers overhead, and hear from the seclusion of the thicket this emanation from nature's heart

this primeval voice, so wild, so pregnant with the life, the new hope and all the characteristic and prophetic meaning of the burgeoning woods.



THE DRUMMING OF THE RUFFED GROUSE



A MATIN SONG

BY EDMUND J. SAWYER SCHENECTADY, N. Y.

As melts autumnal snow from earth,
 As roses blush when they have birth;
 So from the east night melts away,
 So blush the skies at birth of day.
 Tranquil and virgin, vast and still,
 The sleep of valley and of hill.

Hark! from a bough above the rest,
 A sparrow, atremble in throat and breast,
 Hymns, as only a sparrow may,
 The dawning of another day.
 The bough, with dew beads hung along,
 Is vibrant with the matin song;
 Glad, unconscious, beyond restraint;
 Of earth, but with no earthly taint,
 There is a rapture in the tone,
 A simple faith quite all its own.
 (Shall aught for vanity amend,
 Or heav'nly fire to Cain descend?)

In heart I would, and would in words,
 Praise each new morn—like matin birds!
 O could the Here and Now, to me,
 Severed from past and future be,
 And what could move to song the boy
 Be to the man still perfect joy!





A VESPER SONG

BY EDMUND J. SAWYER, SCHENECTADY, N. Y.

One hour remains of storm-racked day
 For expiation; will it pay?
 A blaze of gold grows in the west
 Where clouds, adrift, and yet at rest,
 In burnished seas of flaming sky,
 Haloed in silver sunset lie.

Now, tilted on a lowly spray,
 A little bird pours out his lay:
 Faith and ecstasy in one form,
 And music of the union born.
 Happy the lordlier, grander hymn,
 Where censers swing and aisles are dim,
 Which shall so surely rise to God
 As this strain from the pasture sod.
 It is not loud; what need to be?—
 'Tis heard by God (of chance by me)—
 Not the mate in the field around:
 What of the nest on rain-swept ground?

O when it is God's high behest
 To call my own or me to rest,
 Command to end life's wind and rain,—
 The wreckage and the efforts vain,—
 From my soul shall a vesper rise,
 Of faith and rapture, to the skies?



The White-Rumped Shrike.

BY H. TULLSEN, KNOXVILLE, TENN.

In winter, in southwestern South Dakota, the white-rumped shrike, or butcher-bird, (*Lanius ludovicianus excubitorides*) is seldom seen, but throughout the broader creek—and river valleys where trees and shrubs abound he is apt to be common enough in summer.

In the valley of Grass Creek on the Pine Ridge Indian reservation, I made observations on the nidification of this bird in 1905. About May 15 I noticed a pair of shrikes at work carrying nest material. On May 22 I found their nest—nearly finished. It was in a willow tree near the brook, about nine feet from the ground, and was situated amid a thick tangle of twigs and branches. The bird that was working at the structure slipped away so quietly that, had I not seen her at the first, any sound she might have made could not have called my attention to her. Beginning May 26 a rain set in, lasting for four days, and on the 29th, when the storm ended, the nest was thoroughly soaked. The birds had now abandoned it, for on June 6 I found a new nest, built by the same pair, with one egg in it. This domicile was destroyed by marauding Indian boys on June 8. By June 11 these devoted birds had nearly completed a third nest a short distance from the second: both these last were also in willows. After the first nest had been abandoned I pulled it apart and examined it. The foundation was of coarse sticks; next came soft plants, chiefly wormwood (*Artemisia*), with feathers and strings, all closely and firmly matted together; then, still proceeding inward and upward, came fibers, bark shreds, and cotton—constituting the lining of the nest. While the third nest was in process of construction I saw one of the birds perch upon the old stalk of a great ragweed and pull away the soft, shreddy bark; at another time I saw it tearing in pieces a quantity of cotton from an old quilt.

The pair worked late—until after sundown. I think that they took the softer material from the first nest to

help build the second, as this portion of the former disappeared. When I tore this original nest asunder I found it damp and moldy, even after several days of hot, dry weather, and there is no wonder that the birds deserted it. Ever and anon, during the day, one or the other of the pair would alight on a tall flag-pole to take a look over the adjacent country. After a time they became rather tame.

On June 13 the third nest contained one egg; on June 14, two eggs; on June 15, three eggs; when next visited, June 18, five eggs; and on June 19, six eggs. The next time I came, on July 8, this nest still containing the six eggs, was deserted, no birds being seen near it, nor did they return, although they still tarried in the vicinity.

On June 18 I had found another shrikes' nest, in a willow that "grows aslant a brook." It contained four young, just hatched. They were naked, and yellow, and blind. I saw them again on the next day. The old bird was brooding them on both occasions. On June 21 the little birds were still unable to see, and the yellow of their skins was taking on a greenish tinge. The old bird, the mother I suppose, approached very near while I was peering into the nest, and made a snapping sound with her bill. On June 23 the nestlings had their eyes pretty well opened. June 25, when I called again at the nest, it was empty. The Sioux were not the culprits this time. They could have easily proved an alibi, for like the Arabs all had folded their tents and silently stolen away—to the site of a prospective Fourth of July celebration, miles away. No doubt the magpies were to blame. It was but another tragedy of the nests.

An Odd Nesting Site.

BY HENRY F. PULLEN, VICTORIA, B. C.

It is wonderful how quickly the birds adapt themselves to life in a city. An old rusty tomato can had been thrown out on to a vacant lot in the heart of Victoria city. Two little white-crowned sparrows found it and at once recognized its suitability for their purpose. Usually these sparrows make their nest on the ground under bushes or

very near the ground in low bushes but this was something better. It would protect them from any inclement weather and in it their little home was not likely to be discovered, carefully and lovingly the work was done. Grass woven in circular form was used for the outer framework of the nest and inside this, horsehair with an occasional string intermingled made



WHITE-CROWNED SPARROW'S NEST
In an empty tomato can.

everything cosy. The four little bluish green eggs with the brown spots were laid on four consecutive days and then the happy pair took turns in sitting on them.

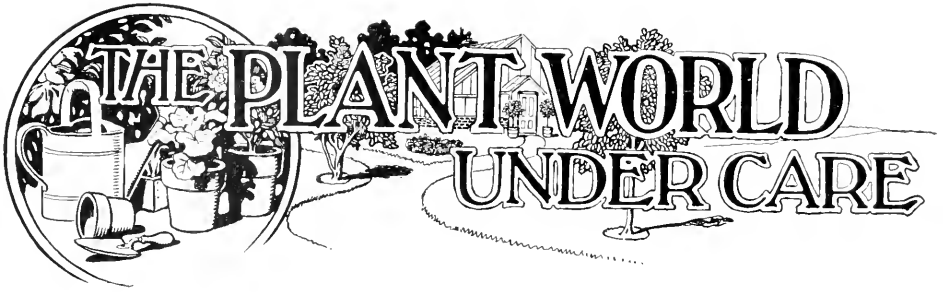
Everything so far had gone well. No unwelcome intruder had discovered their hiding place. They were happy as the day was long. Very soon however they were to learn that they were living in a world in which sorrow and joy are oddly intermingled and the innocent often suffer for the carelessness of others. A boy one day running across the lot came so near that little White Crown became frightened and foolishly flew off her nest. The boy saw her and immediately explored the recesses of the old can.

Now this boy was fond of the little birds and would not for the world have injured them or the nest but he had a friend to whom he showed the cute little thing. This boy told two others and so the news passed around until a boy heard of it who wanted just one egg for his collection.

It was just at this time that the news was told to me in confidence, but when I arrived on the scene I found several boys there looking at the wonder and there were but three eggs left. The next day two more had been taken and still a day later the last precious hope of the sparrows was taken by a boy who did not mean any harm but who just wanted one egg.

This family of sparrows would have eaten thousands of insects if they had been allowed to hatch and grow up. Four sweet little lives would have helped to make the world brighter, had it not been for the thoughtlessness of four boys who each wanted only one egg.





The History of the Cultivated Pansy.

BY THEO. HOLM, BROOKLAND, D. C.

The history of our cultivated plants is a most difficult task to deal with, but is quite interesting and highly instructive. One has to study the geographical distribution of the species in a wild stage, and the history of its cultivation. The literature is copious, but, nevertheless, there are many instances, where we do not get all the information which we desire; as a matter of fact several of these plants are no longer known to occur as "wild," and there are very many that have been cultivated for so many years, that the year or first place of cultivation cannot be traced. We all know that the old Chinese and Egyptians grew cereals, vegetables and flowers, many of which are still in existence, but their native home is frequently yet unknown.

However, the origin and cultivation of our pansy does not date back that far, and the earliest record we have is from the sixteenth century, or to be exact from the year 1542, when a German botanist Leonhart Fuchs mentioned that the wild pansy was planted in gardens on account of its pretty flowers. This wild pansy was the European *Viola tricolor* L., and its popular name was at that time "Dveyfaltigkeytblumlin" with the Germans, and "pensee" with the French, but the name under which it was best known was however "herba trinitatis," referring to its three-colored petals. In England the wild pansy (*V. tricolor*) was cultivated during the last part of the same century under the popular names, "Hartes ease," "Paunsie," and "Three faces in a hood." It is now interesting to see that the English hor-



FIG. 1. VIOLA TRICOLOR

FIG. 2. VIOLA CALCARATA

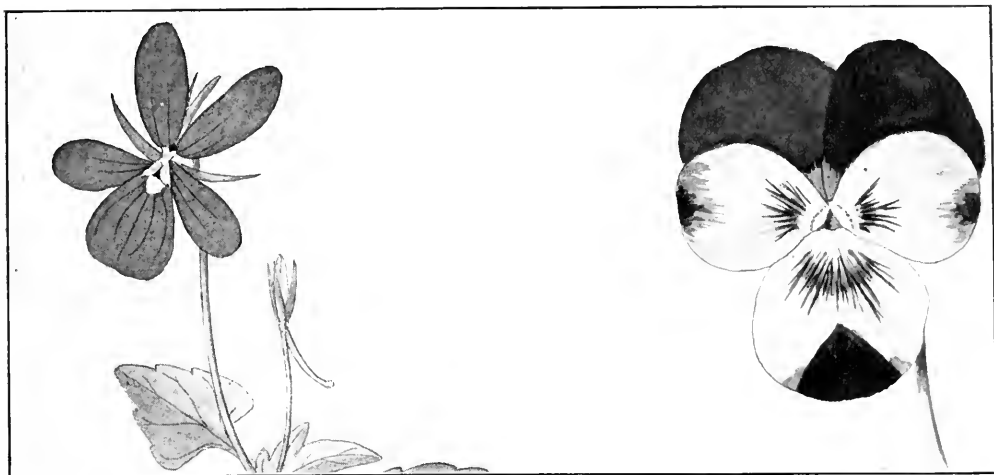


FIG. 3. VIOLA CORNUTA

FIG. 4. "LADY BATH" (1834).

ticulturists introduced another species of *Viola* namely the yellow *V. lutea*, and that a double-flowered variety was known as early as the year 1629 according to Parkinson. About one hundred years later Philip Miller (1731) states that *Viola tricolor* was cultivated very extensively in England, and in many varieties as to size and color of the flowers, beside that *V. lutea* was also grown occasionally. That the pansy was also grown in Denmark and Sweden as early as the middle part of the seventeenth century may be seen from the works of Simon Paulli (1648) and Olof Rudbeck (1658). It is not so strange that this little plant should attain such widespread popularity, when we remember that Linnaeus (1737) recognized not less than nineteen varieties, several of which are quite showy.

The pansies that were, thus, grown in gardens during the sixteenth, seventeenth and eighteenth century were *Viola tricolor* and *V. lutea*, especially, though the former. It was not, however, until the nineteenth century that the culture of pansies should reach its climax. That was when Lady Mary Bennet, daughter of the Count of Tankerville (1810) undertook a rational culture of wild pansies; she collected seeds of so many varieties as she could find, and grew them in her garden. Her example became soon followed by Lady

Monke (1812), and Lord Gambier (1814), whose gardener Thomson of Iver was very successful in producing showy varieties. Seeding was commenced on a great scale, the most showy specimens were carefully selected, and the selection continued from year to year. No artificial cross fecundation was yet attempted, but the flowers were left to the visits of bees and other insects. The fact that *Viola tricolor* was at that time grown side by side with *V. lutea* resulted in the development of hybrids, and it was not long before three other species were introduced in the gardens: *V. Altaica*, *V. calcarata* and *V. cornuta*. These wild species of the genus *Viola* became actually the ancestors of our cultivated pansy of to-day, and the accompanying figures illustrate some of these.

Among the very first large flowered varieties that were raised in this way was, "Lady Bath" (1834), in which the petals were more brilliantly colored than in the parents, while their shape was essentially the same, somewhat elongated. Then followed a period where English pansy raisers laid more stress upon the production of circular flowers, and "Beauty of Anlaby" is one of these.

The production of these large flowered varieties or rather hybrids marks an epoch in Pansy culture; the interest

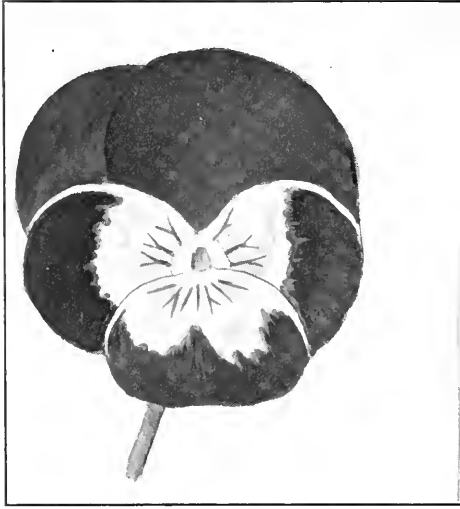


FIG. 5. "BEAUTY OF ANLABY" (1836)

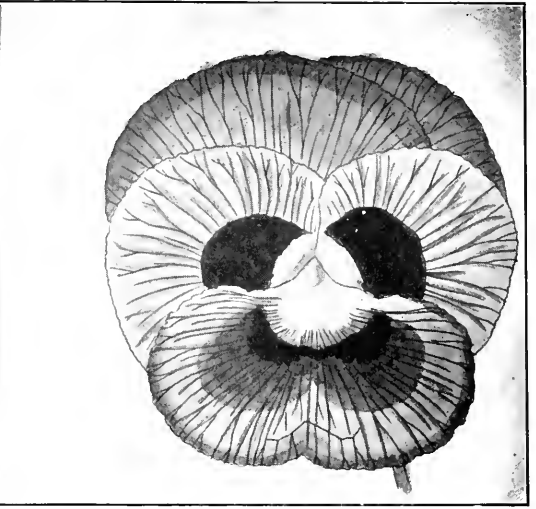


FIG. 6. "MADAME CAMPAN" (1856)

for pansies awoke to such extent that "Pansy clubs" and "Harts ease societies" were established, awarding enormous prizes for the finest flowers that could possibly be produced. The flower, however, should be of a circular outline, and the petals should be of the same color "Selfs" or of two different "Belted pansies." These demands were fully complied with in England, and all other varieties were

discarded or unmercifully annihilated. Fortunately the French horticulturists were more liberal in this respect; they laid more stress upon the coloration than the shape of the petals. We owe to the famous Mieliez of Lille (1850) the production of the magnificent "Napoleon 3" and "Imperatrice Eugenie." In the former of these the petals are purple and yellow, in the latter pink and white, but both had

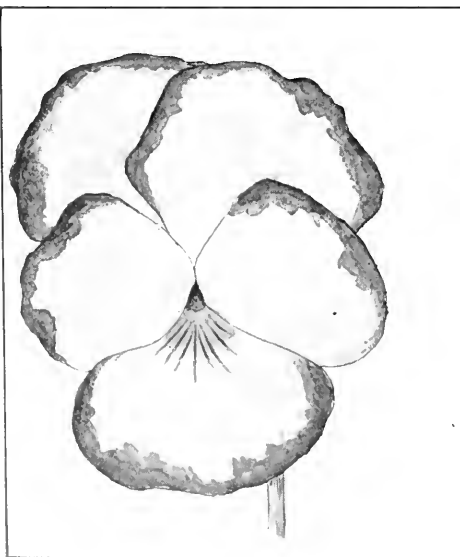


FIG. 7. "DUCHESS OF FIFE" 1890

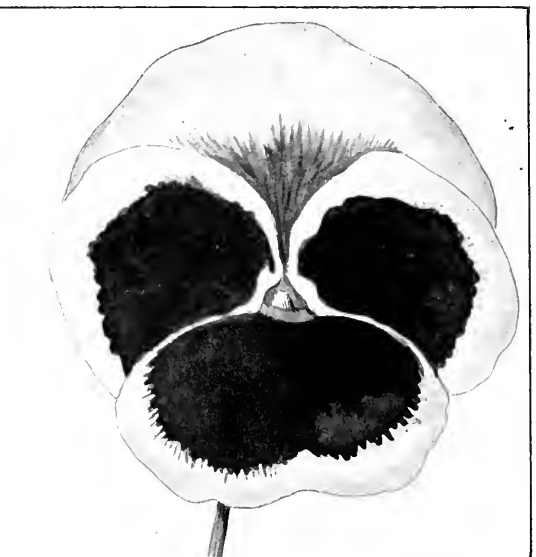


FIG. 8. "EMPERESS PANSY" (1894)

large dark blotches on the lower petals, somewhat like "Madame Campan," raised in Belgium (1856).

A much more modern type is, however, the "Duchess of Fife" (1890) with no blotches, and in which the color is yellow edged with purple; this forms a striking contrast to the so-called Empress Pansy (1894), which by far is the most showy and the most fashionable of all these that have been raised so far.

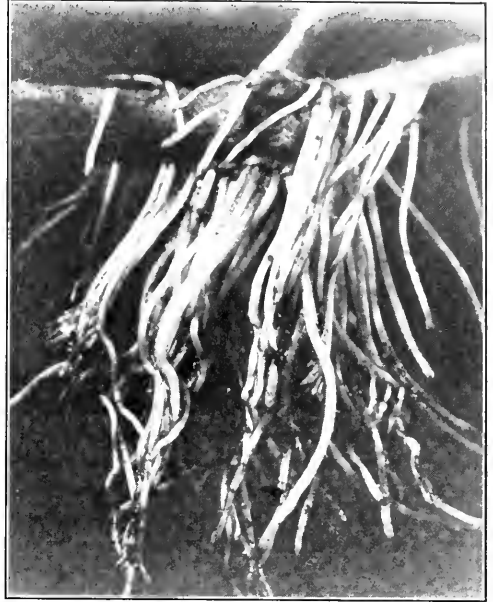
With the exception of green, all the other colors are represented in the cultivated pansies, and the number of different shades is immense. Double flowered varieties are not considered, and in this way we find always in the pansy something of its old, true nature.

Few flowers have become known under so many names as our pansy, and some of these are quite interesting for instance: Stepmother, Blue suneye, Widow herb, Day and night, Two faces under the sun, Call me to you, Kiss at the garden gate, and finally the longest ever attributed to a flower: "meet-her-i'-th'-entry-kiss-her-i'-th'-buttery."

STEMS THAT ARE ROOT-LIKE.

It is interesting to note the first steps in the transformation of a stem into a root, a transformation that is easily observed especially with the stem of tomato vines. In my garden this year the tomato vines were of unusually heavy growth on account of the over enrichment of the soil. From lack of time or for other reasons I failed to train the vines on sticks in the usual manner. They remained especially neglected in one corner of the yard, where they lay on the ground and developed rootlets, or root-like branches, in patches that extended along almost the entire length of the stems. By examining the vines from

the ground upward, one could easily study these roots in all stages of growth, beginning with the first little lenticel just starting to expand on the



THE ROOT-LIKE STEMS

side of the stem and ending with the long rootlets as shown in the photograph. But mentioning the lenticel reminds me that a botanist not long ago told me that he had induced a section of a tree trunk to project tiny roots through the lenticels by keeping it in a damp place. I wonder if any of our readers can give any information on this subject?

Growing Peanuts.

It is an easy matter to grow peanuts in open beds or in boxes filled with earth. It is interesting to watch the "intelligence," seemingly, with which the flower is pushed under ground for the fruiting nut to grow.





Under the Auspices of The Aquarium Society of Philadelphia, Herman T. Wolf, Editor

Water for the Freshwater Aquarium.

Questions as to what kinds of water are best for the household aquarium are so frequently addressed to the writer that some little elucidation on this subject may be of general interest.

The fishes which best survive under these necessarily artificial conditions are the common forms of the pond and stream and the domesticated golden carp or goldfish and its variants, produced by selection and breeding. The most of these are natural to any still or slow-flowing water, and it is the Cyprinidæ or carplike fishes which survive the longest in the aquarium, as they require less oxygen, dissolved or held in suspension in the water, than those whose habitation is cold water or the swift running brook.

Therefore, any water fit for drinking or culinary purposes is all that is required for the usual aquarium fishes; but cold-water fishes require larger containers and a constant change of water admitted under pressure, or else some means of artificial aeration to supply sufficient oxygen.

It is an erroneous idea that water purified by a mechanical filter is injurious. Some inquirers ask whether filtration will remove food for the fishes. Only very few of the low forms of animal and plant life are present at any time, and these are insufficient to sustain the lives of fishes, making feeding necessary to their survival.

Filtration by mechanical means is, if anything, beneficial, as it removes the spores and larvae of parasites and other natural enemies, and when sufficient growing plants are present to liberate oxygen and consume carbonic

acid gas, is preferable to unfiltered water, as it is clearer and cleaner and will cause less sedimentary deposit than the usual muddy water directly from the mains.

When filtration is aided or effected by the use of alum, sulphate of copper or other astringent substances, however, such water is unfit for the aquarium and may cause the immediate or ultimate death of all the fishes. This was mentioned in the last issue. Where such water is furnished by the city supply, it had best not be used, and soft water from other source employed.

Under right conditions, a change of water in the aquarium is necessary only at long intervals, then rain water, thoroughly aerated by frequent pouring from one vessel to another and exposure to the atmosphere some days before use, is advisable; or spring or well water similarly treated, to modify its hardness. These conditions are not present in many cities of the United States; and the question of the *kind* of water for the aquarium is not as important as many fanciers believe.

Any potable water not purified by chemicals is all that is required; mishaps to the aquarium and its inhabitants can usually be traced to causes other than the water supply.

Aquarium Scavengers.

To maintain the balance between animal and plant life, prevent the deterioration of the water, remove parasites, and to consume sedimentary deposits, offal and excreta, in the aquarium, scavengers are imperatively necessary. These consists of molluscs,

larval forms of amphibia and some species of fishes harmless to the other animal inmates.

Of the molluscs, those species which feed on algae, the minute aquatic plants, and decaying vegetation, infusoria, rotifera and the general refuse only should be introduced, not those which prefer living and growing plants. Experience has taught the aquarist that five species of snails and three species of mussels are best for these purposes. They are the common forms of Planorbis, popularly known as ram's horn, trumpet or flat snails, and the large *P. magnificus*, or Cape Fear river snail; also the Vivipara, of which the Potomac and Georgia snails, *V. viviparus* and *V. georgianus*, and the introduced Japanese snail, *V. mallicatus*, are preferred; and the so-called Transparent African snail, *L. auricularia*. Two or more kinds of these are advisable as they all vary somewhat in preference of diet.

Of the mussels the small Sphaerium and the larger Lampsilus and Margaritana longest survive and are most effectual as scavengers.

Tadpoles are also beneficial in consuming the sediment, food offal and other organic substances, and of these frog-tadpoles remain the longest in the larval state.

To consume worms, leeches, polyps and animal parasites, small specimens of sticklebacks and Indian paradise fishes are used, which in a few days will effectually remove these pests.

In a freshwater aquarium of say twenty-five gallons of water, ten or twelve snails, four small and two large mussels and four or six tadpoles will be sufficient. The sticklebacks and paradise fishes need only be introduced when the vermes and hydrozoa have increased to such numbers as to be objectionable or dangerous to the other animals present.

Saltwater aquarium scavengers are not as efficient as those of freshwater; but the common forms of whelks and limpets, bivalves, shrimps and small crabs are used; and, though some also feed on the marine vegetation, they are fairly effective scavengers when the

feeding of the other inmates is properly regulated. As marine plants are introduced more to enhance the picturesque appearance of the aquarium than to serve as oxygenators, and as they do not thrive under the changed conditions, their partial destruction by these scavengers needs no serious consideration.

Enclosed Pond Aquaria.

Greenhouses for the display and propagation of tender and exotic plants or the growing of fine fruit are now so general that something new and different may appeal to those whose means will permit of its indulgence. Attention is therefore directed to the possibilities of a water garden which would combine the features of the aquarium and the pond, to display the beauties of both the fauna and flora of the pond and river, and also permit of the keeping of highly interesting foreign forms of fishes and plants that would probably not survive in the aquarium or greenhouse tank except under the care of an experienced attendant.

Veritable living pictures could be produced that in ever-varying beauty and entertainment could not be equalled by any other so limited expenditure of money, thought and good taste, as by this artistic arrangement of the water garden.

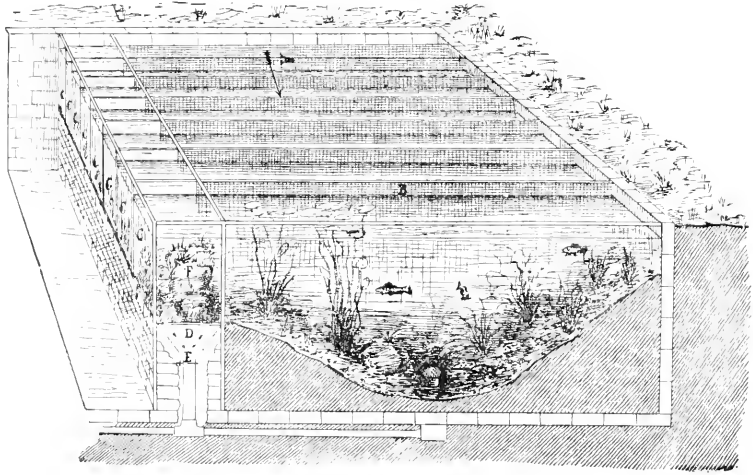
The suggestion originated with Mr. Wm. P. Seal and was published in a bulletin of the U. S. Fish Commission; the idea being to construct a glass enclosure similar to a green house, or to make it a part or adjunct to a greenhouse, thereby bringing the inhabitants of the pond where their living and loving may be observed and so add another esthetic pleasure to our existence.

In carrying out this thought, the aquaria would be built on the margin of a pond or other water reservoir and would consist of a series of glass-front compartments extending back into the pond, arranged at the front like an aquarium, with a movable back screen, so that any of the inhabitants may be

either trapped or allowed to roam at will in the larger rear enclosures.

As the illustration No. 1 shows, the

pockets for aquatic plants, or other attractive arrangement of submerged or floating plants made, which will



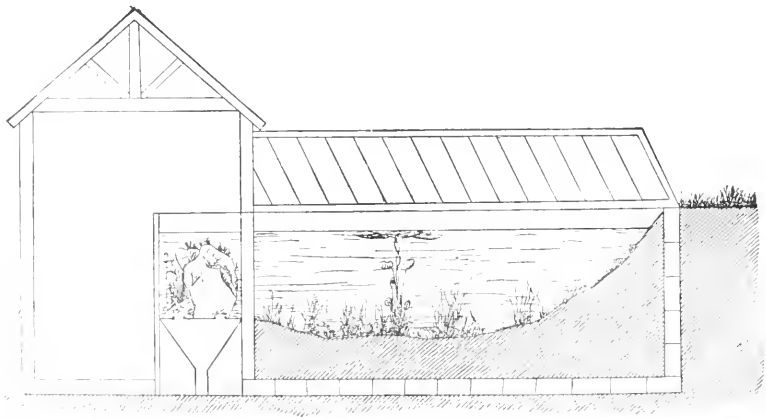
A POND AQUARIUM

water-pens (A), extending back from each aquarium front, are separated by partitions (B) from each other, and the aquaria (C) are furnished with wire-mesh movable backs. The bottoms (D) are perforated to allow the escape of sedimentary deposits and an occasional change of water through the funnel-shaped gutter (E), which, together with a drain from the low point of each compartment, are led to some point outside the building.

In each of the aquaria a mound of rocks (F) may be erected, having

vary the picture in each enclosure. A great wealth of other plants, water-poppies, lilies, lotuses, umbrella plant, arrowheads, rushes, sedges, flags, cattails and all else that grows in, or out of the water, could be planted in the reservoirs that would produce the effect of a submerged garden and bring the life history of the aquatic flora to view as has never before been done.

Each compartment could contain different genera and species of fishes, in one the common goldfish and carp



A SECTION OF ENCLOSURE FOR A POND AQUARIUM

the next the Japanese fringetail, fantail, comet and nymph goldfishes; a third the telescopic-eyed Chinese Mottled and Moor goldfishes, a fourth the Indian Paradise fishes, a fifth the Golden Ide, a sixth the Green and Golden tenches; and so on to the minnows, sunfishes, dace, killifishes, catfishes and eels, perch, trout, etc.; or a number of these which live in amity, together in one compartment; opportunity being offered for the display of any of the native and exotic fishes of freshwater in almost natural surroundings, free from the artificialities and restraint of the aquarium or fish tank, a vivarium in its broadest sense.

By this arrangement all necessity for a change of water would be dispensed with and except about twice a year, when considerable new water should be added, filling in as much as has evaporated would suffice for the maintenance of this pond-garden in perfect condition; as the growing plants would liberate sufficient oxygen for the fishes, and the fishes sufficient carbonic acid gas required by the plants in their growth; in other words, the balanced aquarium on a gigantic scale. The diagram No. 2 shows a further development of the thought, an artificial pond entirely enclosed in a greenhouse and thereby protected from inclement weather, ice and snow, an admirable arrangement for the study of all forms of fluvial life.

Can the reader form an adequate mental picture of the great beauty of an aquatic garden such as this suggests? Its maintenance would be simplicity itself, when once installed; and would not require even a modicum of the attention necessary to operate a greenhouse for plants. Has anyone the desire to venture this new thing of beauty? THE GUIDE TO NATURE would aid by advise and council and heartily endorse the attempt.

The Household Aquarium.

BY SAMUEL MCCLARY III, M. D., MEMBER
AQUARIUM SOCIETY OF PHILADELPHIA.

At this season of the year the household aquarium is an important subject

for consideration; and at the society's request, I am pleased to offer the following observations and suggestions.

The best size of the aquarium for the dwelling is one containing about thirty to eighty gallons, larger ones may be dangerous on account of their weight and smaller ones will require too frequent cleaning.

The frames should be of metal, those of brass make more effective adornments than gilding or paint over iron frames. It should be constructed to have a large surface, at least as wide as high and not over twenty inches deep, as fishes thrive better in shallow water. The base should be of slate and the sides of heavy plate glass, so joined that very little cement comes into contact with the water.

A good aquarium cement is composed of one part red lead, one part litharge, twelve parts glazier's putty mixed to a thick paste with boiled linseed oil and a little ivory black.

The best medium in which to root the plants is a lower layer of small pebbles and a covering of clean coarse sand; the pebbles permitting an easy spreading of the roots, and the sand preventing too much of the residuum, particles of food etc. becoming mixed with this covering to possibly contaminate the water and over this a thin layer of small pebbles.

The best aquarium plants are the ribbon-leaved *Sagittarias* (Arrowheads) *Cabomba* (fanwort) *Vallisneria* (eelgrass) *Ludwigia* (loosestrife) *Potamogeton* (channelweed) and *Anacharis* (pondweed) as these best perform the necessary functions of liberating oxygen and absorbing the carbonic acid gas given off by living creatures. The most of these will thrive set directly into the pebbles and sand, but they may be planted in small pots in clean soil covered with pebbles and the layer of sand; which latter should not be level but arranged with a depression in the centre or in one corner where the humus or precipitates may collect for easy removal with the lifting tube or a siphon.

The plants may be arranged in

groups according to their height and foliage, and to act as a screen from excessive light with an open space in the front and centre.

The best light for plants and the aquarium is a northern exposure, but when this may not be had an eastern light is satisfactory with say two hours of not too strong sunlight in the morning.

The best scavengers are Japanese and native snails, the Ram's-horn and Potomac, pond mussels and frog tadpoles. The Molluses should have their shells scrubbed and the plants receive an antiseptic bath of two or three minutes in a solution of two teaspoonsful of Cresoptic to the gallon of water before being placed in the aquarium.

A glass or other cover may be placed on the aquarium, but it should not fit so closely as to prevent the free circulation of air, and had best be set upon rubber buttons on the upper frame. This will make the evaporation less rapid and keep out dust and foreign particles.

The fishes should only be placed into the aquarium after the plants are rooted and are oxygenating the water. A few small pieces of plaster of paris are beneficial as they add lime and neutralize the acidity of the water, necessary for the development of the bony structure of the fishes and shells of the molluses.

A balance of plant and animal life is necessary, which means that the conditions be such that enough oxygen is supplied to keep the fishes in comfort and to prevent the need for their coming to the surface to breathe the air direct. A good rule is to have an abundance of plant life and not over one inch of fish body for each gallon of water contained, excluding the tails; one snail to each fish and two or three mussels. The molluses should be closely watched that they may not die and contaminate the water.

About once a week the humus collecting at the lower level should be removed.

Feeding is so important a subject

that it should be taken up in a separate paper. Most of the prescribed foods are too concentrated, that is, they have too little bulk for the amount of contained nutrition, and frequently cause constipation. I approve of the following as an aquarium food:

- 1 pound cornmeal flour.
- 1 pound Bethlehem oat-meal.
- $\frac{1}{2}$ pound shredded codfish.
- 4 eggs.
- 1 tablespoonful of table salt.
- 1 teaspoonful of epsom salt.

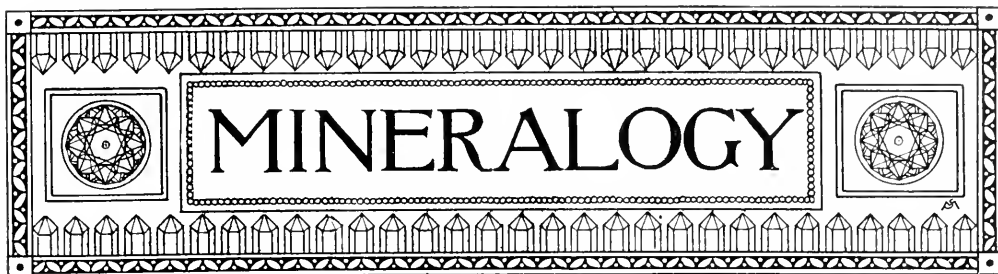
and sufficient water to make a paste, thoroughly mixed and steamed for four hours, then forced through a colander or other strainer and dried at a low heat. This should be occasionally varied with other food, all sparingly fed. It is a general practice to feed entirely too much and too often—once every other day in winter and daily in the summer for six-months-old fishes; younger fishes should be fed oftener in smaller quantity. No food should remain in the aquarium fifteen minutes after it has been given. Some form of feeding dish is a good method of learning just how little will be sufficient. Always avoid overfeeding.

The natural small pond life, consisting of the tiny water animalculae is the best fish food.

Nets should be shallow, made of bobbinet and handled carefully so as not to injure the fishes. Scissors should be used in trimming the plants and a thermometer is necessary to regulate the water temperature when transfers are made from one water to another. Fine breeds of goldfishes should never suffer a sudden change of more than four or five degrees in temperature.

In closing this general paper on aquarium conditions, I wish to emphasize several guiding points.

Be clean with everything; Disinfect all plants and animals before adding them to the aquarium; even quarantining a week or ten days all new inmates. Have all the conditions as near nature as possible, and feed sparingly, if you wish to be assured of a fair measure of success with the aquarium.

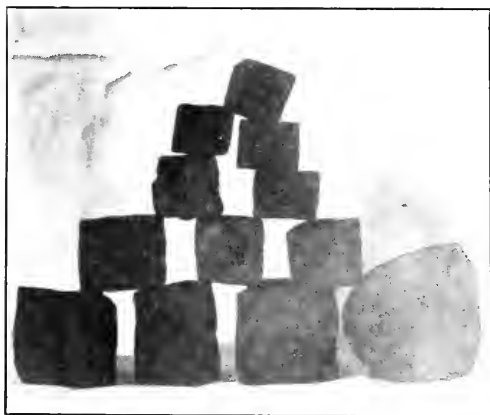


Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

Minerals Occurring in the Neighborhood of the University of Virginia.

BY W. M. M. THORNTON, JR.
CHARLOTTESVILLE, VA.

During the past summer and autumn Mr. G. F. R. Jackson and I took a



LIMONITE AFTER PYRITE, ALBEMARLE COUNTY, VIRGINIA

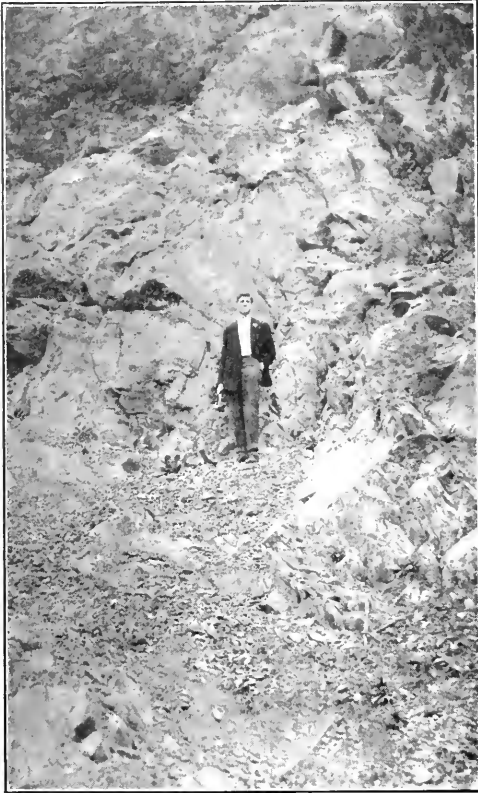
good many tramps in Albemarle Co., Va., with the three-fold object of enjoying the fresh air and exercise, observing and discussing the rather com-

plex Geology of the region, and collecting all the different species of minerals and rocks that could be brought to light. When the desire to make a mineral collection first took hold of me, I naturally asked the question; What minerals (in a state approaching purity) could be found in and around my home. The answer as it came from others was not encouraging, and indeed my first searches were almost fruitless. Mr. Jackson and I, however, determined to investigate thoroughly, and were rather agreeably surprised to find about a dozen specimens, which I consider not contemptible illustrations of the varieties they represent. The purposes of this little article are two: viz., to encourage the study of Mineralogy, especially by the method of seeking the earth's constituents where they have been differentiated and lie hid in their rocky or earthy homes, and to give to those locally interested and to those interested in the geographical occurrence of minerals generally some little account of what is available. A brief description of each specimen and its mode of occurrence follows.



AMETHYST, ALBEMARLE COUNTY, VIRGINIA

Calcite:—Monticello Mountain, on which stands the historic home of Thomas Jefferson, is about two miles southeast of Charlottesville. The



VIEW IN MONTICELLO QUARRY
Showing veins of quartz and calcite in
chloritic schist.

mountain is one of a range formed of an ancient igneous rock now highly metamorphosed. The most conspicuous minerals composing the rock are quartz, chlorite, and epidote, so that its color varies from the grass green of the chlorite to the "bull-frog green" of the epidote. Near the foot of the mountain where the road crosses Moore's Creek the rock is exposed by the road cut. Here small veins of calcite traverse the rock. On opening up along these veins, crystallized calcite in fair examples was found. The specimen in my cabinet is a small pocket in the schist lined with calcite crystals. The little cavern of white crystals against the green background

makes a unique and attractive specimen.

Chlorite:—As we follow the same road at the point where it starts up the mountain and the creek makes a bend and skirts around the base of the mountain, the Charlottesville rock quarry is situated. A good deal of rock has been taken out for road metal and the consequent exposure is 70 or 80 feet high and about 50 yards long. Along the wall were found cross sections of irregular veins of chlorite. The mineral is very soft, dark green—almost black on a fracture surface—though the streak is grass green. It seems to be composed of very small scales tightly packed together. It is apparently very pure; but it has not as yet been identified as a particular chlorite. It is hoped that a chemical analysis as soon as practicable will determine this point.

Specular Hematite:—Quartz veins are common in the chloritic schist and crystallized hematite has been frequently deposited in fissures in the quartz. On the road side near the Monticello gate two pieces of milky quartz were found and on them considerable specular hematite. Equally rich masses have not been found in place.

Quartz:—Quartz does not occur in large distinct crystals; but some interesting massive varieties are mentioned below. Beyond the Monticello entrance, however, a narrow dike of quartz porphyry cuts through the chloritic schist. On the joint planes of the porphyry small crystals were found implanted, most of which approach the normal form. Smoky quartz was found along the Monticello road side. The mass is almost black and on parts of the fracture surface the lustre is almost dull. It seems probable that the smokiness is due to included black hornblende or possibly tourmaline. Following this same road past Monticello, the old Virginia home named "Morven" is reached. Many pieces of amethyst, large and small, have been found on this place. I am indebted to a lady of the neighborhood for a specimen, weighing 8½ ounces. In structure it is a mass of crowded and fre-

quently twinned crystals, which is shown by re-entrant angles and striations over the whole surface. It appears deep purple at one end and



VIEW IN QUARRY AT CHARLOTTESVILLE RESERVOIR

Showing pegmatite dike on the left and interbedded hornblende schist on the right in granite gneiss.

nearly colorless at the other. About 5 miles west from the University, the Charlottesville reservoir is situated among hills of Archean granite gneiss. Two amethysts were found loose a little north of the reservoir. The better piece is pale in color and shows several pyramids capping one another. Unfortunately it has many flaws. This is the only amethyst I know of from this locality, so the accidental find remains to be explained. A curious pale blue opalescent quartz occurs in the granite gneiss area. The cause of this color is an interesting problem. Some years ago Prof. F. P. Dunnington examined thin sections with the microscope and always found crystallites of rutile present. But according to Dr. T. L. Watson much of perfectly colorless Appalachian quartz shows crystallites of rutile, so that minute needles of rutile do not necessarily give rise to blue color. At Roseland,

in Nelson Co., blue quartz is an abundant constituent of the pegmatite dike that carries rutile and some ilmenite; so at any rate it is very closely associated with titanium compounds.

Limonite after pyrite:—On the northwest outskirts of Charlottesville, pseudomorphs of limonite after pyrite are abundant in the soil. The pyrite originally existed in Huronian mica slate, which is now very much disintegrated. The form is the simple cube, and some of the smaller crystals are nearly perfect; though the larger ones are generally elongated. Penetration twins of two or more individuals are common, and the facial striations are often clearly shown. At Rio on the Southern R. R., where the mica slate is less decomposed, cubes were found in the rock. This proves the mica slate to have been the matrix.

Near the Charlottesville reservoir the minerals of the granite gneiss have been differentiated and masses of black scaly hornblende and plagioclase feldspar can be obtained. Finally residual clay occurs both in granite gneiss and mica schist regions.

It is hoped that this brief account can sometime be expanded so as to embrace Albemarle Co. as a whole, when doubtless a greater number of species and more interesting occurrences can be recorded.

THE OPAL.

(A MYTHOLOGICAL POEM.)

A dewdrop came, with a spark of flame

He had caught from the sun's last ray,

To a violet's breast, where he lay at rest

'Till the hours brought back the day.

The rose looked down, with a blush and frown:

But she smiled, all at once, to view
Her own bright form, with its coloring warm.

Reflected back by the dew.

Then the stranger took a stolen look

At the sky so soft and blue;

And a leaflet green, with a silvery sheen,

Was seen by the idler too.

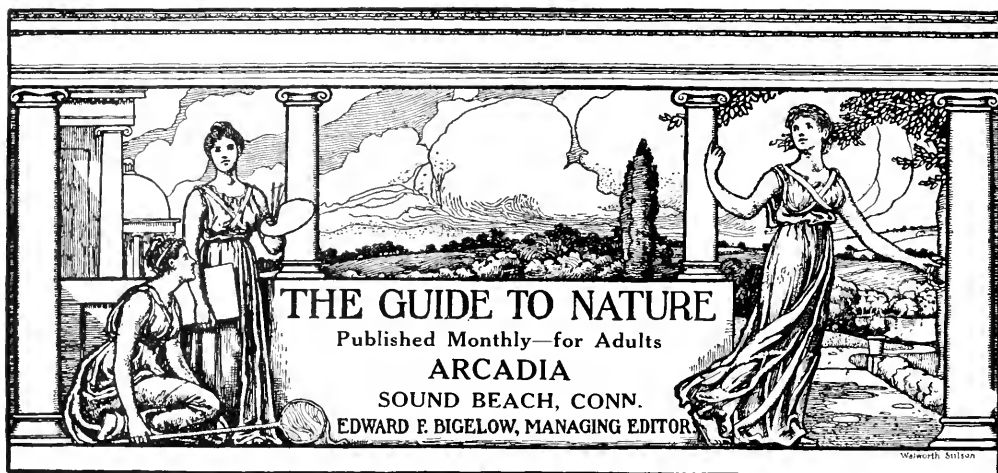
A cold north wind, as he thus reclined,

Of a sudden raged around,

And a maiden fair, who was walking there,

Next morning an opal found.

[The above poem was found among some torn leaves of a book on gems in mythology, but the real name of the book or its author could not be learned.—Editor.]



Our Summer School.

Monday, June 21st, will be the opening day for our first annual summer school of nature in Arcadia. It will close on Friday, July 9th. The school will hold this session without fail, even if there be but one pupil and that one be Edward F. Bigelow. Wouldn't you like to join with him and be able to say in future years, when Arcadia shall be greater than it is to-day, "I was a member of the first nature school held in Arcadia, Sound Beach, Connecticut?"

And do not forget that we are all children in the study of God's works, and however great may be our attainments, we are all only beginners. The school will welcome you to the limit of its capacity whether you are nine or ninety, whether or not you know a clam from a mussel, a dandelion from a buttercup, a blue jay from a kingfisher; whether or not you are a member of the kindergarten department or a savant.

But wait a moment. Perhaps we can get to the gist of the thing by a briefer method. We will not accept you as a pupil unless you have a genuine interest in at least some phase of this wonderful and beautiful world, and express a desire to know more. Your presence here will be a tacit admission of such interest and desire, and nothing more is necessary. Arcadia is not a place in which to pass

the idle days of a summer vacation. It is not a place in which "to loaf and possess your soul" in empty day-dreaming, although for those purposes no region can be better adapted. It is a place for serious work, for earnest thought and for mental exertion. If you come, it must be with these facts in mind. Recreation will not be entirely absent. But that will come only after the work has been done for the day.

The Central Idea.

There is a wide range, it must be admitted, in the conversational enthusiasm of a sailing trip (with jocose references to the Fat One), in the enthusiastic study of the tobacco beetle, in elaborate biological arguments relative to a deformed claw, and in several other articles in this number which, perhaps, is wider in range of topics and of treatment than any previous number.

But after all the amplitude is perhaps not so great as it seems. A little analysis and comparison will show the reader that each topic is true to the central idea of *THE GUIDE TO NATURE* and that it is in direct educational relation with some phase of nature, especially with what it gives us pleasure to call "commonplace nature with uncommon interest." The writers on these topics and on others in this number have found instruction

and entertainment in a special aspect of nature; they have treated their subjects well, and, we are sure, the reader will be gratified and instructed. **THE GUIDE TO NATURE** is a magazine of wide range of sympathy for nature in education and recreation. If you have a holiday and spend it in studying or only in admiring nature, and really do something worth doing from either point of view, or if you diligently use microtome and microscope for a decade on some one class of objects, then you are included within our central idea.

The test is—what did you see or do that will be helpful, entertaining or inspiring to others, or that will tend to influence others to follow in your footsteps? **THE GUIDE TO NATURE** seeks your cooperation and welcomes your observations.

Faithful and Efficient.

No letters and contributions come to **THE GUIDE TO NATURE** which show more faithful and efficient interest in nature than those from Dr. R. Menger of San Antonio, Texas. Unlike some other correspondents, he does not get provoked if we are obliged to return now and then an account of observations for which we cannot find room. Instead of argument and "Stop my subscription," he sends something next time that is so good that we must find room for it at once.

Then, too, he says and does something; he does not send mere words

about what he would like to do nor does he send indefinite eulogies of all the glories of nature and of nothing in particular. He gets down to business. He sees things. He ascertains



DR. R. MENGER
San Antonio, Texas.

facts. He does not get discouraged. He is just the kind of faithful worker we commend to other workers. See his article, "Peculiar Metamorphosis of the Tobacco Beetle," on page 94 of this number.

CORRESPONDENCE AND INFORMATION

Examples of Albinism.

Julietta, Indiana.

TO THE EDITOR:

I see in the April number of **THE GUIDE TO NATURE** some observations of natural freaks among our feathered

friends. The accounts of albinos remind me of my own experience.

Until a year ago, our community had only a small number of blackbirds; but last spring a large flock made its summer home in this vicinity. Hereto-

fore I had always been of the opinion that blackbirds built in evergreens but this colony, ignoring the few firs and cedars about them, preferred to protect their nests and nestlings in hollow beeches. While I watched them as they were busily engaged in their home-making, my attention was attracted by one of their number who resembled his fellows in every respect with the exception of one wing which was pure white. I often saw this particular bird during the summer and in the hazy autumnal days. When our colony collected for their southward flight, he was among the number, and in the congregation there were two whose tails were adorned with white feathers. This spring the bird is with us again, as is also one of the white tailed variety and I await with interest the advent of the young brood.

A few years ago a neighbor spoke of having seen a small white bird on his premises. Investigation proved this white bird to be a perfect albino

English sparrow. Only a sparrow it was, but withal a thing of beauty, and it seemed that had all members of its kind possessed such beauty surely they would be viewed in a kindlier light by mankind.

And now, dear Mr. Editor, will you give us some reasons for such exceptions to Nature's unchangeable laws?

Fraternally,
GEORGE W. LANCASTER.

I recently sent an almost spherical nubbin of corn to an experienced agriculturist, asking him why it took such a form. His answer contains volumes of wisdom. Ponder it well.

"I haven't got so far as the irregular ear. I've been studying corn for many years and do not yet know why it grows long in usual form."

Then think a little of variation. No two individuals alike, not even two snowflakes, blades of grass, leaves or human beings. Curious, isn't it, that we ever think of "unchangeable laws?"—Editor.



Good Suggestions for Family Chapter By-Laws.

BY-LAWS OF MELLETT CHAPTER OF THE
A. A. NO. 1019.

Article I.

Title and Object.

Section 1. The name of this Chapter shall be
MELLETT CHAPTER OF THE
A. A. No. 1019.

Section 2. The object of this Chapter is to participate in the advantages of membership in The Agassiz Association for the advancement of its members in the search for knowledge, wisdom and truth through the observation and study of natural objects, the natural sciences and philosophy.

Article II. Members.

Section 1. Membership in this Chapter shall consist of regular, associate and corresponding members.

Section 2. Any member of the family of Edwin D. Mellen of Cambridge, Massachusetts, their near relatives and descendants of good character may become regular members upon payment of the current dues to the Recording Secretary.

Section 3. Any person of good character may be proposed for associate membership at a meeting of the Chapter.

Election shall be by ballot; and, unless there be two or more ballots in the negative, a person so voted upon

as a candidate shall be admitted to associate membership on subscribing to the By-Laws and paying the current dues.

Associate membership shall not at any one time exceed ten in number.

Section 4. Any person of good character may be proposed for corresponding membership at a meeting of the Chapter.

Election shall be by ballot as provided for associate membership.

Corresponding members shall be exempt from the payment of dues and assessments.

Section 5. Regular and associate members are entitled to vote and to hold office.

Corresponding members shall not be entitled to vote or to hold office but they shall be entitled to all other privileges of membership.

Section 6. At any regular meeting of the Chapter the presiding officer shall declare the membership forfeited of any regular or associate member whose dues or assessments are unpaid for one year, without prejudice, however to the good intent and character of a delinquent; and provided that unpaid dues and assessments may be abated and the membership may be continued by vote of the Chapter.

Article III.

Dues and Assessments.

Section 1. The annual dues shall be one dollar and shall be payable on the first day of January of each year.

Section 2. Assessments may be levied upon regular and associate members to defray the expense of excursions, investigations and for such other purposes as may be authorized by vote of two-thirds of the members present and voting at a meeting of the Chapter; provided, however, that payment of an assessment shall be binding upon those members only who participate in its application.

Article IV.

Officers.

Section 1. The officers of this Chapter shall be a President, a Vice-President, a Treasurer, a Recording Secretary and a Corresponding Secretary.

Section 2. The officers shall be

elected by ballot at the annual meeting to hold office for one year or until their successors are chosen.

Section 3. Any vacancy occurring may be filled at any meeting in the manner provided for election at an annual meeting.

Article V.

Duties of Officers.

Section 1. The President shall preside at all meetings of the Chapter and shall perform the duties usually appertaining to the office.

Section 2. The Vice-President shall, in the absence of the President, perform all the duties of that officer.

Section 3. The Treasurer shall collect all dues and assessments, have charge of all funds, and from said funds shall pay all bills which have been approved at a meeting of the Chapter. He shall submit a report of his accounts to the Chapter at the annual meeting or at any other meeting if required.

Section 4. The Recording Secretary shall keep a record of the proceedings of the Chapter. He shall notify all members and officers of their elections and committees of their appointments, and shall issue notifications when directed by the President, in the absence of the President and Vice-President he shall call a meeting to order and shall preside until a chairman is chosen.

Section 5. The Corresponding Secretary shall conduct the affairs of the Chapter in its relations with outside parties, subject, however, to the direction or approval of the President or of the Chapter. He shall conduct all correspondence except that which is the province of the Treasurer or Recording Secretary in the discharge of their duties.

He shall, during the first week of March in each year, send to the President of the Agassiz Association a carefully prepared annual report of the doings of this Chapter. Should this Chapter at any time disband he shall send immediate notice thereof to the President of the Agassiz Association.

Article VI.

Meetings.

Section 1. The annual meeting

shall be held on the last Saturday in February.

Section 2. The President may call meetings at such times as may deem expedient, and shall do so on the written request of three or more members.

Section 3. For the transaction of business three members shall constitute a quorum.

Section 4. Members shall be allowed to invite friends to meetings of the Chapter by consent of the presiding officer.

Section 5. The order of exercises at all regular meetings shall be: a. Roll Call; b. Minutes of last meeting; c. Treasurer's report; d. Report of Corresponding Secretary; e. Reports of Committees; f. Reports of members on assignments, etc.; g. Unfinished business; h. Miscellaneous business; i. Adjournment.

Article VII.

Veto-Powers.

Section 1. The President, or Vice-President, shall have the power of veto

over the acts of the members in meeting assembled.

Section 2. The records of any meeting shall receive the approval of the President or Vice-President before the transactions of a meeting shall become effective. Said approval may be by declaration of the President or Vice-President spread upon the records at the time of adjournment or by written approval upon the records.

Section 3. Any vote or resolution may be passed over a veto by the votes of three-fourths of the members present at the same or next meeting.

Article VIII.

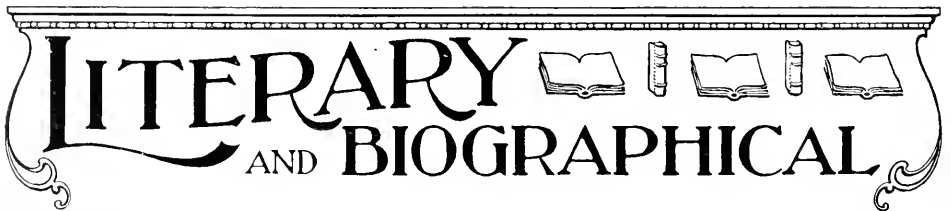
Parliamentary Usage.

In all matters of parliamentary usage Cushing's Manual shall be the recognized authority.

Article IX.

Amendments.

These By-Laws may be amended at any regular meeting by vote of three-fourths of the members present and voting, said amendment having been proposed in writing at a prior meeting.



Manual of Biological Projection and Anesthesia of Animals. A practical guide in the selection and operation of projection apparatus, the methods of preparing live animals and plants for projection, the anesthesia of animals, and the little knacks in manipulation which insure success in projecting vivographs. By Aaron Hodgman Cole, A. M., Instructor in Biology and Projection in the Chicago Normal School. Chicago: A. H. Cole, 6022 Monroe Avenue.

This book practically exemplifies a method of studying living minute organisms that I have advocated and used for many years. I firmly believe that such projection is for most objects far more effective than is study under the compound microscope.

The author has excellently worked out many devices of convenience and advocates extensively the use of chlorotone.

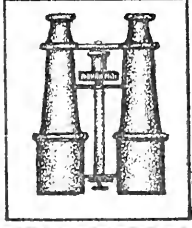
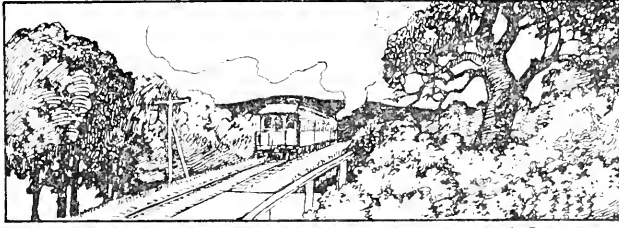
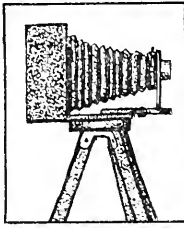
It is hoped that the use of his methods

will encourage individual students to do all the laboratory work that time and facilities permit in the study of live organisms, and will enable teachers to more wisely direct biological study and thoroughly test and properly broaden the student's knowledge, while adding interest and creating enthusiasm.

Practical Guide to the Wild Flowers and Fruits. By George Lincoln Walton, M. D. Philadelphia: J. B. Lippincott Company.

This book is based like Dana's and some others on the color. Charts for each color of flower or fruit have been so arranged that a given specimen may be traced through successive divisions to the group in which it will be found.

The author has an especially kindly feeling for other books for the same end, and says this is to supplement not to compete or to replace.



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WELCOMING NEW FRIENDS.

With this issue "The Amateur Naturalist," Ashland, Maine, is merged into THE GUIDE TO NATURE, as explained in the following letter from the editor and publisher of that magazine:

To the Subscribers of "The Amateur Naturalist:"

Dear Friends:

When in January, 1904, I began the publication of "The Amateur Naturalist," it was but the consummation of a plan formed when a boy of seven years I strolled with my father along the pebbly beach of Lake Ontario and gathered my first collection of minerals. Then it was my thoughts turned definitely toward the study of nature, and as the years came and went, as my knowledge of the subject grew and my interest in the unfolding the story of the great book of nature revealed in the rocks, the trees, the plants, the birds, the insects, increased, the desire to publish such information as I had gained and to colabor with others and increase among my fellow men a love for the study of God's handiwork took form in my mind and developed until "The Amateur Naturalist" began its career.

To publish this has been a work of pleasure, but also of sacrifice. "The call of the wild" has been neglected while the editor sat at the case setting type or ran the printing press. But new friendships were formed, the mental horizon broadened and added information gathered into the storehouse of knowledge, and it is with deep regret that the management of "The Amateur Naturalist" is discontinued. But business cares and duties are such that the editor finds it impossible to give it the care necessary. THE GUIDE TO NATURE follows the same lines as was intended by "The Amateur Naturalist," but does so more successfully, and brings with it a larger amount of experience and a corps of writers holding allegiance to a strong and influential nature society—The Agassiz Association. Into THE GUIDE TO NATURE, "The Amateur Naturalist" is therefore merged, and to it I commend all my subscribers, and while I bid "The Amateur Naturalist" a farewell, as must they, we may again meet in the columns of THE GUIDE TO NATURE.

Sincerely,

CHARLES D. PENDELL,

Editor and Publisher of "The Amateur Naturalist."

Important News for Mineralogists.

We have secured a collection of exceptionally fine minerals collected by an American professor of national repute; it is beyond doubt the finest collection we have yet handled. It consists of eight large cases of minerals all of which are fine. Lists are in preparation, and will be sent only on application.

AN INTERESTING COLLECTION OF SEMI-PRECIOUS STONES.

We secured from a bankrupt sale of a well known eastern concern whose specialty was the cutting and polish-

ing of stones for mineralogists a unique lot of cut semi-precious stones of unusual beauty and rarity. They must be seen to be appreciated. They have been priced so low that the prices do not tell the tale. We name a few below; they run from 50c. to \$2.50 each: unycite, perthite, aventurine, green-trap, cinnabar, thulite, sunstone, moonstone, amazonstone, chrysoprase green chalcedony, sodalite, labradorite, malachite, azurite, jade, turquoise, ruby matrix, emerald matrix, rose quartz, lapis-lazuli, jasper, agate, moss agate, carnelian, moss opal, blood-

stone, thompsonite, chlorastrolite, dumortierite, diopside, the latest, from Congo, at \$1.50 per c. and all other known semi and precious stones.

A TWO MONTHS BARGAIN SALE.

It has been usual for the past four years to offer special inducements to visit us during the summer months. In order to do this, with little expense to yourself, we offer you a 10% discount on rare and polished minerals and cut gems and 20% on ordinary mineral specimens. This enables you to pay your travelling expense with the discount on your bill. If you are able to visit us and see our wonderful display, write us what you are interested in, and we will send you a box on approval. We prefer to be busy even if we have to divide our profits with you. Don't delay but write or call on us at once. This offer holds good only for July and August.

If you have not yet received our new 12 page mineral and 10 page gem circular, write us and we will send them at once. A. H. Petereit, 81-83-Fulton Street, New York City.

Personal.

The Mineral Collector was merged in *THE GUIDE TO NATURE* with the expectation that the interests of mineralogists would thereby be advanced. *THE GUIDE TO NATURE* is published by gifts from friends and the membership fees of a company of students and lovers of nature known as The Agassiz Association. No one receives a salary nor any money compensation. Many persons, including myself, devote time and money to "the good of the cause." If we were a business institution we would invest in the publication of a large, well illustrated department of "Mineralogy" and say, "Behold the goods. Will you buy?" But we are not a business; we are a co-operation and you are or should be one of the co-operators. The question is, what will you, and others do to advance the interests of the cause? You doubtless are more interested in mineralogy than I. I am willing to devote much time and some money, but I cannot do all. If the burden is left mostly to me, it comes too hard on me and members of my family who assist. If every mineralogist would send his own subscription and that of a friend (only one dollar and seventy-

five (\$1.75) cents a year for the two) and even one good article (not too long) with illustrations, how, oh, how the work would grow, what a fine department of many pages we could have. How easy it would be for all!

Please try it.

Let us have the two subscriptions and one article. I am willing to do my part. I want to make the department larger and better. What is your vote? I cannot do it all.

WANTED—Photographs and articles of interest to children for my *Nature* and Science of St. Nicholas Magazine or for adults for the *Guide to Nature*. Please send for examination whatever you may have, or submit lists and outlines, of what you can supply Edward F. Bigelow, Sound Beach, Ct.

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Vol. XI, 1909

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Santa Monica, California.



"Auch Ich war in Arcadia geboren."—"*Travels in Italy*" by Goethe.

The monogram of the AA weaves into Arcadia.



ARCADIA

Our beloved AA is the beginning and center, the center and end, and the beginning and end of the new nature Arcadia. In fact, the principle of The Agassiz Association, "study nature, not books," was the foundation of Arcadia; it is our constant aim, and it permeates all our work.





A VISTA THROUGH THE BRANCHES OF A HUGE OAK TREE

The world's work must be done, and only a small part of it can be done in the woods and fields. The merchants may not all turn ploughmen and woodchoppers. Nor is it necessary. What we need to do, and are learning to do, is to go to nature for our rest and health and recreation.—Dallas Lore Sharpe in "The Lay of the Land."



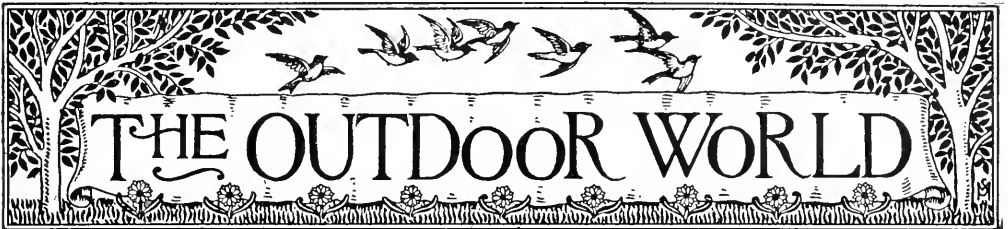
THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

JULY, 1909

No. 4



In the Laramie Beds of Wyoming

BY CHARLES H. STERNBERG, LAWRENCE, KANSAS



THE beds of grey or yellowish sandstone, massive or cross-bedded with interspaces filled with clay, and thin beds of marl, have, scattered through them, concretions, ranging in size from a small marble to eight inches in diameter; also many large flint-like masses of very peculiar shapes, often they are elongate, over a hundred feet long, and only two or three feet thick. They are often in the form of great flattened disks, when the soft sand is worn away by erosion, the pillars capped with these disks resemble mushrooms. I saw one that resembled the face of a man with skull cap; another like a laughing baby, and so on in endless array of strange forms. The sculptury of the land masses is different from any region I have explored. These beds were deposited in the border-land between the Age of Reptiles and Mammals.

The great dinosaurs whose ponderous weight once shook the earth, are on the verge of total annihilation, and the dawn of the age of mammals is foreshadowed by the presence of small marsupial-like mammals.

From what I have written you will expect a rough, cut up land in the Laramie, owing to the fragile nature of the rock, I will venture to say there is no good building stone in the formation, for though there is a layer of hard flinty rock that tops some of the tablelands, it falls into flint like flakes that soon disintegrate. The main drainage canals as soon as they leave the flood plains of the principle creeks, or rivers retreat by way of deep gorges, often quite narrow. Many lateral ravines scour out the country into narrow canyons, separated by ridges, or they may meet one that is encroaching the divide from the other side and a great table land is formed that gradually recedes to the



"THE PILLARS CAPPED WITH THESE DISKS RESEMBLE MUSHROOMS"

center, and a cone shaped mound is the result. They stand up in groups often against the distant horizon and resemble haystacks. The canyons

are often bridged by the narrow concretion-like hardened masses of rock, or they stand out along an escarpment like balconies to some titanic building.



"THEY STAND UP IN GROUPS OFTEN AGAINST THE DISTANT HORIZON AND RESEMBLE HAYSTACKS"

The entire region covering many square miles is destitute of human habitation except a sheep ranch or two and a few sheep or cattle men. In this solitude the writer and his three sons entered last summer to collect the wondrous dinosaurs, those mighty lizards. The largest known entire skeleton from an older formation, *Diplodocus Carnegie* was named after the famous Iron King. It measures 17 feet high at the hips and is 82 feet in length. Here, in Converse Co., Wyo., we spent several months with

gin. When these beds were elevated above tide-water the water running off them, descended into the fresh water lakes of the Laramie age, and formed her thousand feet of strata. Now these semi-deserts are elevated 5,000 above sea-level. Then they were near the sea. In fact salt water beds are sometimes found in the formation. We imagine it a country of morrasses and bayous like the Everglades of Florida, with narrow, deep, and sluggish streams, that winds their sullen course slowly among the cat tails, and swamp



"QUARRYING" TO SECURE THOSE WONDROUS DINOSAURS

our horses, wagon and tent. Before we left the field we got 65 miles from our base of supplies. The Laramie Beds seem to occupy a great basin whose outer rim consists of the yellowish sandstones, of the Fox Hills Group, filled with massive brown concretions in which are numbers of shells, Amonites, etc., all marine animals. Farther back are the great deposits of clay, the Fort Pierre Group, filled with alkaline matter that permeates all the surface and spring water. Here great *Baculites* several feet in length and other shells attest their salt water ori-

gin. While on the ridges between, solid ground, the Palmatocoe and other trees flourish in great jungles of semi-tropical growth. The silent glassy flow of one of the streams suddenly is agitated by the vibrations of a powerful tail whose rapid undulatory motion casts off riddle after riddle of little wavelets, that expand and spread to either shore. Suddenly they cease, and a huge head full three feet in length, appears above the water, as also the short, heavy neck that supports it. The head terminates in a broad bill, shaped like that of a duck, armed with a sharp cutting edge of



"WE SPENT SEVERAL MONTHS WITH OUR HORSES, WAGON AND TENT"

horn. While farther back in the roof and floor of the mouth are great magazines holding 2,000 teeth. The cutting edges of these teeth are arranged like a pair of scissors on each side of the mouth, and as the duck-bill crops the

rank vegetation they are cut by the teeth behind, as an old-fashioned straw cutter used to cut the straw pushed through it. But the huge lizard, for it is a lizard, is hungry, so resting with his hind limbs planted firmly on the



A FLOCK OF SHEEP ON GREASEWOOD CREEK, CONVERSE COUNTY, WYOMING
 Photograph by Geo. F. Sternberg.

bottom with the front ones that are much smaller, only one sixth as large as the hind ones, begin to draw into a huge mouth, great armsful of the juicy foliage, which he nips off with his duck-bill and passes back to be cut into shreds with the scissor-like teeth. As part of the body is still hidden in the water we can not realize the huge dimensions of this lizard, until weary of feeding, he pushes a pathway through the dense foliage to the

length follow a flattened swimming organ, whose undulatory motion had cast so many wavelets against the rushes that lined the bayou.

As he rises on his hind feet the water pours off a brilliantly colored body with scales arranged in beautiful patterns, as if to imitate the various colored rank vegetation among which he lives. There he stands a monument of grace and beauty, and he must be twenty feet in height. He darts his



BREASTBONE AND FRONT OF SKELETON OF THE GREAT TRACHODON
NOW IN THE AMERICAN MUSEUM

Showing the dermal covering and also the limbs at right angles to body as it lay in the quarry in the Laramie Beds of Converse County, Wyoming.

Photograph by Geo. F. Sternberg.

solid land, and with the aid of his fore feet pulls himself out on the shore. His huge hind limbs eight feet in length with three powerful toes are armed with hoofs of horn. While his front ones are but five feet long, having three hoofs and a rudimentary one that is used as a clumsy thumb for grasping. A great tail some ten feet in

duck-bill out in all directions as if scenting the air for his natural enemy. As if satisfied he drops to the ground, and assumes his natural position when on land, moving gracefully along on all four limbs. His back and rounded hips, swell in beautiful curves, and his flexible scale-covered skin folds in handsome lines, its bright colors har-

monize with the sparkling vegetation that surrounds him. But hark! the silence is broken by a roaring or hissing sound, that momentarily grows louder. Our lizard stands erect as if to note the direction of the sound, then with leaps and strides he bounds for the open water, his only place of safety. As he stoops for motive power to leap into the stream, a bolt as of thunder strikes him on the hips with a shock that causes the earth to tremble, our saurian has received a mortal wound and he sinks into the water and disappears from view.

the end of a massive head, armed with lancet-like teeth some four inches in length. His five toes are armed with huge claws with which to tear and rend his victim. But he disappears in the forest. After the gases form in our duck-billed dinosaur, his carcass is raised to the surface, and carried head first with the current. The head drags under the shoulder, and in time the abdominal wall allows the gases to escape the walls collapse, and, stretched on his back at full length, it sinks to burial in the white sand below. This sand rapidly fills the abdominal



SKULL OF THE FAMOUS TRACHODON NOW IN AMERICAN MUSEUM

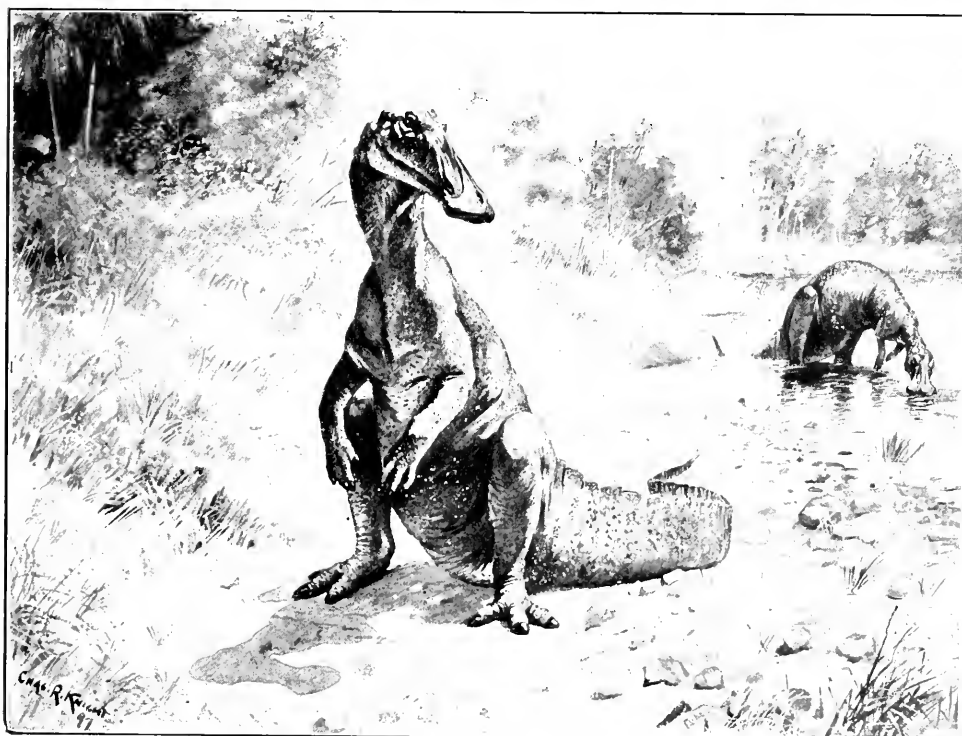
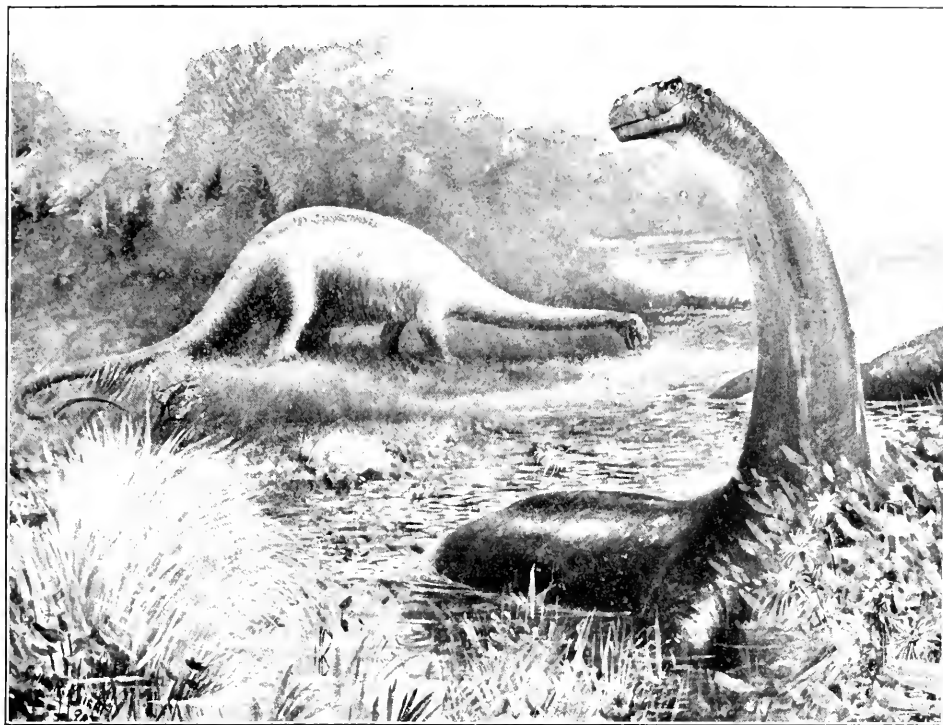
When cleaned the entire skin impression was found nearly intact in the fine sandstone. The skull lay under the body.

Photograph by Charles H. Sternberg.

His conqueror strides along the shore, lashing himself with his powerful tail, and emitting angry hisses as his prey goes down. We have a good view of this greatest of all carnivorous dinosaur named by Prof. Osborn, *Tyrano saurus, rex.*, the king of tyrants among lizards. He measures thirty-nine feet from the end of his tail to

cavity and piles up around the body and preserves it in its normal position. Time wings its flight and slowly the continent is raised, west of the Mississippi to the tune of the waters of the Colorado River, which carve out its right of way at the rate of elevation, with its tools gravel and sand.

The scene changes. The father and



BRONTOSAURUS (UPPER)

DINOSAUR (LOWER)

four sons for weeks have explored the Lance Creek, Greasewood and Schneider Creek regions without success. Every night the father asked the sons, What luck? and received the same answer, Nothing. But one day late in August my oldest son, George, who has been my chief assistant in the fossil fields of the west for twelve years went down a ravine he had worked in without success, accompanied by his young brother Levi and he stumbled upon the burial ground of the very Dinosaur we saw in imagination, when this old world was young. Time would fail me to tell of the anxiety, care, labor and expense before that noblest of all the specimens of duck-billed dinosaurs that has been found, reached in safety the great American Museum of Natural History, 77th Street and Central Park, New York. Prof. Osborn gave me the help of his able preparators, and their skill uncovered the impressions of the dermal covering in the soft and easily disintegrated grey sandstone. It was purchased, and at last described, in part at least, before the American Association for the Advancement of Science at their Baltimore meeting last December during the holidays. President Osborn of the American Museum told the scientific world gathered there of this wonderful animal. The museum has two splendidly prepared and mounted specimens. This specimen weighed 4,400 pounds and it took four horses to haul it in to Lusk, 65 miles away.

NOTE:—The cuts on the preceding page are lent by Henry Holt & Company, New York City, and are from "The Life of a Fossil Hunter" (Sternberg).

Handling the Banded Rattlesnake.

BY C. A. CLARK, LYNN, MASSACHUSETTS.

It is dangerous even to make an attempt to handle a live rattlesnake or any other poisonous reptile, unless one is experienced and has some correct knowledge of its habits. It is more dangerous to handle these deadly reptiles with gloves than with the bare hands, as gloves deaden the feeling, and one cannot tell whether or not he is holding the snake just right. The scientific naturalist always handles them without gloves.

It is the dare-devil and those who handle dangerous reptiles only for the sake of doing a daring act that receive fatal injuries. Usually it is not the



C. A. CLARK HANDLING A LARGE BANDED RATTLESNAKE (*CROTALUS HORRIDUS*)

Photograph by L. A. Wentworth, Lynn, Massachusetts.

scientific man. We are all liable to make mistakes, but as a rule the cool-headed naturalist generally gets through this world without any serious accidents from these deadly reptiles. Handling live rattlesnakes is not a pleasure, and people are scarce who will make any attempt even to get near them in their natural haunts. It is a wise person who runs from a rattlesnake, and when I come in con-

tact with one I always run too but it is right in among the ledges and bushes, with forked stick in one hand and a strong black duck bag in the other. I always go in at the side of a dangerous snake and never in front, because there are too many chances to be assumed by frontal approach. As soon as I get near enough I pin the snake down with my forked stick over its neck, and, reaching down with my right hand, I seize it with my thumb and forefinger close to the jaws. Some persons think that this is too near its mouth, but such persons are in error, because every joint in the backbone is a ball-and-socket, and if I should take the snake no further than one-half inch behind the jaws, and not have my thumb and forefinger close against them, it would give the reptile a chance to turn and hook his fangs into some part of my hand.

In the upper jaw of a rattlesnake on each side is a poison gland and from each gland is a canal which runs down to the two fangs, and when these fangs enter our flesh the pressure forces the poison through the canal, through the two hollow fangs and into the flesh. The amount of venom which a rattlesnake injects is about one grain, enough to kill a human being.

For the last twenty-five years I have handled and captured every species of snake in Essex County, and have never been bitten by any, but when a rattler shall puncture my veins with his two poison fangs I shall abandon "nature study" and give the undertaker a job. If we have steady nerves and a true knowledge of the snakes' habits there is not much danger. Snakes are as much afraid of us as we are of them and they will always try to make their escape. Rattlesnakes will generally give us warning by shaking their rattles, and when we hear the sound, which is more like that of escaping steam than like a rattle, it means danger ahead. I think the rattlesnake is in a way a fair snake to deal with, because it will give us warning, while the deadly copperhead will not.

There are thirteen species of rattle-

snakes in the United States but only the banded rattlesnake is found in Essex County, and that is growing scarcer every year.

The illustration shows the only safe way in which to hold such a snake.

Lying in a rattlesnakes' den is not at all dangerous because they know when we are there and will not appear for some time after we leave the place.

Few persons understand much about the banded or timber snake (*Crotalus horridus*) which is the only rattlesnake found in Essex County. I therefore take pleasure in giving some of the facts. It grows to a length of five feet, and has been known to have as many as fifteen young in one brood, but as a rule the number is only from seven to twelve. The young when born vary in length from seven to twelve inches, and have a soft button on the tip of the tail. In a few days they shed their skin and begin to feed on mice and other small animals. They grow rapidly, and in about two months they shed the skin for the second time, after which they have the first rattle which is soft and black. In a few days the button becomes dry, and when the tail is shaken it produces a faint buzzing, caused by the loosely attached button rasping against the rattle. The first rattle appears at about the last of the season, and it is then time for the snake to enter winter quarters in the sunny side of hills and ledges. The first warm days of April bring them out again and from that time onward they grow very rapidly.

In the first part of June they shed their skin again and then the second rattle appears, which is larger than the first one. Every succeeding rattle grows larger with the growth of the snake. After the first year the rattlesnake sheds its skin three times a year—spring, midsummer and fall, and it has a new rattle after each shedding, which makes three rattles a year after the first year, and thus continues until maturity when growth ceases.

The food of a rattlesnake consists of mice, ground squirrels and other small rodents. If the rattlesnakes eat enough at one meal to satisfy them

they will eat only about three times through the season, but if they eat only a little, such as a single mouse, they will eat again in about two weeks.

The young rattlesnakes are provided with teeth and poison fangs when born, and the two poison glands in the upper jaw contain the venom ready for immediate use.

Snakes take water frequently and after eating are very sluggish until their food is digested. They also take regular baths.

A rattlesnake can spring to a distance equalling, at the most, from about one-half to two-thirds of its length, and will generally strike below the knee if a person is standing. It is not necessary for a rattlesnake to coil before it bites because its two poison fangs are very sharp and all it has to do is to bend its neck into an S-shape and hook on, when the fangs quickly penetrate the flesh.

Snakes' tongues, wrongly called stingers, are harmless. They are used to feel the way while the snake is blind, which is for only a few days while shedding the skin, an event that occurs three times a year.

When I am handling a live rattlesnake I can feel a buzzing vibration all through the snake's body when it is rattling, and I have a similar feeling in my fingers and hands. The sensation is like that caused by a slight shock from an electric battery.

How snakes crawl is to most persons a mystery. In order to see the movement, we should have to see a living skeleton, and if we could do that we should see all of its ribs in motion. The ribs are the snake's legs while the belly scales are its feet, therefore the movement is internal and cannot be seen.

Rattlesnakes are among the most deadly of reptiles and should be feared by all.



The Heavens in July.

BY PROF. S. ALFRED MITCHELL, OF
COLUMBIA UNIVERSITY.

The most interesting astronomical object for the year 1909 is unquestionably the planet Mars, which comes closer to the earth than it has since the year 1892. Much will be written in newspapers and magazines concerning the ruddy planet, and it would be well to know how much to believe of what is written, or how big a grain of salt to take. Already we hear talk of signalling to Mars by mirror and by wireless. Mars, like the earth, is a planet and circles the sun in its orbit. The earth goes about the sun almost in a circle with the sun only a million and a half miles from its center. As everybody knows, the distance from the earth to the sun is nearly 93,000,000 miles. The average distance to Mars

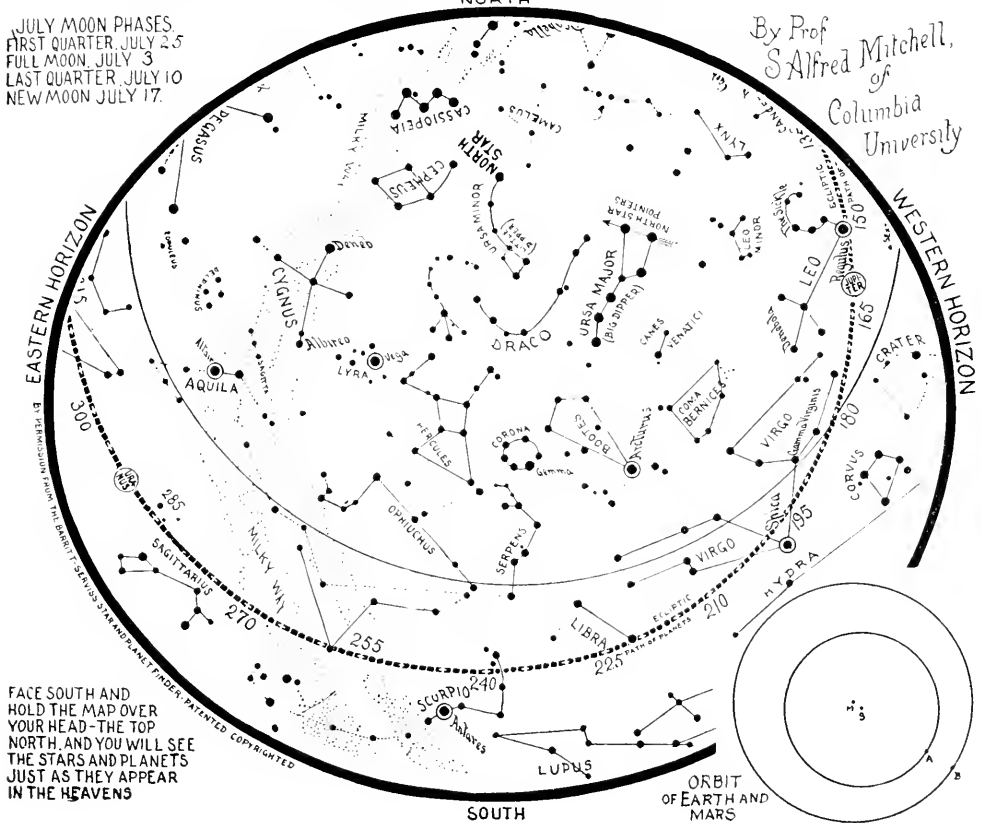
is 1.52 times greater than this, or 141,500,000 miles, but its orbit does not so closely approximate a circle, for the sun is 13,000,000 miles away from the centre, so that the greatest distance from sun to Mars is 154,500,000 miles, the least distance 128,500,000 miles. It needs only an elementary knowledge of astronomy to enable anyone to draw the approximate paths of earth and Mars about the sun, and the whole orbits may readily be plotted out by the aid of a ruler and pair of compasses. Draw a circle with a radius of 2.33 inches. The center S of this circle will represent the sun, and the circle the path of the earth. Draw any diameter of the circle. Lay off a distance, S M, equal to 0.33 inches, with M as centre draw a circle with radius of 3.53 inches. This second circle will closely represent the orbit of Mars.

The closest possible approach of the two planets takes place when earth is at A, and Mars at B; this distance is evidently (128,500,000—93,000,000), 35½ millions of miles. In 1909 the distance is 38½ millions.

The earth goes about the sun in a year of 365¼ days. Mars travels slower and takes 687 days. If the sun,

the earth every two years and fifty days. A look at the small diagram will show after a favorable opposition takes place, that Mars is farther off at each successive opposition till the time of the least favorable approach happens, when the distance is 154,500,000—93,000,000, or 61½ million miles. Favorable oppositions re-occur

EVENING SKY MAP FOR JULY



earth and Mars are in a straight line, with planet and sun on opposite sides of the earth, Mars is said to be in opposition, opposite the sun, and consequently comes on the meridian at midnight. As earth moves quicker about the sun, it takes it some time to gain a lap in the celestial course, and it is but an elementary exercise in arithmetic to show that the time required is 780 days. This is the synodic period, the time from opposition to opposition. Thus Mars will be close to

after seven synodic revolutions or once every fifteen years, and the most favorable oppositions are those which happen about the middle of August. In 1907, opposition occurred in July, in 1909 in September, so that neither are so well situated as those of 1892 and 1877. But the opposition of the present year is more favorable than that of 1907, first, because Mars is a little closer, and second, because it has a greater declination, and so is higher up towards the zenith and better

situated for astronomical observations.

That the earth is the only inhabited spot in the universe no one is rash enough to assert. Of the bodies of our solar system, life at all approximating what we have on the earth is possible only on Mars. It resembles the earth in a great many features, its day is about the same length as ours, it is tilted in its orbit approximately the same amount, so that the seasons progress nearly the same as for the earth, with the polar ice caps to show the effect of winter. Mars is much smaller than the earth, only 4,200 miles in diameter, instead of 7,918, and is probably much older. Life is found in such abundance on the earth in all varieties and under such adverse conditions, in the midst of the tropical desert and in the rigors of the Arctic winter. The South Pole expedition found that small animals frozen in the ice for three years resumed their vitality when thawed out, and deep sea soundings have brought to light marines found living under almost incomprehensible pressures.

Verily, life exists on the earth under apparently impossible conditions! Such things we must remember when we turn our telescopes on Mars and find there conditions utterly opposite to life as we know it on the earth. That there is life on Mars undoubtedly is possible, that there is life of some sort there seems almost certain, but that it has been proven that Mars is inhabited by thinking, rational human beings "is another story." To prove this would be the greatest triumph of the age. But to hold communication with them by mirrors or wireless or by some other means! It is almost too great a leap of the imagination!

The difficulties of signalling operations are readily apparent. If we place ourselves on the earth almost in a straight line between sun and Mars, it doesn't at once seem clear how we could reflect light through an angle of almost 180 degrees, or how if we were the men on Mars it would be possible to see the signals from earth with it almost in line with the sun. To see our signals it would require that the people on Mars pay far closer atten-

tion to appearances on earth than we are paying to infinitesimal changes of light in the evening star Venus.

We must also confess our ignorance of the methods whereby the learned professor from Amherst, even if he in his specially constructed balloon, should succeed in reaching the great altitude of ten miles from mother earth, is going to recognize the "sounds" from Mars, 38,499,990 miles away, more readily than those from earth but ten miles off. Indeed we read many strange things these days!

Mars, the god of war for the ancients, has become the planet of war for the astronomers, for there is unfortunately a great lack of unanimity among observers of Mars. Let us hope that the 1909 opposition may bring a little more order out of the chaos!

THE PLANETS

The month of July is very important in planetary history. Mercury is a morning star and reaches its greatest western elongation on the 7th. Venus is an evening star and is becoming more and more conspicuous each night. On July 15 it sets more than an hour and a half later than the sun. On July 1st Mars is a morning star in the constellation Pisces and rises at 11 P. M.; at the middle of the month it rises half an hour earlier. Its motion, among the stars is direct. Jupiter still continues to be a brilliant object in the heavens though it is slowly getting further west each night. Saturn is a morning star, rising about midnight. It is at quadrature July 15. On July 11 Uranus reaches opposition, and may readily be picked up as a sixth magnitude star by the help of the map. On the 9th of the month Neptune is in conjunction with the sun.

Mr. O. J. Lee, at the Yerkes observatory, during the past few months has made a number of photographs with the two-foot reflector in an attempt to locate Halley's comet, and found that it must have been fainter than the 17th magnitude since it was not discovered on his plates. The comet is now almost in line with the

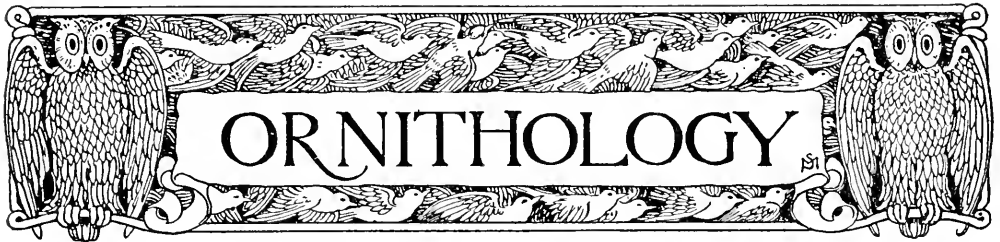
sun and its discovery is not possible for a month or two.

Profs. Hale and Ritchey, of the Carnegie Solar observatory at Mt. Wilson, California, have found a firm in Paris willing to undertake the carting of the disk of glass for the mirror 100 inches in diameter and the contract has been let. It will be remembered that after bringing the former disk a year ago from Paris to Mt. Wilson, such bad defects were found in it as to render it worthless for telescopic purposes.

The mirror five feet in diameter has been mounted there, and preliminary observations show it to be of magnificent definition.

CONSTELLATIONS

As usual the chart shows the sky as it appears at 9 P. M. on the first of the month, at 8 o'clock on the 15th or at 7 P. M. at the end. The four prominent stars are Arcturus and Spica west of the meridian, Vega and Altair east.



The Cat and The Birds.

BY ELIZABETH BREWSTER, SUMMIT, NEW JERSEY.

The sunny slope between the dining room window and the old spruce tree is a rendezvous for birds. Late in the fall, the house mother hung a piece of suet to a low bough and here all winter came chickadees and woodpeckers to feast and once a tufted titmouse ventured shyly to try this fare. The blue jays came too, but they were less welcome. The house mother mistrusted them and feared their bullying her other pets.

But one day she changed her mind. Spring had come. The robins and song sparrows were busy building their nests and the sunny slope by the spruce tree gave them many a tuft of dry grass for lining.

Then came trouble. A black cat with cruel yellow eyes found the spot. She hid under the spruce bough or climbed stealthily up the rough trunk of the tree. The little mother threw stones which never hit and the black cat only smiled. Even a broom only made Mrs. Puss run a few steps. Early one morning the little mother heard a clamor. Robins and blue jays were wailing and screaming. She

looked out. The black cat was crouched on a branch of the spruce tree and circling round and round her were two jays and three robins. Nearer and nearer they flew, until even the hardened cat could stand it no longer. And slowly at first, then faster and faster, she backed away and at last gave one dash over the fence.

The next morning back she came. So did the birds and the result was the same. The third day she came, cautiously, and just one jay perched above her, straightened out her strong neck, gave a swoop and a cry, and the black cat fled. May she never come back.

Notes on Spring Migrations in Northern New Jersey.

BY R. C. CASKEY, MORRISTOWN, NEW JERSEY.

The migrations of the present spring have shown some peculiarities. In fact every migration season has its unusual features, due probably to unseasonable weather either in the immediate vicinity or at some remote point.

The past winter was an unusual one. The moderate temperature during most of the time and the absence of deep snows were very favorable

for birds, and many that generally migrate were with us through the entire season.

Meadow larks and white-throated sparrows, of which we generally have only a few during the cold months, were very common all through the winter. On New Year's day I flushed twenty-four meadow larks in one field and on Washington's Birthday they were in full song.

Field sparrows which have never before been known to winter here were fairly common all the season, and even a few fox sparrows remained with us. A chewink was seen here on December 19th and a phoebe on December 14th.

In such a winter it is hard to account for the presence of redpolls but they were unusually common as were also American crossbills.

The first spring migrants were seen on February 13th, on which date I saw two purple grackles. On February 22nd red-winged blackbirds were seen and were singing.

These first arrivals were unusually early. Then followed a period of cold weather, with snow, sleet and high winds, lasting until the middle of March and retarding the migrations so that the next lot of arrivals was no earlier than usual.

The coming of the first swallow is always hailed with joy but the one white-bellied swallow, which I saw on March 31st, only served to make good the old adage that one swallow does not make a summer, for the first part of April was truly March-like.

The migration of the warblers is watched by bird lovers with the keenest interest, and the sight of a Yellow Palm on April 7th was a real delight.

The next arrival of the warbler family was a Louisiana water-thrush on the 9th but not until the 18th did the myrtles appear. One yellow warbler was observed on *April 1st very early, but no more were seen until May 4th.* There was a very large flight of warblers on May 15th, the beautiful black-burnian being really abundant on that date. A few of the rarer bay-breasted were seen. On that date I noted sixteen species of warblers and on the

16th twenty. On the date of writing, May 27th, the migrations are practically over; a few black-poll warblers being yet with us and perhaps some olive and gray-checked thrushes are still to be seen.

The beneficial effect of the anti-spring-shooting law has been clearly shown by the unusual number of ducks and geese on our meadows this year. Not for a long time have they been so numerous or so easily observed.

It was my privilege to witness recently in company with two other bird lovers a most unusual sight. We had gone to the neighborhood of the bushes that fringed the bank of a stream, to observe some small birds, when our attention was attracted by what appeared to be, at a distance of about a hundred feet, several very, strongly marked black-and-white birds.

Closer observation showed them to be the heads of seven Canada geese which were quietly sitting by the edge of the water. They seemed to be no more alarmed at our presence than if they had belonged to the barnyard and been accustomed to the society of human beings. They allowed us to approach to within fifty feet of them and to level our field glasses and look as long as we liked. On our closer approach they quietly took to the water and started to swim down stream which was not more than twenty feet wide, and it was only when one of the party ran to the edge of the water and headed them off that they finally took wing, forming as they flew the well known wedge. Until then we were not sure that they were not domesticated specimens that had escaped from some preserve.

The Horrors of the Plume Trade.

BY WILLIAM DUTCHER, NEW YORK CITY.

Ignoring the economic value of wild birds, which alone should be a sufficient reason for their preservation, there is another reason why none should be killed for millinery ornaments. The horrors attending the collection of plumes of Herons is beyond the powers of language to describe, and can best be shown pictorially. Much has been written on the subject

in the past, and it seems almost impossible that any woman who reads current bird literature or the public press can fail to know the extreme cruelty attending the traffic in wild-bird plumage. The American women who are still willing to wear the plumes of the white Herons sometimes offer as an excuse that they are not taken from native Herons; but it is immaterial whether the birds were

false. Human skill cannot reproduce a feather, and, after the breeding season, all herons' plumes are worn and ragged, and are, therefore, unfit for use.

Mr. A. H. E. Mattingley, of Melbourne, graphically describes the horrors he witnessed at a heron rookery in New South Wales, which had been raided by plume-hunters and verified his statements by the camera.*



BROODING EGRET—THE DORSAL TRAIN OF NUPTIAL PLUMES ARE HANGING OVER THE TAIL FEATHERS.

Photographed by A. H. E. Mattingley.

killed in America or in some other part of the world. The same cruelty is practiced in the Eastern Hemisphere as in the Western. The paltry price in money that is paid for the plumes is not to be compared to the price paid in blood and suffering.

Women must remember:

That white herons wear the coveted plumes only during the breeding season.

That the parent birds must be shot in order to obtain the plumes.

That the young birds in the nests must starve, in consequence of the death of the parents.

That all statements that the plumes are manufactured or are gathered after being molted by the adult birds are

"Notwithstanding the extreme heat and the myriads of mosquitos, I determined to revisit the locality during my Christmas holidays, in order to obtain one picture only—namely, that of a white crane, or egret, feeding its young. When near the place, I could see some large patches of white, either floating in the water, or reclining on the fallen trees in the vicinity of the egret's rookery. This set me speculating as to the cause of this unusual sight. As I drew nearer, what a spectacle met my gaze—a sight that made my blood fairly boil with indignation. There, strewn on the floating waterweed, and also on adjacent logs, were at least fifty carcasses of large white and smaller plumed egrets—nearly

* Reprinted by permission from "The Emu," the official organ of the Australian Ornithologists' Union.



THE COST OF A PLUME. THE PICTURE TELLS ITS OWN TALE

Photographed by A. H. E. Mattingley.

one-third of the rookery, perhaps more—the birds having been shot off their nests containing young. What a holocaust! Plundered for their plumes. What a monument of human callous-

ness! There were fifty birds ruthlessly destroyed, besides their young (about 200) left to die of starvation! This last fact was betokened by at least seventy carcasses of the nestlings, which



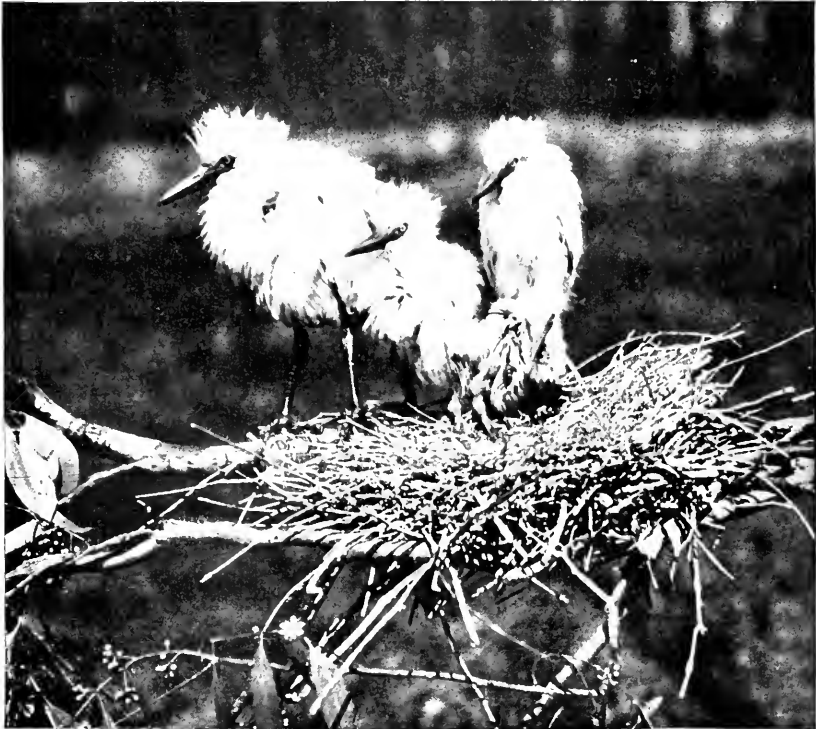
AWAITING THE END—TOO WEAK TO STAND OR CRY FOR FOOD—DEATH WILL BE A HAPPY RELEASE

Photographed by A. H. E. Mattingley.

had become so weak that their legs had refused to support them, and they had fallen from the nests into the water below, and had been miserably drowned; while, in the trees above, the remainder of the parentless young ones could be seen staggering in the nests, some of them falling with a splash into the water, as their waning strength left them too exhausted to hold up any longer, while others simply stretched themselves out on the nest and so expired. Others, again,

manner such beautiful birds—the embodiment of all that is pure, graceful and good?

"In one tree at the heronry the nests of the plumed egret (*Mesophox plumifera*) and egret (*Herodias timoriensis*) were seen. In another large tree a photo was taken of two young plumed egret and one young large egret together in the same nest. These three birds were the sole survivors of several broods of both species which had nested together in the



FATHERLESS AND MOTHERLESS—NO ONE TO FEED THEM—
GROWING WEAKER—ONE ALREADY DEAD FROM STARVA-
TION AND EXPOSURE

Photographed by A. H. E. Mattingley.

were seen trying in vain to attract the attention of passing egrets, which were flying with food in their bills to feed their own young, and it was a pitiful sight indeed to see these starvelings with outstretched necks and gaping bills imploring the passing birds to feed them. What a sickening sight! How my heart ached for them! How could any one but a cold-blooded, callous monster destroy in this wholesale

same tree. They had evidently sought one another's company, because all the balance of the nestlings had expired through lack of nourishment, their parents having been shot by the plume-hunters, or, rather, 'plume-plunderers.'

A like gruesome story is given by Mr. William L. Finley, Northwest Field Agent of the National Association of Audubon Societies, after he had

explored the region about Lake Malheur, Oregon, where formerly thousands of White Herons bred, but now none are to be found—all absolutely exterminated by plume-hunters.

Every aigrette we see, whether adorning (spare the mark) a woman's head, or for sale in the shops, has been torn from the body of a dead heron. This vandalism will not cease while the reward of gold lasts, unless the heart of fashion changes or drastic laws are enacted forbidding the sale of herons' plumes irrespective of from what part of the world the plumes are taken.

This unholy trade must be stamped out.—Leaflet of The Audubon Society.

Cedar Birds Feign Death.

BY O. M. MAKOWSKY, STAMFORD, CONNECTICUT.

The cedar bird may well be called a trick bird instead of a songster. In the summer of 1881 when I lived in the village of Helmetta, New Jersey, I went walking along the ponds looking for magnolias and water lilies and chanced to notice two young cedar

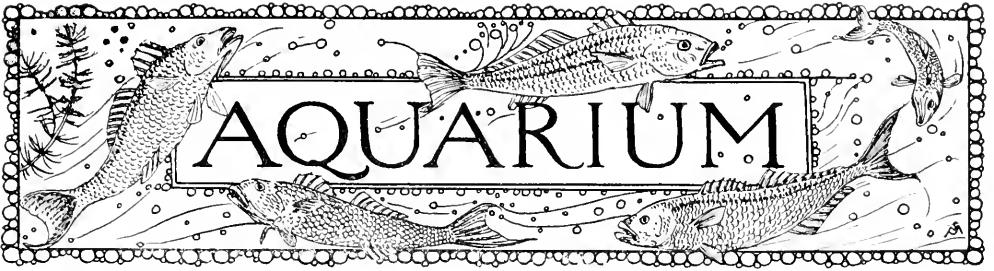
birds perched closely together on one limb of a mulberry tree and saw that they were asleep. I went to the factory and got a large box and put it under the limb of the tree where the birds were, so that I could stand on it, to catch them. Both birds were easily caught. I then took them home, closed all the doors and windows and put both birds on a table to find out if they could fly as they were nearly full grown. To my astonishment both were apparently dead. I opened one of the windows and dropped both birds outside, and to my great surprise they flew away.

A few years after while in New York City, I chanced to see an Arabian exhibiting some birds on the street. One of the birds, a parouquet, fired off a small toy cannon, aiming it at a cedar bird. When the cannon was set off, the cedar bird fell over, giving one the impression that the bird was dead. Then I recalled how the birds I had seen before played the trick on me. I therefore think a cedar bird should be called a trickster instead of a singster, as he has not much song anyway.



GREBES ON CRANE LAKE

A realistic bird group at the American Museum of Natural History.



Under the Auspices of The Aquarium Society of Philadelphia, Herman T. Wolf, Editor

Domesticated Air-Breathing Fishes.

A number of the smaller species of the large family of Labyrinthici or tropical lung-fishes have been domesticated to an aquarium existence in Europe, and some of them are now bred in the United States. Among these are the Formosa paradise fish or flag-fin, the Indian paradise fish, macro-pode or large-fin; the Indian gourami, the Siamese fighting fish, the Bengalese thread fish, the East Indian climbing perch and archer perch, and the dwarfed South American chanchito; all native of the intertropical belt and requiring warm water for their existence.

Peculiarities of formation of the labyrinth enables these fishes to absorb oxygen not only from the water but also directly from the air, for which reason they are easily kept in small aquaria and do not require the well-aerated water necessary to the existence of other freshwater fishes.

Three species are generally known in the United States and are most interesting pets; the Paradise fish, the Gourami and the dwarf Chanchito. Of these the former has been the longest introduced and is the better known to aquarists.

The Indian Paradise fish, *Macropodus viridi-auratus* is derived by selection from the common Macropode, *M. venustus*, native to the rice fields of Formosa, Southern China and East India. The male is a gaudily-colored small fish with remarkably developed fins, the long dorsal, anal and caudal growing to points and the rays of all the fins extending beyond the connecting tissue. During the nuptial season it has a scintillating brownish color

over the body and fins, the pectorals usually marked with orange and yellow stripes and red mottlings; while the body is dotted with olive and has reddish, bluish and greenish opalescent bands. On the operculum or gill cover there is a dark yellowish-red spot, and the keen black eyes have red irides. The smaller female is usually duller and paler in color with brown stripes, and has smaller or more rounded fins.

The Gourami somewhat resembles the sunfish in form and size, but has the snout turned upward with the lips nearly vertical. The dorsal, pectoral and caudal fins are like those of the striped sunfish, but the anal fin is longer and extends from below the branchiosticals to the caudal fin. The ventral fins are placed under about the centre line of the head and each has the second ray extended to a very long thread-like streamer, which like those of other fishes are useful in exploring cracks and crevices for food. The colors of the male during the mating season are a lustrous reddish-bronze on the back and sides, overlaid with bluish and greenish vertical bands of bright metallic lustre; and the abdomen silver, marked with vague brown and grey rings and dots. The fins are steel-blue and grey, striped with yellow and white broken bands or spots; while the long thread of the ventral fins is usually orange-yellow in color and the pectoral fin marked with a black spot. The black eyes have red or yellow irides. The female is more dull in color and does not display the brilliant markings of the male fish.

The Chanchito may be compared in outline with the Tautog or common blackfish, and is a belligerent, active

little fish in the aquarium. In nuptial garb the male is of lustrous green and yellowish color striped with dark, usually black, bands continued over the dorsal and anal fins, some of which, towards the tail, are marked with bright black spots. The eyes also assume a green lustre with gleaming red reflections and have red and yellow irides. The females are less brightly colored and have faintly marked stripes.

The life, nest-building habits and propagation of the Indian Paradise fish are described by Mr. Heilman, an expert breeder of these interesting aquarium pets in a paper which will appear in a future issue of THE GUIDE TO NATURE. Those of the Gourami and Chanchito are not as generally known and will be briefly mentioned:

For the Gourami, the temperature of the water should be 75° to 80° F. An abundance of rooted and floating aquatic plants should be provided for nest-building material, of which the fishes will form natural galleries and build a nearly spiral-formed nest composed of plants and mud, when the latter is obtainable. Both the male and female work on its construction, but it is the duty of the male to guard the young, with which he is active until they acquire a length of one-half to three-quarter inch. Then the parents should be removed, as, though their principal food is vegetable, they become cannibals in the confines of the aquarium.

The Chanchito forms its nest in the sand by excavating a depression or a furrow of considerable area with the head, fins and tail; sometimes more than one nest is made. After the spawn is deposited, the fishes take position over the nest to guard it and to change the water by rapid movements of the paired fins, habits similar to those of the Sunfish. After the young are hatched they are herded together and then led and guarded by the parents move about the aquarium until old enough to care for themselves, the older fishes engaging in battle with any other fish which may intrude. Their aggressive habits prevent the keeping of other fishes in comfort in their containers, and when

possible, it is better to devote an aquarium for their sole occupancy, removing the parents as soon as the young are able to care for themselves and no longer swim in schools.

These three species of labyrinthine fishes are more interesting aquarium inmates than the sluggish, pampered and artificially developed toy varieties of the goldfish.

The Double-Finned Japanese and Chinese Goldfishes.

The tenacity of life of the carp and its kindred forms led to their propagation as ornamental and domesticated fishes. The carp was first known as coming from China and bore the name of a sea fish. It was developed as a freshwater fish "in the province of Tche-Kiang, which extends as far as the sea," and may have followed the habit of other migrating fishes, coming to fresh-water to spawn; when it was first confined to salt-water and later to fresh-water ponds and streams.

The first described carp was a slender, long-bodied fish, similar to the scaled carp, *Cyprinus carpio communis*, and from it other species were produced by selection. Among these are the mirror carp, *C. carpio specularis*; the leather carp, *C. carpio coriaceus*; the golden carp, *C. carpio auratus*; and from this latter the crasian carp, *Carassius carrassius*, a short-bodied, flat-sided fish, the undoubted ancestor of the goldfish, *Carassius auratus*, now divided into two varieties, the European and American common goldfish.

From a pond existence this fish was next transferred to smaller containers where its propagation could be better controlled and then to the modern aquarium. Under this close observation all the variations common to animals under domestication were noted and led to the production of other breeds differing from the original parent stock; and it is this breeding and careful selection which has produced the remarkable forms of goldfishes now known to us, all of Oriental origin and development. None other of the ichthyic fauna shows such wide variations as the Chinese, Jap-

rieties of the goldfish. Every Chinese, Corean and Sumatran toy conceivable variation in body, head, snout, mouth, eye, color and habit has been developed as a result of the tireless patience and perseverance characteristic of the Oriental, as also changes in the forms and the duplication of fins.

Experiments with the lower forms of animals have proven that disturbances of the eggs, by shaking apart the cells produced by the first cleavage of the ova, will cause the develop-

ment of two embryos from the same egg and later became a more or less fixed character of the breed, as may be seen in the highly prized Chinese and Japanese goldfishes now successfully bred in the United States.

Careful examinations of the embryos of these double-finned fishes reveal that the duplicated fins are first laid out as two longitudinal thicknesses or folds, and as these are necessarily confined to the anal and caudal fins, are formed along the ventral sides of the post-anal section of the body. At a

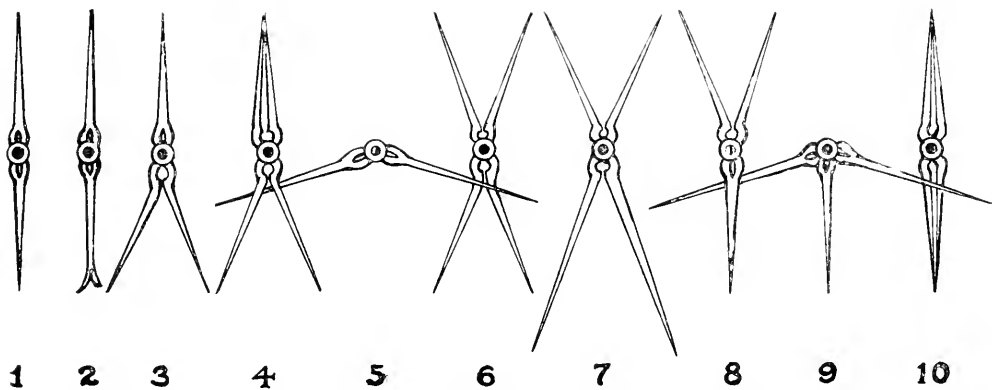


DIAGRAM OF THE VERTEBRÆ AND TAIL-RAYS OF GOLDFISHES

1. Single tail of the common goldfish.
2. Duplication of ventral edge of single tail.
3. Tripod tail: upper lobe single; lower lobe in duplicate.
4. Web tail: two separate tails joined only at the dorsal edge.
5. Dolphin tail: double tail joined at the dorsal edge and flattened to a horizontal plane.
6. Fan tail: duplicate, vertical, single tails placed side by side.
7. Fringe tail: a very long, exactly similar, double tail.
8. Arrow tail: upper lobe in duplicate; lower lobe single.
9. Rudder tail: duplicate, horizontal, upper lobe; single, vertical, lower lobe.
10. Bag tail: double tail joined at both the dorsal and ventral edges.

ment of two embryos from the same egg and the production of monstrosities; some with two heads on a single body, others with duplicated extremital parts, and still others without some of these extremital parts and the duplication of others. By some simple practice, such as violently shaking or other disturbances of the eggs, the Orientals developed double monsters, which did not survive, and others with their fins in duplicate, which peculi-

later period of development, they form separate duplicate fins placed side by side in their respective proper positions.

In the natural state, these monstrosities would not be likely to survive, though this does sometimes occur, for encumbered with auxilliary extremities they would be hampered in their movements and would not so readily obtain food or escape their enemies as their normally constituted

brethren; but under the care of the breeder, they are preserved and transmit to some of their progeny these desired peculiarities.

How these tendencies are transmitted to the ova has never been fully determined, but in crustaceans, batracia, reptiles and fishes heredity is stronger than in the higher forms of animal life, especially so with fishes, and the partly double bodies of the parents influence the young and tend to a preservation of these peculiarities. These may, in a measure, be a benefit, as the large and duplicated fins with their great amount of surface will serve as important adjuncts to gill respiration in the confines of the usually badly aerated tanks and aquaria. This is also indicated by the very red color of the blood in the arteries and capillaries of the long-tailed goldfishes.

Duplication of the anal fin consists of two fins placed side by side. Then they serve the same purpose as the single fin in guiding the movements of the fish. But with some breeds having abnormally large and unwieldy double tails, the duplicate anal fins are placed at an angle to each other and by their flapping motion largely take the place of the tail in swimming, as its muscles are atrophied and the long double tail becomes an actual hindrance to the fish, which swims by movements of the body muscles and not by those of the tail.

The normally constituted tail of the goldfish consists of a single, slightly bifurcated, vertical blade at the extremity of the spine, articulated so that it is flexible in all directions. Abnormalities of the caudal fin vary considerably and have been made characteristic of different breeds. A gradual transition from the single to the double tail can be traced which has also been further developed, as the appended diagrams will show. The simplest transition state from single to double is seen when the tail, normal in other respects, has the ventral (lower) edge slightly furrowed with a median line or groove, the greater part of the tail being vertical and median. This indicates the first tendency to a double

tail. When the division extends further up, the lower half of the tail may be double. This is known as a "tripod-tail" and is not desirable to the expert fancier. Sometimes the duplication extends quite to the upper margin and is joined only at the dorsal (upper) edge, which produces two complete blades joined at the first rays on a line with the back of the fish. This form is known as the "web-tail." These halves may be flattened into a horizontal plane and then the double tail is represented as a single piece and is known as the "dolphin-tail," the desired form in the Celestial telescope goldfish.

Another form is when the tail is normal in outline but in place of a single tail it is present in duplicate; that is, two single tails separated quite to the base, directly vertical on the same plan, of exactly the same shape and conformation and parallel to each other. This is the true "fan-tail" and is characteristic of that breed of goldfish.

A further development is the "fringe-tail," an immense, drooping, double tail, divided to the base and floating behind the fish like a great mass of dainty lace, much longer than the body of the fish, of which each half is exactly like the other in conformation, length, droop and texture. This very long growth of tail is only acquired after the maturity of the fish, though the expert can detect the tendency in very young fishes.

All these forms of duplicate fins are present in the breeds now cultivated in the United States; but Doctor S. Matsubara, Director of the Imperial Fisheries Institute at Tokio, mentions three other forms: the "arrow-tail" in which the upper half of the tail is in duplicate and the lower half single; the "rudder-tail" in which the double upper half is horizontally expanded and the single lower half vertical; and the "bag-tail" which consists of a double tail joined at both the dorsal and vertical edges.

Some of the young of American bred fishes show indications of a triple development of tail but none have as

yet survived much beyond the size of fry. In these cases the upper lobes of the tail are in duplicate and an extra fold is noticed in the lower lobes making them triplicate. The diagram would be a combination of the Fig. 5 and 8. None have been sufficiently perfect in development to have all the lobes separated to the base of the tail, but selection of those fishes which exhibit these tendencies and their further propagation would ultimately produce triple-tailed goldfishes. Such a complicated structure, however, would not add to the beauty of the fishes and would appear like a conglomerate tangle of tails, to carry which would be impossible and so weaken the fry as to cause their deaths from exhaustion.

In some of the breeds the dorsal (back) fin has been entirely eliminated and the scales are evenly imbricated over the back and sides; in others the anal fins are absent, while with some breeds there is no evidence of either dorsal or anal fins. These fishes maintain their balance with the paired fins, the pectorals and ventrals, and either have long and very narrow double tails or have the double tail expanded as shown in Fig. 5 which also by its flapping motion aids in swimming.

In conclusion it may be well to state that only a very small proportion of the young exhibit the desired tail forms in perfection, not over five per cent. of those that survive to an age of three or four months, and these should be kept in large containers with abundant plant life and sufficient food, preferably the natural minute pond life consisting of the crustaceans, daphnia, cyclops, polyphemus and cypris of which more will be stated in a later paper.

Establishment of More Aquarium Societies.

BY DR. HERMAN BURGIN, PRESIDENT OF THE PHILADELPHIA AQUARIUM SOCIETY.

As far as is known to the writer there are but two aquarium societies in the eastern section of the United States. One is located in Philadelphia, the other in Jersey City, New

Jersey. The writer has no knowledge of the existence of any similar societies anywhere else in this great country. In contrast to this condition, almost all of the Continental European cities have one or more. For instance, Berlin and its suburbs support four—the "Verband der Aquarien und Terrarien Freunde," the "Verein fuer Aquarien Freunde," the "Nymphae Alba," the "Triton" and "Élodea," whilst Hamburg has two—the "Salvinia" and the "Humboldt."

Aquarium societies are decidedly the best means for acquiring and disseminating reliable information relative to the Aquarium and its inhabitants, and assist by the common interchange of experiences in removing uncertainties and the annoying difficulties that constantly confront even the most expert fancier as well as the tyro.

In order to encourage lovers of the aquarium to form such societies, it would be a pleasure to the officers of the Philadelphia Aquarium Society to bring before those interested the procedure, Constitution, By-Laws and such other practical points that have led to the marked success of our, the parent society.

The expense of maintenance is but trifling. With an entrance fee of one dollar and annual dues of one dollar and twenty cents, paid monthly, this society has had for the past ten years an average membership of nearly two hundred; has met all its obligations, acquired necessary paraphernalia and has in addition a moderate invested fund to meet extraordinary expenses. The meetings for exhibitions of fishes, plants and other pertinent matters are held monthly, excepting June, July and August. Formal subjects for discussion are presented in advance of the meetings; but the "letter-box for information," which is open to everyone interested, often brings out more discussions than the set subject for the evening.

Blue, red and white ribbons representing first, second and third prizes, and a consolation ribbon when no competition exists, are awarded for the finest exhibits.

Annually two diplomas of honor are

given; one in January for the finest fish owned by a member, and one in February for the finest fish bred by a member. A silver cup owned by the Society is each year in the custody of the member having the finest household aquarium; to become his property after three years winning the award: Mr. Frederick Godshall, of Philadelphia, in November last, won the trophy for the third time and thus retains its possession, although others have held it for a year at a time, each having his name engraved thereon.

The Society was formed in 1898 and has done much to popularize the aquarium and the rearing of the finer breeds of aquarium fishes. The result also of the discussions at the meetings is the production by one of our members of a book that is recognized as the most voluminous and complete work on the subject of freshwater and marine aquaria, the breeding and care of domesticated fishes and all kindred subjects. This work is profusely illustrated by the author himself, practically all the drawings having been made from the exhibits at the meetings.

The membership of the Society is not confined to Philadelphia, a number of enthusiasts within a radius of one hundred miles are active members and frequent attendants at meetings. The subject is a wide one and admits of much original research and observation. From small beginnings the proceedings have advanced to subjects of considerable importance often involving protracted scientific studies, and much of the work could be applied to the propagation of food fishes, as will be demonstrated from time to time in the report of the proceedings published in *THE GUIDE TO NATURE*.

It is earnestly hoped that some of the readers of this paper will take up the subject and form similar societies. All that the Philadelphia Society has developed is freely offered as an incentive and guide to equally good results. Every city in the United States should have an Aquarium Society; and all that is required to found one is a little advertising in the daily papers; aqua-

rium fanciers will all be glad to join an inexpensive movement that will redound to the benefit of all. The Philadelphia Society started with a charter membership of eighteen and increased to one hundred and thirty-six during the second season.

Notes on a Worm Infesting Fresh-water Snails.

BY WILLIAM T. INNES, JR., SECRETARY
AQUARIUM SOCIETY OF PHILADELPHIA.

In closely scrutinizing some about half-inch long Cape Fear river snails, I noticed a scumlike covering on the exposed parts, the head and neck.



Upon closer examination I found the animals beset with numerous tiny

worms which appeared like minute white lines attached by the head and hinder parts, similar to leeches, and apparently deriving nutrition from the fluids of the animal which had not the power to dislodge them.

Upon removing the snails to a glass of water some of the worms became detached and moved about like a geometrical caterpillar or measuring worm.

They proved to be Annelids of the order Oligochaeta, genus *Chaetogaster*, species *C. limnaii*, and those I observed were about 1-20 to 1-10 inch in length, segmented and slightly flattened, with a pronounced head and adhering bristles on the under side of the body, of chalky white color and possessing considerable power of expansion and contraction.

C. limnaii was first described by von Baer in 1827, as occurring in Europe, but in 1901 was found infesting a *Physa* and later a *Planorbis* snail by W. A. Wilcox, of Boston. They are described as occurring on molluscs only at definite periods and are not strictly parasitic but may be useful to their hosts, as Lankaster found their alimentary canal distended with small entomostraca, rotifera and protozoa, all likely to infest snails and other molluscs.

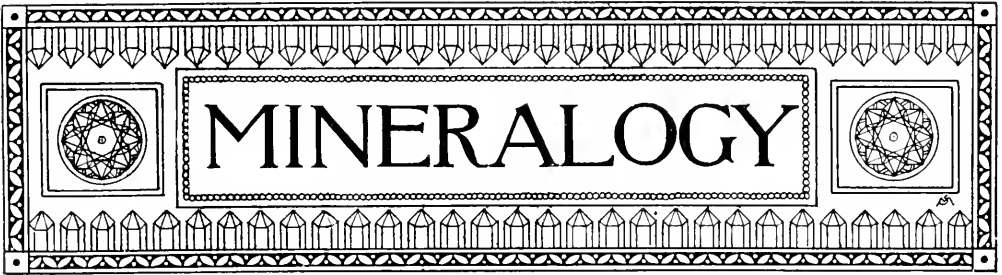
Their reproduction is by budding, and they usually occur in numbers

upon one host, when the dead individuals produce the scumlike appearance noticed by me. The semi-parasitic stage is usually during the winter months.

This is the only species of the large order that inclines to parasitism and is the smallest in regard to size. None of the species are harmful to fishes, some being terrestrial, others fresh-

water and a very few marine in habit.

In one of my tanks a number of wild snails, *Physa heterostropha*, had made themselves uninvited inmates, and I found that they were also infested by this microscopic worm. I later found that young goldfish fry ate these worms greedily. This is the first reported instance of their occurrence in the vicinity of Philadelphia.



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

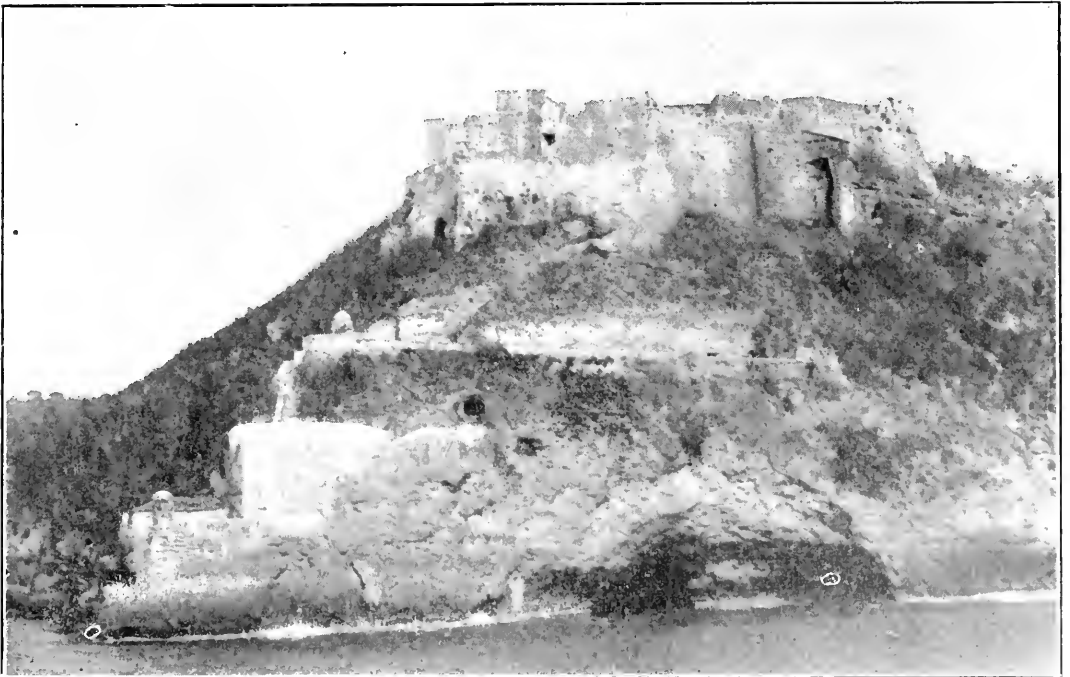
A Cuban Cave.

Caves have a fascination not only for mineralogists and nature students but for almost everybody.

The picture of Morro Castle is in-

teresting not only for its historical interest but because it shows at its base a cave being worn out of the coral reefs which form its foundation.

The second picture, although it rep-



MORRO CASTLE, SANTIAGO DE CUBA, SHOWING SEA CAVE NOW FORMING UNDERNEATH

Photograph by Capt. Jos. Priest.

resents the interior of a cavern more than a half mile inland, was really first formed by the ocean, before this part of the country was uplifted. This whole section of country seems to be coral reefs and limestone formation, so that as the water gradually found

renowned Ruins of Mitla (south of Oaxaca, Mexico) constructs its abode, about one yard wide and in the center about six inches high, perfectly circular hills. I neglected to bring a few specimens of the interesting architects along.



INTERIOR OF CUEVÁS DE CARIBISS, PROVINCE OF SANTIAGO DE CUBA

Flash light photograph by Capt. Jos. Priest.

its way through the interstices in the rock, it carried a plentiful supply of bicarbonate of calcium which formed the stalactites and stalagmites which adorn this cavern, a fine example of which can be seen at The American Museum of Natural History.

The Ant as a Mineral Collector.

BY CARL G. KLEINSTUCK, KALAMAZOO,
MICHIGAN.

I enclose herewith a small sample of the building material with which a comparatively small but rather big-headed ant I found in the heart of the

The whole glittering hill is formed of myriads of those quartz crystals, marvelously uniform, and the most wonderful fact of the whole thing is, that far and near the most scrutinizing observer is utterly unable to detect the remotest sign of quartz neither above nor directly underground. My guide, wondering at my search and finally asking for an explanation, laughingly pointed to a row of hills four or five miles distant and told me that each one of the shining pebbles was carried by one "ormida" from those mountains to the hill in the ruins. Interesting isn't it?

Barite and Aragonite.

These are two minerals which are almost always attractive and when they occur in combination, as shown in the accompanying illustration, they



BARITE AND ARAGONITE, CUMBERLAND, ENGLAND

are very beautiful. The barite in this specimen shows a triangular form of nearly opaque, milky color, with the aragonite deposited on it in bright, transparent, glassy, needlelike crystals standing out in all directions.

Barite is a sulphate of Baryta and occurs generally in tabular form and is sometimes tinged yellow, red, green, blue and brown. Aragonite is a carbonate of lime and derives its name from Aragon in Spain where it is found in contact twins. Its occurrence is very wide, covering almost the entire globe, and it also crystallizes in various and sometimes grotesque forms.

Accept my sincere congratulations on the establishment of Arcadia; it sounds good and some day I will call and see how good it is.—Richard C. McGregor, Assistant, Bureau of Sciences, Manila, P. I.

The Cullinan.

TRANSLATED FROM THE GERMAN BY ALBERT H. PETEREIT, NEW YORK CITY.

This largest one of all diamonds found up to date weighs $3,025\frac{3}{4}$ carats—32.674 ounces. Its length is 4.409 inches; its height, 2.52 inches; its width, 2.01 inches. It shows eight surfaces, four of which have been produced by cleaving while the other ones show the original crystallization.

Considering that the "Excelsior," found in 1893, which was the largest diamond before the Cullinan was found had a weight of only $971\frac{3}{4}$ carats one might imagine the exorbitant dimensions of this wonder of nature.

The Cullinan received its name from Mr. T. M. Cullinan, the president of the Premier Diamond Mining Company, Ltd., in whose mines, about twenty miles northwest from Pretoria, the stone was found on January 26th, 1905.

Captain Wells discovered something sparkling at one of the stone walls. He went close to the spot and recognized an unusually large diamond. He was not able to loosen the stone at once, same being still held by its matrix. After some hours of hard work he at last succeeded in securing his treasure.

At the Premier Mine from September, 1903, to June 1905, twenty-two diamonds of more than one hundred carats were found; viz., four of more than three hundred carats, two of two hundred to three hundred carats and sixteen of one hundred to two hundred carats.

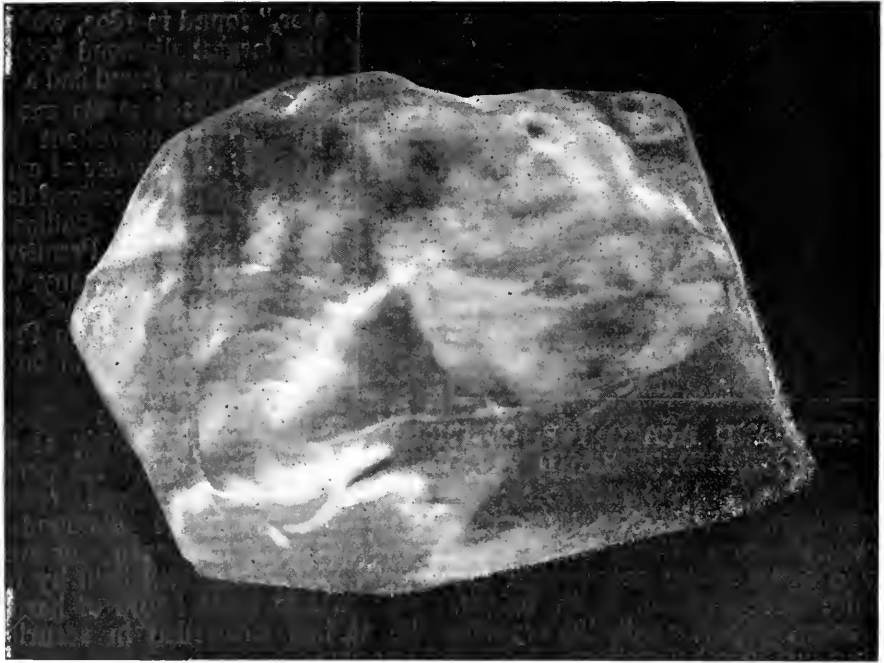
In 1907 the South African Government purchased this diamond for £150,000 and presented it to King Edward of England.

Upon the advice of the London Diamond Concern, Levy Nephew, the king decided to entrust the well known jeweller, J. T. Asscher of Amsterdam, with the cutting of this stone in his model factory.

The Cullinan was cleaved on February 10th, 1908, by the eldest partner of this firm, Mr. Jos. Asscher, and ground by Mr. Henry Koe, an eminent expert in this kind of workmanship. It will be of interest to know what Dr. G. A. Molengraaff, now professor at the Technical High School in Delft (Holland), to whom the diamond was sent by the direction of the Premier Mine, says about this magnificent stone:

ice or that of hyalite. The diamond shows some inclusions and also some feathers or inside cleaving surfaces. However, they are so situated that the value of the diamond is not lessened by same. No doubt it is the clearest of all known giant diamonds.

"The question has been raised whether it will be possible to find the other pieces that have been blown off by cleaving. Of course there is a possibility of finding them but no one



THE CULLINAN

"Although the diamond is a giant gem, it evidently seems to be only a part of a much larger stone, the form of which can be only guessed. Four pieces of this main stone have been blown off along the cleaving surfaces that, as we are aware, show the position of octahedrons. Each of these pieces must have had an enormous circumference. Therefore, the stone, lately found, shows only a part of its former surface.

"The stone is a single crystal without twin surfaces or twin lamels. It is fully clear. Its perfect lucidity is best to be compared with that of clean

would be able to say whether or where they will be found.

"Diamonds originate in very great depths from carbon material which has been dissolved in melted basic plutonic minerals. Out of these minerals, crystallized by enormous pressure and powerful temperature prevailing in those depths of the inner earth, the carbon material turns into pure diamonds. During the time of volcanic eruptions the diamonds were thrown out by enormous power to the surface, and by the strong friction which must have existed when the minerals passed through the crater pit the pieces were

severed from the main stone. It may be that, in the course of an eruption, the diamonds have been thrown out. But they might just as well still rest in the vulcan pit and the chances are that this successful and famous mining company will succeed in locating them."

Sir William Crookes, the famous English scientist, who wrote an article about the origin of diamonds, is also of the opinion that the Cullinan is only the smaller part of an octahedron split by crystal cleaving. He predicts that the Premier Diamond Company may succeed in locating also the larger part of this giant diamond.

The Arrangement of Specimens.

BY HOWARD R. GOODWIN, PHILADELPHIA,
PENNSYLVANIA.

After the article on the passing of the drawer cabinet by Charles H. Pennypacker, in the May number of *THE GUIDE TO NATURE*, it may not be amiss to say a few words in reference to the matter of effective grouping of specimens. I have seen several collections of minerals containing fine specimens which lost much of their attractiveness on account of poor arrangement, overcrowding, etc. A shelf filled with quartz crystals will present a dazzling appearance but much of the detail is lost in the general white effect, whereas crystals and groups of quartz crystals scattered through the case will brighten up the whole collection.

In arranging a shelf of minerals the best results are obtained by placing in the center the largest and most showy specimens and grouping the others about it without crowding, placing the smaller ones in the foreground.

In my cabinet is a shelf arranged as follows: a large specimen of purple fluorite for center, flanked on either

side by yellow calcite crystals; in front of the fluorite is a cluster of transparent quartz crystals; these stand out in bold relief against the background of deep purple. Smaller specimens carefully placed as regards color contrasts complete the group; calcites of pink, yellow or red tints contrasting beautifully with green fluorite, amazon stone, malachite, williamsite, prehnite and beryl. Sulphur crystals side by side with brilliant blue, quartz coated chrysocolla, while a group of milk white quartz crystals is relieved by a cluster of jet black smoky quartz.

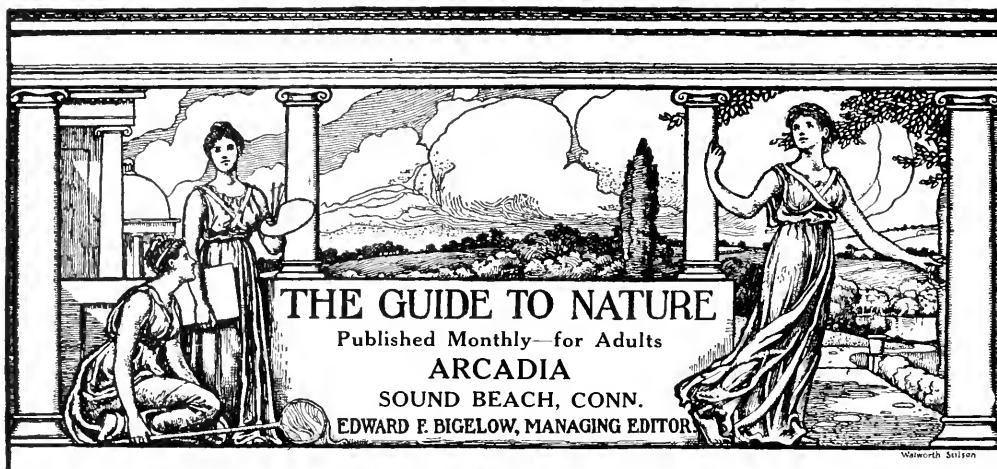
It is not necessary to have all crystallized specimens, as many massive minerals are very rich in color, and many ores are bright and showy, the iridescence of turgite, chalcopyrite and bornite; the glittering iron pyrite, galena and hematite all help to produce a pleasing effect. All this is not scientific, but it has been my experience that most collectors are lovers of the beautiful in nature and seek to preserve such specimens as they may be able to secure, not so much for the purpose of deep study as a means of recreation and decoration of the home.

A small cabinet of well chosen specimens judiciously arranged will give pleasure to any one with ordinary intelligence, while to any one of an artistic temperament it is a never ending source of enjoyment.

I enclose check for renewal subscription to *THE GUIDE TO NATURE*. I could not be without it.—Professor George Park Singer.

I must say *THE GUIDE TO NATURE* is making good as the best all around nature magazine that I have ever seen—past or present.—Chas. D. Pendell.





It Pays to Fight.

Many of our readers have expressed surprise at the statement that more than one-third of a million dollars has come to The Audubon Societies in four years. Without a doubt a very important factor in bringing in that money has been the effective and radical and most commendable legislative measures in preventing bird destruction. The merits of The Audubon Societies are self-evident, and their legislative work and their prosecutions have been skillfully conducted and made known. It is interesting and indeed almost humorous to see how such radical measures appeal to the public.

This phase is even more noticeable in The Humane Societies. Suppose their efforts had been confined to teaching people old and young to care lovingly and faithfully for pets and domesticated animals of labor. How much money would have fallen into their coffers do you suppose? But bring the man into court. Pound him as he pounded his horse and as unfeelingly, and the hat then passed is filled to overflowing. "Lick him and we'll back you up," has many constructions.

* * * * *

Seriously, my friends, do you not think The Agassiz Association should abandon its policy of thirty-four years' standing, of peace on earth, good will to men, of kindness to men and women, boys and girls, birds and horses,

and engage a few lawyers, thrash a few people, make laws that rare flowers must be plucked, that graceful snakes must be stoned, that fines will be imposed on those who manifest an artistic sense, that thirty days will follow omission to study the frog pond? Then, Oh then, we shall not worry about money to pay the printer and the engraver.

Yes, I am coming more and more not only to admire commendable fighting, but it is dawning on me, my friends, that it *pays!*

Aquatic Nature: An Undeveloped Field.

There is no more important, timely or suggestive article in this number of THE GUIDE TO NATURE than that entitled the "Establishment of More Aquarium Societies" by Dr. Herman Burgin, President of the Philadelphia Aquarium Society. We commend the article to the careful reading of every nature lover and especially to every member of The Agassiz Association.

Think for a moment. Do we not all agree that there is nothing more interesting or more easily available for home or school nature study than an aquarium? And there is nothing more ornamental nor cleaner nor that demands less care. Then why are there so few? Why only two aquarium societies in the whole United States?

The New York Aquarium is liber-

ally patronized, a fact that shows an intense interest on the part of the public. We have had for years innumerable societies for the observation of birds, plants insects, minerals—of everything but aquaria. Let us form AA Chapters largely devoted to aquaria. It is an undeveloped and interesting field. It is true that an occasional aquarium is to be seen in school or home. But are not most of them neglected or ill kept or far short of their possibilities through ignorance as to what may be done? Let us develop that field.

MICRO-AQUARIA.

Then, too, think of the possibilities of aquaria devoted to microscopic life. A glass cup or a shallow, wide-mouthed jar containing water from the nearest ditch or mill pond, and with a spray or two of some aquatic plant collected from the same source, will supply an abundance of microscopic life of many kinds and become a prolific hunting ground for the microscopist, although he may have only a small instrument and low magnifying power. Every drop from such an aquarium will show him something that he has never before seen and which he could never see without such a microscopical aquarium. Such a vessel rapidly and easily prepared, and kept covered by a piece of glass, will remain in good condition for months. It will demand only an occasional addition of a little water and a fresh spray or two of the aquatic plant, all of which costs nothing but is worth much.

What's The Use?

Now be frank, you repeated askers of that question, "What's the 'use' of this or that? You mean wherein can you wear it or eat it or wherein does it produce something you can wear or eat. Isn't life more than stomach or protection from the weather? I can imagine a dog, horse or pig asking, "What's the use?" meaning only can I eat it or will it give me protection from storm, shade in heat or warmth in cold; but it is difficult to realize mentally, or shall I say spiritually, a human being bringing every-

thing to the level of food or shelter. Have we no spirit of esthetics, no pleasure in abstract thought, no employment for faculties above those of the mere animal that we must insist and argue about the physical use of all things? True, let us admit it, a cavy isn't the best animal to raise for meat; a fantail isn't equal to a chicken; listening to the music of an oriole may not "pay" as well as listening to a stock "ticker;" but all these that you regard as inferior become superior the moment you look at the subject from the human and not the animal point of view. If thought, love, appreciation of beauty and similar faculties are the highest attributes of humanity, then one who lives in that realm and exercises those faculties on the songs of birds, the beauty of star or flower, insect or pet, may well ask of what use are your utilitarian interests. A Great Naturalist centuries ago pointed out that it is possible to gain the whole world and lose one's soul.

Removal of Cat's Kittens.

One of our most appreciative naturalist friends writes as follows:

"I am much pleased with the May number of *THE GUIDE TO NATURE*, but I want to criticise the owner of the cat which adopted the squirrels. A cat should never be deprived of all her kittens. If she is allowed to raise one of them it will generally make a good animal. My mother's rule was to allow the cat to make her own selection of her favorite baby by removing the kittens from the nest and allowing the cat to pick out one and take it back on the theory that the mother would naturally pick her favorite baby first. Occasionally, however, there may be some choice on the part of the owner as to the markings of the kittens in which case it may be necessary to allow the mother only a limited choice."

I am delighted with *THE GUIDE TO NATURE* and am talking it up wherever I get a chance. It should be in every school, every library and every reading room in the United States. It is wholesome, instructive, clean and handsome.—Geo. W. Geist.

An Effective Friend of Birds.

William Dutcher was born January 20th, 1846 at Piscataway, New Jersey; his father being the Rev. Jacob Conklin Dutcher of Tarrytown, New York, and his mother Margaretta Ayres of New Brunswick, New Jersey.

On his father's side, he is a direct descendant of Capt. William Dutcher of revolutionary fame and also of Isaac Van Wart one of the captors of the unfortunate Major Andre. On his mother's side he is a direct descendant of Edward Fuller, one of the Mayflower pilgrims.

Such education as was obtained by Mr. Dutcher was in the common schools of the country of his day, but unfortunate circumstances compelled him to commence work for a livelihood when he was about fourteen years of age. Up to the age of twenty, he successfully conducted a small farm in the State of Massachusetts; subsequently he came to New York and engaged in the business of life insurance, in which he has continued for over a period of forty years, during all of which period he has never represented but two companies.

Mr. Dutcher supplemented his rather meager early education by reading and association with educated people; both his reading and association being largely natural history subjects.

He has always been deeply interested in the life history of birds and especially in their protection from the economic as well as the aesthetic standpoint.

He was a member of the original A. O. U. Committee for the protection of birds which was established in 1884 and was always a member or chairman of the said A. O. U. Committee until this work was turned over to the Audubon Societies, and later to the National Association, of which he has been President since its organization and incorporation. He devotes a very large part of his time to this work and has always done so without compensation of any kind whatever, considering it a civic duty he is called upon to perform, owing to his intimate knowledge of birds and their relation to humanity.



WILLIAM DUTCHER

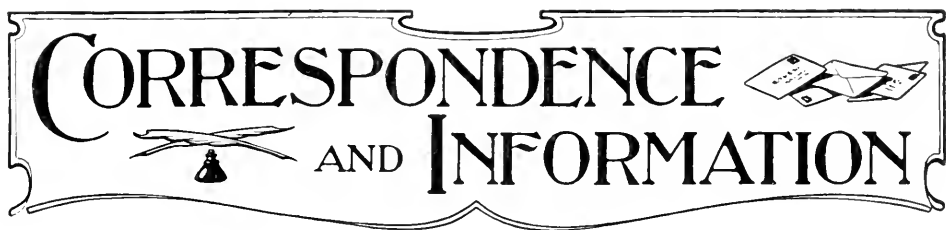
Mr. Dutcher is a Fellow of the following societies:

American Ornithologists' Union,
New York Academy of Sciences,
New York Zoological Society,
The American Association for the Advancement of Science,
The Royal Society for the Protection of Birds, Great Britain,

and is also a member of the Linnaean Society of New York, the American Museum of Natural History, Zoological Society and the Sons of the American Revolution, the Mayflower descendants.

During his many years' residence in New York City he always took an active part in reform politics, being one of the originators of good Government clubs, and was also a member of the Citizen's Union. He is independent in politics.

CORRESPONDENCE AND INFORMATION



A Word from California.

Chico, California.

TO THE EDITOR:

THE GUIDE TO NATURE fills a unique place in current literature. I hope you will not try to make it any less 'childish.' I do not see how nature study can ever be taught successfully in any other way, and I fear that just here is where so many teachers are making a mistake. Of this I am convinced by years of experience with the teaching of the subject. Success to this most excellent teacher of nature.

Very truly yours,

RILEY O. JOHNSON.

Department of Biological Science,
State Normal School.

Remedy for Ivy Poisoning.

Cincinnati, O.

TO THE EDITOR:

Apropos to this being the period of year when a great many seek surcease from work and relief from the torridity of cities, by flying to the mountains, the rivers, the lakes and the country, a word of suggestion and advice may not be amiss. I have in mind the dangers from "Poison Ivy." People should be taught to recognize it and thereby minimize the number of cases of poisoning; but even this is not an absolute safe-guard, especially when one is busily engaged in pursuit of some interesting object of Natural History.

Some persons can handle it with perfect safety, even to the extent of chewing the leaves; while others are affected by the slightest touch, and for them an ounce of prevention is worth far more than a pound of cure. Strange as it may seem, so very few people, even physicians do not know the sovereign remedy for rhus toxicodendron; it is Tincture of Grindelia.

When the poisoning has occurred and the characteristic symptoms are present, it is to be applied on gauze, clothes, or cotton, which have been saturated in a solution of 1 to 4 or 1 to 5. Before the poison has had a chance to act, or where one has come in contact with the poison ivy, it is advisable to sponge the exposed portions of the body with this diluted solution, care to be exercised not to get any of it into the eyes as it smarts rather savagely. I have never known it to fail, even in cases where a number of other remedies have been tried unsuccessfully. It is almost a specific, or as nearly so as anything we know of. I never take a trip into the country or the woods, nor do I take canoe trips, without a supply of Tr. of Grindelia.

Yours very truly,

G. A. HINNEN.

Observations in Prospect Park.

234 Willoughby Avenue,
Brooklyn, New York.

TO THE EDITOR:

While watching the grey squirrels this spring I fell to wondering if their store of nuts is exhausted before the new crop ripens, and to wondering further what in that case these beasts, when far removed from the park peanut supply, depend upon for food. Not long after my question was partly answered when I saw a grey squirrel with his "arms" full of green grass which he was industriously eating. Later I saw another squirrel standing by a clump of rather coarse grass, eating it from the plant. All the grass of that kind near by looked as though it had been cropped off in the same way. After that I more than once saw a squirrel busily eating the catkins from a hornbeam tree.

Singularly enough, as I closed the above sentence, I caught sight of a friend in grey fur eating the green fruit from a mulberry tree. I then be-thought me that cherries will soon be ripe and later the various kinds of wild cherries, and the cherry stones may pass for nuts.

A little sheet of water in Prospect Park, Brooklyn, is nearly surrounded by shrubs and trees. On May 16th of

this year I heard a loud splash as though a brick, perhaps, had fallen into this little pond. By the time I could get from behind a tree trunk which obstructed my vision, a fish hawk or American osprey was just rising from the surface of the water with a large goldfish in his talons. He flew heavily away over the trees, his brilliant prey gleaming in the sunshine.

CAROLINE M. HARTWELL.



Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

A Field Day.

REPORT OF CHAPTER 587, CONCORD, NEW HAMPSHIRE.

A cloudy day in May, a ravine, only a cow path on a steep hillside, bushes, homes of the brown tails not yet dispossessed, past the yard of an unkempt farmhouse. As we walked on shut in by the hills an almost uncanny feeling stole over us. One called attention to the purple glow of the sweet fern that made the place beautiful; another showed us the fertile bud near the tip, longer and unlike the others; only the crow for birds whose, "Caw, caw," seemed a part of the lonely place.

While the others scrambled up the hill to see a bird, I zigzagged down under some scraggy, stunted pines and found what made the day a red letter one to me (by first find), a group of earthstar mushrooms. Its history is interesting. It is first deep in earth in a nest of thread-like mycelium. The ball is covered with a double coat; the outer, thick and leathery, covers the inner closely like a coat of mail, but separate from it at maturity it bursts from the thread-like mycelium, breaks into separate lobes which lift it from the ball from the ground, to

the air. There were several; they seemed to be arranged sociably in groups.

Disseminating AA Interests.

FROM ANNUAL REPORT, FOR 1908., OF ELMER WALTER, CORRESPONDING MEMBER, NO. 2002, PERU, INDIANA.

For more than a year I have been maintaining a "Young Folks'" department in a Missouri local newspaper. It has been the aim to make natural science the leading feature of this department and to make the readers acquainted with the Agassiz Association. In this connection I have sought correspondence with the readers interested in nature study.

During the year 1908 I have furnished the newspaper about twelve columns of copy, and written or sent AA literature to nine different persons and with some of these have since maintained a regular correspondence. Four of the number have contributed articles for our department and three of these seem to be steadfast friends of the idea and appreciative students of nature. We seek to establish a "Home Newspaper Legion" of young folks for mutual improvement by correspondence and especially to promote nature

study. The idea is to get young folks interested in the home newspaper by maintaining a department in it for them. In this way it is hoped the AA may become known in places and through avenues not now reached by THE GUIDE TO NATURE.

Insignificant as the country newspaper may seem, it has its special field and that field is not necessarily confined to the town or county where it is published. It is capable of reaching to the antipodes. My first response came from the far away Philippines, and another was from the Atlantic coast of New England. If there are other corresponding members of the AA who can offer helpful suggestions in promoting this idea, I shall be glad to hear from them.

As to my actual nature study during 1908, it has been of a varied character. Besides keeping diary, I make notes of little incidents observed in the domain of nature. Some pertain to new facts learned and some to common incidents observed, such as the arrival or departure of the migratory birds. Some of the most common birds are loved because their songs, needing no revision, are the same as they were ages ago, and to hear them is to be carried back in imagination to the sunny days of youth. Of the rare varieties of birds it is an event worth while to observe the occasional presence of one. They also recall other days when their forest homes were not totally devastated and they were more common neighbors with us.

* * * *

Twenty-five years ago the red squirrel was almost unknown here; but there were a few gray squirrels and the fox squirrel was common. Now the latter two species are seldom seen, while the red squirrels are common. The red squirrel is enough rat-like in its nature that it boldly comes to the corn crib or orchard to search for food and if too closely pressed by dogs or other enemies, is very quick and skillful in making its escape and does not hesitate to go into hollow logs or holes in the ground in order to elude its pursuer. I witnessed an escape of this kind. Treed on two low spread-

ing butternut trees near each other on a hill-side, the red squirrel outwitted the dog by rapidly running down the trunk of one tree nearly to the dog, then quickly back among the branches to the other tree, repeating this maneuver until the dog became confused by having to run first to the foot of one tree and then to the other. The squirrel finally darted safely to the ground and found refuge either in or under some old rotten logs or in holes made in the ground by chipmunks. I saw a number of summer nests of the red squirrel in the same thicket mentioned in former observations and in the vicinity of the old oak tree illustrated in the December GUIDE TO NATURE. I examined one of these nests and found it to be made wholly of dry grass. Much of the grass near the center of the nest was cut or ground up fine. The nest was about ten feet from the ground on a group of bushy saplings covered with grape vines.

In my walk to the woods, the dog which accompanied me "treed" an opossum in a hollow ash stump near a paw paw thicket. The stump was only a few feet high, sawed off flat on top and contained an opening at the center just large enough to admit the opossum, and widening out below just right to make a comfortable nest nicely lined with dry leaves. I brought the pocket-mirror into use, reflecting the sunlight in on the animal, which acknowledged the intrusion by the sparkle of its eyes, and turning its pointed snout up toward me, indulged in the usual threatening "possum grin." It was near enough that I could have touched it with my hand, but I did not want to make closer acquaintance with those sharp teeth. The dog also could see the opossum, but could not reach it without my assistance; so, after watching the little forest denizen for a while, we went away, leaving it in peaceful possession. The next time I visited that place the stump was empty, and a few weeks later was destroyed by forest fires.

Along a railroad, more than a half mile from that place I saw where an opossum had been killed by the cars,

near where it seemingly had been dining on the remains of a turkey that had met its death under the wheels. Whether these incidents pertain to one or more individual animals, I can only conjecture.

The latter incident calls attention to the numerous tragedies among the lower animals as a result of their getting in the way of railroad trains. During the year I noted as other victims a "rain-crow" (a bird I think to be of the cuckoo family), a screech owl, and a number of rabbits. One evening I met a freight train. After it had passed I resumed the right-of-way and had walked only a few steps when, in the dim twilight, I saw a rabbit floundering against the wire fence alongside the railroad. In its confusion I succeeded in picking up the little animal. I expected to find it badly mutilated; but only one hind foot had been cut off by the cars. Goldfinches, chickens, ducks, cats, muskrats, frogs, turtles, etc., I have observed as the victims in former casualties.

As another menace to bird life, telephone and telegraph lines and wire fences play a prominent part. I saw a golden-winged woodpecker fly against the wire poultry netting enclosing a chicken-park. The bird was stunned, but managed to fly into a nearby basswood tree, where it sat moping, with its beak open and its tongue lolling out. After a while it seemed to revive and, I hope, finally recovered. My recollection is that on a former occasion the body of a dove was found that had been killed by flying against this same fence.

I saw an interesting example of protective mimicry in a caterpillar on a raspberry bush. Clinging by its hind feet, it stood out motionless at an angle, for all the world like one of the green twigs or branches. Its coloring was greenish, mottled with spots, that added to the resemblance and made it more difficult to distinguish the creature from the parts of the host plant it was mimicking.

I was witness to a part of the process of metamorphosis of an insect from the pupa to the imago stage. It was about 5 o'clock in the afternoon of a warm day that I saw the insect sit-

ting on a nail partly driven into the door-frame of a summer kitchen or out-building. When first observed, the developing wings were crumpled up into little triangular projections on the creature's body. I placed it on a leaf and was examining it with a magnifying glass. There was one moulting or sloughing off of the outer skin while I watched it. In about an hour's time the wings had developed and unfolded almost enough for the insect to fly. Not being well enough versed in entomology, I am not positive as to its identity, but think it was some sort of "May-fly." It had prominent eyes of a bronze metallic color; filament-like antennae; body greenish; wings thin, gauzy and finely veined.

METEOROLOGY.

I observed an aurora appearing as an arch of light in the north at 10 o'clock p. m.

An aurora was seen as a soft yellowish-white light in the north, somewhat as an arch across the horizon and with occasional faint vertical streamers; about 8 o'clock p. m.

I observed a sun halo. The condition of the weather was a temperature somewhere above freezing, probably at 38° or 40° Fahr. A cloudy haze came over the sky from the southwest. The halo consisted of an inner circle whose radius was about the same as the distance of the sun above the horizon. About equally distant outside of this was dimly visible the right arc of a larger circle, extending from above the sun to the horizon north of it. The haze did not extend far enough south to form the left arc of this outer circle. The inner circle was intersected overhead by an arc, forming a bright spot or parhelion just above the sun. The limbs of this arc extended only about half way toward the outer circle. This halo was not to say extremely brilliant, but the prismatic colors were dimly perceptible. It differed from the halo described in the April GUIDE TO NATURE, in that there were only the two circles, or parts of circles, and the arc instead of being on the outer circle was on the inner circle. A rain set in at dusk, followed by clear, cold and windy weather and a cold wave the succeeding night.

The La Rue Holmes Nature Lovers League

By George Klinge, Summit, New Jersey

Explanation:—The aim of this League are in many respects the same as The Agassiz Association. Therefore it has been proposed that the adult interests be represented by "The Guide to Nature" and that the League co-operate, or possibly be affiliated, with The Agassiz Association.—E. F. B.

Ten addresses were given to the various Chapters during the month of May.

* * * * *

Leaflets concerning wild flower protection were distributed in three school chapters during May; leaflets on bird protection, in one school chapter and one home chapter.

* * * * *

The L. H. Nature League Chapters organized during the past month are: The Bright Eyes Chapter, Madison, New Jersey; The Madison Library Boys' Club Chapter; The Morristown School Chapter.

Trailing Arbutus.

Our member, Mrs. L. F. Brown, of Morristown, N. J., in an interesting wild flower census, gives trailing arbutus as being found in Morristown; we have no other record of it in this vicinity, and would be glad to hear from others as to its existing elsewhere in this section.

The arbutus is a much abused form of nature's riches. Where it yet lingers the despoiling hands of the thoughtless are rapidly exterminating it, as at Lakewood, N. J., where it has given pleasure to so many who have been content to enjoy its beauty without curtailing it.

If the sale of arbutus, as well as gentians, pipsissewa and other rapidly disappearing forms of plant-life, were met by the determination of flower-lovers, to purchase no wild bloom whatever of flower-venders or florists, a prolific source of destruction would soon cease to exist.

Personal Observation.

BY B. S. BOWDISH, SOUTH ORANGE, N. J.

A key note to nature study, and one that the great naturalist and teacher, Agassiz always showed his apprecia-

tion of, is personal observation, independent investigation. The tasks that this greatest of nature teachers set his pupils were such as would best develop the faculties of seeing and hearing for themselves.

What we discover by our own original investigation is more sure to be retained in our memory and to do us a greater amount of good than what we obtain at second hand from the studies of others.

I remember during the early stages of my interest in insect life, an occasion when I found several of the *larvae* of the Common Eastern Swallowtail Butterfly, *Papilio asterias*, feeding on caraway leaves. At that time the mature insect was not known to me by name, nor did I have the slightest idea what sort of appearing butterfly should be expected from the *larvae* in hand, but I placed them in a box with a mosquito bar over the top, furnished them with their natural food, and placed the box in a cool position, while I awaited results. After my captives assumed the pupa stage I did not consider it necessary to keep the mosquito bar over a hole about half an inch in diameter in one side of the box, as surely the butterflies could not escape from this small aperture. One morning when I inspected the prison of my three quiet captives I found I had two strange additions to the population, in the shape of slender, tawny reddish ichneuman flies which eventually proved to be *Trogus epssorius* Brulle. Further investigation showed a neat round hole in the side of each of two of my pupae, and I promptly developed a suspicion as to the character of the ichneuman flies which subsequent recourse to the authorities proved correct.

Later the remaining *pupa* split its skin to allow an *asterias* to escape.

Identification was comparatively simple and the insight I had gained into the life cycle of this beautiful and interesting insect was attended with a pleasure that no book information could have given me. Moreover it was impressed on my mind indelibly. What I may have learned of insect lore from the writings of others may be soon forgotten, but that one bit of insect life that was blended with a brief chapter of my own life occupies a bright and unfading corner in my memory.

Yesterday.

BY ALFRED KINSEY, SOUTH ORANGE CHAPTER NO. 3.

As part of its spring program, the L. H. Nature Lovers League had arranged with Dr. Kummel, the New Jersey State Geologist, to take any boys who were interested, out over the country around Summit.

Saturday, May the 8th, found a group of boys gathered in the building of the Y. M. C. A., Summit, listening to the plan for the trip.

First we were to cross the railroad and notice the morains and trap-rock quarries, just east of Summit. We were told the story of hundreds of centuries ago. Yesterday, for so the geologist counts thirty-five thousand years, was the glacial period. Moving like so much cold tar, a vast ice-sheet spread, with a thickness of perhaps two miles, over the larger part of northern North America. The glacier's course was marked with scratches on the rocks; even whole mountains were scratched out of existence.

Then the effect of the warm southern sun was felt, and quickly in comparison with its onward march, the ice-sheet melted away, dropping its burden of gravel, rocks, and boulders; so were formed new mountains, the terminal morains.

We were told that the true morains are distinguished as hills built of rock and gravel deposits, between which hills lie level plains of sand and finer gravel.

Though Summit is built, for the most part, on these morains, the formation of the so-called First and Second Mountains, must not be confused

with the glacial period. It can easily be seen how hills formed of layers of trap-rock, sandstone, and shale, have lost their sandstone to some extent, by action of winds and rains, leaving the harder trap to form the mountains; the steep western slopes being due to the slant of the layers of rock.

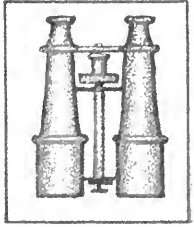
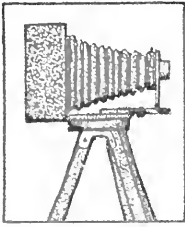
Toward noon we saw the glacial deltas—delta-shaped bits of land built by the streams of the melting ice, laid out like the ribs of a fan—one of these deltas seen by us, is in the form of a very perfect alluvial fan—a hummock built by modern winds and rains.

An enjoyable lunch, eaten out under the open sky, over, we moved on—true, now in rather a straggling fashion—and spent the rest of our time in learning about Lake Passaic. Acting as a dam, which even now would work wonders, if built across the Passaic at Little Falls, the glacier turned the river and built "Yesterday's" vast lake, thirty miles long and fifteen miles wide with an average depth of two hundred feet; a lake large enough to flow over almost the entire State of Rhode Island.

At the southern end of Long Hill, we saw what Dr. Kummel calls one of the best of geological landmarks; a vast mass of sand, rising about a hundred feet, shaped like a bowl with the front broken out. This is the spit still standing as it was when the waves of long past ages left it.

After viewing the quarries; learning that rock containing iron looks red as a result of the appearance of rust; that the thinness of soil on mountain tops is due to the earth having been washed off by rains; indeed learning many other things, we turned homeward; a group of boys—yes, most likely tired—who had learned more of the subject considered, in that one walk than a year of class-room work had ever taught them.

Maybe not every one remembered everything they were told, but the Nature League, and Dr. Kummel were, no doubt, repaid for their kindness by the thought that every one of the boys carried home with him something worth remembering concerning that one day's most interesting trip.



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"Auch Ich war in Arcadia geboren."—"*Travels in Italy*" by Goethe.

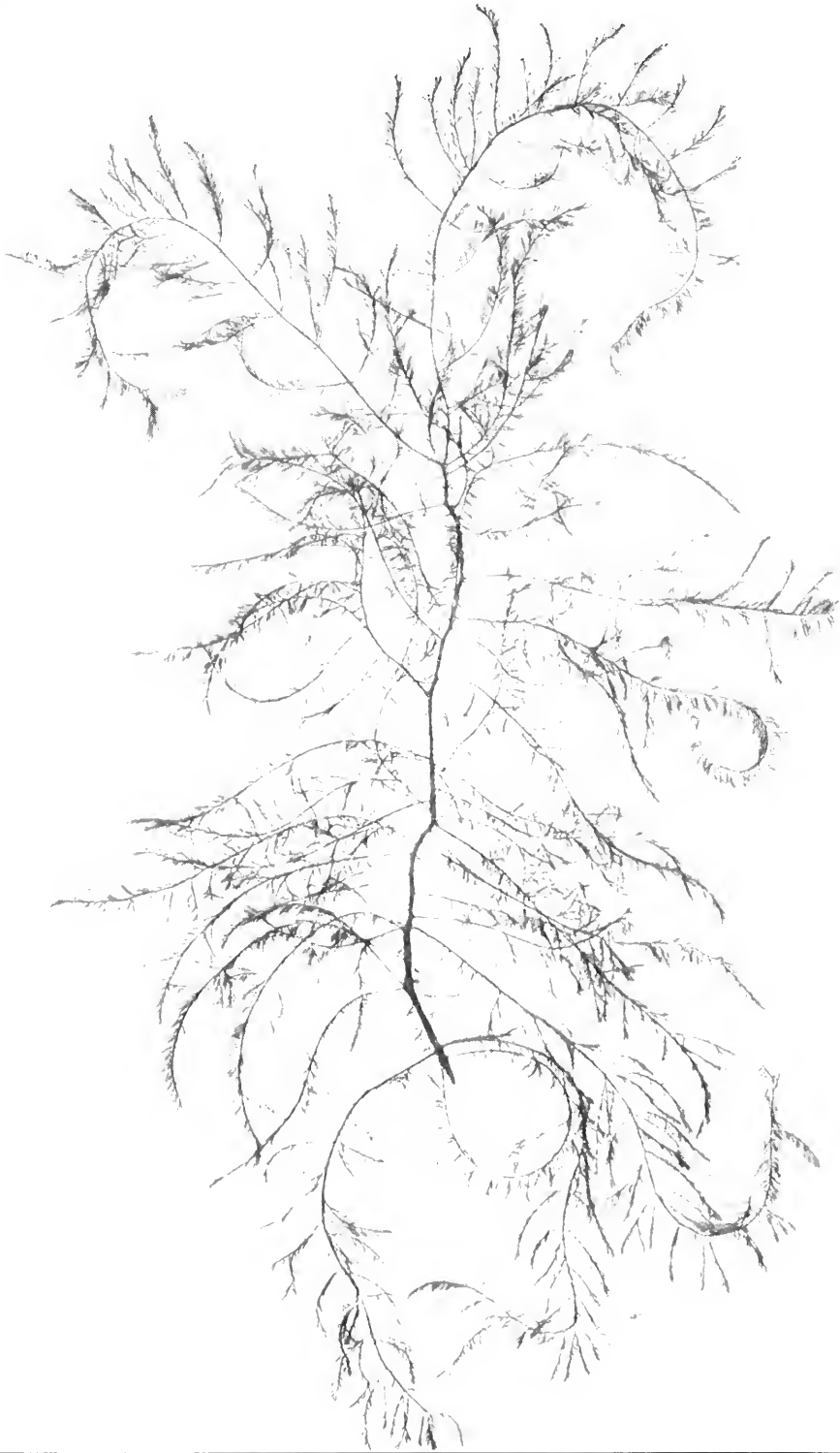
The monogram of the AA weaves into Arcadia.



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Our beloved AA is the beginning and center, the center and end, and the beginning and end of the new nature Arcadia. In fact, the principle of The Agassiz Association, "study nature, not books," was the foundation of Arcadia; it is our constant aim, and it permeates all our work.





A DAINTY SPECIMEN FROM A ROCK-POL
(*Dasya elegans*. Chenille weed)

"He has achieved success who has lived well, laughed often and loved much; who has gained the respect of intelligent men and the love of little children; who has filled his niche and accomplished his task; who has left the world better than he found it, whether by an improved poppy, a perfect poem or a rescued soul; who has never lacked appreciation of Earth's beauty or failed to express it; who has always looked for the best in others and given the best he had; whose memory is a benediction."—*A Woman of Kansas in "Long Island Agronomist."*



THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

AUGUST, 1909

No. 5



A Rock=Pool by the Sea

BY MISS SARA ROOT ADAMS, EAST ORANGE, N. J.

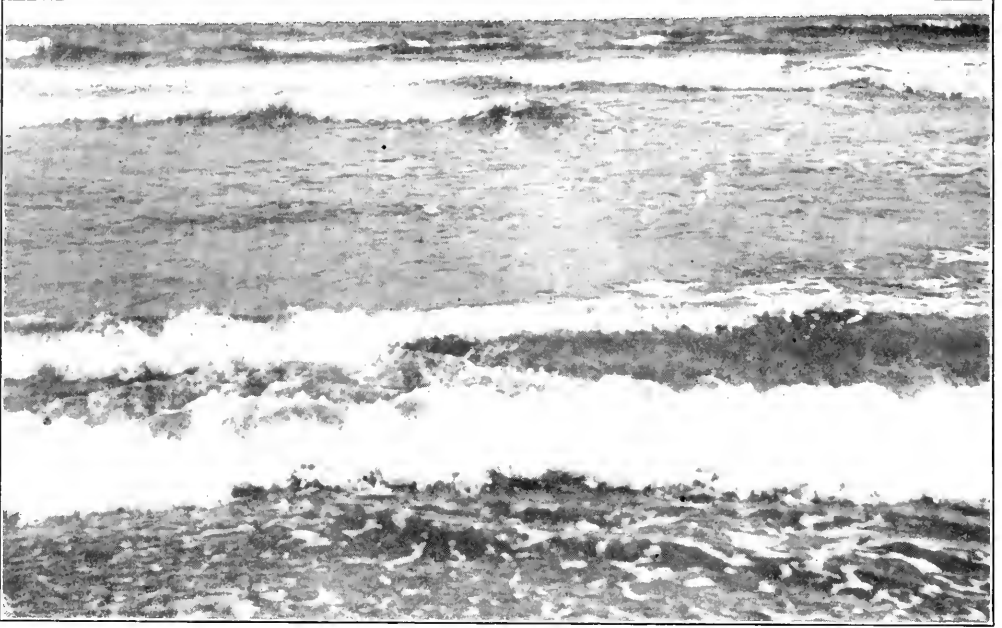


WHAT could be more delightful than a clear morning on the coast of Maine! The sky is bright blue, with a few fleecy clouds in the north; the sea darker blue, and sparkling as with diamonds; the islands and points, green with fields and woods, and white with huge seams of quartz and feldspar, are brought into bold relief against sea and sky.

But I must not linger to enjoy the view this morning, for the tide is low, and the waves, which, yesterday, were breaking on the rocks with a loud roar, today creep lazily up around points of rock and over fields of sea-weed. This is a propitious time for a natural history expedition, and accordingly, I set out, in an appropriate and unfashionable costume, which includes broad hat, rubber boots, and stout walking stick.

My way lies across the rocky pas-

tures, to the cliffs. These are formed principally of a micaceous rock, which lies in strata slanting 20° or 30° from the perpendicular, and is shot through, here and there, at various angles, with dikes of quartz, trap and other rocks. Climbing down some thirty feet, by the aid of my staff, over the irregular steps formed by these rocks, I find myself almost on a level with the sea. The rocks now at my feet are of the same kind as the cliffs, but these are worn by the waves. Passing over these, I come to rocks which the tide has so lately left that they are still wet, and the shining, brown sea-weed growing upon them is so slippery as to require slow and careful stepping, and nice balancing on their tops, to keep one from slipping into the deep pools left by the tide between them. Today, however, my rubber boots make me quite independent of such carefulness, and I step boldly through the smaller pools, securing a firmer foot-

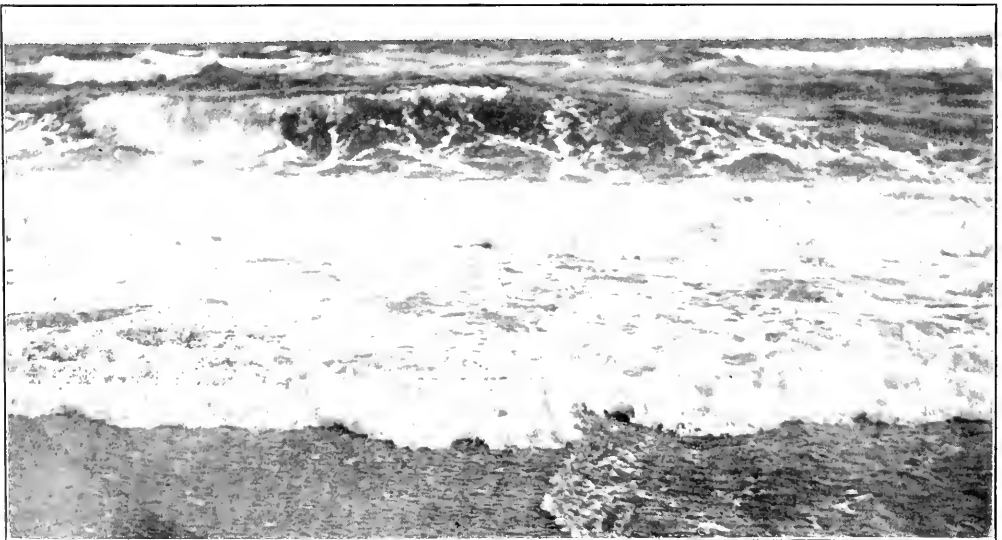


"THE WAVES WHICH YESTERDAY WERE BREAKING"

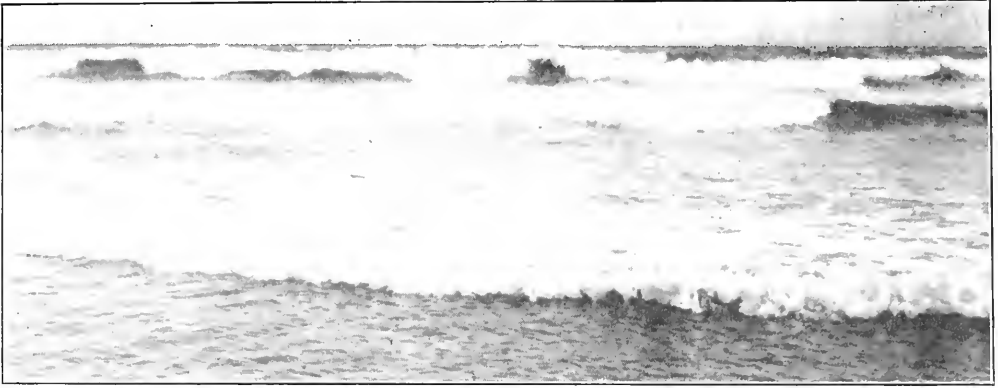
ing. Before me rises still another ledge of rock, of much the same character as the higher ledges. Standing on its lowest step, I find that, notwithstanding its insignificant appearance when seen from the top of the cliff, it rises three or four feet above my head. The other side of this ledge slopes directly to the sea, and all its hollows are filled

with mussels, and its ridges crowned with barnacles.

But the deep pool at the foot of this ledge, on its landward side, is my especial place of observation to-day. It is the largest of these pools, being about thirty feet long, five or six feet wide, and perhaps five feet deep in the middle. Kneeling on the sea weed,



A STUDY IN THE WAVES ROLLING IN TOWARDS THE ROCK-POOLS



AN INTERESTING STUDY IN OVERLAPPING AND FALLING OF WAVES

with the protecting ledge behind me, I prepare to investigate with eyes and hands, the marvellous collection of treasures before me.

The rocky sides of this pool are in themselves interesting enough to employ many a day, and the study would include the three great kingdoms, as the brilliant colors of the rock are due partly to the minute animals and plants upon its surface.

The pool is lined with sea-plants of many varieties, which would prove an interesting study in their manner of

growth and reproduction. Even the coarse, brown bladder-wrack, or rock-weed, which grows on the top of the rock, has a most curious history. Here, also, is the Irish or Iceland moss, beautiful enough, in its brilliant shades of purple, brown and green, with here and there a strange electric blue tint, to ornament a parlor table. The waving brown ribbons of the laminaria, the bright green ulva, and many other plants, help to decorate this garden of the sea.

As I turn my attention from the



A COMPANY OF CLAM DIGGERS AT THE POOLS ON THE BEACH



A NATURE CLASS STUDYING THE POOLS AND ROCKY BEACH

plants to the animals, I notice with renewed interest, the resemblance of sea-animals to land-plants, and am reminded of the curious fact that the spores of some sea-plants have the power of independent motion. The creatures that first meet my eye are the sponges—red, yellow and green—which show so little sign of animal life that a microscope is needed for a careful study of them.

Much higher in the scale of life are the sea-anemones, whose family name is actinia. These are among the most beautiful of sea-animals, though in this

cold water they have not such brilliant colors as in a warmer latitude. Here they show all shades and tints of brown, with now and then a salmon pink, and occasionally a bright orange. The largest specimen that I ever found measured, with tentacles spread, four or five inches in diameter. How like a little flower-garden is a cluster of these small ones, with their delicate pink and fawn-colored tentacles moving to and fro in the clear water!

Their power of mending themselves when injured is wonderful. I have read of one which was cut trans-



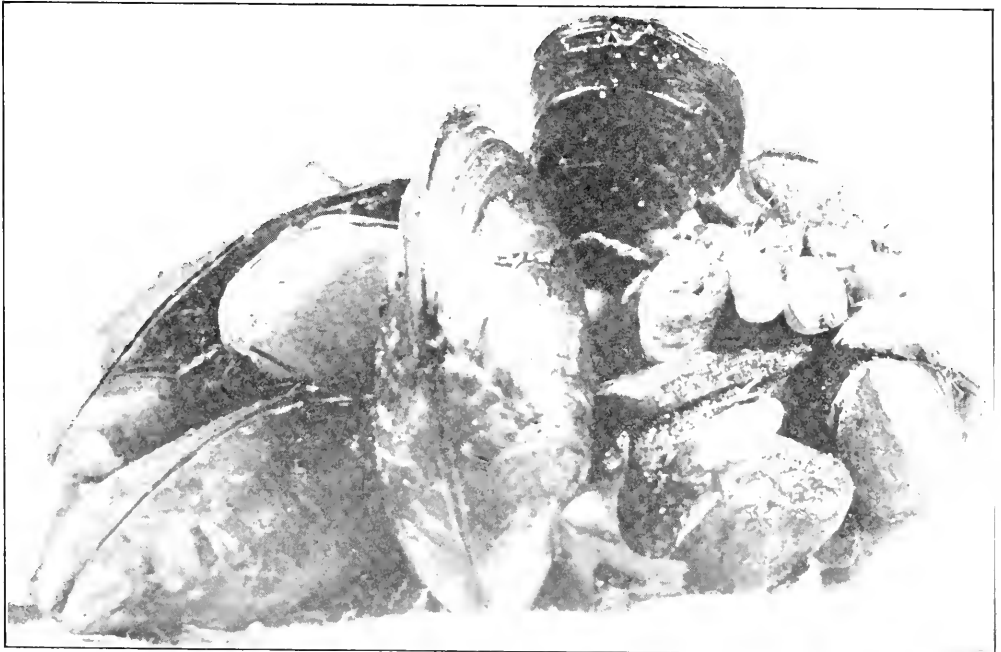
"THE SEA-ANEMONES . . . ARE AMONG THE MOST BEAUTIFUL OF SEA-ANIMALS"



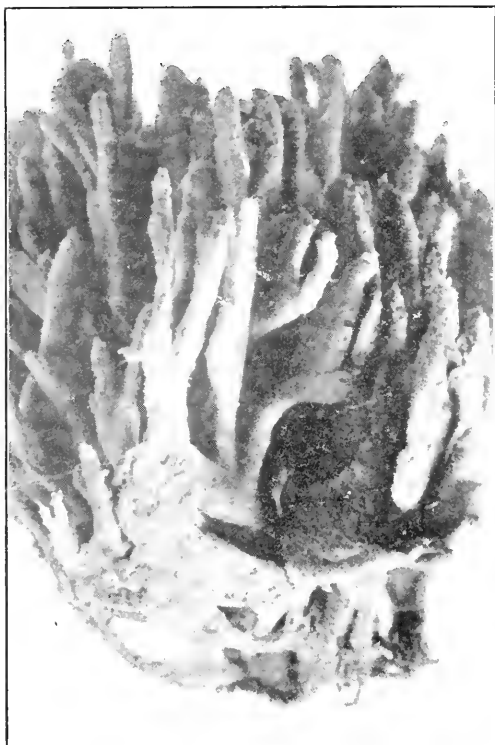
A CLUMP OF SPONGE FROM THE NEW ENGLAND (LONG ISLAND) COAST

versely, and another, vertically, and each case resulted in the formation of two perfect anemones. It is also recorded that, if one be torn roughly from the surface to which it clings, each piece remaining attached will, in time become an anemone. I have never tried any of these experi-

ments with anemones, but once accidentally illustrated their power of endurance. I was feeding them with pieces of clam dropped from a fork into the jar which served as an aquarium, when the fork slipped from my hand, and pierced, from mouth to base, an anemone in the bottom of the jar.



THE BYSSUS OF MUSSELS FASTEN THEM AND THE PEBBLES TOGETHER



A DAINTY FINGER SPONGE FOUND IN A
ROCK-POOL

Though I immediately took out the fork, I had heard the points clink on the glass; and as the injured creature quickly drew in its tentacles and transformed itself into a leathery lump, I felt that it could never survive the blow. But, after a few minutes, I saw, to my astonishment, the tentacles slowly reappearing, and soon the anemone was as fully blossomed as before the accident. I dropped a piece of clam into the water just over the creature's mouth, and the tentacles, slowly waving to and fro, made a current which drew the food into the mouth. This is its usual mode of eating, and in this case, seemed to be performed with as much ease as if nothing had disturbed its quiet life.

The food of this animal consists of various creatures of the sea, in some cases larger than itself. Worms, crabs, young fish—these are among its favorites, all hard and shelly parts being disposed of by turning its stomach inside out!

The anemone has the power of thrusting out from various parts of its body, tiny white filaments, with which it kills its victim before swallowing it. A naturalist writes that he has seen young mackerel die from coming in contact with an anemone.

The larvae of these animals are formed in the tentacles; from these they pass into the stomach, and are ejected from the mouth with the refuse of the food. An anemone in the Zoological Gardens of Paris, having taken a large quantity of food, ejected a portion of it, and in this mass were found thirty-eight young anemones. In some cases the young grow on the outside of the parent, like buds on a plant; after a time they detach themselves, and become separate individuals.

The tide is now fast approaching the pool, and I must hurry to make my call on the other inhabitants.

The most noticeable are the star-fish and sea-urchins, or more scientifically, the asterias and echinus. The former are the more brilliant in color, being



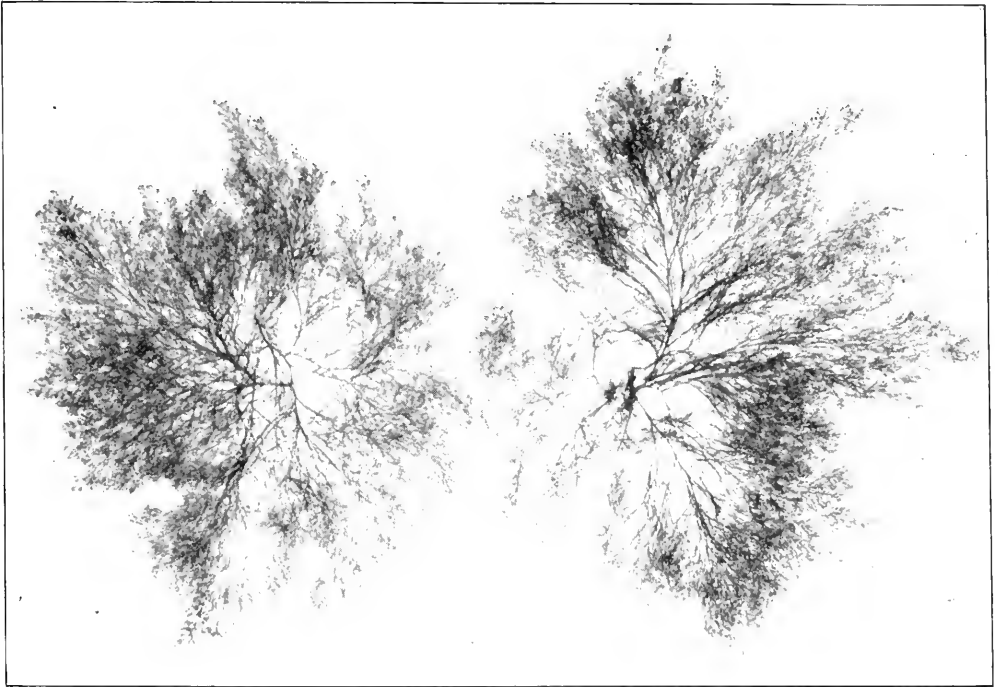
THE CURIOUS TWISTINGS OF THE SERPULA
ON AN OYSTER SHELL

of various shades and tints of red, orange, purple and brown. What rough, horny backs they have, and yet they can bend their rays into so many different positions, and the delicate white tentacles on the under side wave, as the rays are lifted, almost as gracefully as those of the anemone.

I once saw one swallow a small snail, shell and all. The star-fish was clinging to the side of the glass jar which was its temporary home, and had spread itself over the small, nearly round shell of the littorina, which

of its tentacles. In this way it can eat even mussels and oysters, covering its victim with a poisonous fluid, thus causing the shell to open, when the star-fish quickly devours the contents. I have seen one during this process, the thin membrane which forms the stomach appearing like a large white bubble. Oystermen consider the star-fish an enemy, it makes such havoc in the oyster-beds.

The sea-urchins or sea-chestnuts are not beautiful creatures. They look much like chestnut burrs, but are



A GEM IN SEA ALGAE FROM A ROCK-POOL.
(*Callithamnion corybosum*)
One hundred and fifty varieties

looked much larger than the star-fish's mouth. When I left the room, the poor littorina was gradually disappearing, only a small part of the shell being visible, and, on returning, I hunted through the jar in vain for the bright yellow shell. But the star-fish became the liveliest of its kind in the aquarium, and never showed any sign of indigestion.

The asterias inverts its stomach upon whatever of its prey is too large to be drawn into its mouth by means

darker in color; and the burrs in the woods do not have the power to send out long tentacles from their spines, and work themselves slowly around, using the little suckers at the end of these tentacles as feet. The digestive system of the sea-urchin is remarkable. Its skeleton consists of no less than thirty pieces. The teeth, which form part of this wonderfully jointed skeleton, are five in number, long, sharp, curved, and very hard. They can cut the hardest substances, and would soon



FEEDING THE GULLS ON THE BEACH

be worn out, did they not grow from the base as they are worn at the point, like those of rodents.

I have read, in a work translated from the French by an English naturalist, that the sea-urchins hollow out holes for themselves in the hardest rocks. I am curious to know whether on any part of our coast they do this. Those described in the work mentioned above seem to be similar to ours in other respects. As I pass my hand along the steep side of the pool before me, I perceive that these urchins are not in hollows, as, when they make their presence known by their sharp spines, I can detach them from the surface of the rock.

As I kneel on the seaweed, watching these singular creatures, a little cascade suddenly appears at one end of the pool. The tide has been creeping up slowly but surely, and in one place has crept over the edge of the pool, bringing a new impulse of life into this busy little world. I am warned in time, and cannot even stop to watch the many varieties of snails crawling over the seaweed, but must scramble

up the rocks to a safe place; for this low-lying mass of seaweed will soon be covered by the tide, and in a few hours the outlying ledge of rock will be all that marks the spot where live and grow these wonderful creatures of the sea.

I find *THE GUIDE TO NATURE* particularly good of its kind and am pleased to know that nature study is increasing in popularity so fast, as is evident by the success of your journal and an increasing supply of literature along popular lines. All possible stimulus along such lines is most praiseworthy and desirable. Keep up the good work. Enthusiasts of your leading genial type are rare indeed, but "get there," and I wish you continued successes.—E. H. Eames, Bridgeport, Connecticut.

THE GUIDE TO NATURE for last month is the right sort, and contains a whole lot of healthy and interesting material to bring before young naturalists *in any part of the world*.—Dr. R. W. Shufeldt.





The Heavens for August.

BY PROF. S. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

Though very little is heard from the daily press regarding the proposed signals to Mars, the astronomical interest in this planet is continually increasing, due to the better and better position each night of the planet in the sky. On August 1st the bright reddish star on the horizon about 9:30 P.M. is Mars. On August 15th it rises at nine o'clock, on the 22nd about 8:30, and at the end of the month shortly before eight. During the month the planet will decrease its distance from the earth enormously, and consequently its brightness will be much augmented. At the beginning of the month, it will be forty-nine millions of miles away, at the middle of August this distance will be decreased by six million miles and at the end of the month this will be still further decreased to about $38\frac{1}{2}$ millions of miles. The least distance will take place on September 18, when Mars will be about two-fifths as far away as our sun is, or about $36\frac{1}{4}$ millions of miles. By referring to the diagram on the Map for July, the reader may readily satisfy himself concerning these facts by remembering that the distance from earth to sun on the diagram is 92,000,000 miles on the first of the month. Mars has a diameter extending 9.5", it is still gibbous in appearance. By the middle of the month the diameter has increased to 11", and by the end of the month to 12". The increase in diameter brings with it a corresponding increase in brightness, of course caused by the lessening distance from the earth.

Observations on Mars do not require the largest telescope in the world for very excellent work may be done by glasses of moderate size. Map

making of Mars began about 1840 by Beer and Maedler. The improvement in refracting telescopes about this time, mainly through the work of Fraunhofer in Germany, rendered better drawings possible through increase of optical power. By 1867, the appearance of Mars was well known from the measures of the "eagle-eyed Dawes," of England, and a map by Richard A. Proctor tells us of the configuration of the planet. Forty years ago, it was thought that the dark portions on Mars were water, great oceans and seas covering about three-eighths of the planet, and that the lighter colored areas were dry land. The white patches around the north and south poles were evidently polar ice caps. This reasoning by analogy from what is seen on the earth, it was agreed that Mars was a miniature earth, and that its ruddy appearance was due to an abundant supply of water vapor in its atmosphere. There seemed to be no reason then why Mars should not be inhabited by people very much resembling those on our own planet.

The remarkable discoveries of Schiaparelli in 1877 lent a new interest to the planet. In the transparent skies of Italy, this excellent astronomer saw markings on Mars never before detected by human eyes. Running from the so-called seas into the continents were thin, more or less straight markings, which resembled an estuary or river. These he called by the Italian name "Canali," or channels, and he likened them in appearance to the English Channel. Schiaparelli saw a channel here and another there till there seemed to be a network all over the planet. These markings were caught sight of by using a small telescope but eight inches in diameter. Other astronomers with much larger glasses and recognized as being as keen-eyed

as this Italian could see none of them. But what he saw in 1877 was nothing compared with what the opposition two years later, in 1879, brought, the canals which earlier appeared as a single line now were seen to be double, two thin straight lines running for thousands of miles parallel to each other and with no variations. This was really almost too much for the rest of the astronomical world! Schiaparelli, however, had a splendid reputation, he had done excellent work in

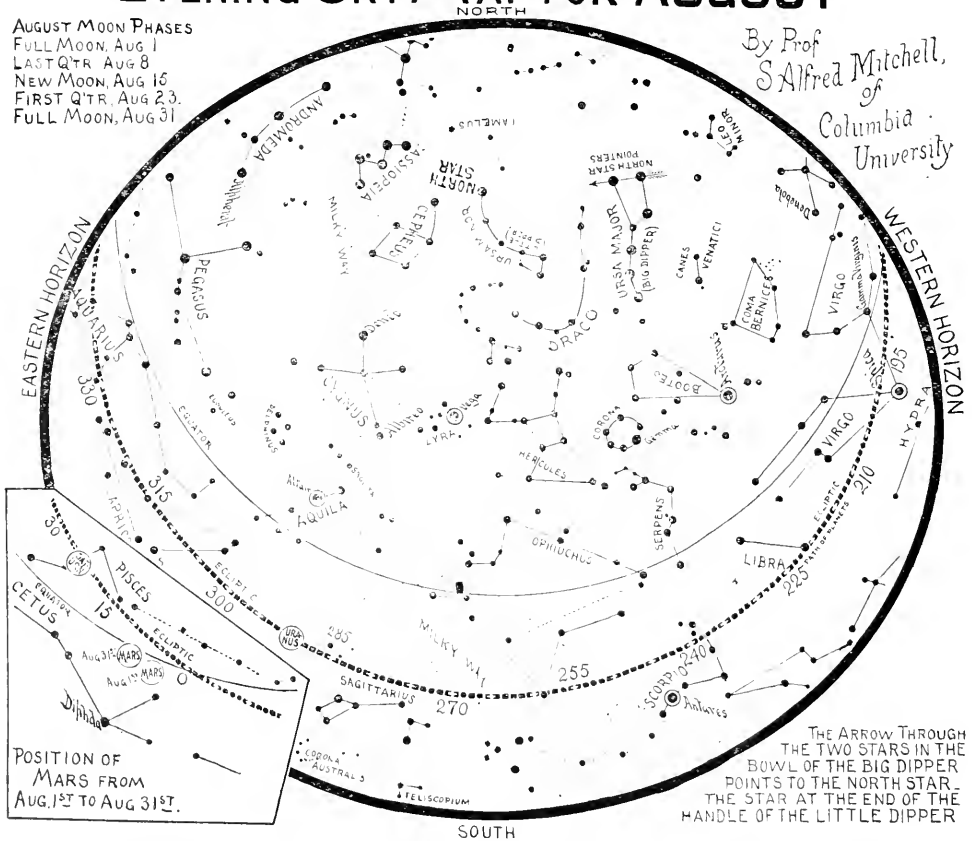
not till 1886 that there was a second astronomer who could see them.

At the favorable opposition of 1892, Mr. Percival Lowell, of Boston, became interested in Mars, and obtaining a large telescope of 24 inches in diameter, he decided to locate it in the most favorable spot for observation on Mars. This, he determined, was not around the "Hub," but away out in the midst of the arid lands of Arizona, at Flagstaff. Prof. Lowell and his assistants there have now been working

EVENING SKY MAP FOR AUGUST

AUGUST MOON PHASES
 FULL MOON, AUG 1
 LAST QTR, AUG 8
 NEW MOON, AUG 15
 FIRST QTR, AUG 23
 FULL MOON, AUG 31

By Prof
 S Alfred Mitchell,
 of
 Columbia
 University



other lines of research and his observations on Mars could not be lightly turned aside. Of course the rest of the astronomical world looked upon the doubling of the canals with great derision, for this looked plainly to be a defect of eyesight. But no amount of scorn could alter Schiaparelli's belief in the canals, they were realities for him, and for nine long years he had these visions all to himself, for it was

on Mars for seventeen years, they have gone at the investigations with splendid scientific spirit, and the astronomical world is greatly indebted to the Lowell observatory for a great mass of most excellent observations on the planet, whether the rest of the astronomers agree with him or not. Prof. Lowell is convinced that Mars is inhabited, and the "canali" of Schiaparelli are canals, artificial waterways

dug by the inhabitants of Mars for the purpose of irrigation. When one reads Lowell's works, "Mars and its Canals," and "Mars the Abode of Life," he is ready to believe in the thirty-nine articles of faith enumerated by the author of the books; there seems to be no other possibility. Mars must be inhabited. If the appearances on Mars are in reality exactly as Lowell describes them, it certainly is very plausible that these are canals on Mars made by engineering skill. But these canals are very difficult to see, in fact the great majority of astronomers have never seen anything at all like the markings as described by Lowell. Prof. Barnard, the recognized greatest planetary observer of the present day, has never seen anything at all like the canals even with the 36-inch Lick telescope or the 40-inch Yerkes. He has seen a wealth of detail on the planet which changes from time with the advance of the Martian seasons.

Mars undoubtedly seems to have life on it, for there are changes going on that can be explained only under this supposition, it is entirely possible that animal and human life are also to be found there, but the consensus of opinion at the present day seems to be that nothing is proven regarding the presence of human beings on Mars. The astronomical world is looking forward with the greatest eagerness to the approaching opposition of Mars, when visual observation and photographs will be made in great numbers in an attempt to settle what is, from the popular standpoint, the most important problem in astronomy.

THE PLANETS.

A splendid idea of planetary motion can readily be learned if possessors of star maps would plot down on them from day to day the position of Mars. On the first of the month it will be found in the constellation of Pisces about 3° from the visual equinox. It moves easterly each day till the 23rd of the month when it becomes stationary and then starts to retrograde or move towards the west. The writer would like to urge that the position of Mars be plotted every few days on the map.

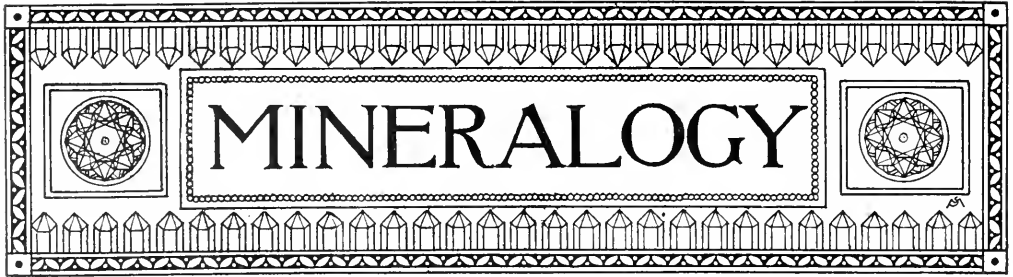
Venus is becoming each night more and more conspicuous, and getting farther and farther east each night but is not shown on the map, as it sets before the hours for which it is arranged this month. Jupiter still continues to be prominent in the evening sky, but is slowly getting farther west each evening. On August 12th, Venus and Jupiter will be very close to each other; at closest approach Venus will be but 12' north of Jupiter. They will be closest together at 2 A. M. on August 12th, but should be watched for several nights before and after this date. A very pretty sight will be in the western sky on August 17th, when Jupiter, Venus and the thin crescent moon will be very close together the moon passing 4° to the south of the planets. Mercury is not well placed to be seen this month. At the middle of August Saturn will be found in Pisces and will rise about 10 P. M. On August 15th Uranus is on the meridian at 9:43 P. M. Neptune is now too close to the sun to be well seen.

MISCELLANEOUS.

The first comet of the year was discovered by Daniel, of Princeton, on the morning of June 15th. Twenty-four hours earlier at Marseilles, France, Borrelly independently discovered the same comet, though the news of the discovery was not made public till after it was announced by Daniel. The comet should therefore be known as the Borrelly-Daniel Comet, or Comet 1909a. This was a small and inconspicuous comet, and could be seen only with a telescope. It had passed its maximum brightness when discovered. It will soon be possible to begin again the search for Halley's Comet, for during the past few months it has been in the direction of the sun.

THE HEAVENS.

The chart, as usual, represents the appearance of the heavens at 9 P. M. on the first of the month, 8 P. M. on the 15th, and 7 P. M. on the 31st. The bright star almost overhead is Vega, the star towards which the sun and the solar system are moving at the rate of a million miles a day.



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

Minerals of Stamford, Connecticut.

BY WILLIAM C. BANKS, STAMFORD,
CONNECTICUT.

Search your home locality for minerals, even if it is not on the published list. The specimens, more or less good, are surely there. For instance; Stamford is not reported as yielding any thing much but Yale locks, but I have personally collected the following minerals, in quite good specimens. From Shippan: Hematite, ironstone geodes, kaolinite, chlorite, and a drift mass about five hundred pounds in weight, of good green Vesuvianite, and plenty of quartz sand and pebbles, they are pretty anyhow. Simsbury district: Almandite in coarse crystals, some nearly two inches in diameter associated with fibrous hornblende; biotite, crystallized. Near Talmadge Hill, talc var. steatite, gray-green potstone. On Henry Street, near the canal; good epidote crystallized with feldspar, but no terminated crystals. This occurs in a quarry of quartz diorite rock, a trap rock, at the contact with the gneiss. In the same quarry I found some fair tremolite, in crystals through quartz; iron pyrites, and one small bit of molybdenite. In the quarry on West Avenue quite good microcline, in bluish white cleavages, also iron pyrites. In the neighborhood of Grove Street good incrusting radiations of stilbite; one seen when I was a school boy, lingers in my memory as being upward of three inches in diameter; it was unobtainable however. In the Cove district among the drift material and along the shore I have found red and green jasper, red and blue quartz in fairly good specimens; good crystals of muscovite in

granite; red almandite, small crystals in granulite rock; garnet and magnetite sands. In the gneiss rock, in crevices, good pseudomorphs of limonite often siderite in small but distinct twins; compact feldspar, a felsite rock. Across the line in Darien, on the property of George Gregory, good anthophyllite in drift masses. These are all I believe, but they are enough to prove that you needn't rely on a published list of localities to show you where to look for mineral specimens. Remember the darky proverb, "Look for coon tracks, find coon tracks." So out with your hammers and search.

Curious Crystals.

BY HOWARD R. GOODWIN, PHILADELPHIA,
PENNSYLVANIA.

In minerals, as in some other lines, the odd things attract as much attention as the more perfectly formed and beautiful specimens

In the quartz group, for instance, are many eccentric forms, the capped quartz which is illustrated in this number being one that is quite common in some localities. This specimen is nine inches high by five in diameter, and the original crystal has been covered by a deposit of minute crystals of dolomite; then, a fresh supply of silica having materialized, crystal building was resumed, a second crystal being formed over the first but not entirely enclosing it.

At some unknown period after this took place, the exposed portions of the dolomite were removed by decomposition, revealing the outlines of the original crystals; the dolomite protected by the outer crystal, however, is plainly visible (in the specimen)

through the transparent portions of the "cap" as it is termed. From Jefferson County, Montana, come crystals of



CAPPED QUARTZ

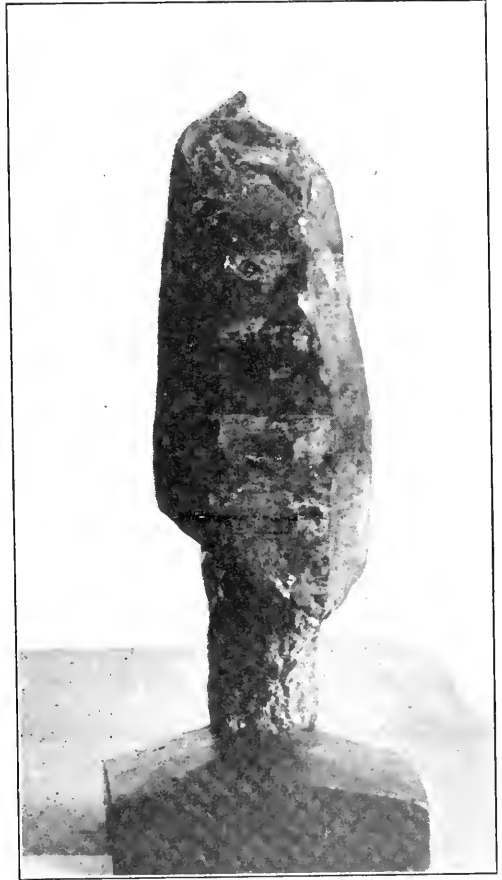
quartz (some of which are jet black in color due to inclusions of tourmaline) that have "caps" of beautiful amethyst. These are gems indeed. In my collection are crystals that have been broken by pressure or other natural causes and "healed" by a fresh supply of silica or other mineral matter.

Curved and twisted crystals are by no means rare, and crystals often have cavities in the interior which contain a liquid in which are bubbles of air or gas which are seen to move as the crystal is turned. This is quite common in the beautiful limpid quartz crystals found in various parts of Herkimer County, New York.

Phantom crystals show a shadowy outline or series of outlines within the crystal, usually parallel to the planes of the crystal. A crystal from Gage, New Mexico, in my collection shows two chloritic phantoms at the termination and two amethystine phantoms in the middle of the prism.

The "sceptre" or "rocket" quartz is a slender prism capped by a short,

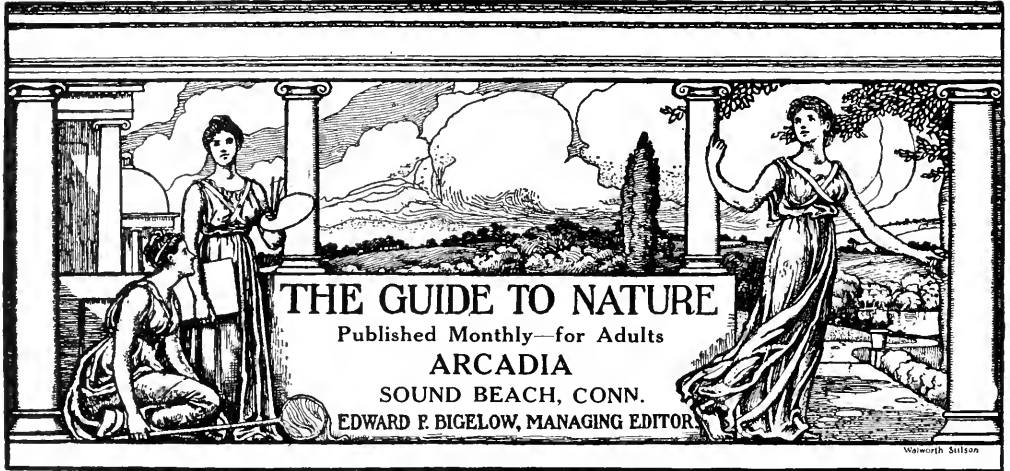
stout crystal. A specimen in my collection has a smoky amethystine cap on a stem of milky white quartz. A collection of quartz crystals alone will prove interesting and attractive if all the different forms and colorings are represented. Some of the minerals which occur as inclusions in quartz are clay, rutile, asbestos, chlorite, dolomite,



SCEPTRE QUARTZ

hematite, actinolite, tourmaline, mica, hornblende and various metallic minerals.





Special Visiting Day.

The Arcadia Nature Institution is nearly ready to begin its work. The "Sound Beach Idea" has been growing into tangible form for its expression.

The special visiting and inspection day will be Saturday, September 18, 9:00 a. m. to 6:00 p. m. You are cordially invited to be present.

The outfit is yet far from complete, but it is growing and is sufficiently settled to enter more extensively upon its real work. For several months the preparations and adjustments have occupied chief attention.

Arcadia is to create and increase a knowledge and love of nature among boys and girls, men and women. Its regular publications are "Nature and Science" of "St. Nicholas" (New York City) for young folks and "The Guide to Nature" for adults. Its motto for all is, "Commonplace nature with uncommon interest."

Arcadia is a free Bureau of Information on every phase of nature or natural science. Its only requirement is:

a personal call by the inquirer or a stamped and self-addressed envelope; it is to aid and be aided. It gladly welcomes co-operation and suggestions: let us have both well manifested on or before September 18th.

Come or write or send.

Novel Demonstration of the Need.

Arcadia consists of several buildings (in addition to the experimental grounds) in the center of the business section of Sound Beach, next to the post-office and a few rods from the railroad station. The main office building is within a few feet of the sidewalk. The Arcadia buildings are the first to be erected on the lot, and owing to many delays have for several months been in process of erection.

When I took possession of the business office, an announcement of the work of Arcadia and especially of its Summer School was sent to every house in Sound Beach. One lady who has joined the school solicited her friends also to become members. Among those thus invited was a prominent business man who goes to the station by automobile every morning and evening.

When he was thus solicited, the following conversation took place:

"What is Arcadia?" he inquired.

"Didn't you read the circular?" said the lady.

"No; never saw one."

"But then you have seen the buildings next to the post-office?"

"There are no buildings next to the post-office; always been a vacant lot."

"What!" she exclaimed. "You do not mean to affirm that you have not seen those buildings in the process of erection for the last four months?"

"I tell you there are none."

The argument grew warm until the man, embarrassed by the laughter of the other members of the family, said in self-defense that he steered his own automobile and always had to give close attention to his "machine" in that crowded part of the street near the station. Therefore, etc.

* * * * *

Now I do not tell his story to laugh at the man as did the members of his family and others, but rather to express sympathy and to excuse him. There are millions of human beings in his condition—going through life so intent on ways and means, on strictly utilitarian "steering" (and they do not all run automobiles) that they see nothing of interest to the right nor to the left. New stars might appear or the Great Dipper or Scorpio vanish unnoticed. Neglected flowers stretch forth in invitation from every wayside and field, insects buzz their attractions, birds sing their welcome; still the eyes are fixed in but one direction. The owners of such eyes have been seeing but have never seen, living but never lived in the broadest sense, been through the world but never in it, been—but what is the use in continuing! Every observer knows all that I would say if I should write columns more, knows all that I realize of the needs of this Arcadia in helping people to see on all sides, to live a full life, to get into tune with the Infinite, to reap a harvest of beauty and instruction and inspiration.

Yes, Arcadia is needed and we thank that automobilist for so good a demonstration of one phase of its need.

* * * * *

Perhaps, in truest art, I should stop

just here, happy that the text was given, content that my little sermon has been preached, that the moral is self-evident. But I cannot refrain from shouting out again, you throngs everywhere rushing by, nature is here, here for you; it is worth your thought and time to investigate; the true naturalist invites you to more than a fad, to more than a collector's spirit, to more than delving in things disagreeable or uncanny. He offers you life in all its fullness; he offers you relief from the strain of always looking out for the road and the jostlings and the collisions.

It Has Been Discovered.

Listen, my nature study teachers, to a modern fable.

Once upon a Time for somewhat a Long Time, a number of People went to Search for a Hidden Treasure in a Forest. Each member of the Party Took his own Method of Searching, according to Talents and Interests. Some watched, a few dug, others Calculated with Elaborate Instruments and not a Few Sat Negligently under the Trees with Apparent Interest and Said, "Hugh! You'll never find it!" Occasionally all stopped and met in little groups or larger Congress to Discuss the Prospects and Progress. Suddenly a small group of workers shouted exultantly, "Here it is." Then gladly ran to their aid a few others singly and in little parties. But many especially those under the trees and not a few more Diligent Workers only glanced that way and Casually said, "Oh, Pshaw! They haven't got it; we won't go to see. I almost hope they haven't for, even if they have, it would not be so much to our credit as to idle and hunt and calculate and talk. We won't help them to get it out; we will Look the Other Way and make believe it Hasn't Been Found.

But not a few who ran Hastily To Assist at once said, "It's even Greater Good and Credit to land the Treasure than merely to find it. One can Find it but it takes many to Distribute—to Make Available.

* * * * *

For years we all have talked and the-

orized and discussed the pros and cons of nature study. Finally its merits became generally accepted. Then came Arcadia with its ways and means of personal aid to all who need such aid. Do not be idle; do not talk; do not theorize; but come and dig. You shall have full credit for all you do, now in our early days. 'Tis your treasure; it is ours. Will you be "one of us?"

A Swallow Observation.

Grosse Pointe Farms, Michigan.

TO THE EDITOR:—

I was looking across the city from the sixteenth story of the Ford Building here. There is a fine view there. One can see the Detroit River with Bell Isle lying in it, and the city, appears a bewildering mass of roofs of every conceivable shape and size.

Some one on a floor above me tore up a sheet of paper into pieces of about one square inch each and threw these

pieces out of a window. Like little white butterflies the pieces sailed about, going some up and some down, and didn't a swallow swoop down on one of these pieces and catch it in his mouth! I cannot be sure but I believe he swallowed it. At any rate he returned and caught another and yet another of those flying bits of paper. After tasting one it would seem he could hardly have been deceived, thinking them insects. As for me, I think he enjoyed sailing through that boundless sea of air and snapping up those fluttering bits. The probabilities are that the same thing often happens there and perhaps this is an idiosyncrasy of this particular bird.

Very truly yours,

FREDERICK SCHWANKOVSKY.

Please experiment and see whether the swallow actually takes several pieces, how many, etc. Try colored papers.



Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

Furnished a Room.

One of our oldest and most loyal chapters, No. 91 of Buffalo, New York, has supplied all the furniture for the mailing and accounting room of the new AA Home. The outfit consists of a large, flat top desk in beautiful oak, pull slides and filing drawers at each end, a five-foot center table, a wrapping table and several chairs. A framed inscription on the wall gives to all visitors information of the liberal gift.

If other Chapters desire to make memorial gifts, we shall be glad to give information on the things most needed. We are also starting a museum and will welcome single specimens or cabinets.

Society for the Protection of Native Plants.

There is danger of extermination of many interesting and beautiful wild flowers through thoughtless and indiscriminate picking. Those flowers which are gathered for sale are in especial danger, as, when they become commercially valuable, they are gathered in great quantities. The only way of checking this is to refrain from buying.

It is hoped that the love of natural beauty which is encouraged in us by the nature books will lead us one step further, and induce us to pick few flowers instead of many, and to use moderation in breaking large branches of flowering shrubs, which will live in

water but a few days, but represent the growth of many years.

This society urges that we all use

1. Moderation. Do not pick all that you find. Many flowers must be left to develop seeds for future plants.

2. Care. Never pull up the plant, for the roots are of no use in a bunch of flowers, and their destruction means the extinction of the plant. *Cut* when possible.

3. Judgment. Many flowers, such as wild roses, asters, and golden-rod, may be picked with impunity, but when flowers are few or rare do not pick them. Do not pick flowers which must die before you reach home, nor great quantities of those flowers whose grace and beauty are better seen in a few than in many massed together.

For the leaflets of the society apply to Miss M. E. Carter, Boston Society of Natural History, Boston.

Don't Delude Yourself.

Are you a chemist?

Oh, yes. I am a very great chemist; have always been a chemist since I can remember. My father and mother were great chemists.

I am glad to know that. I am publishing a magazine devoted to chemistry and shall be pleased to have you take active interest. I have a laboratory too, and would like you to make some special analysis.

Oh no; no. I'm not a chemist in that way. I love chemistry; I just dote on it; that's all.

But please be more specific. In what does your chemistry consist and that of your father and mother, uncle, cousin, sister and aunt.

Oh, we go around all day long and enjoy breathing oxygen and nitrogen; every time we are thirsty we drink copiously of hydrogen and oxygen; we dote on that, especially with proper acids and essential oils, and then, why, will you believe it, we once read in a book that our whole family eats proteids and carbons, etc.

What kind of a chemist, dear reader, is that? Wouldn't any well-informed chemist "collapse" if any one should lay claim to the name of chemist on any so flimsy a foundation?

But, you expostulate, no sane or

sensible person even made such a claim.

Perhaps not, for the foregoing is to be regarded as a sort of fable. The moral is, "Be candid." That suppositious "chemist" whose claim to the title was breathing air and drinking water has an exact counterpart in many who assert, "I am as much a nature lover as you; I dote on nature," my father and mother always taught me to like nature. "I've been with nature all my life (sic) but you see I have no time to read magazines like yours and no time to study the nature about which you write."

Usually it will be found that such a love of nature consists in a ride over a country road on a sunshiny day; in using flowers for ornament; in casually glancing at trees, or, well, you know.

If you really are a lover of nature, you will pay some devoted, thoughtful, painstaking attention to at least some one phase of her work. Fancy a lover of any kind that does not pay devoted assiduous attention to the beloved, and has no time to read letters from the loved one—but the application is self-evident.

I have great respect for the candor of the man who said, "I don't care a rap about nature. It is true I like outdoor exercise and outdoor sports but as for nature as you fellows find it who go prying into stone piles and quarries, and poke around in ditches, and catch bugs and things, I couldn't bear it. For a bird give me a chicken or a turkey well cooked, and for a plant a roll of choice Havana is good enough for me!"

Some Satisfactions, More Inspirations.

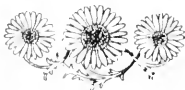
The 1909 Session of the Arcadia Summer School is ended. It was a success—just enough to make the work a pleasure and to afford satisfaction that the session was attempted though amidst most discouraging surroundings, in the fact that none of the buildings were completed, and teams and men were busy in grading the grounds.

On the other hand, it was not so great a success as to leave no inspirations and desires for further improve-

ment. " 'Tis not in mortals to command success; we'll do more, Sempronious, we'll deserve it." The Summer School was a great success in at least one particular—it showed that it deserved success. It also showed markedly how difficult it is to implant a new idea in the minds of the public. It seemed to the Director that all was perfectly plain and fully announced. By means of circulars, announcements in *THE GUIDE TO NATURE* and various other periodicals, information was widely circulated. Local newspapers were especially liberal in interest. One devoted over a column with bold head lines. The gist of it was that the school began, June 21, was for all ages and in any department of nature with terms and selection of subjects left wholly to each member of the school. Could anything be clearer, broader or more liberal? And yet the curious misconstructions, the inquiries the "didn't know about it," "couldn't understand what you were going to do," were some humorous and some painful, at least to the Director.

Sessions were held on Mondays, Wednesdays and Fridays, at 9:00 a.m. for boys and girls and at 2:00 p.m. for men and women. There were indoor class work at laboratory tables, conferences, quizzes, seminars and lectures. There were special demonstrations in the apiarian laboratory. There were five excursions, including one afternoon in an oyster boat on the Sound at the conclusion of which tea was served in an Italian garden by a friend of the school. The membership of the school was seventeen boys and girls and seventeen men and women.

The session of 1910 will be under greatly improved facilities but on the same general plan as this—one month all ages, all topics, pay what you wish. Already we have enrolled several for that session. Perhaps you would like to be a member.



Gleanings Near to Nature's Heart.

BY KATE A. JONES, GRANTHAM, NEW HAMPSHIRE.

"The glory of the Lord is seen upon the mountains."

I am sitting in a peaceful valley with grand old mountains towering above me, broad fields white with daisies or golden with buttercups before me, hundreds of birds singing merrily, and the air full of the smell of new mown hay, while over all hangs the bending sky full of sunshine.

It is in such surroundings that one especially appreciates the truth of Reverend Henry M. Field's beautiful thought: "Nature soothes and comforts us; she speaks in gentle tones, as if she had a heart of tenderness, a motherly sympathy with the sorrow of her children. There is something in the deep silence of the woods that seems to say, "Peace, be still!" The brooks murmur softly as they flow between their mossy banks, as if they would not disturb our musings, but "glide into them, and steal away their sharpness ere we are aware." The robins sing in notes not too gay, but that speak of returning spring after a long dark winter; and the soft airs that touch the brow seem to lift gently the grief that rested there, and carry it away on the evening wind."

After months spent in the city how good it seems to breathe the once more the pure air, and look out across the broad intervals. The rides in the city seem so limited and circumscribed compared to the miles and miles of hill and plain upon which we gaze when we drive or walk among the pine clad hills; we follow the narrow road beside winding streams, through quaint covered wooden bridges and across the meadows—where meadow larks are singing sweetly and bright flowers lift their cups to the sun. Back to the pleasant farmhouse just at sunset as the last light of day touches the mountain tops with a parting splendor, and we see:—

"The gold against the amethyst,
The green against the rose."

The La Rue Holmes Nature Lovers League

By George Klinge, Summit, New Jersey

Explanation:— The aims of this League are in many respects the same as those of The Agassiz Association. Therefore it has been proposed that the adult interests be represented by "The Guide to Nature" and that the League co-operate, or possibly be affiliated, with The Agassiz Association.—E. F. B.

August Wild Flowers.

Though the months of spring are rich in pleasure for the wild flower lover, nature has her wealth in flora through other months as well, and in this latitude to August is given lavishly of both tender and rich coloring.

The flowers that bordered the meadows and roadsides in July linger over, in many species, in undiminished beauty, while other blooms are opening to tell us, in true Autumn fashion, that the reign of Summer is over.

Among blooms in white, which do so much to beautify fields and roadsides in early August, is the mountain mint, of pretty delicate foliage and clustered white flowers, held on delicate stems perhaps eighteen inches above the ground.

The white snakeroot (*Eupatorium ageratoidee*) too, a more imposing and beautiful resident of woods, comes with the late summer, its white clusters of small tubular blossoms rivaling in beauty, far and away, that other *Eupatorium* the boneset, blooming simultaneously and adding its share of attractiveness to spaces, chiefly pre-empted by the purples and reds of the iron and Joe Pye weeds.

Another choice bloom of the August woods and hedgerows is the Culvers root (*Veronica Virginica*), form of beauty which we share with the flower-lovers of Japan, where the same species is to be found. No eye finding pleasure in nature's grace can fail to be attracted by the tall swaying stems, reaching five or six feet in the air, with their lance-shaped, whorled leaves and surmounted by numerous slender spikes of white; a fairy-like company stirring with every breath of passing air.

Those of us who are lucky enough to find also the rapidly disappearing starry campion (*Silene stellata*), whose loose panicles of white flowers are hung on tall, slender, waving stems, must look for it longer than we used to do, unless we happen to know where it yet survives the vandalism of today. It is one of the members of the catch-fly family, which belongs to our eastern flora, and is quite beautiful enough with its fringed, airy bells, to occupy a place in any garden. If the lover of flowers, who has not yet learned to find pleasure in looking upon their



FALSE DRAGON HEAD
Rapidly Disappearing

beauty and unselfishly leaving them where they grew would at least consider nature sufficiently to cut rather than pull the blooms, much less damage would be done in nature's wild gardens. To pull the blooms of the starry campion is usually to tear the lithe thing from the soil and close its sweet period of ministry forever.

To one not familiar with all the bright things of wood and meadow, the first sight of the great willow-herb's (*Epilobium angustifolium*) long racemes of pink flowers, reaching perhaps five or six feet in the air, is a revelation indeed.

When we find this showy *Epilobium* the first inspiration must always be to glance around for burnt woodwork, or downward to the soil for crumbling plaster as, true to its name of fire-weed, it usually locates amid the debris of some ruined house; in itself it is something of a shaft of flame.

Of more tender coloring, blooming in August or September, is the false-dragon-head (*Physostegia Virginiana*), a very erect pretty member of the mint family, with the proverbial square stems, leaves opposite and toothed, to be met with either in meadow or roadside. The flowers of delicate violet pink, veined with deeper coloring, clustered in tall spikes, reaching four or five feet above the ground, are among the most attractive of our late blooms, entirely too stately and lovely to be passed unnoticed by any lover of nature's beauty.

In purple there is the little down-trodden heal-all (*Brunella Vulgaris*), also a mint, which, though largely unnoticed and usually mowed down, if given the chance will beautify an untrodden corner or spread its purple over a roadside. To one who notices how nature contrives to overcome or conform to the demands of circumstance, this little mint reveals a spirit of conquest over adversity. A luxuriant grower when all goes well, its close spikes may stand up a foot above the ground, but when its home is where a close-cutting mower passes over, one may see the mosaic of heal-all and

grass, the purple held in safety close to the earth, unscathed by the blade of the mower.

This little wayside wanderer is possessed of healing qualities long known and utilized in the old world and somewhat in the new. If one would see the deep tones of purple, the "crushed



GREAT BLUE LOBELIA (RATTLE-SNAKEROOT
AT RIGHT SIDE)

The great pure lobelia is one of the loveliest flowers but is growing very scarce through the recklessness of flower hunters.

strawberry" hues blending with tall grasses, let him look over the marshland, the undisturbed wood-lot or meadow where the iron-weeds and the Joe Pye-weeds cluster in companies and stand towering well above the groups of Golden-rods.

Beauty lies under foot and on every side: where nature reigns its common yarrows, daisies, black-eyed Susans, lend charm to the hedge-rows and fields, though these humble growths be only classed with most obtrusive weeds.

Who does not enjoy sauntering through a pathway where chicory spreads its blue? Even though this name be among those of intruders on farm-lands, where it is indeed a most unwelcome guest, a purer blue is not to be found along the ranks of the flowers, and seems the more enjoyable because of bringing to the roadside a color not always present among the flowers.

The chicory is not valued for its beauty alone, but from ancient times, when the Egyptians used it lavishly as an article of diet, until the present its name is among the valued forms of vegetation in some districts. Not only the leaves have been used as food, but as we all know, its roots are roasted and ground for use as a substitute for coffee, both in this country and abroad.

If August has her sturdy weeds, flaunting rich coloring in reds and yellows, it also has its frail, fair blooms, delicate as any spring-time flower. Among these one would not forget the hare-bell (*Campanula-rotundifolia*), sometimes given erroneously as hair-bell, whose thread-like stems might seem to indicate the appropriateness of the latter title.

From July to latest autumn its bright, airy bells decorate the delicate stems, drooping over rocks or stones and vibrate with every breath of air, even the leaves being almost as thread-like as the stem. When one sits under a tent or roof and dreams over wild life outside, while torrents beat and mad winds rush by, how impossible it seems

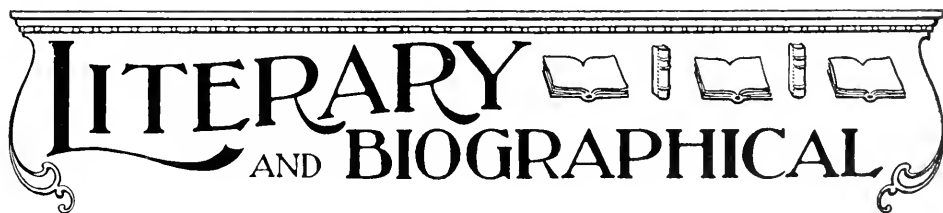
for such a fragile flower to live, yet go to it when the sun shines out and all the storm is lushed, and you will see how soon the victor buds hang out their azure bells.

Last November, in the wild garden of the writer, the harebells were fresh and blue though looking through a veil of melting snow. But the hand of the flower-gatherer is robbing this country of these forms of beauty, which through their agency annually grows less, however able they may be to hold their own through beating storms.

For stateliness and beauty perhaps no flower of the wild can take precedence of the lobelias—the great lobelia (*Lobelia syphilitica*), of purest blue, and *Lobelia Cardinalis*, the cardinal flower, of richest crimson. Only the remnants of these fair spirits now haunt deep woods and brooksides with their rich foliage and racemes of nature's most brilliant coloring; they, like the vast array of exterminated woodland flowers are passing, through the hand of the flower gatherer, from nature's pageant. The humblest weeds are agents of usefulness and sources of joy to those who accept, in loving spirit, their lowly ministry.

Unconsciously the influence of the wayside flower lightens the shadows of the days, even for those who never pause to speak its name, or to consider its wondrous beauty. With such wealth on every side, few of us, perhaps ever wait to consider what this world would be without the ministry of the flowers.

In the article by R. C. Caskey in the July issue of *THE GUIDE TO NATURE*, the date of seeing a yellow warbler should have read April 21st and not April 1st.



LITERARY AND BIOGRAPHICAL

One Hundred Experiments in Elementary Agriculture for California Schools. By Riley O. Johnson, Head of Department of Biology and Nature-Study, State Normal School, Chico, California.

"In this bulletin the writer has attempted to give to teachers in connected form a full and suggestive series of experiments in elementary agriculture, dealing as fully as possible with the physics, chemistry and biology of the subject."

The Home Aquarium and How to Care for It. A Guide to Its Fishes, Other Animals, and Plants, with many Illustrations. By Eugene Smith. New York City: E. P. Dutton & Company.

Mr. Smith is an aquarist; he knows what he is writing about. He has produced a convenient handbook, especially for those who wish to establish home aquaria.

Flying Plover: His Stories, Told Him by Squat-by-the-fire. By G. E. Theodore Roberts. Illustrated and decorated by Charles Livingston Bull. L. C. Page & Company.

Plover is a young boy in Labrador. The book contains stories told by his grandmother. "The old woman's name was Squat-by-the-fire. She was the wisest person in the tribe, in spite of the fact that an old man who lived in another village said that he knew twice as much as anybody in the whole world. She was deep in medicine and history and story-telling. She could paint fine pictures on bark and cured skins, and was skilful in the carving of wonderful little figures in wood and bone and walrus ivory. She knew so much, and looked so wise, and had such bright eyes, that many of the tribesmen believed that she was a magician."

John Walton Spencer: "Uncle John."

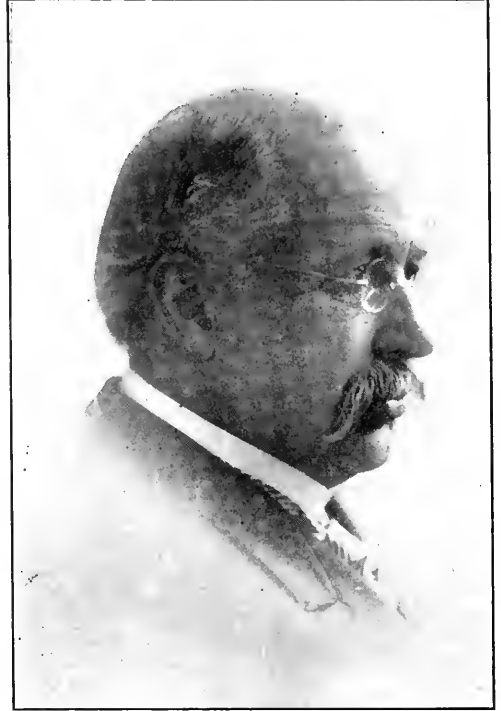
BY ANNA BOTSFORD COMSTOCK,
ITHACA, N. Y.

It is by the second name at the head of this article that the man I am to write about is best and most widely known. Frequently letters came to him, addressed in sprawling, unformed hand-writing to, "Uncle John, Cornell University," with no mention of surname, or of city or state. Postal clerks got used to such a state of affairs, and when the much-prized replies were taken from the office, the children's confidence in their friend was justified.

And so, it is about "Uncle John" that I prefer to write. He was born at Cherry Valley, New York, in June of 1843, but soon afterward his parents moved to Westfield, in Chautauqua County. The moving was not accomplished by stepping aboard of a train in the morning, and arriving at their destination on the same day. They traveled by the packet-boat on the Erie Canal to Buffalo, and from thence to Westfield by Lake Erie schooner, a "two-master."

He grew up on the farm, attending the district school, but getting far

more of the knowledge which was to prepare him for his greatest work, in his daily tasks, the "chores" about the farm, which are always waiting for the younger part of any family surrounded



"UNCLE JOHN" WALTON SPENCER

by the growing things which make up most of the farmer's work and life. Even his experience as a business man was strongly biased by the influence of his farm up-bringing. "I made my first money by a venture in ducks," he wrote to a lad who had asked him "how a fellow could make a little money of his own." "I dropped potatoes for a neighbor all one warm day in May and received in payment my dinner and thirteen duck eggs, which I set under a 'broody' hen borrowed from another neighbor;" and then followed the amusing story of his early cares as a property-holder and the amount of his final profits.

A term at the select school supplemented that of the home district and with the coming of age came the young man's desire to see the world. He went west, saw San Francisco in the

fever of the war-time days, when gold was at a premium and gold-mining the chief industry of the state whose wheat fields and orange groves were later to yield her greater wealth than all her mines; he sailed before the mast in Pacific Ocean ships and in the "fo'c'sle" listened to the tales of seamen to whom the great sea was but a highway for the world's trade; he lived for a year and a half in the Sandwich Islands, when as an independent native kingdom, their commerce and agriculture were in a state comparatively primitive, when one thinks of their present development and riches.

But the home claimed him and he returned to the farm. As the years went by the conviction grew with him that the state was doing too little to help the farmer, upon whose prosperity and content the real welfare of a people rests; not only the young men, who in those days chose the College of Agriculture in far fewer numbers than they do now when "going in for an education," but the men and women too old to go to school, and the boys and girls too young to chose a life's vocation, needed that the school should come to them.

The same thought had been dwelling in other minds, and at the New York State Agricultural College an "Extension Department" had been organized. Mr. Spencer became a member of the staff in November, 1896, and soon after was begun the publication of the "Farmers' Reading-Course Bulletins," and the "Nature-Study Leaflets" for the public schools. Both were carried on by correspondence plan. The college felt a little uncertain of the spirit in which the Nature-study would be received by the teachers. It was not required work. There was no doubt about its value, but it was feared that many might look upon it as only another fad added to those with which they were already acquainted. "Real farmers" too, who held the plow and trod in its furrows, were prone to think that there was little for them to learn from "book farmers." But to the Teachers' Institutes and the Farmers' Institutes came Uncle John and his colleagues persuasively declaring

that Nature's ways had not yet all been found out and that the teaching offered by the scientific people was of genuine, practical value.

It was no wonder that the farmers, the teachers, and beyond all others, the children in the schools, responded to the touch of his magnetic personality. He was himself a farmer, and had been for years endeavoring to understand the *why* of agricultural processes as well as the *how*; he could speak from experience. Soon the farmers who were receiving the Reading-Course and returning Discussion Papers were numbered by the thousands, and the enrollment of "Junior Naturalists" was not long in reaching twenty-five thousand names. Increased appropriations for the Extension Department became necessary and the state granted them, believing the work to be well worth while.

The avowed purpose of both lines of work was to convince the country dwellers that their lines were, in general, cast in pleasant places; that "a little land well tilled" could be made to yield as good an income, and one which could be more pleasantly and advantageously disposed, than the same amount of effect could obtain in other ways; and that if the underlying principles of their work were better understood, it would be deprived of much of its drudgery.

The lessons prepared for the pupils in the schools strove to help the children to see what they were looking at and to draw a correct inference from what they saw, sure that such a knowledge of the beauty and use of the common things in the world about them would lead them to love the country better and be content to live therein. They were encouraged to write to Uncle John about what they saw, and to ask questions concerning things they wished to know of the living, growing world about them. And they did write; for several years the number of letters received from his "nieces and nephews" was more than thirty thousand. Never was a request from a child willingly neglected, though acknowledgments were made whenever possible through the

good offices of the teachers. But his direct, personal correspondence with the children of the state reached an enormous volume. This part of the work absorbed his full time and strength and the Reading-Course was given over to other hands. He not only wrote to the children, he visited and talked to them in their schools, generally at their urgent invitation. Once each year, when the children of the home county were invited to Cornell for a day, it was not the picnic on the Campus nor the various things to be seen in the buildings which held the foremost place in their thoughts, but the meeting with Uncle John. "You are the best loved man in the state," said one of the colleagues, seeing him extricate himself from one eager troop, only to be engulfed by another.

His is a great power, that of reaching out and drawing toward him the hearts of the young, and its influence over the thousands of hearts and minds who felt it, cannot be slight nor transient. The children miss him and he will be remembered by them long and fondly. I can perhaps end this article best in his own words, spoken as he was about to leave the university on reaching the age of retirement: "As the time approaches when I am to lay down this work because of having reached the age limit and return to my beloved 'Bellwether,' and there 'mark time' to the end, I can look back in a perspective way over the events of the past twelve years as I have never done before. I can see how the pioneer promoters thought only of the work and never of themselves or how they would be considered by the public. As for myself I am glad that I have learned to know the heart of a child and that I have lived to see three-score and five years."

But though his years are three-score and five he is not old, nor can he ever be old. The spirit of eternal youth vivifies his every thought and act, and his heart will ever be child-like and in full sympathy with the heart of even the youngest of his nephews and nieces.

FAVORITE SAYINGS BY MR. SPENCER.

Beware of the ignorance of the educated in plans for the benefit of the plain people.

My slogan has been to give one thing to a thousand children rather than a thousand things to one. The former is extension teaching, the latter is academic.

In nature there is nothing so aggressive as the impulse for motherhood. The timid rabbit has caused greater devastation in Australia than the lion in Africa.

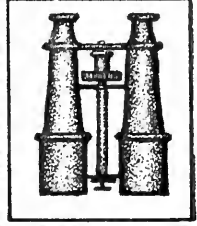
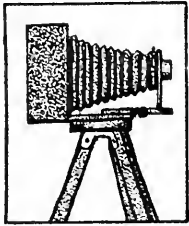
The man who can find comradeship in associating with himself has a fountain of culture. Life in a "Hurrah's nest" is enervating. The man or woman to whom folks are necessary is to be pitied.

All plants have an impulse to grow, produce seeds and thereby hold the soil against rivals. The opportunity of the husbandman is to rely upon that impulse and by making plants comfortable, secure a harvest.

The bane of our education is that it is planned for paragon children. Mediocre children have qualities that the world needs. The gnarled oak gives strength to the ship but is not sought after for quarter sawing to be used in making ornamental furniture.

When a farm boy carrying wood for the kitchen stove, wood was a bore; carrying ball bats for a game down on the flats was a privilege eagerly sought. Stove wood and ball bats may have come from the same tree. The man is an alchemist who is able to place the same halo about stove wood duties that he finds in ball bat pleasures.

The soil is the sepulcher and the resurrection of all life in the past. The greater the sepulcher the greater the resurrection. The greater the resurrection the greater the growth. The life of yesterday seeks the earth to-day that new life may come from it to-morrow. The soil is composed of stone flour and organic matter mixed (humus);—the greater the store of organic matter the greater the fertility.



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Sound Beach, Conn.

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EDWARD F. BIGELOW, Managing Editor

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PUBLISHER'S NOTICES

A Double Number.

On account of mechanical difficulties and consequent delays at the printing office, the publication of "The Guide to Nature" has been pushed forward a few days each month. To catch up this number contains double the number of pages of our last issue and is for September-October. We are promised that the next number will be issued on time.

How to Live in Arcadia.

Our Arcadia, the Home of THE GUIDE TO NATURE and allied interests—the Nature Institution, is but the office, the working headquarters, of a larger Arcadia than which there is no finer on earth.

The name of Sound Beach emphasizes the attractions of one section of the wonderfully beautiful and interesting beach of Long Island Sound. All along the shore there is marine scenery unsurpassed by any other in the world. For the naturalist, these biological collecting grounds are unequalled. Extending northward from the beach are excellent roads and trolley lines giving easy access, afoot or on wheels, to Arcadian scenery that would make the original Pan covetous—as wild, picturesque and primitive as in the days when the Indian tribes (commemorated in many local names) were most active and prosperous.

There are frequent cosy resting places for the tired, many picturesque scenes for camerist or artist and plenty of detail for the careful student.

Thus far it has been our mission to be a guide from the point of view of a nat-

uralist. With this issue THE GUIDE TO NATURE broadens its scope by guidance to those in search of homes, temporary or permanent, in this famous Arcadian country.

If you wish to board, to rent, to buy or to build, write to THE GUIDE TO NATURE.

If you have any of these facilities to offer, write to THE GUIDE TO NATURE.

In fact, for any information of getting to, living in or profiting by the greater or the smaller Arcadia, write to THE GUIDE TO NATURE.

The Sound Beach Idea.

Progress in the building and equipment of Arcadia at Sound Beach together with certain developments of plans as brought out in the Summer School, gradually reveals the fact that the Institution stands for a distinct new idea of more than local interest. When first announced it was generally supposed locally that Arcadia is merely the headquarters for naturalists and the dissemination of natural science information. Now it is evident that Arcadia has back of it a distinct new social idea, the development of which will be watched with general interest. If successful, Sound Beach will signify not merely a location but a new idea in summer resorts.

Every year the migration from city to country increases. This public demand has been to the profit of the real estate dealer or business house. Ingenious methods have been adopted to successfully advertise the various resorts. Railroads and steamship lines have made known as attractively as possible their facilities of travel. Enterprising business houses have vied with each other to supply all needed goods. The city resident seeking the country or seashore, mountain or lake, has therefore been able to go and to return, to buy or lease

land, to obtain meats, groceries, vegetables, etc.

But, strange to say, until the establishment of Arcadia there has been no place of popular resort where one could get the essential thing desired—that is, the real interest of the resort. To eat, to breathe, to sleep, to exercise, all the usual concomitants of the resort, are but to cater to the animal. For the change of thought, for food for the esthetic and mental faculties, there has been no provision. Arcadia is supplying the guidance needed by the city resident in seeking the enjoyment of the country. It takes all ages, and all degrees of wealth or lack of it, and says, "You are a thinking person; you are a human being; you are more than the colt in the field to merely run, feed and sleep. We will assist you in developing your best faculties, in getting at the real interests of this resort to which you have come."

Such an idea well put into practice cannot fail to be efficacious in building up a place of resort from the mental stress and strain of the city.

The Sound Beach idea will succeed; it will be copied in other places.

And the strangest thing about it all is that no one has thought of it before. To many a resident of New York coming to Sound Beach a guide is needed as much as in the wildest woods of Maine or in the Adirondacks. One can get lost mentally in a world of wonders and never find one's self as much as easily as to be lost physically in a roadless forest.

We Are What People Call Us.

I.

We are a restaurant.

* * * * *

Note:—Before proceeding further, let us explain. There is an old saying, with much truth in it, that a person may be or become that in which he has implicit confidence and earnest faith. We propose to go further and say that Arcadia will accept and become everything that the people persist in erroneously calling it. It is so difficult to change public opinion that we take the easier course and accept and assume all that we are called. While the buildings of Arcadia (seven thus far) have been in the process of erection, there have been many curious remarks of misunderstanding our simple yet important purpose of leading people to a knowledge and love of nature. We have been amused; we have been vexed; now we are resigned and accept anything you

persist in calling us, as will be set forth in a series of articles of which this is No. 1.

* * * * *

Yes, we are a restaurant. It must be admitted that at the time of moving into the biological building and getting settled the tables and glassware, we gently denied and further explained to the man who came in and inquired, "Are you ready to serve dinner here yet?"

Come to reconsider, that is our speciality, only an occasional meal and not a year around hotel of steady technical work and routine, of piling up large stores for regular guests.

Not a hotel of Carnegie Institution nor a great University for the benefit of a regular select few who can afford it or are regularly profited by it; but a "restaurant" for the common people who have "homes" of their own but come to us for change or convenience. Just a restaurer, a restorer, to take you tired with the stress and strain of modern civilization for a brief respite from the strenuous duties of the day. Just now and then a meal of good things, selected carefully and supplied in pleasing adaptation to your tastes.

Yes, we are merely a restaurant; as time will permit, in respite from other things, we give you a feast from Nature's bountiful realm. Oh, continue to call us a restaurant! May we never become a great hotel!

We are and always have been a magazine of *real* estate, not artificialities. We will issue at least "a rambler's lease" to you. Is your title good, really, not only legally?

It Has Come to This

"Are you fond of country life?"

"I never saw any."

"What?"

"Fact."

"But I thought you were going to spend your vacation in the country."

"So I did, but I found there only a bad imitation of city life." *Newspaper clipping.*

The above, heading and all, has been published in several newspapers. It expresses, as stated, a fact. There are thousands of people who think they have been to "country" or "seashore," who have not a bit of interest in either place. They have merely changed the location

of city rush of fashion and automobiles, of pomp and ceremony, of nerve strain and card parties.

It is the mission of THE GUIDE TO NATURE to show the real interests and aid in obtaining the benefits of country or suburbs, of "the simple life," of education as well as recreation, of rest and strength to mind and body.

Going to the City?

That is the big city, New York. If you are going there, the best place to stay is at the Hotel Cumberland. The location is good; there is an air of good taste and refinement, and the fare is excellent. There is no better place for a day, a week or a month. It is on Broadway and only a short walk north of Times Square.

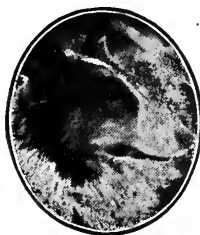
"Anastigmatics."

Our readers will remember with pleasure the excellent publication offered last year by the Bausch & Lomb Optical Company under the name "Anastigmatics." We are in receipt of the 1909 edition of Anastigmatics and find it an improvement over last year's booklet inasmuch as it is more complete and lists the three new photographic accessories. The booklet gives a very clear and brief description of the superior advantages possessed by the Anastigmat as compared with the Rapid Rectilinear Lens, with convincing illustrations. There is also a short article on enlarging which will be of assistance to amateurs. Wide angle lenses are included in the new booklet, and splendid examples of the work possible with the different lenses listed are given throughout the booklet.

The new accessories are: an improved tele-photo attachment, new ray filters and the compound shutter. These useful articles are described and illustrated and their use widens the scope of the work which the amateurs may undertake successfully.

"Anastigmatics" concludes with a helpful list of suggestions which indicates the best lenses to be used together with the size of shutter for a large number of different cameras.

"Anastigmatics" for 1909 may be obtained from your dealer, or direct by addressing the Bausch & Lomb Optical Company at Rochester, New York or the branch offices.



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The owner of one of the choicest farms in this vicinity desires The Guide to Nature to make known that his property is for sale. The view and scenery are unexcelled for the nature lover. Vessels sailing on the Sound for forty miles can be seen from the piazza. Fifteen room house. Kewanee system of water. Good barns and garage. Seventy acres—ten woodland, sixty ready for plow. Only four miles from Stamford.

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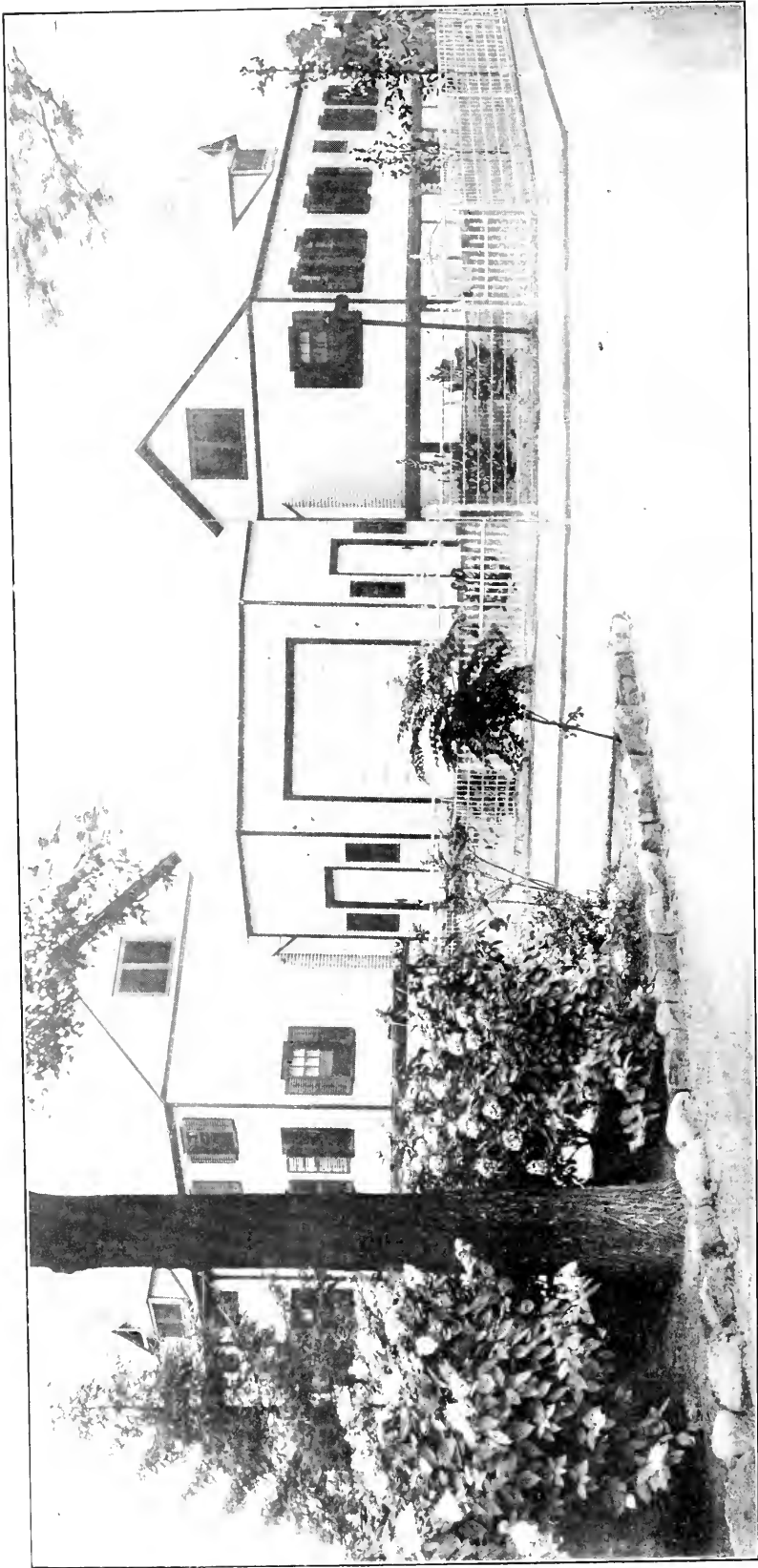
Just a little nervous, a little tired, a little discouraged?

As a few strokes from a loving hand will soothe a weary forehead, so the gentle pressure of the wild grass soothes and strokes away the nervous tension born of civilized life.—*Richard Jefferies.*

Arcadia

We live in our Arcadia. Would you like to have us help you to find your Arcadia or, if you have found it, help you to derive the most possible value from it?





RESIDENCE, ENTRANCE AND OFFICE BUILDINGS OF ARCADIA, THE NEW NATURE INSTITUTION, AT SOUND BEACH, CONNECTICUT.



"Let us learn to be content with what we have. Let us get rid of our false estimates, set up all the higher ideals—a quiet home; vines of our own planting; a few books full of the inspiration of a genius; a few friends worthy of being loved, and able to love us in return; a hundred innocent pleasures that bring no pain or remorse; a devotion to the right that will never swerve; a simple religion empty of bigotry, full of trust and hope and love—and to such philosophy this world will give up all the empty joy it has."—*David Swing*

✻

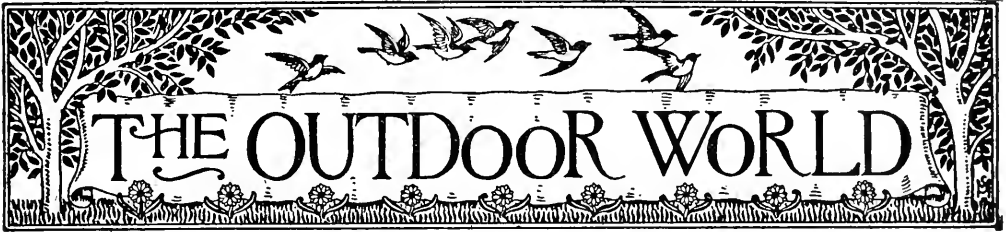
THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

SEPTEMBER-OCTOBER, 1909

Nos. 6 and 7



The Explorations of the New Arcadia

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT



ARCADIA is a fact. There have been times when it seemed like a Munchausen dream. Now its existence has been verified, explored and reported by an interested public. It took three days to do it.

Saturday, September eighteenth, as announced, was the Special Visiting Day, but not all could come then. Three ushers were kept busy all Saturday escorting parties and explaining details. This inspection was continued on Sunday afternoon by those who had requested to postpone their visit till then on account of engagements on Saturday. The local school children made their visit on Monday. They devoted chief attention to the home of "Nature and Science" and left permanent imprints of their visit upon camera plates as well as upon the yet unfurrowed ground in front of the A.A. Home.

The buildings thus far erected are seven in number, as follows:

1. Residence.
2. Entrance to court.
3. Administration.
4. General biological laboratory containing photographic gallery and dark room.
5. Apiarian laboratory.
6. Greenhouse with tank aquarium.
7. Pet house with yards and indoor and outdoor cages for pets.

This completes all ten listed in the announcement in the January, 1909, issue of THE GUIDE TO NATURE, with the exception of the astronomical gallery and bird house. The separate building then announced for photography was included in the biological laboratory. Space has been left for the bird house and the observatory. The southeast corner is to be fenced off and laid out for experimental work and study of plants. Trees, shrubs and climbing vines (no two alike) are to occupy all space not taken by buildings and paths. It will be really "a little country."

Upon entering the administration

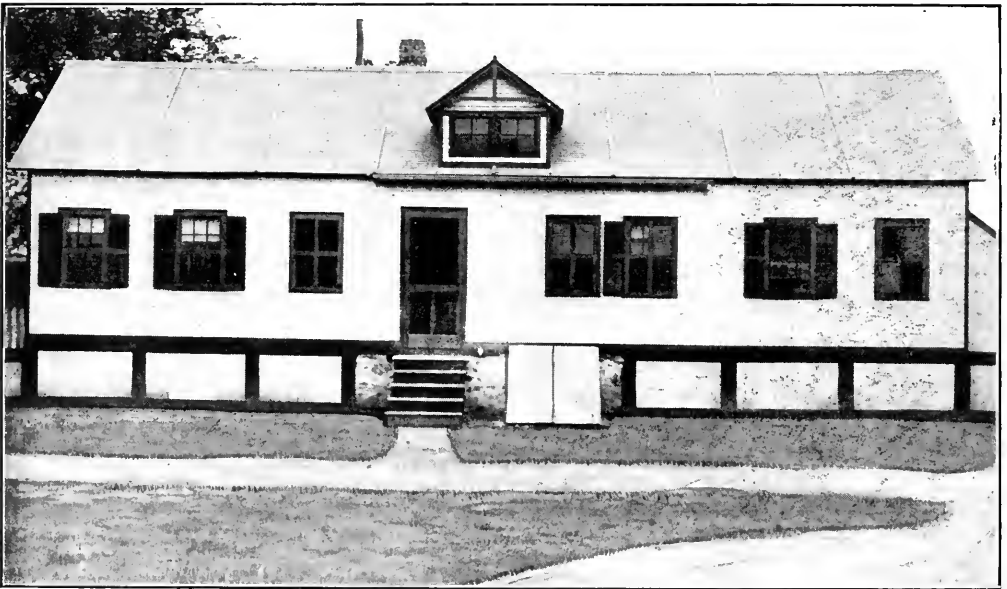
building, otherwise known as the AA Home, the visitors wrote their names in a register, beside which were the cash books. Any contributor to the institution is not only permitted to examine these cash books but is urged to do so. Every member, subscriber or contributor may thus know all income and expenditure. Thus far the records of these books have met with unanimous approval.

In the mailing and accounting room the furniture was supplied by AA Chapter No. 91 of Buffalo, New York.

adding to the picturesqueness of that corner of the court.

In this laboratory is an operating bench fitted with stereopticon, media-scope and projection microscope. Acetylene is supplied by a generating tank fitted with one hundred pounds of carbide. Oxygen and hydrogen are supplied in fifty-foot compression cylinders. Thus there is every facility for photo-micrographic work or for projection.

Back of this bench is a botanical cabinet supplementing the botanical



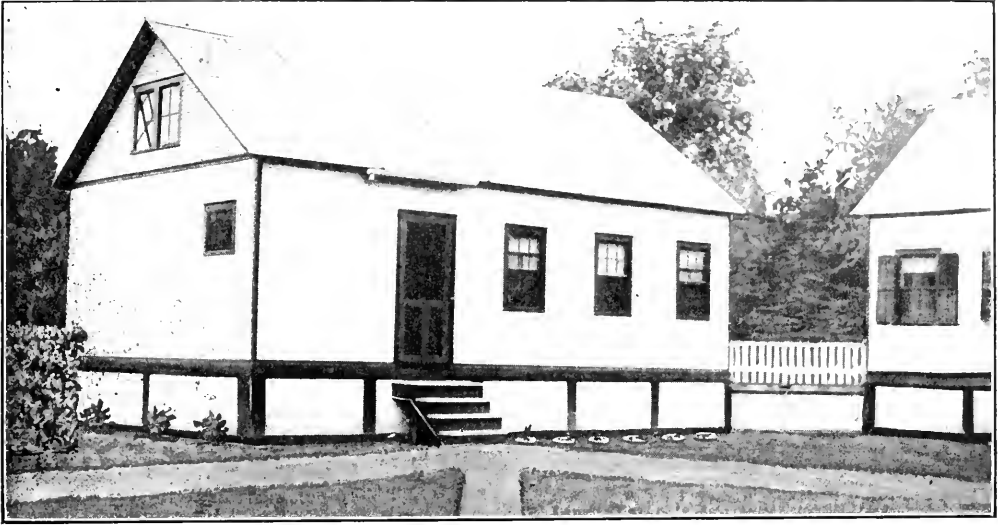
THE ADMINISTRATION BUILDING VIEWED FROM THE COURT SIDE.

At the rear of this room is a hall, later to be fitted with shelves as the nucleus of a museum. Connecting with this hall is the vivaria room in which are specimens of local turtles, frogs, toads, crickets, etc. The vivaria are placed before a window with excellent adjustment for proper proportions of light and shade. The occupants of the vivaria are happy and contented—perhaps more so than in their native haunts. The boys and girls were especially interested in the “baby” snapping turtle which seems far removed from the ferocious looking big fellows in the tank in the green house. To enter the biological laboratory, one crosses a bridge with artistic railings,

working table in another part of the room. At the right of the room is an aquatic table and sink with four faucets, rubber tubing, etc., supplying ten aquaria of various sizes. Here are to be conducted extensive experiments not only in science but in household and schoolroom aquaria.

In this room is to be done nature work in the name and spirit of Louis Agassiz, and it is a satisfaction to know that the tables and some other equipments were largely supplied by two daughters and a grandson of the famous scientist.

Among the interesting demonstrations, at the other end of the room, were two methods of seed dispersal—

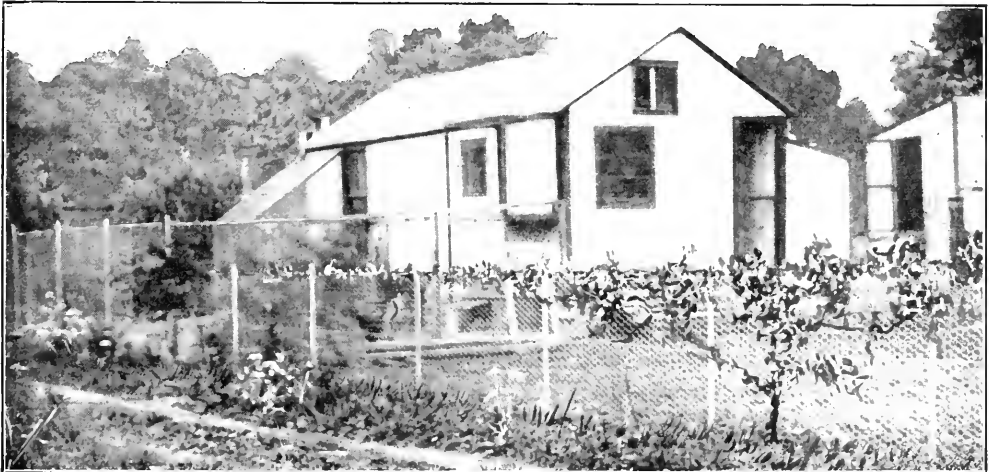


THE BIOLOGICAL LABORATORY AND PHOTOGRAPHIC GALLERY.

the plumose tails of the clematis and the popping seeds of the witch-hazel. For two days, including Visiting Day, the many branches of witch-hazel on the wall "fired" their seeds in every direction. A few were thrown the entire length of the building.

In the photographic gallery were displayed many drawings for "Nature and Science" of "St. Nicholas" by some of the best naturalist artists of the country. Among these was work by Messrs. King, Davis, Sawyer, Megargee, Aaron, Stilson and others. All these

drawings were carefully examined and much admired. On two other tables were displayed large masses of specimens (awaiting photography) with accompanying letters from children in all parts of the world. These letters, plentiful and interesting, had not been selected for the occasion but were "just as they came" the current month. The correspondence of "Nature and Science" of "St. Nicholas" has become so large that it is an increasing problem to attend to it all. Added to this is the extensive correspondence of the



THE PET HOUSE, AT LEFT, AND END OF APIARIAN LABORATORY, AT THE RIGHT.
(The greenhouse is back of the pet house.)

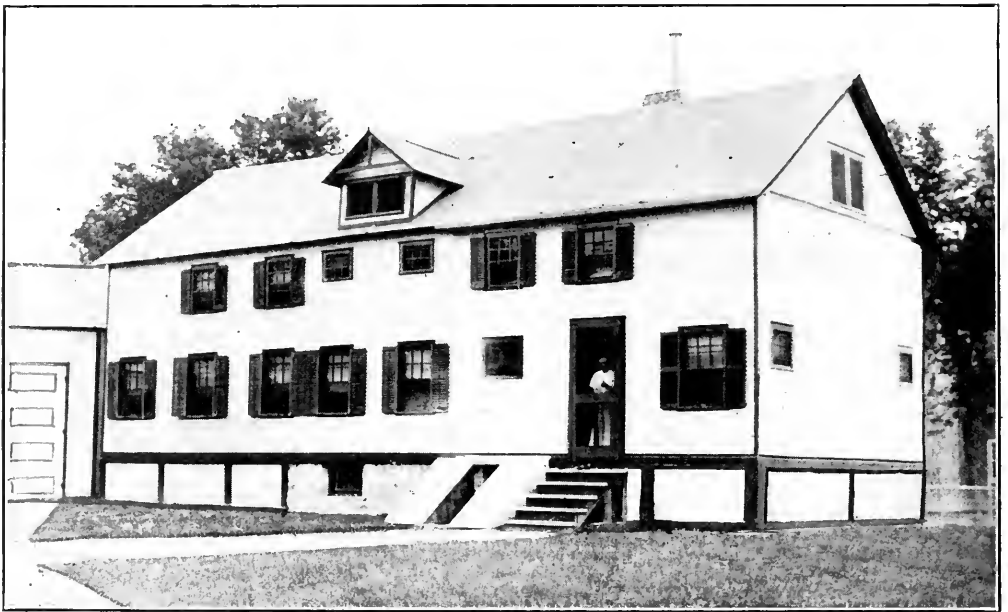
adult AA and of others who write to have recorded some observation or to obtain information. At the west end of the room is a novel set of photographic mirrors, in unique setting, donated to the institution by Mr. W. W. Heroy of the Pittsburgh Plate Glass Company. Some ingenious optical effects gained by use of these mirrors greatly amused the visitors.

Next the groups of visitors were escorted to the apiarian laboratory. Here were shown nests of mud wasps, social wasps, yellow jackets, hornets and bumblebees. In this last the bumblebees were emerging from their yellow,

mented with working benches outside. Among the attractions was a hollow log (door opening to give a view of the interior) sent by the American Museum of Natural History, New York City, for refitting with bee construction.

In a cage near the entrance to the pet house were the fantails bred by Mr. William E. Butler of Glenbrook. These were much admired, and justly so, because they are the choicest specimens of the fanciers' art, the product of a lifetime of careful, loving, enthusiastic skill.

Among the other attractions were



THE COURT SIDE OF THE RESIDENCE.

egg-shaped cocoons—to the interest of some visitors and the fright of others. Not a person was stung by them. Honeybees in all sorts of hives were shown. Among the exhibits was the educational beehive exhibited by The A. I. Root Company at the Jamestown Exposition. This hive shows everything in the life of the honeybee from the magnified "tongue" in action to the latest methods in queen rearing. This laboratory is the most extensive and best equipped for its work with bees and other Hymenoptera of any in existence. The experimental stands are equipped with eighteen hives, supple-

several hutches of cavies, including a pure white one in a family of jet black. This "freak" is the only one with white hair for many generations. Who shall say why nature thus went off at right angles to the regular outward course?

The blinking family of screech owls, making "funny running down sounds like tiny music boxes," elicited no little laughter which caused the grotesque birds to assume more than before an expression of wonder as to what it was all about. The hawk, crows, woodchuck and quail came in for a fair share of attention.

In the insectary the center of atten-

tion were the nests of ants. In one a huge black female was surrounded by the little ones, quite naturally suggesting the remark, "Like a hen with her chickens."

In the greenhouse were plants of tea, which caused many of the visitors to confess, in surprised tone, "Why, I didn't know it looked like that." The *Mimosa*, or sensitive plant, caused even greater surprised expression, "I never saw a plant that acts so like an animal."

"Yes," was the reply by the "funny" man of the party, it's superior to some animals; it can "shut up" at even a suggestion."

The collie puppies danced a welcome and barked a good-bye to all visitors as they passed down by the running yard and stopped a moment to examine the white pine "forests" (in plant boxes) growing from the seed. Though slighted by most of the visitors, these experimentations in elementary forestry attracted the close inspection of an appreciative few.

Although Arcadia has been in the process of equipment and settling for only a few weeks, it took each party from an hour and a quarter to an hour and a half to "go through," though the usher of each party hurried on as expeditiously as possible.

Enough has been done to show the possibilities and probabilities; enough was said to show the appreciation of the public.

Arcadia is a fact. The work has begun. Its future is what *you* as well as *as we*—make it.

The new buildings of Arcadia are the workmanship of The Springfield Portable House Company, Springfield, Massachusetts. They are of neat design and convenient arrangement.

The neat appearance of Arcadia is much enhanced by a firm fence of artistic design put up by Caleb Nash, Mount Vernon, New York.

The electric wiring of the residence and entrance buildings was done in excellent manner by The C. A. Williams Co., of Stamford, Conn.

The Life of a Timber Rattlesnake.

BY C. A. CLARK, LYNN, MASSACHUSETTS.

When rattlesnakes first make their appearance in the spring, after their long hibernating period in the warm side of a hill or ledge, they may be seen basking among the rocks during the warm, sunny days. They remain among the ledges near their hibernating den until it is time for them to leave the hills and go to the swampy lowland to spend midsummer.

They mate before leaving the hills and after reaching the lowlands each pair locates in a favorite place where they remain until it is nearly time for them to enter the hills again to pass the cold winter days in their den where several of them hibernate together.

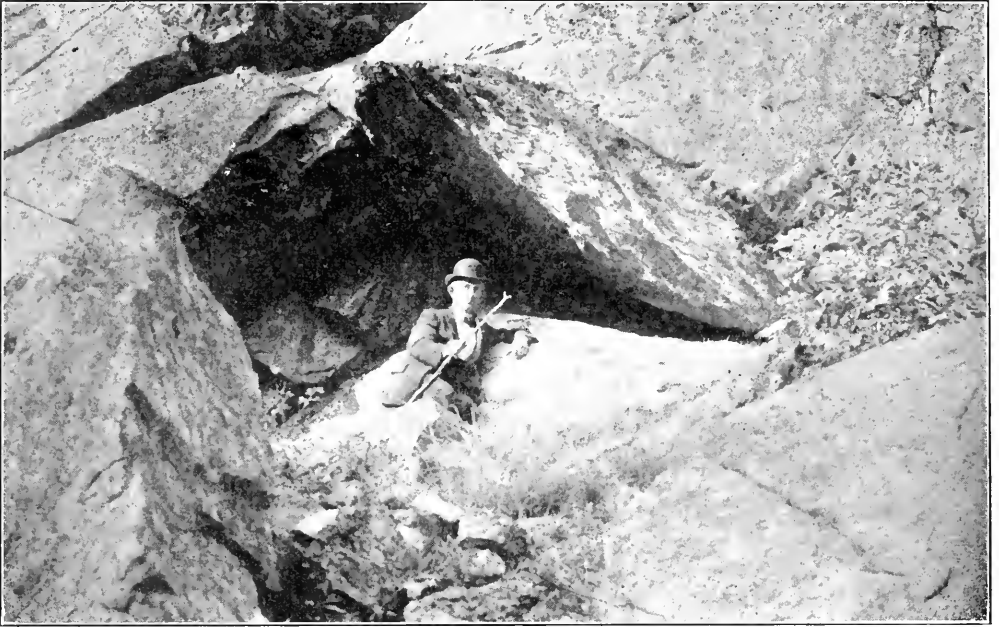
The young rattlesnakes, which are born during July and August and sometimes in the first week of September, when entering the den for their first winter's sleep are from seven to twelve inches in length and have the button and one rattle, which indicate the first year. If a person should see a rattlesnake answering that description in the fall, he will know that the snake was born the same year.

On entering their dens all snakes are very fat and go through the winter without eating or drinking, living only on the fat their bodies contain.

As to the age of a rattlesnake, it is difficult to tell the exact age unless it was born and kept in captivity, because they may grow three or sometimes four rattles in a year and they also may lose more than that number. As a rule they grow three rattles a year after the first year. They always have a new rattle after each shedding of their skins and they shed their skins as many times a year as they grow rattles.

Rattlesnakes hibernate in the same dens and are seen in the same living places for years and will remain in such places until molested.

The illustration shows the writer resting in a rattlesnakes' den. This feat is not so dangerous as it seems because the snakes know he is there and they are just as much afraid of him as some people are of them; therefore, they will not come out of the den until everything is safe and quiet.



C. A. CLARK, LYNN, MASSACHUSETTS, RESTING IN A RATTLESNAKE DEN.
 Photographed by L. A. Wentworth, Lynn, Massachusetts.

One reason that rattlesnakes are not frequently seen is because they do not live in suitable travelling places for the human being, and are seen by only those who hunt them and those who happen to come in contact with them while crossing fields and ledgy places. The rattlesnake is more dangerous in the spring than at any other time of the year because the venom has been gathering all through the winter so that when they come out of their dens their two glands are full of the deadly poison and a bite then would very likely prove fatal in a very short time. In the fall, after capturing their prey during the summer season, their glands contain less of the venom because they have used it to kill the little animals that they eat.

Rattlesnakes pass a quiet life and will not make any attempt to harm us if we keep away from them.

Many of our happiest glimpses of nature are accidental. We stumble upon things, yet it happens usually when we are trying to find something.—*Dallas Lore Sharp.*

“Ough! I Don’t Like Snakes.”

That there is in the greater part of humanity a dislike of snakes is as generally an admitted fact as is the existence of snakes. It is useless to combat this mental aversion. Humanity will not love snakes, notwithstanding all the pleas and eulogies of herpetologists. All that can be expected is to have justice done. I have implicit confidence that humanity will be just, if the facts in the case are rightly set forth.

Newspapers are printed to please as large a part of humanity as possible. Perhaps this fact accounts for the many misstatements regarding snakes. “Snakes, poor things,” says John Muir, “nobody but God love them.” Most newspapers are not catering to that constituency, in facts of nature!

Did any reader ever see an item in a newspaper about snakes that had a good word for them? No. Such good words would not please humanity in general; it would not add to the constituency desired. An example has recently come to my attention.

A Cincinnati newspaper under big “scare head” of “Bad Snakes Scare

Berry Pickers," says that snakes are found in the bushes and are a great "trouble and danger," that "the unusual wet weather has brought out large numbers." That newspaper serves up vivid accounts of "the nauseating effect on the pickers of grasping a slimy snake when thrusting the hands under the heavy foliage of the bushes," "in danger of blood poisoning from the bite of even a garter snake at this time of the year (note the newspaper timeliness). It eulogizes and makes a hero of a Boone County, Kentucky, huckster who had killed twenty black snakes this month while gathering berries. And all this I suppose with graphic accounts of "fights in the bushes" pleased the berry pickers and doubtless added to the fame of the newspaper for affording "interesting reading." But the "interest" lacks one vital essential to most real lovers of nature, even if they do not include snakes in the love—the statements are not true.

One of our faithful Corresponding Members, Dr. G. A. Hinnen, of Cincinnati, was in readiness to point out some of the most flagrant errors in an extended article from which we quote the following:

"Never was falsehood greater than this of the 'slimy snake.' A snake is not slimy, nor has there ever been a slimy one. No animal is as immaculately clean as a snake; it is free from vermin of all kinds, such as is found on other animals, such as cats and dogs, and its skin is never slimy; even after a bath or swim the snake emerges with its body absolutely dry.

A snake's habits are cleanly; its food must be absolutely so, or the snake will not touch it, and so its mouth harbors fewer germs and less filth than does that of a pet cat or dog. Compared with the proboscis or foot, of a filthy house fly, or a mosquito, the balance is decidedly on the snake's side.

"When spied by man the first effort on the part of the snake is to escape and get out of harm's way. A snake will not attack unless driven to bay or frightened suddenly. It is the human

mind which conjures up all sorts of fantastic and fanciful usually impossible things, which the snake is supposed to do, such as taking its tail in its mouth and forming a hoop to roll after people, etc.

"Now, as to snakes venturing into houses and yards, they do this for but a single purpose, viz., in quest of food. In some parts of the world snakes are welcomed in houses, for, without them, rats and mice would make life absolutely unendurable. If they come into yards they do so to gather up the insects which abound on the vegetables and plants.

'Yes, they do 'steal things from the farmer;' they steal the rats and mice, cribs, the cellars and pantries; they do steal the cutworms, the grubs; the gnats and the flies and caterpillars, which devastate the farmer's crops. If he but observed carefully he would be convinced beyond any doubt that this is what the snake does.

"Why do snakes seek berry patches? The reason for this is very simple. To begin with, berry patches as a rule abound with innumerable insects, and so the snake is in the midst of plenty. Secondly, the prickles of the bushes afford protection to the snake from its enemies. That is the reason snakes prefer berry patches; they are not there to eat the berries, but to destroy the many insects of the berries.

"The Boone County huckster who has killed no less than twenty black-snakes this month in his berry patches, is an ignoramus. If he took half a day's time to investigate this matter he would be convinced that the snakes protect his berries from insect ravages, and that they are really worth his protection, and that they are not his enemies as he so foolishly and ridiculously imagines.

"Snakes do not eat vegetable matter in any shape or form; their food consists of slugs, beetles, bugs, caterpillars, grubs, rats, mice, etc., and these creatures must all be alive or the snake will not touch them. Where food of this character abounds the snake will be found.

"They are not man's enemy, but one

of his very best friends, asking nothing in return for their inestimable services, but to be let severely alone. They harm no one and should be welcomed and protected by farmers, truck gardeners, nurserymen, in fact by mankind in general. Watch them at work in the potato fields and along the sweet potato rows as they silently glide from plant to plant picking off each caterpillar or slug or worm, doing no injury to man and none to the growing plants. Watch them in the corn crib as they lie in wait for the sneaking rat or the destructive mouse.

"One snake in a corn crib will do more to rid the place of rats and mice than a dozen cats can ever do. Furthermore, the snake will not intrude itself into anybody's way, nor will it keep awake the family by caterwauling all night.

"Quiet, unobtrusive, ever seeking a place to hide when detected, always ready to help mankind, the wrongly despised and abused snake leads its simple and useful life. Papers like yours could save the farmers thousands of dollars by trying to educate the people in the right way; when you consider that the average annual loss in this country from insect ravages alone amounts to from \$300,000,000 to \$400,000,000, and that there must be added to this damage caused by rats, mice, etc., etc., the figures amount beyond belief. With more birds, more snakes, more toads, etc., this loss could be reduced by more than seventy-five per cent."

A Plea for Outdoor Exercise.

We all desire health, but few understand how to retain it, and when lost we resort to narcotics and other drugs instead of going to the fields and woods and holding sweet communion with the mother of all life. Nature offers no concoction, she appeals to no legislatures to authorize poisonous preservatives in her food. For real vigor she bids us come to her realms of sunshine and vivifying atmosphere, to her spacious meadows and view her wonderful panorama of miraculous transformations. By the glowing power of her sunshine she warms into life the

little sleeping germs that have silently nestled in the bosom of old mother earth for so many months. She bids the delicate forms of the grass and grain and flowers to come forth, energized by some invisible power; lifting their heads toward the light they are kissed by the glowing sunbeams, clothed by nature in all the beautiful colors of the rainbow. Soon they cover the fields and meadows with a sheen of splendor.

Certainly, when we view these realms of beauty it will be a harbinger of revitalizing power to the tired and the weary, an inspiration of health to all.

Come to the fields of golf where the soft white clouds look down with tender smiles from out the purple blue. Where the zephyrs are perfumed by the sweet scented blossoms of the flowers and trees, where all can bathe in the gleaming sunshine, breathe the vitalizing air and drive the poison from the lungs, the venom from the nerves and the germ dust from the system. All these are within your reach if you will join our Country Club and play the healthful, animating game of golf. It may cause you to execrate or bless, to frown or smile, to scowl or laugh, to be disgusting or pleased but for the time at least it will banish domestic and business cares, cultivate your social nature, rest the body and the mind, preserve your health and strength and put money in your purse. The inspiring atmosphere will quicken the pulse, place roses on your cheek, a twinkle in the eye, tints of sunshine on the lips and a laughing happy smile upon the countenance. Every man and woman within our beautiful Mahoning valley should come into our fold for we have an abundance of sun, air and exercise. The real springs and sources of health with all their accompanying blessings.

"View the haunts of Nature. The calm shade shall bring a kindred calm, and the sweet breeze

That makes the green leaves dance, shall waft a balm to thy sick heart.

—G. W. PORTER, in *The American Golfer*.

So far as that phase of outdoor interest represented by golf is concerned this is a good appeal. Mr. Porter evidently believes also in what he calls the "wonderful panorama of miraculous transformations." Golf is good

and Mr. Porter is right that golfing is not all for the golfer. These other interests are well represented by *THE GUIDE TO NATURE, of which every golfer as well as all other lovers of outdoors should be a reader.*



The Heavens for October

BY PROF. S. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

The scientific world has been electrified to learn of Dr. Frederick A. Cook's claim that he has reached the point farthest north, and before this had ceased being a nine days' wonder or even the ink was dry on the announcing press came news that Commander Robert E. Peary had "nailed the Stars and Stripes to the North Pole" and in consequence all eyes have been riveted on these daring attempts to acquire fame. The inborn love of discovery which attracted these men drew Christopher Columbus across the Atlantic, and also spurred on Henry Hudson in his several voyages to find the Northwest passage to India. In 1607 Hudson made an attempt to make his way between Greenland and Spitzbergen, reaching as far north as latitude $80^{\circ} 23'$, and the following year he tried in vain to pass through between Spitzbergen and Nova Zembla. In 1609 still in search of the passage to India in his small boat, the "Half Moon," he sailed up the Hudson River as far as Troy, the Three Hundredth Anniversary of which we are now celebrating. Though it is no longer necessary to find a passage to India, intrepid navigators have endured untold hardships in trying to reach the pole of the earth, and the names of Hansen, Greely, the Duke of Abruzzi, Commander Peary and Lieut. Shackleton, stand out indelibly as fine examples of what determined effort

may do in surmounting difficulties. Beyond the desire of conquering where others have failed, there seems to be no very great scientific value in these polar expeditions, except that of solving the astronomical problem of reaching a point ninety degrees from the equator.

In Peary's expedition of 1906, he found that there was an easterly drift of the polar ice, indicating the absence of any large bodies of land, and as a result of this information both Peary and Cook veered to the west of north in their quests for the pole. The observations of both explorers show that they each took a remarkably straight course to the pole, and each traveled very quickly. Cook's astronomical positions make clear that after having been two months on his trip subsisting on tallow, etc., he was able to make over the rough ice and snow nearly twenty miles per day for the thirteen days before discovering the pole, on April 21, 1908.

The method whereby one's position is determined on such an expedition, being a problem of practical astronomy, will undoubtedly be of interest to readers of the Star Map. One naturally supposes that night within the polar regions, lasting as it does for six months, must be one which gets blacker and blacker, with the "darkest hour just before the dawn"—a poetic fancy in which there is not a particle of truth. Two different effects make the polar nights less black. The first

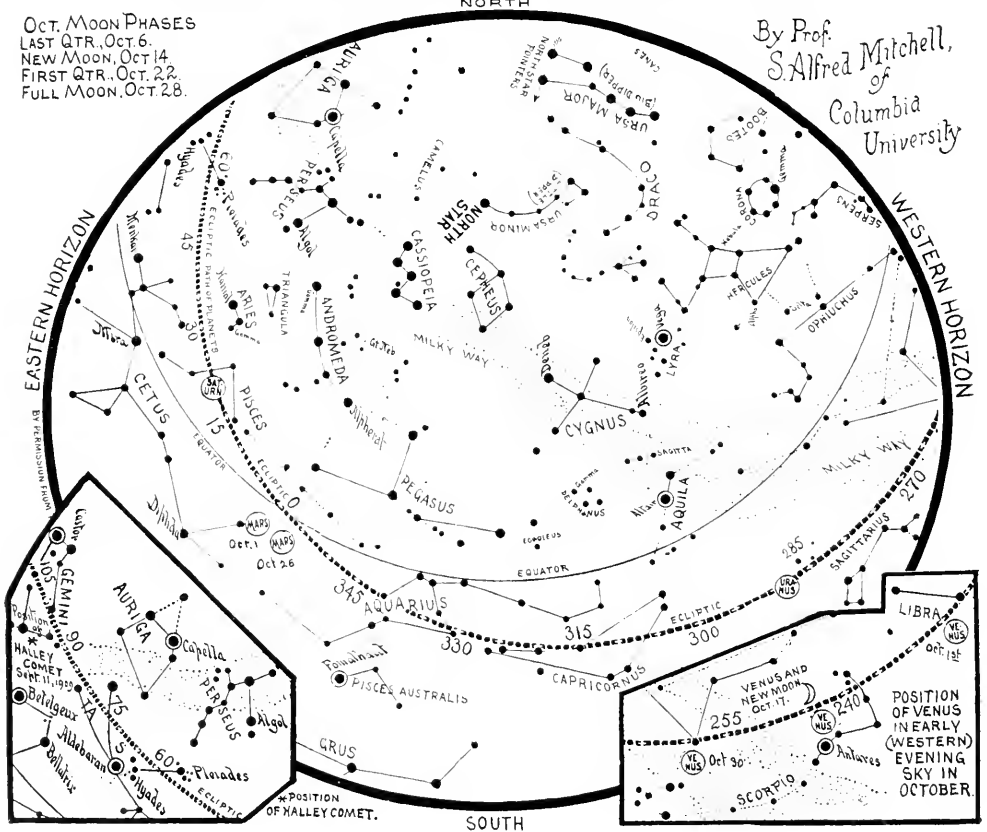
of these is that twilight lasts until the sun is 18° below the horizon. Where Dr. Cook spent the winter in Annotak, there was some twilight even at the very depth of winter. Secondly, the mid-winter moon would be above the horizon continuously for two weeks, from first quarter through the full moon to third quarter, and those who have seen the full moon shining on the snow will know how brilliant that

the final dash like that accomplished only by Cook and two Esquimos. The ordinary navigator's sextant would be too heavy and bulky, and would have to be replaced by a less cumbersome instrument. Peary ordinarily carried a small sextant, a so-called pocket sextant. The ship's chronometer in its square case, would give way to a good pocket time-piece though two or three small chronometers might be carried.

EVENING SKY MAP FOR OCTOBER

OCT. MOON PHASES
 LAST QTR., Oct. 6.
 NEW MOON, Oct. 14.
 FIRST QTR., Oct. 22.
 FULL MOON, Oct. 28.

By Prof. S. Alfred Mitchell,
 of
 Columbia
 University



would make the polar night. In addition to these two, there would be the brilliant aurora borealis or northern lights. But temperatures of 83° below Zero Fahrenheit! Not very many of us would wish to experience a polar winter.

In the sledge trip to the pole, a distance about equalling that from Washington to Boston, no heavy instruments could be carried, and especially so in

The sea captain observes the altitude of the sun by bringing it in contact with the horizon where sea and sky meet. But in the frozen north there is no such horizon, the ice floes are thrown up into hummocks and hills, and an altitude of the sun above the visible horizon would lead to inaccurate results. On land explorations, an artificial horizon is made by pouring mercury into a little shallow tray. But mercury

freezes at 40° below zero. A blackened glass plate made horizontal by means of spirit levels was used by Cook and well answered the purpose.

In a polar dash, the latitude is the important information desired. Longitude i. e., the difference between local and Greenwich time is difficult to obtain and inaccurate. Consequently, latitude must be determined by methods which will not involve an accurate knowledge of the time. The sun's greatest altitude during the twenty-four hours would give the time of local noon and latitude from such an observation could be readily determined; and twelve hours later at midnight the sun's altitude would be least, and latitude could again be determined. When the greatest and least altitudes were the same, or in other words, when the sun did not change in altitude at all (except for its change in declination in the sky), then was the latitude 90° , and the north pole was reached. It is readily seen, the small instruments, the difficulty of determining the horizon, and the bitter cold combine together to make the observations of no great accuracy. Under such conditions it is questionable whether the position of the pole could be determined within ten miles!

After making so many carefully planned voyages to the north and after the many years of diligent work looking towards the climax of his life in the discovery of the pole, it does seem that the honor of being first to the top of the world should belong to Peary. It was Peary's accurate observations that paved the way for Cook's success, but it will be very difficult for Peary to prove that he himself was the first to reach the pole. In this conviction it may be said that a polar expedition would give the freest possible rein to an explorer willing to sacrifice his personal honesty to the desire of winning fame, and the applause of the world. Such a traveller could readily fix up his observations, adding a few miles and a few minutes of arc each day, and if skilfully done there would not be the slightest possible danger of detection. But we cannot imagine a scientist capable of so demeaning himself to gain a few short weeks or months of popular-

ity, for an accident might happen, the deceit might be detected, and he would then go down to posterity as the greatest liar of the ages. Cook's veracity has been sadly impeached, but when his whole story can be told and his observations examined, he will be abundantly able to verify his claim that he was the first to reach the pole. In all scientific work it is generally the date of the announcement which counts for priority, and as Cook and Peary made their claims within five days of each other the honor of discovering the North Pole must necessarily be a divided one.

THE PLANETS.

Remarkably little is heard regarding our near neighbor in space Mars. This is undoubtedly due to the poor weather conditions that have been met with generally throughout Europe and in general throughout our own country. For some reason very little detail seems to be present on Mars. It is now past its nearest approach to the earth which occurred September 15. It increases its distance very slowly, and in September and October are usually the months of finest seeing at our observatories, we may expect important discoveries in the near future. Mars continues to retrograde till October 27, when it becomes stationary. A close approach of Mars and the moon occurs on September 30, and again on October 25. These will have an added interest coming so near the times of the Harvest and Hunter's full moons. Saturn is readily located from its position a little east of Mars. Venus is becoming nightly more conspicuous, slowly drawing farther away from the Sun.

THE CONSTELLATIONS.

As usual the chart shows the sky as it appears at 9 P. M., on the first of the month, at 8 o'clock on the 15th and at 7 P. M. at the end. It shows probably the most barren starry region in the whole heavens. The four planets, Venus, Uranus, Mars and Saturn, however, and fine clear autumn nights make the skies most interesting, and the interest is increased as we watch a few hours later the splendid winter constellations rising high over the western horizon.

SEES HALLEY'S COMET.

First Sight Recorded by Professor Wolff of Heidelberg.

Cambridge, Mass., Sept. 12.—Halley's comet, for which astronomers the world over have been eagerly watching, has been seen, after an absence of seventy-four years, according to a dispatch received to-day at the Harvard Observatory from Professor Wolff of Heidelberg.

The sight was obtained on September 11 in right ascension, 6:18:12; declination, 17° 11' north. It could be made out only with a large telescope.

The position of the comet at the date of its re-discovery by Prof. Wolff is shown in the small section map in the lower left hand corner above, as it does not come into view in the East until 11 P. M. on Oct. 1st, two hours later than the main map is arranged for on that date.



Under the Auspices of The Aquarium Society of Philadelphia, Herman T. Wolf, Editor

Pond Breeding of Goldfishes.

In the May number of THE GUIDE TO NATURE, relative to the propagation of aquarium fishes, a greenhouse admirably arranged with breeding tanks and storage basins was shown, the principal purpose of which is the storage and sale of goldfishes bred in other localities.

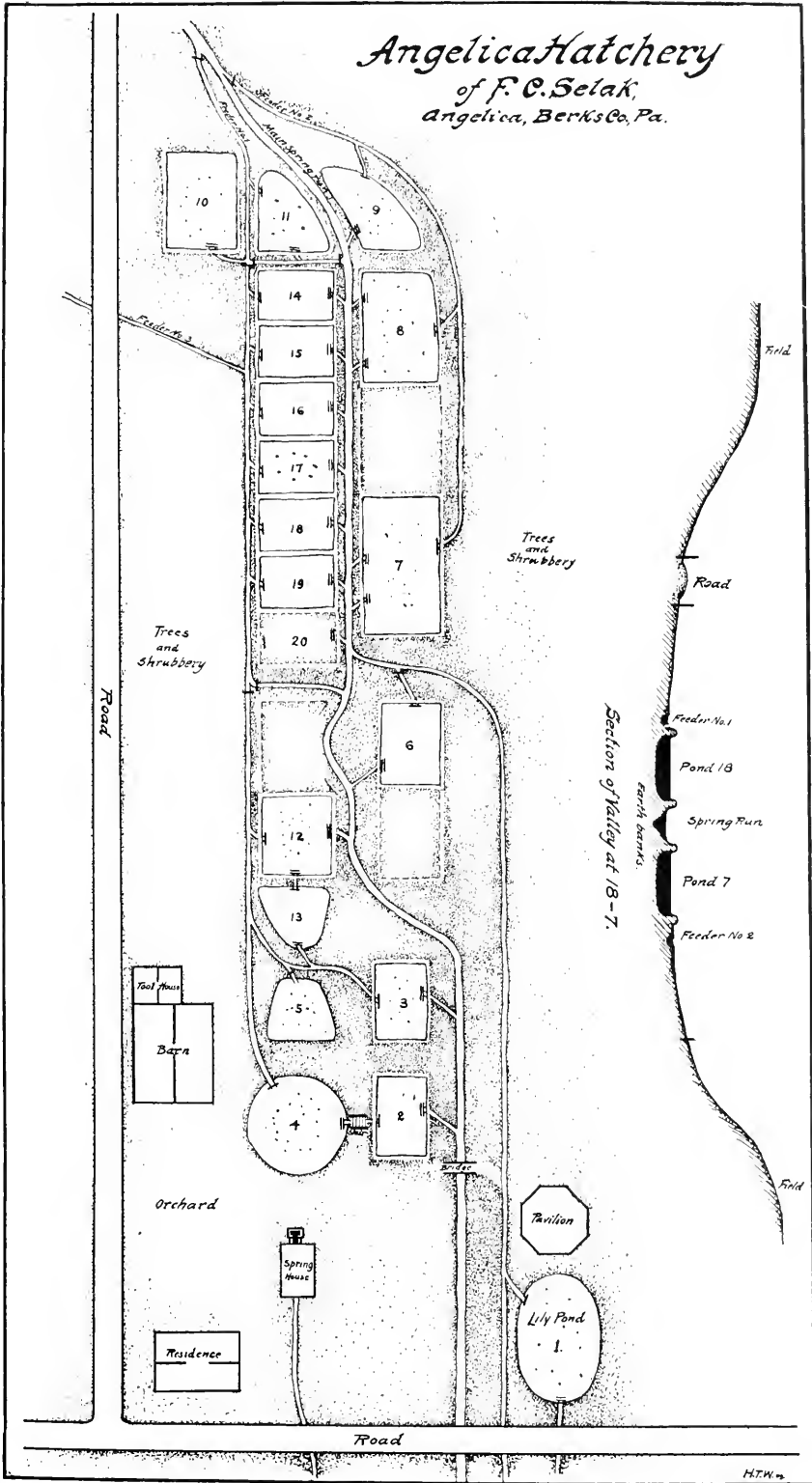
The editor of this section recently visited these establishments and also found the hatching ponds so well arranged that their reproduction here will be of interest to the general reader and of marked benefit to those interested in fish culture.

The greenhouse of Mr. Frank C. Selak is located near the business center of Reading, Pennsylvania, the hatchery a half mile beyond the village of Angelica and six miles from the city, the latter property consisting of what was two farms comprising one hundred acres. Nearly parallel to one of the roads was a marshy stretch of meadow bordered by trees and underbrush and depressed between fields of higher elevation, which constitutes a natural, sheltered valley. A spring run passed through this valley and the contour of the land favored the site for ponds in

connection with the country residence of the owner. Investigation revealed the existence of more than fifty springs.

The first year, 1904, the lily pond was made, in which also to keep a few goldfishes, when it was found they thrived so well that the following year three other ponds, Nos. 2, 3 and 4, were added with the view of breeding fishes and resulted in obtaining three thousand young goldfishes which were sold at retail in Reading.

The next year six more ponds were made and the result was twenty thousand fishes of salable size after the season, all of which were readily disposed of at wholesale and retail. In 1908 ten additional ponds were made, but the cold weather of the late spring and early summer prevented the development of the young fishes and great losses occurred, so that at the selling season the crop was not as good as the previous year. On account of the illness of the owner the industry languished during the present season, and the result is not very promising, but in another year, with the present excellent facilities, at least one hundred thousand common goldfishes should be bred, and as these command prices at



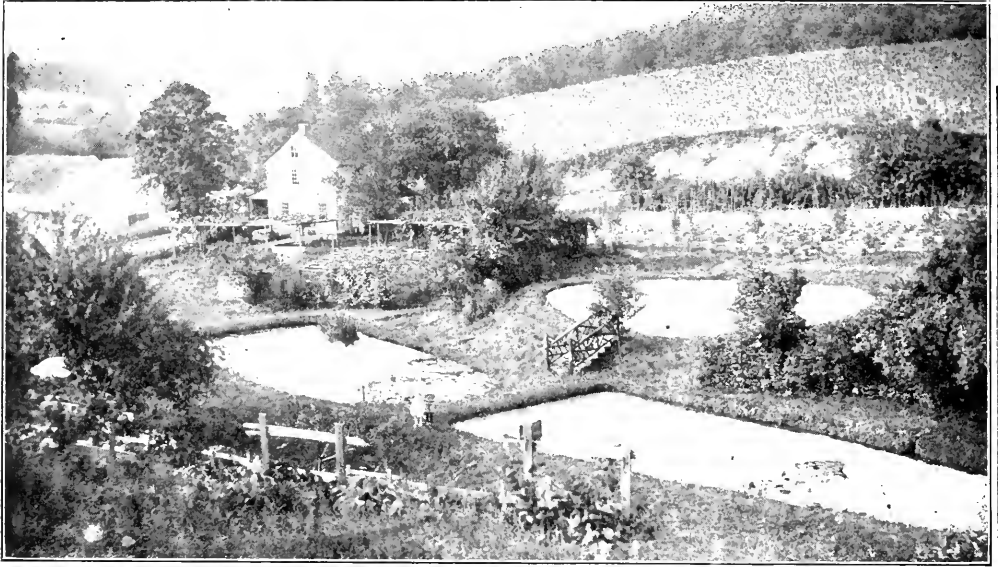


FIG. 1. PONDS TWO, THREE AND FOUR.

wholesale of three dollars and fifty cents to eight dollars and fifty cents per thousand, a satisfactory return for the considerable investment seems assured.

As indicated by the appended field sketch, the ponds are located as favored by the natural contour of the narrow valley. Some are depressions in the soil which required little labor in their construction; others are partly bordered by earth walls, and many are surrounded by earth embankments.

From the point of intake to outlet there is an even drop or decline down grade to the intersecting roadway, so that the water flow is by gravity the whole length of the series of ponds.

The approximate area of the ponds is the following:

No. 1 Pond	.....	85	by	40	feet
" 2 "	.....	70	"	30	"
" 3 "	.....	70	"	30	"
" 4 "	.....	90 feet diameter			
" 5 "	.....	35	"	30	feet
" 6 "	.....	70	"	40	"

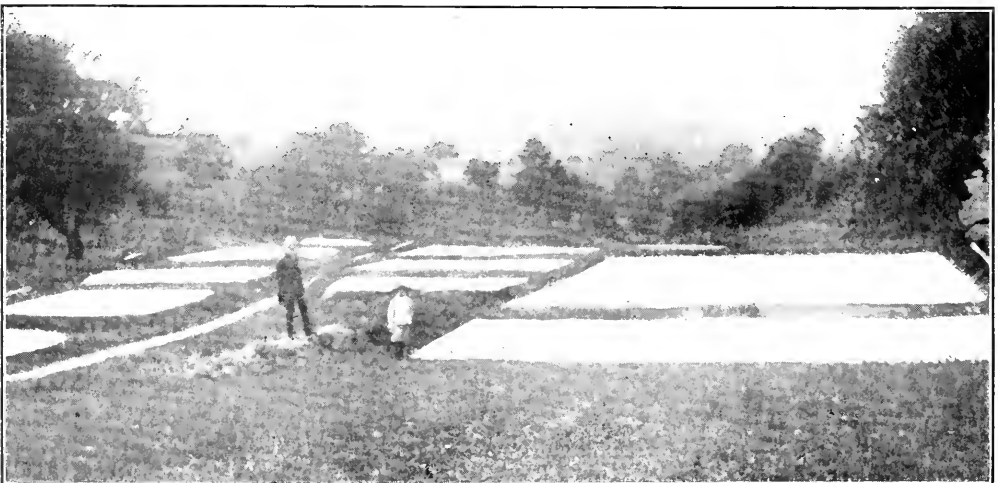


FIG. 2. UPPER PONDS. NUMBERS SEVEN TO SIXTEEN.

No. 7 Pond	.....	150	by	60	feet
" 8 "	.....	120	"	60	"
" 9 "	.....	60	"	40	"
" 10 "	.....	100	"	60	"
" 11 "	.....	60	"	60	"
" 12 "	.....	90	"	80	"
" 13 "	.....	50	"	40	"
" 14 to 20 Ponds..	60	"	35	ft.	each

whole arrangement being so exceedingly simple yet eminently effective as to be worthy of admiration.

Many of the ponds abound in myriophyllum, potamogeton, chara and water lilies, which offer excellent shelter to the fishes and some protection from natural enemies. Shotgun patrol is



FIG. 3. PONDS FOUR AND ONE.

As indicated, many of the ponds contain a number of live springs and all are fed from the three feeders, the intakes indicated by a single line and the outlets by double lines, designating the channels and sluices. The outflow is all returned to the main spring run, and the water supply is confined in dug ditches controlled by a simple but effective system of flood gates. Each of the feeders would contain about two feet width of water after an average rainfall and the spring run four or five feet.

The sloping bottoms of the ponds permit of any depth of water from a few inches to two or three feet, the

also maintained, but the winged enemies are so wary that another simpler method of protection is more effective. Around all the ponds posts have been erected upon which muskrat traps are fastened which capture kingfishers, shikepokes, shrikes and herons, while the shotgun and rifle take care of muskrats, snakes and frogs.

It is the intention of the owner to also extensively breed the finer toy varieties of the goldfish, spawning and hatching them in his greenhouse and then transferring them to the ponds where they will sooner acquire salable size. At present they are reared in the greenhouse tanks.

The Household Aquarium and Its Inmates and Management.

Part I.

The keeping of an aquarium with its living plant and animal inmates is an esthetic pleasure not equalled by other easily obtained and inexpensive means. Land plants and animals are interesting, but they do not offer the continual fascination of this glimpse of fluvial life, which when properly arranged is a beautiful, ever-varying living picture and the handsomest ornament of the household.

Success with the aquarium depends upon an understanding of the simple principles of aquatic existence, most failures being due to a lack of this knowledge. It is really the pond or pool in miniature, and to achieve success these conditions must be reproduced.

Only in comparatively recent times has this been understood. In 1833 Priestly discovered that growing plants gave off oxygen; in 1844 Ward succeeded in keeping fishes together with plants in stillwater aquaria; in 1850 Warrington published his observations on the inter-relation of vegetal and animal life; and in 1856 Gosse established the necessity of scavengers, and so solved the problem of the properly-balanced or self-sustaining aquarium.

In the breathing of the aquatic fauna a considerable quantity of air is absorbed, required for the oxidation of the waste carbonaceous matter, producing carbonic acid gas; which, in the presence of sunlight, is absorbed by the plants, the contained carbon being required to add to their solid structure and the thus purified oxygen liberated into the water to sustain the living creatures. By this double action of plants and animals an almost perfect balance is sustained, the animals diminishing the oxygen and adding to the carbonic acid gas, and the plants diminishing the carbonic acid gas and adding to the oxygen.

Hence if plant and animal life is present in correct proportion, the quality of the water is only disturbed by the presence of other elements produced by the decomposition of organic

matter, dead animals, decaying plants, excrement and uneaten food; and to check this deleterious change molluscs and other scavengers are required. With this necessary law of aquatic existence in mind, together with careful feeding and good daylight, nearly the whole difficulties of aquarium keeping are solved.

Artificial aeration for the fresh-water aquarium is not required in the presence of a vigorous plant growth, but marine plants are lower forms, the Cryptogams, all inferior generators of oxygen, and some such means is imperative for the marine or salt-water aquarium.

In establishing an aquarium any water-tight receptacle will serve, but the larger its contents the better will be the results. Its form should be such as to admit of large surface aeration. Glass receptacles have the advantage that their contents may be more easily observed, but the ordinary fish globes are the worst of all forms. All-glass vessels are too liable to fracture by the pressure of the water, by expansion and contraction, and by accidents. The brass or iron framed glass aquarium with slate bottom is the best and its form should be that of a double cube, which for the novice may be 32 inches long, 16 inches wide, and 16 inches high, and for the experienced aquarist 48 by 24 by 20 inches or larger.

It should be placed upon a table or stand facing either a northern or north-eastern light in the summer and in the winter where it will receive a few hours of the morning sunlight. The light should be principally on the surface of the water and be such that it will not materially change the water temperature. Too strong is as injurious as too little light.

Any drinking water will serve for the fresh-water aquarium, as the fishes usually kept are those of the pond or slow-flowing stream, but for those of cold-water brooks attention must be given to both its character and temperature. This will be treated of hereafter.

In installing an aquarium the first important consideration is the proper

aquatic plants. None of fresh water is strictly aquatic and always has its foliage submerged, as during the flowering season all develop either surface-floating or emersed leaves and blossoms; but those whose habit is to remain submerged at other times are the best liberators of oxygen; and, except for ornamental purposes, should be given the preference in the aquarium. The more generally distributed or easily obtainable of these, in the order in which they best fulfill their purpose, are the ribbon-leaved arrowheads, *Sagittaria natans* and *S. sinensis*; the watershield or fanwort, *Cabomba caroliniana* and *C. rosaeifolia*; the ditchmoss, *Anacharis canadensis* and the cultivated *A. canadensis gigantea*; the eel or tape-grass, *Vallisneria spiralis*; the water-milfoil, *Myriophyllum spicatum* and the nearly related parrot's feather or Proserpinaca, *M. proserpinacoides*; the swamp-loosestrife, *Ludwigia palustris* and *L. glandulosa*, together with the handsomest tropical species *L. mulertii*; the stone-worts, *Nitella gracilis* and *Chara gym-nopus*; and the less desirable but ornamental hornwort (*Ceratophyllum*), willowmoss (*Fontinalis*), riverweed (*Potamogeton*), starwort (*Callitriche*), bladderwort (*Utricularia*), and many other partially submerged or floating plants which add beauty and attraction to the aquarium. These will be more fully described in a later article.

Next to plants scavengers should have the attention of the aquarist, as success largely depends upon their efficiency in disposing of the refuse and offal.

The scavengers of the freshwater aquarium are tadpoles, snails and mussels. Frog tadpoles retain their larval form longer than toads; when either develop legs and assume the adult form they subsist on live food and are no longer of use in the aquarium. Of the freshwater snails four species best serve as scavengers, the ramshorn snail, *Plan-orbis trivolvis* and *P. campanulatus*, the Potomac snail, *Viviparus viviparus*, the transparent African snail, *Lymnaea auricularia* and the Japanese snail, *V. mal-leatus*, each differing somewhat in preferred diet. If these cannot be obtained any other freshwater snails which will not destroy the plants may be introduced.

Of the freshwater mussels any taken from stillwater will serve, but those of the genera *Lampsilus* and *Margaritina* survive the longest in the aquarium.

Sand, small pebbles and sod soil are also required, into which to root the plants. Sea sand, the smaller pebbles known as "grit" and clean turf taken immediately under the roots of lawn grass are generally used.

These materials at hand, only the fishes still remain to be described and this will be done later; it is now in order to arrange the aquarium, which should be established a week or two before fishes are introduced.

The inside of the aquarium should be cleaned with whiting for the glass and salt water for the slate bottom, thoroughly rinsed and set into position. *Sagittaria*, *Cabomba*, *Anacharis*, *Myriophyllum*, *Proserpinaca* and *Nitella* may be set directly into the sand or pebbles, but *Vallisneria*, *Ludwigia* and *Potamogeton* thrive best when planted in shallow pots or dishes into which turf is placed and covered with pebbles. A layer of sand two-inches thick should first be put into the aquarium and then the plants neatly set into it, arranging them on the three sides towards the light and leaving an open space on the inner side towards the room, for the living inmates to disport themselves. Then sand, pots etc. should be covered with an inch thickness of grit, placed so that the side facing the room is of slightly lower level than the others, that the humus (refuse) may there collect for easy cleaning.

When the plants are arranged, they should be covered with wrapping paper upon which the water may be slowly poured so as not to disturb the contents and then the aquarium filled to the top. Tadpoles, snails and mussels should be put in at once and the aquarium left undisturbed until the water is clear, the plants rooted and growing, the molluscs and tadpoles acclimated and active, and then only the fishes introduced.

For a 32 by 16 by 16 inches aquarium, having a capacity of 32 gallons of water, six tadpoles, ten or twelve snails and two mussels would be required; for smaller aquaria proportionately less.

(Continued in our following number).

Managing Goldfish in Summer.

The managing editor of *THE GUIDE TO NATURE*, had occasion to pass through Philadelphia, and took the opportunity to call on some members of the Aquarium Society. A great many practical points were brought out and they can probably best be given to our readers in the form of the interviews as they actually took place.

The first call was on Mr. William T. Innes, Jr., Secretary of the Aquarium Society. The accompanying illustration shows his general plan of keeping his fish during the summer. His only available space is in a narrow side alley, but the conditions here are all that could be desired in a city location.

Q. Is this a satisfactory light for your purposes?

A. Yes, entirely so. I get about three quarters of an hour of morning sun, and a good overhead light the rest of the day. When one has a mixed variety of plants this is about an ideal condition. It is particularly suited for *Sagittaria*.

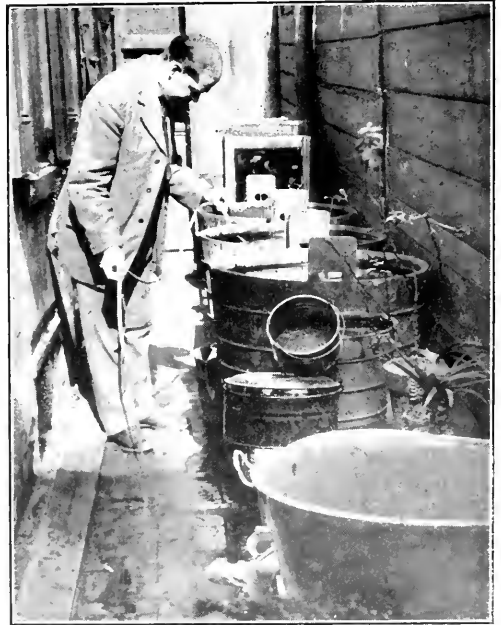
Q. Is there much dust in the city air that settles on the water?

A. Yes, quite a little—partly from smoke and partly from pollen off the vines. I draw it off with a piece of newspaper just the width of the surface of the water. Lay the paper flat on the water and draw quickly across. Cleaning the surface this way once a day is satisfactory at most seasons but when the pollen is falling very heavily from the creeper vines, I cover over everything with a strip of Organdie a yard wide and the whole length of the side yard, weighting it down on the edges with little lead buttons, such as are made to use in ladies' skirts. By keeping the handles of the tubs in a straight line and connecting with a string it supports the cloth from falling into the water.

Q. Why do you use tubs instead of aquaria?

A. Fish thrive much better in a tub or any vessel having opaque sides. You see in natural conditions the fish only gets top light, and the light coming through the sides of an aquarium while pretty for us to look at is not natural to the fish. In fact, some of the most

highly developed fancy fish will die if taken out of a tub or tank and put into an aquarium. Of course it is not practical to have many tubs in a residence during the winter, but by getting the fish into good strong condition during the summer season, they generally manage to pull through until the next spring.



WILLIAM T. INNES, JR., AT WORK WITH HIS GOLDFISH IN TUBS, PANS, ETC.

Q. I notice you have your *Sagittaria* in small pots in the tubs. Why is this?

A. It is principally for convenience. These plants can be very readily lifted out and the bottom water of the tub siphoned off; also the plants are what is known as the Giant *Sagittaria*. By keeping them in small pots they are prevented from getting too large. Of course some people like them as large as possible. This depends upon how much room you have; it is also a matter of taste.

Q. You speak of siphoning off the bottom of the tub. How do you do this?

A. By filling a three-foot piece of half inch rubber tubing with water, closing both ends with the fingers, placing one end in the tub the other at a point lower than the surface of the water, and then removing the fingers. The water will then flow out freely. Move the end

of the hose around the bottom of the tub, picking up whatever dirt you can see. It is necessary to use great care not to draw in any small fish. Nearly every aquarist in spite of care has at some time drawn a valuable young fish through the hose. This is very apt to be fatal to the fish.

Q. Have you any other way of keeping the aquarium clean?

A. There are several helps, all of which should be used. The plant known as willow moss or *Fontinalis* is very useful. This plant seems to collect the dirt in and about itself and can be lifted out and washed off. It can then be returned to the aquarium. Common river mussels are of advantage to introduce into an aquarium. They almost constantly draw in and expel the water, taking out from it as their food the finely suspended organic matter. Then the snails are indispensable. The best kinds are the Cape Fear river ramshorn snail, the Japanese snail, and the African snail.

Q. Which snail do you consider the best?

A. My own experience favors the ramshorn. They clean the sides very closely, will attack dead plant or animal life, and will not injure living plant life. They seem never to stop work. The Japanese snail is also very good, but I do not think they clean quite as closely as the ramshorn and they stay in the sand at certain seasons.

Q. What seasons are these?

A. Principally breeding time. The Japanese snail is peculiar in that the eggs are hatched out within the shell of the mother, when they emerge they are quite a fair size, say about as large as a pea. This is quite an advantage because they are too large for the fish to eat. Where snails are hatched out on the plants or sides of the aquarium, they are very small and are quite a delicacy to the fish. The African snail is very active and quite pretty, but very short lived. It is a serious matter having snails die and not know about it. They foul the water very quickly.

Q. Do you change the water frequently?

A. No, I never change it except to

make up for evaporation and what dirty water is occasionally drawn off.

Q. What kind of tubs do you prefer?

A. Old wooden tubs are the best. New wooden tubs should have running water in them for at least a week. They better support the growth of algae or "green moss" as it is called. This purifies the water and helps the fish. Paper mache tubs are also very good.

Q. What plants do you consider to be the best oxygenators?

A. *Sagittaria* or *Anacharis*. *Ludwigia* is very popular and looks pretty in an aquarium but is a poor oxygenator, unless very well started. It does best in pots with soil.

Q. In potting plants what kind of soil do you use?

A. Any garden soil that is sweet. I fill the pot about four fifths with earth and fill the rest with sand. This keeps the fish from stirring up the earth and making the water muddy.

Q. What do you give the fish as their principal article for food?

A. For the fish over three months old, boiled oatmeal just as it comes off the breakfast table. To the fish that are hatched the present year, I give so much that it takes nearly all day for them to eat it. If I were home I should prefer giving them two feedings not quite as large, but this is out of the question for most amateurs. It is not just the best thing to have so much food in the water for so long a time. The fish over a year old get just as much as they can eat at one time, that is, they get one good meal a day. The fish under three months of age are fed live daphnia, which I collect in still water ponds at the outskirts of the city, where there is likely to be decomposing vegetable or animal matter.

Q. Do any undesirable insects get collected with the daphnia?

A. Yes indeed. That is one of the greatest difficulties we have to contend with. In this vicinity our principal troubles come from what are known as water-boatmen and tiger beetle larvae. The larvae of the dragon fly and other larvae are also fatal to young fish, but I personally have found very few of them in my tanks.

Q. Do you feed daphnia to the youngest fish?

A. Yes, but I strain it through a brass wire cloth so that only the smallest come through. This cloth can be had in the larger wire goods houses and in mesh is a little too fine for a small pin to go through it. (Mr. Innes has this wire cloth soldered into the bottom of what was a small round tin pail. This pail is shown in the illustration.—E. F. B.)

Q. I suppose you give the larger daphnia to the larger fish?

A. Yes, that is the idea. As soon as they are large enough to eat the full size daphnia, I give them all they can possibly eat of this food until they are about three months old. I also give a little to all of the larger fish if I can spare it. Some enthusiasts collect daphnia every day and feed their large fish nothing else all summer. However, this is quite a contract and I find that my fish do very well on my system of running things.

Q. When do you bring the fish in the house?

A. The younger ones about the fifteenth of September. Of course this applies to Philadelphia, allowance must be made for other locations. Many young fish receive a permanent setback by being out doors in cool September nights. This is also true of the older fish of the highly bred varieties. I do not like to have the water go below 62 degrees for them. The larger fish may stay out a little later but September is the best time to plant and start the house aquarium.

Habits and Breeding of the Paradise Fish.

BY JOSEPH F. HEILMAN, VICE-PRESIDENT
PHILADELPHIA AQUARIUM SOCIETY.

There are several varieties of the macropode or Paradise fish which I have kept in aquaria and successfully bred.

The common or dwarf Paradise is not as gaudy as the larger domesticated three and one-half to four inches long *M. viridi-auratus*, and is striped with red and brown, not banded; nor has it the very long fin development of the latter fish. Their habits and methods of

procreation are similar however, and the following description would apply to either or both.

I have fully come to the conclusion that the male fish has the power of changing his colors at will, as when closely observed it will be noticed that the beautiful colorings will vary in intensity and hue over the body, especially if the fish is excited or in a combative mood. The colors of the



PARADISE FISH IN AN AQUARIUM.
Photographed by L. B. Spencer.

female fish, which are brown with olive spots at other times, change to a light drab or steel-grey during the spawning period, but at no time has she much power of changing her hues, as does the male fish.

The Paradise fish is of a quiet nature when undisturbed, contented to float lazily in the water, seemingly without moving a fin, but always alert and watching for anything alive that may come his way. When disturbed or excited he will dart about with great rapidity and pounce upon whatever will serve as food or suggest itself as an enemy. During the mating and spawning season he is very vicious and will even leap out of the water, snapping his jaws at any object that may be pointed at him and producing a sound like the closing of the jaws of a steel trap.

The fish is a good feeder preferring live food, either the small water crustaceans or earthworms, and will leap out of the water a distance of several inches for a worm held between the fingers above the water surface of the aquarium; or in the water will take the food with a sudden darting movement most interesting to watch.

At the time of spawning the male will deliberately select a female and with her seek a secluded section of the aquarium to build the nest, and woe betide any other fish that has the temerity to usurp his mate or to come within the bounds of his chosen territory.

The nest is built on the surface of the water and it is the male that performs this duty. From the mouth he expels air bubbles covered with a gelatinous substance, which are carefully clustered together to form a floating fairy nest. As soon as the eggs are deposited by the female and fertilized by the male, he carefully gathers and deposits them in the nest of bubbles and guards them until they hatch, which takes about three days, during which time not even the female is permitted to approach.

The spawning takes place several times during the summer. I have found it advisable to remove the female after each spawning, as she develops cannibalistic tendencies, as is also the case with some males, but this more usually after the young fry has reached some size and begins to take up an independent existence.

My best success in rearing these fishes is by a method of my own devising, which is taking away the spawn directly after the male deposits it in the nest. This I do by the use of a large spoon or ladle, carefully skimming the nest from the water surface and depositing it into another previously prepared receptacle. By this means I have been successful in hatching and maturing 50 per cent. more young fishes than by leaving the male to take charge of the nest and protect the young.

For a period of 8 or 10 days the newly hatched fry do not require any food; then they will take very small

Daphnia (tiny freshwater crustaceans) or rice flour sprinkled on the water surface, but discretion must be used in feeding the latter, as too much flour may foul the water and kill the fish.

The Paradise fish is easy to keep in the household aquarium. I have matured fifty fish in a five gallon bell jar; and as they are air-breathers no such careful watch of the water conditions is necessary as with the fine breeds of the goldfish.

Care must be exercised that the fishes may not leap out of the containers. It is advisable to cover the top with a piece of glass or small-meshed wire netting. Leaping seems to be a characteristic of the fish, but whether it is due to efforts to get at insects that may hover over the aquarium, or to restlessness or to unsatisfactory water conditions I have not been enabled fully to determine; but it may be any of these or due to a migrating instinct.

The Paradise fish is a good aquarium scavenger. It will clean out all insects and worms that would breed in aquaria in which goldfishes alone are kept. I have had aquaria infested with rotifera to an extent that they were literally filled with them. When the goldfishes were removed and a half dozen Paradise fishes substituted, in a few days every trace of them had disappeared, after which I returned the goldfishes and had no further trouble from that source. This has also been done to dispose of the objectionable tubicolous worms and hydra.

Large Paradise fishes cannot be kept with goldfishes, but small ones, introduced when quite young, are beneficial as scavengers and I greatly prefer them to tadpoles, as they better keep the aquarium clean of insects and some forms of parasites. It is not well, however, to introduce those which have attained a length of one inch or over, not previously accustomed to goldfishes, as then there is likelihood of their molesting the slow-moving goldfishes, tearing their fins and tails.

The Gourami is larger than the Paradise fish with a heavy-set body. In the breeding season the beautiful iridescent colors of the male surpass

those of the Paradise. They have only recently been introduced and I have not yet had opportunity to give them much study, nor can I at this time give a justifiable description of all their habits, but will do so at some not distant future time.

I would be pleased to give any further information on the breeding and rearing of the Paradise fish, if so desired.

The "Care" of All-Glass Aquaria.

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT.

The best way to care for glass tubs or cylindrical aquaria (and also glass globes) is to leave them tenderly without a regret at non-possession on the shelves of the dealer. This first paragraph was written last.

* * * * *

I had an experience. I received several by freight, all well packed in straw and in perfect condition. I placed them on a table, not even washing them. The next day one was hopelessly cracked or at least so badly cracked that it is useless for its prime purpose, but may be partly filled with gravel or earth and "do" for a vivarium or terrarium. The next day along comes a professor, biological professor of extended experience, and remarks:

"That's the way they go. We lost dozens of them and wondered why. We supposed there was a certain percentage of mortality and disappointment sure to occur. So there may be, but one day, by chance, I discovered the cause of most of the breakages. The assistant girl had washed several and set them to dry in a row. I was seated at a desk not far away. Snap, snap, went two of them almost together. There had been a suspicion of a theory in my mind that a cylindrical aquarium must be wholly wet or wholly dry. I went to the two that had broken and found them dry on one side and still wet on the side where the cracking began. To prove the truth of my theory, I took several from stock and put them in a row on a table. I moistened one side with a damp cloth, and sure enough these went to pieces. We saved the others by at once wiping dry the wetted parts. And look," he

said, pointing to my broken aquarium, "that further verifies my theory. See where the water trickled along the bench from the dripping pet cock and wet one edge of the bottom. It would have been saved if you had only put in a little water in the aquarium; even just enough to cover the bottom would have been all right for the uneven drying or wetting seems not to be disastrous if the other side is all wet, due to the uneven expansion and contraction."

"Simplicity itself," I said, and then I thought all sorts of bad things (perhaps let out a word or two) about the dealers and experts who had not told me about this little trick. And then I thought, as I had lost several in the past ten years, why hadn't I generalized and theorized and deduced an explanation. I too might have had credit for a little insight into causes and effects.

* * * * *

The next morning I started to "fit up." I took a perfectly sound cylindrical jar of the largest size in the lot. It was perfectly dry on the outside, but, alas the professor, had been filled the day before with water to the depth of about two inches. "Just enough to keep it from breaking." I took it into the best room in the house, placed it on a choice ornamental mat on a table by the window in the sunlight. I carefully arranged grit, pebbles and plants, and then stepped back to the rear of the room to admire the effect. I left the room. I soon returned. What, what! What's the matter? It's dripping. Must be a leak or perhaps a little water spilt where I set it. I took hold of the top to move it. W-h-i-sh-h, sl-u-s-h, sm-as-h, rush; a deluge. I and the floor—everything. The top parted company with the base. Then I cleaned up. Oh, what a mess! It was a job, no mistake. Oh, what a floor; what a room! Oh! I didn't realize that there was a barrel of water and a wheelbarrow load of grit in that aquarium. Then I sat down to think about it. In the midst of my meditations a voice inquired solicitously, "What's the matter?"

"Oh, nothing much. Just soliloquizing on a story I read of a man who trained a son in strictest of discipline, and the son went to the bad. Another man thought to profit by that example.

His son was given free rein and, well, that son went to the worse."

Then I went to my desk and wrote the first paragraph of this article.

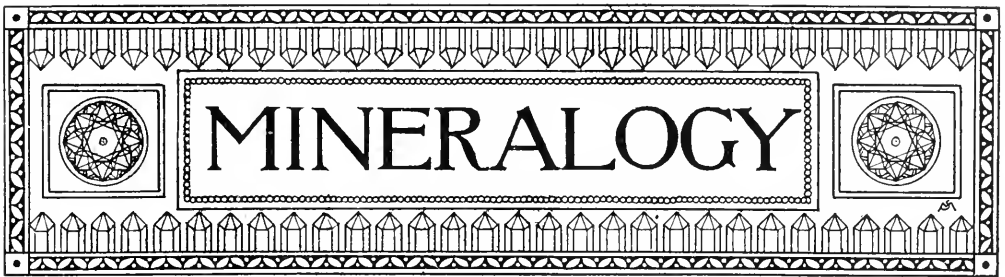
* * * * *

(Cylinders and globes are made of soft white glass that has the habit of considerable expansion and contraction, and when not most carefully annealed will break from very slight causes. The heat of the sun on one side will produce sufficient expansion to cause explosion; setting on a hard or uneven surface will cause cracking and the weight and pressure of the

contents breaking, and moving without lifting them clear will cause a deluge. A scratch with a nail not over one inch long so weakened a twenty inch cylinder that it broke within an hour.

Fish globes are a crime, and all-glass cylinders a curse. Ware free of them. Use only metal-framed aquaria; they are the neatest, strongest and best forms for their contents. Globes suffocate fish; cylinders break from very slight causes.

I wish I could have a national law passed to imprison every dealer for life who sold a torture chamber for fishes—a fish globe!—H. T. W.)



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

Selenite.

Selenite is one of the varieties of gypsum, a mineral that is used principally in the manufacture of plaster of Paris and like products. It is a sulphate of lime; that is, it is a compound of sulphur and lime with some water. It is

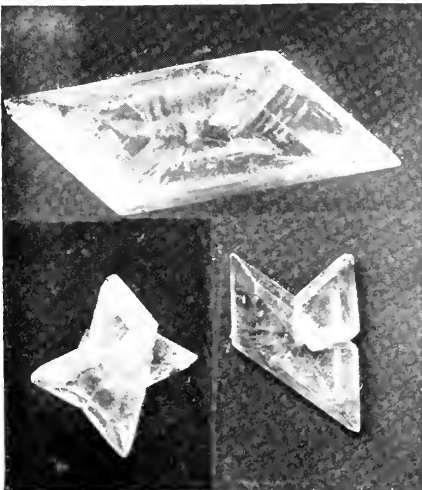


FIG. 1. SELENITE CRYSTALS.

found in extensive deposits in New York, Ohio, Illinois, Virginia, Tennessee and Arkansas, and sparingly in a number of other states. It is also found in Nova Scotia and in most foreign countries.

It occurs generally in transparent, doubly terminated crystals, sometimes singly and at other times in groups. Fig. 1 shows some of the crystals and groups. Fig. 2 shows the interior of a small selenite cave found in Wayne County, Utah. It is thirty-five feet long, ten feet broad and twenty feet high. The whole interior was filled with transparent selenite crystals of immense size. One group of crystals taken from this cave weighed six hundred pounds. It was the finest deposit of selenite ever found. Over twenty tons of fine crystals were taken out and shipped to Salt Lake City.

Some Curious Boulders.

Our first insight into mineralogy is very often from finding or observing some curious pebbles or boulders while on nature strolls through the country.

These are masses of rock that have been detached and rolled around by nature, generally by brooks or rivers,



FIG. 2. INTERIOR OF A SELENITE CAVE.

until their rough edges have been rounded off, when they are called pebbles if small and boulders if large. The picture given herewith is a boulder composed of two minerals, giving it a quite peculiar appearance. The white streaks are veins of quartz and the dark parts are composed of sandstone. The white pebbles so often gathered from beaches are simply clear quartz. At some of the beaches visited by tourists the demand for these clear pebbles is so great that they are made artificially by putting some pieces of clear



THE BOULDER COMPOSED OF QUARTZ AND SANDSTONE.

quartz into a receptacle along with some sand and this is then closed up and revolved until the pieces become rounded, when they are sold to the tourists as natural pebbles and are often cut and mounted, as watch charms or other ornaments.

Bronx Tourmalines

BY EDWIN W. HUMPHREYS, NEW YORK CITY

Tourmaline is one of the most beautiful and attractive as well as one of the commonest minerals found in the Borough of the Bronx, New York City. While it has not the beauty of color or transparency that the varieties found in Maine and California have, it does have that perfection of form which gives so much interest to good crystals of even the commonest of minerals. Instead of being brilliantly colored red, green or yellow as are tourmalines of many other localities, the Bronx specimens are modestly colored, being coal or pitch black and brown. At some localities, moreover, there are found tourmalines whose extremities are of different colors, one end, for example, being red and the other green or some other color. This phenomena apparently does not occur among the Bronx specimens, which in so far as I have seen them, always of a uniform color. Neither the black nor the brown is transparent; the nearest approach to it being in the brown variety which is slightly translucent. Crystals of the latter are sometimes curved.

Specimens of the black tourmaline are often of great beauty. I remember finding one, in particular, in which a mass of the pinkish or flesh-colored feldspar so common in the pegmatite dikes formed the background for a fine, slender, coal black crystal. These black crystals vary greatly in size, some being hairlike and a fraction of an inch in length, while others are several inches across and many inches long. Frequently the termination planes are very well developed. Occasionally, the crystals are cracked across and the interstices filled with quartz or mica, at other times plates of mica are apparently included within the crystal itself. This condition can only be found, however, by breaking the crys-

tal open, when the mica is seen to be so arranged that the plates are parallel to the length of the crystal. In such specimens it seems as if the tourmaline had either crystallized after the mica and so had included some of it within itself or that both had crystallized at the same instant. The inclusion of the tourmaline in the feldspar spoken of before admits of the same inferences.

Usually this mineral is found in individual crystals of varying size, but it sometimes occurs in aggregates of crystals which radiate from a common center forming the so-called radiating tourmaline. Both the brown and the black are found exhibiting this arrangement.

As to distribution, tourmaline may be found in almost any part of the Bronx, though the brown seems to be limited to the limestone formation at Kingsbridge, for despite the fact that I have examined much limestone in other parts of the Bronx I have never been able to find it. The black, however, is much more com-

mon and can be found associated with all the rock formations of the Bronx except the Inwood limestone in which I have never found it. The best places to look for tourmaline are in those excavations in which a pegmatite dike has been cut through, and as these are found extending through the rock formation almost everywhere in the Bronx, the distribution of the mineral is naturally very wide. Some of the exact localities at which it has been found are the following: Clinton Ave. and 180th St.; Webster Ave. near Wendover Ave., radiating black tourmaline; Westchester Ave. near the Bronx River, very fine specimens; Morris Park Ave. and White Plains Road and at other points along this avenue; at the entrance to Bronx Park on Crotona Ave.; in a rock dump at Southern Boulevard and 173rd St. These are only a few of the many places at which this mineral has been found.

If one is interested in the collection of minerals, the present is the time to collect in this Borough. While the rapid building up of this section makes it now a good collecting ground, yet it will ultimately render the gathering of minerals and other natural objects as difficult as it is in the Borough of Manhattan.

Note.—Some years ago I found a needle crystal of transparent green tourmaline in pure white limestone and also a part of a crystal not quite as large in circumference as a lead pencil, of green tourmaline with a pink center, at Kingsbridge Ship Canal.—Editor.

Minerals of New Hampshire.

BY MISS KATE A. JONES, GRANTHAM, NEW HAMPSHIRE.

Grantham, New Hampshire, and adjoining towns are quite rich in geological specimens which are found not only on the mountains but in the granite ledges which stretch for miles along the base of the hills.

During one of my walks I found fine specimens of quartz crystals in chalcidony while in the steep sides of the ledges were pockets lined with sparkling crystals. Among these one finds smoky quartz and the yellow or topaz crystals; others show delicate tints of amethyst, red and green.

A friend recently found some pockets filled with small, needle-like crystals, clear and perfect. Other cavities contained garnets; from one of these he gathered one hundred garnets of various sizes.



BLACK TOURMALINE FOUND IN NEW YORK CITY BY MR. WILLIAM NIVEN AND NOW ON EXHIBITION IN THE AMERICAN MUSEUM OF NATURAL HISTORY.

mon and can be found associated with all the rock formations of the Bronx except the Inwood limestone in which I have never found it. The best places to look for tourmaline are in those excavations

One of our mountains always has the appearance of being snow covered because of the pure white quartz, polished by the storms of ages, which crowns its summit. Here beautiful crystals are found.

At Grafton, New Hampshire, some of the largest crystals known to geologists are found. These crystals are of beryl. One, which I have seen, is in the Museum of Natural History in Boston, Massachusetts. Its weight is two and one-quarter tons. Another, found at the same place, is supposed to be the largest crystal in the world. Its weight is estimated to be not less than five tons. It is a perfect six-sided prism, having a circumference of twelve feet. Three weeks' labor by two men was required to expose this "giant of the mineral kingdom."

In the same town one finds mica, rose, smoky and amethyst quartz, staurolites and tourmalines.

At Lebanon, New Hampshire, is a mine where silver is found. A gentleman who had been interested in the gold mines of California, while travelling through the mountains of New Hampshire, discovered gold in the bed of a little stream at Enfield, New Hampshire. The more earnestly we strive to search out nature's secrets, the more deeply we are impressed by the vastness, the beauty and the richness of God's creations, while often we are led to exclaim, "How wonderful are all His Works!"

A Magnificent Gift.

One of our subscribers, Professor H. A. Green of Tryon, North Carolina, has presented to his native town, for the use of the schools, his valuable collection which besides representing an outlay of several thousands of dollars is also the work of his whole life. It comprises thirteen hundred specimens of minerals, about four hundred and fifty fossils, over five hundred and fifty shells, besides sponges, corals, etc., together with an herbarium of over four thousand plants, twelve hundred of which are seaweeds and two thousand lichens.

Lovers, in conjunction with all other lovers of nature, extend him our hearty thanks for his efforts to instill into the

hearts of the young a love for and a desire to know more of the wonders and beauties of Mother Earth.

A Few More Incidents.

BY WILLIAM C. BANKS, STAMFORD, CONNECTICUT.

The gaining of a little practical knowledge of mineralogy and geology is by no means a waste of effort. When one of the tunnels under the East River was being constructed, one of the engineers reporting on the rocks excavated found what he reported as so much decomposed rock. He sent samples to a mutual friend who was of the opinion that it was soapstone, and passed it along to me. It proved to be merely a very compact blue, and brown and white mottled clay. A lithomarge to be precise. Among the samples was a piece of white dolomite, which he correctly guessed was limestone, and hoped he was right, beside these a bit of gneiss. The point is this, the merest bit of accurate instruction in mineralogy and lithology, would have given this man all the knowledge concerning these things that he is likely to need in his profession. Because of the lack of it he is inconvenienced and obliged to have recourse to another. One day a friend was showing me some minerals, among the rest was one which he assured me was white sulphur, from Vesuvius. Well, it was, together with some lime and water, it was a fine twin Selenite about three inches in length. I got on my knees, figuratively speaking, but he was not amenable to reason. However, he had another selenite, a large Kansas crystal which he offered to break in two and go halves with me. I declined with thanks, so he gave it to me entire. I still have it. Also he had a few other nice things which he should be deprived of, having no true appreciation of their worth and meaning. His specialty is antiques—also postage stamps.

One day I was roaming among the hills with a friend, in search of rocks and scenery, when we encountered a friend of his who was addicted to antiques, chinaware, and such like. In the course of our conversation my friend mentioned the fact that I was

interested more in minerals. Huh! was the reply, some men would collect anything. Of course I felt properly abased. I thought his sense of courtesy positively unique. I hope it is.

One day I was looking over the collections of an old gentleman who had been an instructor in one of the English universities. He had a great many interesting things. Among them large crystals of quartz, from Brazil, enclosing clay; mud crystals he called them.

A gift he told us from Louis Agassiz. It was an extensive and a fine collection right through the list, but the bright particular star was a beautiful suite of English Fluors, mostly in shapely groups of blue purple, greens and yellows. Oh me! Oh my! After we had exhausted our stock of superlatives he unfolded his tale of woe. "Yes," he said, "they are beautiful. I have never seen better; but people tell me they are only good to shy at cats."



ENTOMOLOGY

An Ant's Nest that is Easy to Make.

BY ELLIOT R. DOWNING, PH. D., THE
NORTHERN STATE NORMAL SCHOOL,
MARQUETTE, MICH.

"Go to the ant, thou sluggard; consider her ways, and be wise: which having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest."

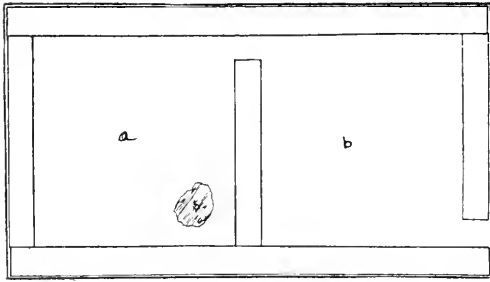
Ever since the days of King Solomon, at least, the ant has been proverbial for her interesting ways, a fit object for study and even worthy of emulation. The nest described here is easy to make and yet is so well adapted to its purpose that even children may keep a colony of ants in it, observing them constantly, for many months. It has been so successful an aid to the study of this interesting little animal in my nature study classes that I am induced to write about it, in the hopes that others, who do not know of it, may add to their pleasure. The idea is not original with me; I learned the method of construction and care of the inmates from Miss A. M. Fielde and afterwards saw several of her articles; others may not have been as fortunate, so the idea is passed on.

Take a piece of glass about five by ten inches as the foundation for the

nest; the exact size is immaterial, but this is convenient for a two chambered nest. Now cut some strips of glass a half inch wide; four of them, ten inches long, four, three and a half inches and two four inches in length. You can buy a glass cutter at the store for ten cents or so and the clerk will show you how to use it or he will cut the strips for you. With china cement attach the long strips close to the long edges of the foundation glass, putting one strip on top of the other, so as to make the wall two thicknesses of the glass high. In a similar way, cement the two four inch strips on at one end and two of the shorter pieces at the other end so as to leave an entrance doorway here. (See the figures.) Fasten the other two short pieces half way between the ends so as to divide the nest into two rooms. You will want, also, two glasses five inches square to serve as roofs for the chambers and two pieces of card board of the same size.

When the cement of the walls is dry, you must bind the edges of the nest with black cloth to keep out the light. Cut a couple of strips of the cloth, say black cambric, ten inches long and an inch and a half wide. Smear one side of each with LePage's

or other good glue and fasten it in place along the top of the wall, then turn it over the edge onto the bottom of the foundation glass. In the same way bind pieces on the ends, leaving the door open. Now cut strips of Turkish toweling an inch wide and the same length as the glass strips, that is, two ten inches, one four and one three



PLAN OF A TWO-ROOM NEST.
a, nursery; b, food room; s, sponge.



PLAN OF THE CROSS SECTION OF THE NEST.
c, black cloth binding; d, Turkish toweling; e, cardboard cover; f, the dotted line represents the rubber band around the nest; s, sponge.

and a half inches long. Fold the long edges of these pieces over until they meet in the midline, leaving the roughest side of the toweling out. Smear the tops of all the walls with glue and fix the toweling on the walls with the turned-in edges down. Lay the roof glasses on the chambers; they are supported by the toweling which permits air to get in and serves to prevent the ants from escaping if the cover is removed for a moment, as they find its rough surface difficult to crawl over. Now place a bit of moist sponge as large as your thumb nail in each room, cover the roof glass with the cardboard squares which may be held in place by rubber bands running around the nest and the house is done.

We must next secure our live stock. I usually take a pint fruit jar when I go out for ants. The wood ant, found in decaying stumps, is a good one to observe, or any of the larger kind that live in the ground or under stones may be used. When you have found a colony of ants, dig into their nest until you find the larvae or cocoons; the

latter egg-shaped, pale yellow objects like small kernels of puffed rice, the former, tiny white worms with one end curved like a hook. Now scoop up some of the ants and their larvae and cocoons into the fruit jar, tie your handkerchief or other cloth over the mouth so they will not smother on the way home.

Now, how shall we induce the ants to go into their new home? It is a very simple matter and yet, until you know how, it is a very difficult task. I once told one of my nature study classes to put the ants in the nest and neglected to give them the detailed directions how to do it. When I returned to the room a few minutes later it was to see a lot of girls frantically shaking ants out of their sleeves, boys chasing ants about the floor or slapping their legs to stop the progress of intruders, for ants are quite as difficult to drive as the proverbially obstinate pig and a good deal more difficult to see when they do bolt for liberty. Take a pan large enough to hold the nest and leave some room besides and place it in a still larger pan. Put some water in this larger pan so that the smaller one will be entirely surrounded by water. Put the nest in the smaller pan; be sure that the sponges are moist and the cardboard covers in place. Dump the contents of the fruit jar down beside the nest and leave it; as the debris dries out the ants will seek for themselves and their young some dark, moist retreat and as the nest is just such a place they will move their larvae and cocoons to it. When they are comfortably settled, plug the entrance doorway with some absorbent cotton or a wad of cloth. Now the nest may be kept anywhere. It is well not to have more than twenty-five or so of the ants and about the same number of larvae and cocoons in one nest.

We may now make one of the rooms the feeding room; remove the cardboard cover from over the roof glass and take the sponge out of this room. Put in a bit of peanut as large as a bird seed or a crumb of sponge cake moistened with honey or a shred of raw meat. Any one of these makes

provision enough for the whole nest, for a week. Stale food should not be left in the nest and if any becomes mouldy, it must be removed at once and the room cleaned. Cleanliness is quite as essential to the health of the ants as it is to human beings and housecleaning should come every two weeks, but it is not a very serious process in this simple house. When the ants are all in the dark room, and that is where they usually are, remove the roof glass from the food room, and plug the doorway leading from it into the nursery. Wipe out the room with a cloth dampened in alcohol so as to kill all mould spores, for mould is fatal to the ants. Now put the moist sponge in the room after it has had time to air a little and cover it with roof glass and card board, first taking the plug out of the doorway between the rooms, however. Take the card-board off of the nursery now and the ants will obligingly remove their possessions and themselves into the clean chamber when you may clean the nursery in the same manner. Always keep the nursery dark, except when the cover is off for a few moments of inspection, and the food room light.

After you have made the first nest and have watched the inhabitants for a while you will probably want to secure other kinds of ants and keep them to compare their habits. Do not try to put more than a single kind of ant in the same nest, at least not until you know a good deal about their out-of-door ways. Larger nests of three or four rooms may be made for the large colonies and small nests for the tiny ants. The animals have been kept in these nests for years so that if you are not at once successful in keeping the colony alive you may be sure that you are neglecting some important detail. Keep the sponges moist, not wet; feed sparingly, occasionally giving a bit of fruit; clean the nest thoroughly. Attention to these things should insure success from the start.

September! Perhaps your chief merit is that you prepare the way and usher in October, the month of the fullness of interest and beauty.

Peculiar Metamorphosis of the Tobacco Beetle.

BY DR. R. MENDER, SAN ANTONIO, TEXAS.

Shortly after my contribution on the tobacco beetle was in the hands of the editor of *THE GUIDE TO NATURE*, I happened to shell out another larval beetle



PHOTOMICROGRAPH OF MATURING TOBACCO BEETLE LARVA.

Very highly magnified. Original, one-eighth inch.

from a cigar in its maturing cycle of development—and a most interesting study it was! Its cubic length was only about one-eighth of an inch, and it was in its shedding stadium. After detecting this specimen, which was partly (its thoracic and head parts, antennae, legs and part of the abdomen) denuded of its previous external integument or hull and of white color, I mounted it in glycerine on a slide glass, and at once prepared the photomicrograph seen herein, which I believe an unusually interesting and rare

specimen to study the genesis of such minute beetles.

The microscope and the photographic reproduction in this issue of *THE GUIDE TO NATURE* from the original specimen show how the developing offspring of this minute larvae (hardly one-eighth of an inch long) sheds its previous integumental environments and gradually frees itself entirely of all its former hulls. The latter are nicely seen on this photograph—about half way stripped off its new anatomy—the lower dark outlines with the characteristic hairy integumental covering (a) and (ab) being gradually peeled off and folded up at the base part (ab) of the new beetle's abdomen, when the thus "newborn" little fellow is about "ripe" to escape into the world—after perhaps one more evolution of its thoracic organs, the wing parts and other of its anatomy. Some outlines of the (ringed) abdomen of this maturing tobacco beetle are quite plainly seen through the dark outlines of the old hull (b) and the developing feet (c)

and one antennal appendage—the jointed and curved organ (d) at the head parts (e) with both dark eyes with lens, and the thoracic outlines (f) are quite conspicuous. The entire process resembles somewhat the shedding process of certain hairy caterpillar (larval butterflies) and other forms of insect life, including the vast numbers of all genera of beetles.

When I first detected this specimen it showed life, but its movements were very feeble and hardly perceptible. It was found snugly imbedded between some of the cigar foldings, in a furrow similar to the larvae found and described and illustrated in the June issue of *THE GUIDE TO NATURE*, but it is a much further advanced pupal state than the one seen in the previous specimen of the single cigar specimen.

This closes the history of the metamorphosis of "just a little bug," the tobacco beetle; and I hope I am not again intruding too lengthily on the valuable space of *THE GUIDE TO NATURE*.



The Peony: "King of the Garden."

BY GEORGE H. PETERSON, FAIR LAWN, N. J.

The peony of to-day stands pre-eminently and unquestioned "King of the Garden," just as for ages the place of "Queen" has been accorded to the rose, and, while the latter has ever been associated in our minds as of the aristocracy of flowers, the most of us have, until recently at least, thought only of the peony as we have of the hollyhock, the larkspur and lavender of "Grandmother's garden," so often now referred to.

Since that day, however, the subject of this sketch has undergone an evolution of wondrous development, until

to-day, we have flowers on four-foot stems, ranging from six to nine inches in diameter, and in color from purest snow white to deepest, blackish maroon; in all imaginable shades of pink and yellow, and often in the same flower combining in wondrous combination many shades and colors. Coarseness, at least in our minds, is usually associated with great size, but this is not true of the peony, for immense as the flowers often are, their delicacy of coloring is scarcely equalled by the rose, and the silky satiny texture of its petals are often such as to put sheer silk itself to blush.

But, I hear some one say, "The chief

charm of the rose is in its sweetness." very well, here, too, the modern peony challenges the "Queen of Flowers." Was ever a rose sweeter than Mme. Crousse or Madam de Verneville? Was ever flower more refreshing than the syringa-like fragrance of Philomele or the spicyness of Mons. Krelage? Did ever flower possess the rich, languorous oriental odor of La Tulipe or Marie Jacquin?

While there are other species of peonies of more or less value, the chief one, and in which such vast improvement has been made, is the *Chinensis* or *Albiflora* class. This was taken up by the French hybridists during the latter half of the past century, with the results which we see and enjoy to-day.

CULTURE OF THE PEONY.

The peony delights in a rich, deep soil of medium character; i. e., that which is neither clay nor sand. Fresh manure should not be placed in contact with root. The peony will live and grow in any ordinary soil, and with ordinary care or, for that matter, with no care at all, but where specimen



THE ACHILLE.

blooms are wanted, special preparation and care should be given.

Planting should be made in fall after the roots are well ripened, which in this latitude, near New York City, occurs during late September and early October. From this time until the first of May they may be planted when-



IN A FIELD OF PEONIES—A MASS OF DELIGHT.

ever the frost is out of the ground, but, when convenient, it is desirable to plant in the early fall. At or near the top of the root will be seen protruding, dormant eyes or buds of a fleshy nature. In planting, the root should be set so that these eyes are about three inches beneath the surface of the soil. If the plants are to remain undisturbed for a long term of years, the roots should be placed three and one-half feet apart. A light mulching of manure may be placed on the surface for the winter, but this is not necessary or even desirable if the ground has been made quite rich. In any event, it is not well to smother the peony during winter, as it is a cold-loving plant, and freezing of root is more beneficial than otherwise.

In spring, soon after the frost is out, the mulching, if any has been given, should be raked aside, and soon thereafter will be seen the strong, reddish-green shoots bursting forth from the ground, and which grow with surprising rapidity. All that is necessary from this time until the flowers bloom is to keep the surface of the ground mellow with a hoe, without going deep enough to disturb or injure the root, also give copious supply of water if rains are infrequent. An occasional application of manure water during the month of May or the period of rapid growth, which corresponds to this time

here, will tend to develop extremely large flowers.

Each strong shoot will usually produce three or four buds, but, with the exception of the largest central one, these should be pinched off where quality and not quantity is desired. After blooming, the only care required will be to see that the ground is kept free of weeds, and in October, when the foliage turns yellow, it may be cut off and removed, and the root beneath the surface is then in the same condition as when first planted, except that it has doubled in size.

While the peony, because of its hardiness, freedom of disease and insect pests, is especially the flower for "the people," it is also one of the most useful of all-around flowers on estates of the rich. There it may be employed in large mass beds, and so will give a color effect perhaps superior to anything else which can be used. For bordering long walks and drives, it is also specially effective. As a cut flower it has scarcely a rival, and is now used very largely in bold decorations. For this purpose, the flower should be cut just as the bud begins to expand, and in this condition it may be kept for a week or more, if placed in water in a cool, dark cellar. It will then open up much larger and finer than if left on the plant.

For foliage effect the peony is also



MARIE JACQUIN.

very useful. Even through the worst droughts of midsummer the foliage retains its fresh, glossy greenness, untouched by insects or diseases, and this can be said of very few other plants in the floricultural world.

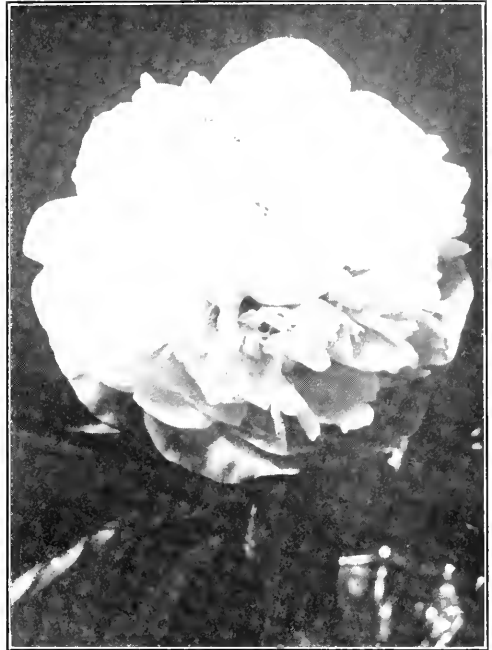
A few of the leading varieties in this class of peonies, and which are most generally successful, are

Edulis Superba
 Festiva Maxima
 Jeanne d'Arc
 La Tulipe
 Duchess de Nemours (Calot)
 Mad. Calot
 Mad. de Verneville
 Marechal MacMahon
 Marie Jacquin
 Modelé de Perfection
 Modeste Guerin
 Couronne d'Or
 Mad. Barillet-Deschamps
 Mad. Ducl
 Mons. Dupont
 Sarah Bernhardt
 Marie Lemoine
 Octavie Demay
 Avalanche
 Claire Dubois
 Mons. Martin Cahuzac

The above will give a wide range of color, form and season.

Next in importance to the above class is the mountain or tree peony. This species bears its flowers some two weeks earlier than the above, and, unlike the *Chinensis* peony, the growth of each year does not die away above the surface of the ground. On the contrary, this growth increases slowly in size each year, and in fall the foliage falls off as with a deciduous shrub. This is an exceedingly interesting class of plants which has been developed to a high state of perfection by the Japanese, with whom it has been a favorite flower for hundreds of years, and, while it is a fairly hardy plant, yet in severe northern latitudes it should be given protection in winter.

Blooming at about the same time as the above, comes *Paeonia Tenuifolia*, a brilliant red flower, both single and double, of medium size. The foliage of this species is particularly attractive,



MARIE LEMOINE.

being very deeply cut, as in a very fine fern.

Following this, and before the Chinese peony blooms, comes *Paeonia Officinalis*, whose chief variety is *Rubra Plena*, the old fashioned red peony of our grandmothers' gardens. The color of this flower is exceptionally brilliant, but, compared with the Chinese varieties, the flower is only moderate in size, is not agreeably fragrant and comes on rather short and not very strong stems.

While there are other species of peonies found in various parts of the world, the above four embrace all that are worthy of general cultivation by the amateur, and no diversion of man will be found so alluring and fascinating as the cultivation and study of this truly wonderful flower.

"Not interested in it," occasionally we hear said of Arcadia or one of its publications. And then we are not discouraged, but increase efforts in that particular direction, because our mission is to interest people in nature, as well as to assist those already interested.

THE CAMERA

The title 'THE CAMERA' is presented in a decorative, stylized font. The word 'THE' is in a smaller, serif font, while 'CAMERA' is in a large, bold, serif font. The letters are set against a background of horizontal lines. To the left of the word 'CAMERA' is a detailed illustration of a vintage camera with a lens and a flash. The entire title is framed by ornate, scroll-like flourishes.

VERY BEAUTIFUL CLOUDS AFTER A MAY THUNDERSTORM AT ORANGE, NEW JERSEY.

Photographic Studies of Squirrel.

Here are some excellent photographs of grey squirrels kindly contributed to THE GUIDE TO NATURE by Dr. Thereon

Kilmer, 165 West Eighty-fifth Street, New York City. They show good skill, patience and love of the graceful animals.



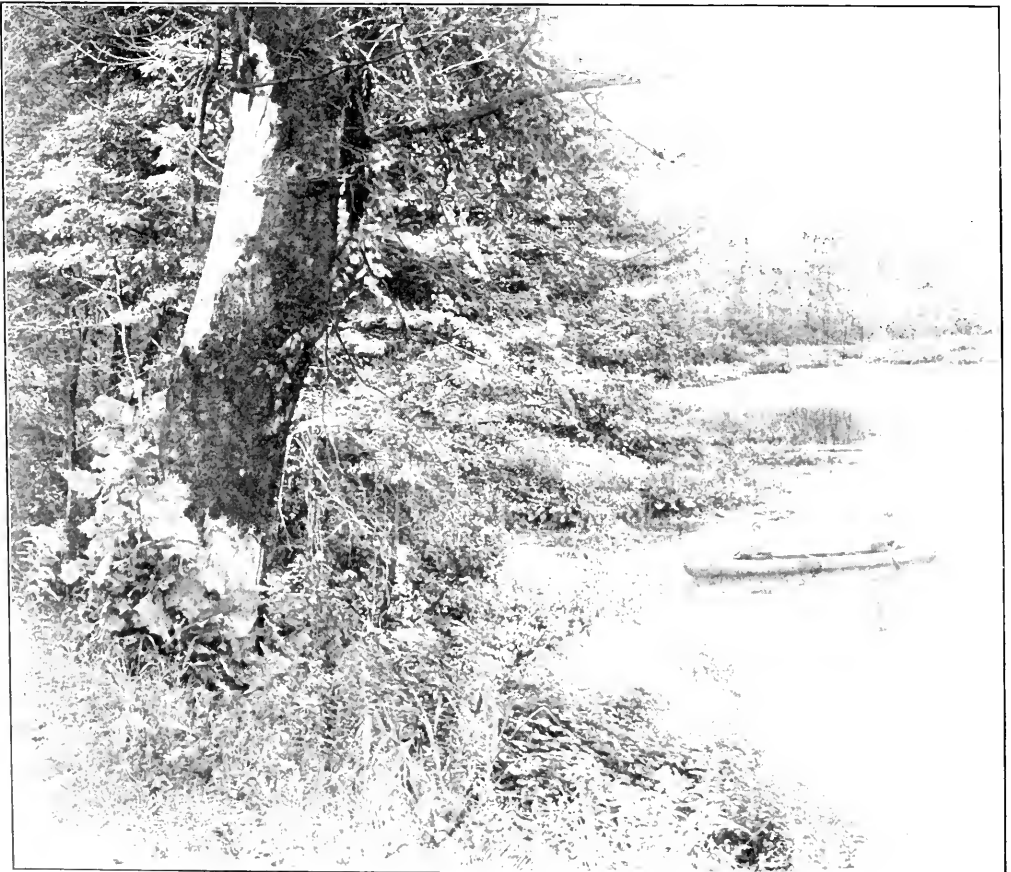
A PROFILE STUDY IN "EATING BREAKFAST."



DON'T YOU WISH YOU HAD A BITE?



"IT'S GOOD."



"ALMOST TOO GOOD FOR PHOTOGRAPHY"

The Charms of Boating.

Here is a gem of the photographic art. The old tree, the distant dreaming vista, the exact angle of the canoe and the delineation of every detail in the reflection, all combine to produce perfection. It seems almost too good for photography. Who would ever think of the "unstable equilibrium" of a canoe in looking at this scene? Rather does one feel a sense of perfect poise and restfulness. Gladly would the beholder float away into dreamland of reality.

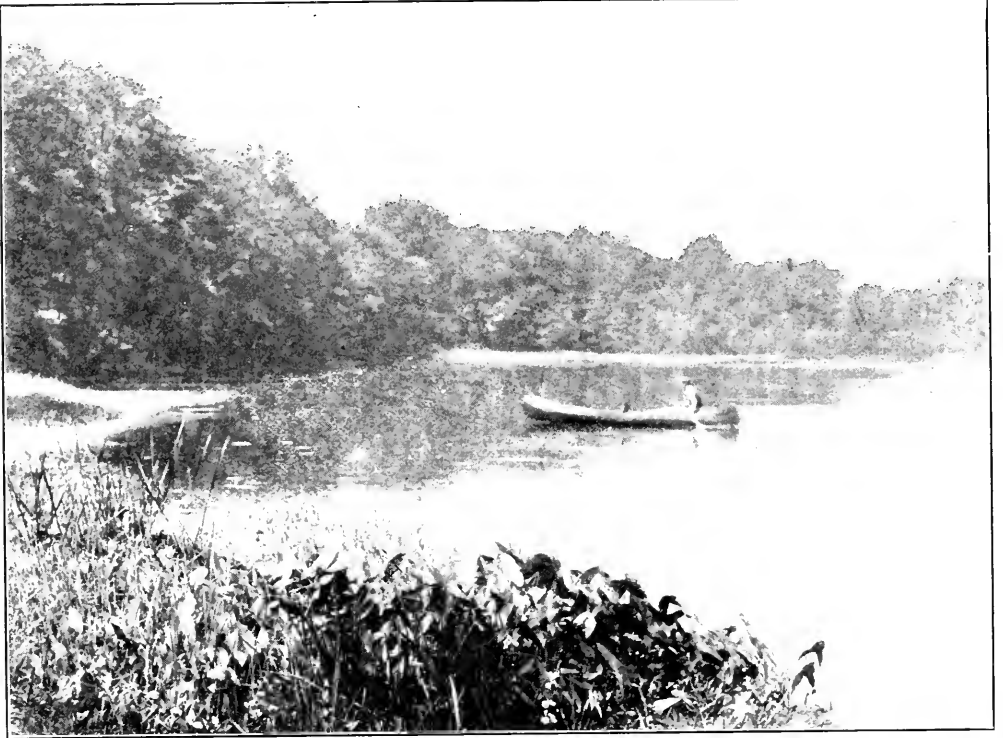
The photographer is Mr. Frank P. Jewett of Orange, New Jersey. He also submits the two following. The boat and the path, the shady tree, the foliated arch and the tangled borderland are worth careful study. Even the tufts of grasses in the center of the foreground were needed there for perfect finish. How the indefinite far-

ther course of the path and the somewhat limited view of the distant boat lure one on, and bring up imaginings of even greater riches. But such is life! The present wealth needs the supplement of uncertain future attractions. And here we have the epitome of all in one picture. That's why I have labelled it, "Life," though there is none visible. Things are sometimes the antithesis of what they seem!

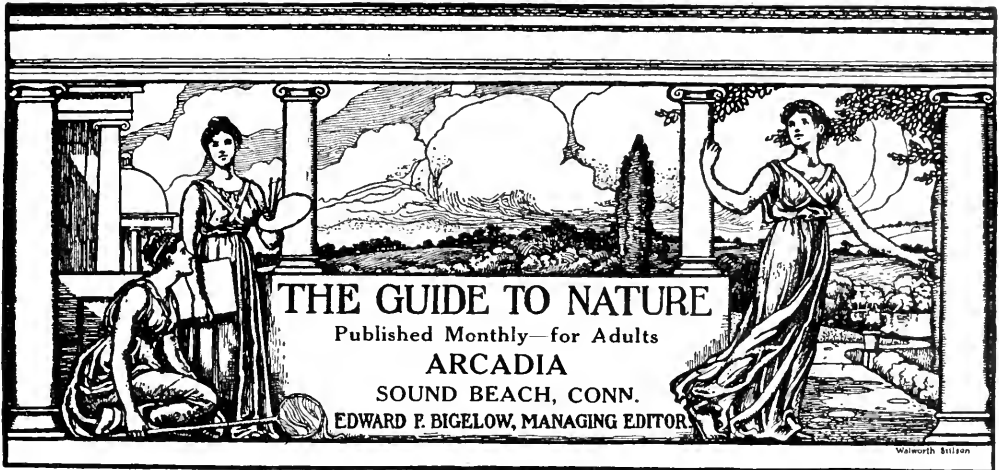
For a study in aquatic plants, of the foreground and the mellow hazy distance, this third picture is well worth close attention. The boatman has not so much pleasure for himself as he gives us. He did his part well. The unconscious beauty of him and the boat will reach thousands of whom he never dreamed. That stroke of the paddle was but one of hundreds, but it was the one that shall live forever. Perhaps some act of ours here or there shall make all the others worth while.



"LIFE"—WHICH WILL YOU TAKE—THE PATH OR THE BOAT?



THE SENTINEL BIRCHES, AND A STUDY IN AUSTRIA.
photographed by Sarah Weaver, Plattsburg, New York.



Why You Should Be a Naturalist.

A naturalist is one who takes an appreciative interest in the natural world. This interest may be general or limited, but in either case it must be real and active. Interest limited to effusive words is fully as sacrilegious as absolute indifference—perhaps indeed more so. The indifference may have the excuse of ignorance, but effusion alone is hypocritical.

You should be a real naturalist:

First, because you have been endowed with intelligence and esthetic powers and placed in an interesting and beautiful world.

Second, because the series of privileges we call life is ensured to us only once. Other privileges may come, but these never again. "Life is real," and the realities are better than the artificialities.

Then you should persist in being a naturalist. Do not admit and act on the force of the argument once or for limited time, and then be content ever afterwards to be a "has been."

Most people are naturalists, at heart, and some of the best are so without knowing it, because they have never realized that their own powers of observation and appreciation come within the scope of the meaning of the term, naturalist.

So do not forget: "A naturalist is one who takes an appreciative interest in the natural world." A general love of starry skies, sunrises and landscapes

may lead to greater riches of less conspicuous things. Truly said Fabricius, "*Natura, maxime miranda in minimis*" (Nature is most to be admired in those works which are the least.)

As a general rule it may be said of the naturalists' riches, as of those of the commercial world, the rarest things or those the most difficult to obtain are the most valuable.

Are you missing much of this nature wealth? If so, strive at once, and earnestly, to obtain that which is yours.

Yes, *you* should be a naturalist, and probably are.

Do Not Be Egotistical.

Do not limit your thoughts to yourself, admire yourself and talk about yourself all the time. Be not always centripetal, but sometimes fly off in centrifugal tangents. Explore the surroundings. Get out of yourself.

I do not mean you, individual, and yet I do as well upon second thought; but I had in mind primarily you, humanity. You, the human race, limit too much your talk, your oratory, your ideas of value, your publications to yourself. Go to any news counter or reading room and a mere glance at ninety-nine per cent. of the periodicals show you that they say incessantly, "I," "I," "I," "I,"—"I, humanity, did this, did that. We like to talk about and think about and read about ourselves too much. Humanity can be too egotistical as well as can an individual. Get out of

yourself, humanity, and recognize that though you may be "it," you are not "all." "There are others," and other forms of life; other things are worthy of careful consideration.

THE GUIDE TO NATURE is the very antithesis of egotism. Its prime purpose is to lead you, humanity, delightfully out of yourself to a considerate appreciation of "the others" around you. The same Power that produced you produced them also. What would you think of a set of children, or one child, in a family that took no notice or had no regard for other members of the same family! I do not believe the Head of the Family would enjoy that. Probably it was this thought in Browning's mind that induced him to write, "God must be glad one loves His world so much."

But, O Browning, why didn't you tell us about the egotist who has no love or regard for the other parts of His World? Perhaps even you, with all your verbal skill, could not have given full expression to your thoughts on such indifference.

Don't be egotistical.

A Life Saving Dog.

There is one dog in Holyoke who ought to have a Carnegie medal for the saving of life, if all accounts of its actions at the time of the big Donoghue fire on Main Street are true. Mr. and Mrs. Joseph Crochier lived on the fourth floor of the block, and the evening of the fire Mr. Crochier was at the Red Men's meeting and the family had retired for the night. Blanche, the eighteen-months old baby, was sleeping in the crib, and at the alarm of fire in some way the family got separated from the baby and she was left behind. According to the story, Rover, a four-year-old bull-dog, owned by Mr. Crochier, was bound to go back into the building and could not be stopped. He got away from those who tried to stop him and, going into the tenement, which was filled with smoke, he seized the infant by the dress and brought her down the four flights of stairs to the open air. The baby was almost stifled with the smoke, but soon recovered. In talking of the matter last

evening, Mr. Crochier said that there was not money enough in Holyoke to buy the dog.—*The Republican*, Springfield, Mass.

CORRESPONDENCE

How Sea Urchins Dig Into Rocks

Grantham, New Hampshire.

TO THE EDITOR:—

Miss Sarah Root Adams in her very interesting article, "A Rock-pool by the Sea," writes: "I have read, in a work translated from the French by an English naturalist, that the sea urchins hollow out holes for themselves in the hardest rocks. I am curious to know whether on any part of our coast they do this."

I have never been able to discover them in their rock homes, but in a little book ("A First Lesson in Natural History") I have, written by Mrs. Agassiz, I find this: "The sea urchin has one very peculiar habit. He bores for himself a hole in the rocks, which just fits him, and makes a very comfortable and snug retreat. The common sea urchin of Nahant, Massachusetts, is one of those that make these singular holes, and you may have an opportunity of seeing them in the rocks there."

So far as I can learn, their method of making these holes, which have been found in both hard and soft rocks, has never been discovered. That they are made by the animals themselves seems to have been proven beyond a doubt, as they are found in them, and fit them so perfectly that no animal not of exactly their size and shape could have fashioned them: they are of all sizes, from that of the young sea urchin to the full grown one.

Some naturalists have supposed them to have been made by the constant friction of a fringe that is in unceasing motion. This fringe, which is invisible to the naked eye, covers the spines of the animal, and by the continued turning over and over of the sea urchin in the same spot the hole may be worn in the rock.

It is hard to believe that these holes, which have been found in the hardest

rock and fit the animal as perfectly as if cut with the nicest instrument, can be made with a substance so delicate and soft as the fringes on the animals.

To me, with what I have been able to learn personally of the sea urchin, it is still an interesting mystery about which I am very anxious to learn more.

KATE A. JONES.

PANSIES IN SEPTEMBER.

BY EMMA PEIRCE, SUGAR HILL, NEW HAMPSHIRE.

Pansies, little faces,
With their airs and graces,
Line the garden path,
September's aftermath.

From shades of deepest night,
To tints of sunshine bright,
And fire on setting suns,
Their color-gamut runs.

And character they have,
As well as color brave,
And messages of cheer
Through blossom time of year.

With charm acquaintance lends,
They greet us like old friends.
And life is richer far
Where beds of pansies are.

OCTOBER.

BY EMMA PEIRCE, SUGAR HILL, NEW HAMPSHIRE.

The trees are rioting in wealth
Of eastern kings of old,
For they have felt the Midas touch,
Are turning into gold.

Refining fires of maples, too,
Are lighting all the land,
The crimson torches, near and far,
Ablaze on every hand.

Their work is ended, one by one
They rest within the wood;
And in this transformation scene
Is written,—“It is good.”



Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

THE NEED OF ASSOCIATION

The development of one's personality cannot be accomplished in isolation or solitude; the process involves close and enduring association with one's fellows. If work were purely a matter of mechanical skill, each worker might have his cell and perform his task, as in a prison. But work involves the entire personality, and personality finds its complete unfolding, not in detachment, but in association—Hamilton Wright Mabie.

Personal

To BOYS AND GIRLS:—

All my magazine writing for boys and girls, and their letters of observations or of inquiry with my answers, are in the "Nature and Science" department of "St. Nicholas" of which I am the editor. While that magazine is not the official organ of the AA, my connection with it and with the AA brings both into close affiliation. All our boys and girls should therefore be regular readers of "St. Nicholas." It is the best magazine ever published for young folks. It also is of great interest to adults, especially to

naturalists. We shall be glad to send you a circular.

We can assist you in any way that you may desire, with or without pay. If you will help us as you may be able, we will reciprocate and will try to live up to the Golden Rule. Our calls are many, our correspondence enormous, our information on every phase of nature is extensive and what we do not know we can find out for you. Careful attention is given to every correspondent. Write plainly, concisely and on only one side of the paper.

The Agassiz Association,
EDWARD F. BIGELOW, PRESIDENT.
Stamford, Connecticut.

Recent Contributions to Arcadia.

Since the furnishing of the accounting room of the AA Home at Arcadia, Sound Beach, by the Buffalo, New York, Chapter (as previously announced) the principal gifts have been as follows:—

A fine pair of large, plate glass, photographic mirrors made to special specifications, contributed by Mr. W. W. Heroy of Stamford, Connecticut.

An equipment of working tables for the laboratory by Mrs. Henry Lee Higginson, Boston, Massachusetts; Dr. Robert T. Morris, New York City, and Mr. Charles M. Goethe, Sacramento, California.

Dr. Amos J. Givens of Stamford, Connecticut, has liberally contributed to the expenses of certain scientific work.

Aid Needed in Operating Expenses.

The following paragraph from the January number of THE GUIDE TO NATURE, in the announcement of Arcadia, is herewith repeated in all its emphasis of bold face type and underlining:

“No provision is made for the expense of assistants, experiments, photography and other operating expenses.”

The prophetic theory that induced that paragraph several months ago, before the foundations of the buildings had been laid, has now merged into actual experience. Let me repeat further from that number:

“I appeal for assistance in expense of operation and in proving the appreciation of the entire plan.”

The student and aiding memberships are as follows:

\$3.00 paid upon entering and \$1.50 per year thereafter constitutes a person a Corresponding Member.

\$5.00 paid annually constitutes a person a Sustaining Member.

\$100.00 paid at one time constitutes a Life Member.

\$1,000.00 paid at one time constitutes a person a Patron.

\$5,000.00 paid constitutes a person a Founder.

\$25,000.00 paid constitutes a person a Benefactor.

I and members of my family who aid are willing to give a large part of our time, to pay rental to the AA for the residence, to devote a large part of personal means, to do all possible—but the rest, an important part, you must do or it will not be done. Come and see the cash books and add your assistance to actual expenses. Let us tell you what we need.

What the AA Means.

The Agassiz Association stands for the study of nature from the student's point of view. It is the University and not the Kindergarten. Whether you are four or eighty-four it says, be an original investigator; see things for yourself; look into the thing, not into what has been written about the thing; what you find, not what someone tells you to find; begin with nature; In the words of the great scientist from whom we take our name, “Study nature, not books.” The Association does not stand for the Kindergarten notion which says, “I will show you how to play the game; then we all will play it.” It does not tell you to study this or that and to do it this month, regardless of the fact that “this” or “that” may be totally inaccessible to you.

Its officers have no salary. They gladly give their time and their labor. It confers honors where it sees honors are especially due. There are no money dividends. It is an Association for mutual helpfulness, in which every member, every Officer, every Councilor contributes time or money, or both, to further the original study of nature. The AA believes that there can be no higher occupation for the human mind and nothing more inspiring than the contemplation of some aspect of this beautiful world.

It frankly invites you and with no secondary motive to join its ranks, to help and to be helped, to give your time and your mite of money to help yourself and to help others, and to receive gratefully the assistance that others can give you.

In this matter of mutual helpfulness in the study of nature, by all ages and in all places, the AA is the oldest, most

extensive and most efficient organization in existence. Its membership means aid; its honors mean merit; its study of nature means love for nature, and its onward course is ever true to its motto "Per naturam ad Deum." On these principles, and to this end, it cordially invites *you*, if you are not already a Member, to become one, or to form a Chapter of Members. If you are a Member, it urges you to greater activity in extending its influence. The work of the AA was never more needed than in this age of artificiality, of the nervous strain and stress of the modern struggle for existence, of the tension of high keyed life, of intense competition, of financial fluctuations and of varying prosperity and adversity. Now more than ever there is a deep meaning in the words "back to nature," or better still, "keep anchored in nature."

You Are Cordially Invited

To become a member, either by forming a Chapter, or as a Corresponding Member. The total necessary expense for an entering Chapter is \$3.00, viz:

CHAPTER ORGANIZATION EXPENSE. "	
Entrance Fee, - - - - -	\$1.25
Handbook, "Three Kingdoms," -	.75
Engraved Charter, mailed in tube	1.00

Total necessary expense to a Chapter upon joining the Association, \$3.00

The Charter is 17x22 inches, handsomely engraved (diploma style) on steel, and contains an excellent portrait of Agassiz, the golden seal of the AA, the names of your officers, the motto of the AA, a representation of our badge, the "Swiss Cross," the name and number of your Chapter, date of its organization, date your annual report is due and the autograph of the President of the AA.

ANNUAL DUES.

The Annual Dues for Chapter, -	\$1.50
The Annual Dues each Member, .	.05

For the \$1.50 the Chapter receives the Official Journal THE GUIDE TO NATURE (subscription \$1.00 per year) and contributes 50c. to general expenses.

For the 5c. individual fee, each member contributes to the expenses of the home office, and obtains the right to

have questions pertaining to nature answered by mail, either by the President, his Private Secretary, or by some member of the Scientific Council. The object of the Council is to place each member in direct communication with authorities in the various departments of nature and science.

CORRESPONDING MEMBER'S EXPENSE

The total necessary expense for an individual joining as Corresponding Member is as follows:

Entrance Fee, - - - - -	\$0.25
Handbook, "Three Kingdoms," -	.75
Certificate of Membership (18x23 in.) - - - - -	.50
	<hr/>
	\$1.50
Annual Dues, - - - - -	\$1.50
	<hr/>
	\$3.00

Includes THE GUIDE TO NATURE, and all the privileges of Council and Home office as with members of Chapters.

AA buttons, 5c each.

Our Humane-ness.

The laws forbid, as I walk the streets, that any one shall punch me; as I sit in my house, no one shall enter and thrash me; nor in any place, shall I be afflicted with galling, grievous, unjust burdens, nor shall I be the subject of cruelty in any form.

But, if that is all humanity has for me, I am of all men most miserable. I want to be more than an object of pity. Indeed a sense of fair treatment, which shall with their pity cater only to their self-satisfaction, is not all I crave—not all I am entitled to at the hands of fellow men. I crave not only to be a target of their humane qualities but one with them. I ask not merely that they have a Band of Mercy to apply that quality to me, as an inferior, but that they have a Band of Interest—for real study and full equable appreciation. I am a part of Creation—by the same Creator as they.

But who is this other I for which I, the writer, plea figuratively, thus putting myself in their place? I am the horse, the dog, the cat, the bird, with myriads of other forms of life, worthy more than Mercy or Protection.

So, I, the writer, say the Bands of Mercy or other Societies of Protection are good only part way. An AA Chapter is far better, in that it finds its mercy *not on our self-satisfaction but in intelligent appreciation.*

It is a self-satisfaction merely to give money to a poor man begging at the door. Such "gifts" are but the purchase of the absence of pain on the part of the "giver." So money given merely to stop our pain, to cater to our sense of justice or pity when a man is pounding his horse, is good; but it isn't the highest ideal. That man plying his club on the horse is manifesting his spirit, not far different, perhaps, from the one who plys money to officer or court to pound him. It is but a little while since we, humanity, came out of savage fight and struggle, and perhaps in the present stage of development the crude methods of Humane Societies or Bands of Mercy or Societies for Protection are the best we can do. There are more Humane Societies, more Bands of Mercy, with pity and clubs of protection than there are Appreciators of Life in all its varied forms, more to pity the horse than the make-up of the man that makes him want to pound the horse, more societies with laws of restraint, catering to self-satisfaction, than there are Chapters of The Agassiz Association with the higher ideals of equality, merit, of equal regret for the "pounding" of the man, or the "shooting" of the hunter, as well as for the suffering of the horse or the death of the white heron.

It's coming yet for a' that and a' that, when man and beast and bird shall brothers be for a' that and a' that.

The AA is but a double emphasis on the beginnings of the alphabet, of the new era, when mankind shall lay aside laws and then necessity, poundings and their incentives, shootings and their motives or selfishness.

The AA has not a law for protection or restraint, not a blow or shot at the man any more than for beast or bird; it peers forward to the ideal man of the future rather than backward to days of savagery.

Are you looking forward or backward? Help us to "ring in the new."

Nature Studies.

BY MISS HARRIET E. WILSON, CORRESPONDING MEMBER NO. 2101, STORMSTOWN CENTRE COUNTY, PENNSYLVANIA.

Nature studies! I have had nothing but nature studies a lifetime. I was born on a farm and lived there more years than I expect to live. Only little more than a year ago we moved to the village and here we have nature too—birds, birds, plenty of them.

I have been interested in two robins. Their nest is in a neighboring lot. They seem to obtain most of their living from my lot. I observed one eat three fishing worms in less than a minute—three fishing worms, my fishing worms that I depend upon to unlock the fertility of the soil. I am not begrudging the robin the worms. The robins were at the green strawberries for breakfast and the last thing at night, leaving very few for me, and now it is the cherries, many of which are being destroyed with the help of the English sparrow.

We notice, too, that the bumblebees are more numerous than they have been for years. I deplored the scarcity of the bumblebees, and the farmers could not grow clover seed. Father said it was the midge in the clover that it would not seed. I know that flowers depend largely upon insect fertilization and the bumblebee visiting the clover would carry pollen from one blossom to another, and perhaps the bumblebee is a foe to the midge. It is my opinion that if it had been properly fertilized the midge would not be there. The bumblebee should be protected by law. It visits the weigelia, mock orange, iris and rose.

This is one of the best places to study nature. We have within sixteen miles the rocks of the different geological ages from lower strata Silurian to the coal measures and, of course, the different soils and flowers.

This is the rich farm land of the Silurian limestone of the Trenton period. There is a fault about a half mile from here where the under strata, Canadian, comes to the surface and with it the iron ore—limonite variety. There are mines two miles from here in the same fault in what we call the Barrens.

The Barrens is sandy, very sandy. The Jack pine, a scrubby, yellow pine, is quite abundant in places. Huckleberries, wild indigo, fern and ground pine abound; cranberries and spatter-dock grow in the numerous ponds or small lakes. The trailing arbutus is much finer here than on the ridge, owing to the sandy soil. No white water lilies grow in this part of the country. They have been grown in tubs. I wish I had some. I would not insure the success of the cultivation.

There are larger limonite mines five miles from here and from a larger fault in the same range as the nearer one, forming a cave in the Silurian limestone. The cave has not been explored owing to the small entrance. One can go in only a few feet.

Through the Barrens is what the geologist calls the "Nittany Valley anticlinal axis." This was a mountain and the rocks on the Tussey Mountain and the Bald Eagle Ridge or Muncy Mountain are the same age. The Medina white and Medina red sandstones of the Muncy Mountain are all thrown down by erosion on the Bald Eagle side of the mountain. The white sandstone or ganister rock is used in making some kind of fire brick for furnaces. Below this is the fossil iron ore and the Paint Spring; farther on is the Blue Spring in the range of the Lower Helderberg limestone, and across the railroad they have a Spook Spring. When my father, born in 1818, was a boy, my grandfather went to the Blue Spring and caught some trout and then had the children suck the water from the trout's mouth as a preventive of whooping cough. The ones who sucked the water did not have it nearly so hard as the ones who did not suck the water from the trout's mouth!

I always make a bow to the Jamestown weed or jimson weed, *Datura stramonium*. When I was suffering from typhoid fever and neuralgia and after I had taken, as I thought, a whole drug store, the doctor proposed to make a poultice of the Jamestown weed. Oh! thanks. I will never forget that James-

town weed. The doctor also added that it would make the hair grow—fried in lard it would make the hair grow on a bald head.

There are wild flowers too numerous to mention—hoarhound made into a tea for colds, catnip for pain, motherwort for the nerves, spearmint and peppermint, boneset or thoroughwort for a cold and to break a fever, life everlasting for a poultice for a carbuncle or a sore in the heart of the hand, vervain or carpenter square which is good for heart trouble, calamus for indigestion, crow's foot for dysentery, black snake-root—colosh—soaked in water for dyspepsia, and the leaves of the tall mullein smoked for bronchitis.

Along the Hudson River and Utica shale there is an oil which floats on the water. The shales disintegrate forming a white potter's clay. The water in a spring is milky. Violets, ferns, cat-tails, huckleberries, dewberries and blackberries are abundant. The sweet eglantine grows here too. It is sweet in its wild home, but when transplanted to the lawn it loses its sweetness and becomes a nuisance. It spreads too much for family comfort.

A tree grew on the Hudson River and Utica shales on which the Indians painted a half-moon and other marks from which this Half-moon Valley received its name. A man by the name of Storm laid out the town which never grows; hence Stormstown. Bald Eagle is named for an Indian chief who had his home along the banks of the Bald Eagle Creek near Milesburg.

The Bear Meadows on top of the Tussey Mountain is sometimes called a peat bog. The ground is springy; in jumping up and down or stamping, the ground will spring up and down. The pitcher plant and some evergreen trees and tall huckleberry-like trees grow here. The pitcher plant and evergreen trees will not bear transplanting.

Minnows, suckers, catfish and eels are caught in the Half-moon Run. The streams of the country are stocked with trout.



The La Rue Holmes Nature Lovers League

By George Kingle, Summit, New Jersey

Join the Crusade in Behalf of Our Trees.

That we know of the danger threatening this country, because of the destruction of our trees, amounts to little unless we individually become factors among the forces tending to stay the destruction or to build up the phalanxes of the trees.

The beneficent influences of the forests result from the combined influence of each tree within its borders. Each tree on the lawn is a factor in nature's laboratory, doing its part for human benefit. We desire to ask of each member of the L. H. Nature League to take up individually the cause of the trees. If the cause be considered a sacred and appealing one, there are few of us who cannot do something in its behalf.

Each tree in being a beneficent agent appeals to us for our friendly consideration. Over deforested land the death-dealing influences of desert conditions eventually prevail. Without trees humanity would shortly perish; it is our part to cherish and add to the number of our trees.

Of the following suggestions one or more are possible for every member, old or young, to take up:

Increase interest in trees by learning all you can about them—what they do and how they do it.

Look up corners where a tree might be planted and plant it. If you have no such corner perhaps your neighbor has one, or more, and might consider favorably a suggestion from you, especially if you accompanied it by an offer to furnish the trees.

Enter with spirit into Arbor Day celebrations, wherever possible interesting children to individually plant trees on their own premises. Such trees often may become especial objects of interest when they bear the name of some member of the family or of a cherished friend.

Allow no tree of yours to be cut down without sufficient reason, in

which event at once plant another. If your tree is cut down, see to it that the wood is all utilized. It took years to build it up. Even its small branches contain heat which may bless some one poorer than yourself. Allow no hiring to burn it up as a brush heap, but help to cultivate the spirit of protection for tree products by looking carefully that something helpful is done with all parts of your tree.

If you reside in a city do not allow the makers of sidewalks to smother your tree; it requires air. Have the earth loosened somewhat about its roots once a year that air and rain may penetrate. Do not forget that a little fertilizer once in a while aids the efforts of your tree to live, though in untoward conditions, and that a little water in times of intense heat would spare it the struggle to maintain its food supply. Your tree is your friend; feed it; water it.

Do not allow horses to be tied to your tree, or linemen to climb it by means of climbing irons. When the bark is broken insect enemies rejoice and take possession.

If you see a tree in danger from a horse, an electric line or human agent, do not simply regret the threatened danger and pass on; do something worth while about it—protect your friend, even if it cost you a scrap of time and trouble.

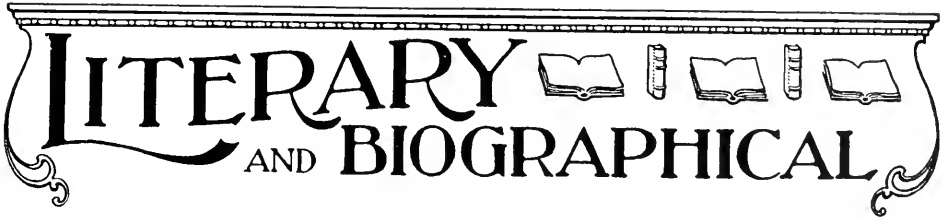
A copy of Professor Forbush's book, entitled, "Useful Birds and Their Protection," will be given as a prize, for the best concise essay on "Some Birds Nearing Extinction," presented by any L. H. Nature League member under twenty-one years of age.

Contest closes November seventh.

A prize, hereafter to be announced, will be given for an essay to be entitled "The Stone Book of The Ages."

A prize will also be presented for the best essay on the geological conditions of the locality where the author resides.

Contests close November seventh.



LITERARY AND BIOGRAPHICAL

Nature in Literature.

BY EARL DOUGLASS, PITTSBURG, PA.

The last cold breath of winter had gone and the air was fresh, pure and mild on the vast prairie that extended in every direction to the warm sky. The spring's work was done and the sowed fields were getting green. There was now time for a little rest and recreation. My sister, her husband and I were riding over the smooth, grassy expanse where the fresh green of spring was mingled with the withered vegetation of the previous year. We were going to a beautiful lake for a couple of days of change and pleasure. I was occupying the back seat alone, yet not alone for I had with me no less distinguished company than Richard Jefferies—at least his spirit was there for I was reading his essay, "Nature and Books."

I know not just how much was due to circumstances, how much to the charm and originality of the author and how much to the smiling prairie, the pure air and the sky; but that essay was one of the most exquisite literary feasts I ever enjoyed. It was like a sweet dream the remembrance of which comes again and again and makes one happy. From that day to this some of its thoughts come to me with the sweet atmosphere and the charming background of the prairie and sky.

How often I have wished that I might find other writings that would give me such extreme delight, that would paint in fresh and original beauty the old world so it would be new again. But "paint" is not the right word. Nature needs no daubing over with a brush or re-veneering. Go deeper into her unfathomed wildernesses, take broader views and you will find that, to your eye, she is en-

dowed with eternal youth and never ending transformation. The writings of men of original thought are ingeniously constructed lenses which show us things that have been there all the time but we either did not see them before or saw them very imperfectly. The aspect of the world is changing all the time as the shifting radiance of knowledge lights one portion or another of our mental sky; but the change is not often so sudden, as when some illuminating thoughts transform the mere rubbish of facts into rare and beautiful things full of life and meaning. We cannot expect to enjoy the supreme and happy moment of first love or conversion every day or every month; but I believe that the most of us could get more out of literature than we do if we knew just what to read and at what time. I believe that the most of us have yet to learn the art of reading, not only what to read but when and where, if we would get the most from books. Not that it will ever be an exact science, that would spoil the charm; but if we would first study guides to the best literature we might get more pleasure and profit from our reading. Leaves fall from the printing presses as thickly as leaves in the autumn woods, but who shall tell us where among them lie hidden the rich paw-paws and the butternuts.

Jefferies said, "There were no books as yet; they have got to be written." Outside of the best poetry, drama and fiction it seems to me that he is about right. The progress of the human race will of course always be of vital importance and therefore our present literature will furnish a rich historic storehouse to be carefully preserved; but how many books of the present time will be read for pleasure

or for the nourishment and growth of mind and heart a hundred years from now? I feel pretty sure that the most of the nature books are yet to be written; yet there are many books that would help us and give us pleasure if we knew just where to find them.

I have wondered if there are many who have had experiences similar to my own. I think it pretty safe to judge at least a few others by ourselves. I have plenty of reading to do, it is part of my work, and, as I chose my profession this reading is a pleasure. Carlyle said, "Blessed is he who has found his work; let him ask no other blessedness." This is the greatest thing in life, but I *do* ask for more. I consider it not only a duty but a pleasure to appreciate to the best of my ability art, literature and the outdoor world. It is rest and refreshment and it makes me see far more in my comparatively narrow line of research. The animals that have left but their bones and teeth buried in the clay beds and sand bars of past times become living animals again. They graze on hillsides that have melted away in the long ages; they repose under trees that have left not a trace behind or only a few rare leaf-prints in the rocks; they wade in reedy marshes, the mud of which is now layers of rock; and many strange pictures come more or less distinctly before me as I walk along our common fields. These are the side trips, the excursions into wonderland, of the specialist; but these he must keep out of his scientific papers which deal with what is accurately known and can be re-confirmed or demonstrated.

But there are times when the ordinary books and scenes do not satisfy. I am longing for something I cannot find. We sometimes hear people say, "I am hungry but I cannot think of anything that I want to eat." My condition is similar to theirs. When I am at home I have access to a large library. I often go to the card catalogue and call for one or more armfuls of books. There is much to be learned from all of them, but perhaps I have been trying to cram my mind with facts for a week and the

fact department has been working overtime and is weary; it needs rest and other departments are longing for exercise. The books are not just what I am craving now. Perhaps the hungry person has had bread, potatoes, pork-and-beans and apple dumpings until he is tired of them. It may be that his digestive organs have been abused, and it may be that it is only the calling of his system for some elements which it needs. Perhaps he wants something that has the wild flavor of the meadows or woods. It may be mushrooms or delicious morelles or fresh fish from the running stream.

I have something of an idea what I want. I may be tired of bare facts or even of thinking of the perpetual strife, disappointments, poverty, suffering and grind of my own species. I want something restful, full of the odor of the fields and groves, the light of flowing streams and placid waters, the deep, solemn shadows of the forests or the boundless freedom of the prairies. I want something that will freshen and brighten the world to me or something that will take me far away on the wings of my imagination. I want sometimes to be made to see the world through the eye of the artist without the use of too much of what seems to me his technical slang; I want to see it as the broad-minded naturalist sees it—not the skeletons of facts alone as they appear in his scientific publications; I want to see nature as she is, more than all the volumes of art, science and poetry that ever have been written; for undoubtedly beyond our best productions there is higher art, science and poetry when we are ready for it. There are lyrics, epics, dramas, marvels and mysteries, and all true. I want sometimes to go back and see things as they appeared to our forefathers, not as they appear through our modern spectacles; I want sometimes to see them as they appear to the wild imagination of a Haggard and sometimes I wish again, as in boyhood, to roam for a little while in the midsummer night's dream of love and fairyland. Do I want too much? I think not. The human mind has not been built by the rule and square, nor

will it ever be a mere machine. If it does it will soon wear out and break down and leave nothing behind but rusting and decaying rubbish. Nature will soon be rid of such trash. The mind has come up through stress and strife, hopes, fears, love and mysteries until it now is itself the greatest of mysteries; and it still lives and grows and probably will ever live and grow by wonder and mystery and the expanse of the imagination. If one could make a vitalized dictionary of it, it would not pay; paper and ink are far better material for encyclopedias. There may be minds like that of Gradgrind that can exist for a while on the dry pabulum of facts but they do not help the world and the tears shed on their graves would never make the violets grow.

A work that is true to nature, true to life, goes straight to the heart. It is its faithfulness to facts that tells—not simple facts of nature alone but facts of human conception of nature, human thought and human feeling as related to the outside world. The great charm in literature is so subtle it takes a genius to bring it out. You read from one author and you feel, "It's very true—Yes." You yawn and your eyes look dull. You take up another book. It electrifies you at once. There are the same symbols in black and white, but you hardly know you see them for the writer has in some mysterious way filled the surrounding atmosphere with pictures—no, not pictures but life.

I remember how much I enjoyed Spenser's "Fairy Queen"—before I read it. I had read about it and it was the beautiful world of imagination to my boyhood as I took those delightful walks in the winter woods, and the fairy scenes of frost, snow, ice, trees and bushes furnished a true fairyland of delight. Spenser was a poet whose writing it requires a poet's mind to appreciate, but, if one had the rare genius to picture these scenes as I saw and felt them, the brave knights, lovely ladies and the wonderful type of loveliness and perfection, the Fairy Queen, as they appeared to my imagination, I am sure it would give ex-

quisite pleasure to the heart of an imaginative boy or girl. Probably there are older persons who would find in it an hour of pure delight. It is unfortunate that in childhood we cannot express our thoughts, and often when we get older we do not have any worth expressing,—at least they are very different. If the old thoughts come again they come as a stolen dream in a field of toil and we forget the little feet that are paddling over the same old road and looking for something they cannot find. That is the reason I wish never to be a child again. It is inexpressibly sweet to look back at some of childhood's scenes; but oh! the pain and loneliness of wishing something one does not know how to get, and wanting to understand so many things, and the hopelessness of finding anything or anybody to put the weary mind at rest.

The harvest fields of Minnesota and Dakota are far away; so are the mellow groves and the sweet air of autumn. I can not take hold of the plow handles and turn the long black furrows in the golden stubble-fields while I take into my being all the surrounding rural scenes and learn the little dramas of the lives of the rural people. I cannot take my gun and dog and hunt the wild duck by the reedy lake or the prairie chicken in the withered grass or harvest field. I cannot see the dog point with meaning at the hidden game nor can I feel the thrill of excitement and delight as the bird arises, whirls and sails rapidly away and then falls before my gun; but I would like to read about these things sometimes, not for the pleasure of killing but for the thrill and charm of life in the open outdoor world. There may sometimes be more pleasures in sitting by a city fireside reading of these things than in doing them; and in our somewhat roundabout progress toward civilization the harmless thrill of reading of these sports may be a stepping-stone toward pleasures as great but harmless.

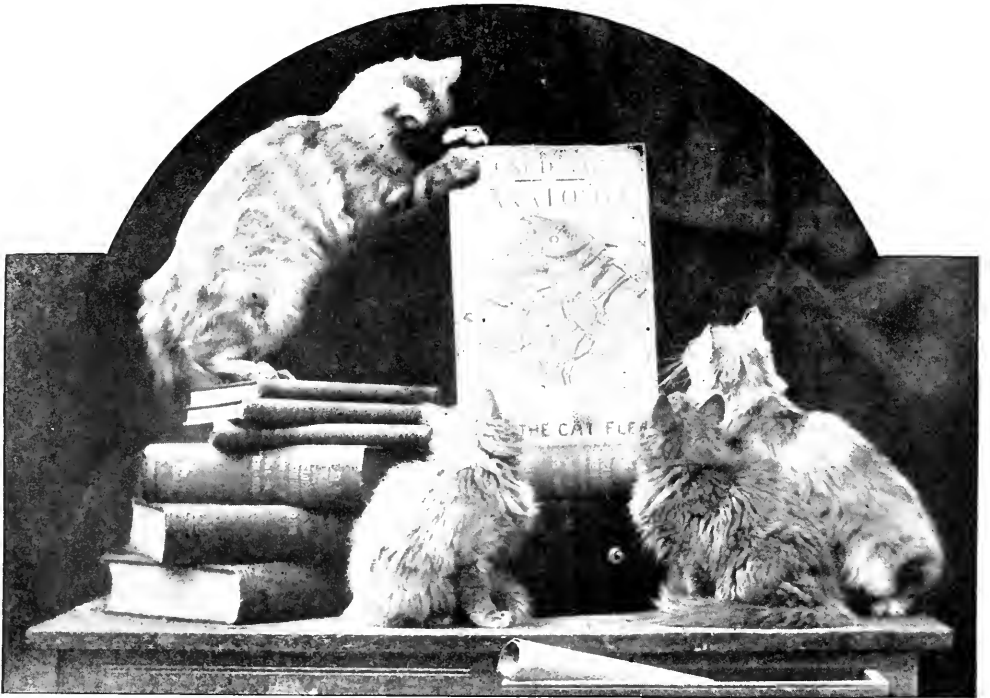
Do I always find what I want to read? No, not always. Sometimes to satisfy my desires I go and try to write it

myself; but I find it isn't as easy as I thought. I get some words down that do not fit the ideas in my mind; I cannot string the shining pearls on the charming necklace in the unique designs that I saw in my imagination, but, like Mary, Queen of Scots, its beauty and charm are spoiled in the execution. In some way the pitcher gets broken at the fountain, yet, I have at least had a drink and feel satisfied. I am glad, however, that there are a

omnivorous readers in our country that there are not cranks enough to support such a publication. Undoubtedly THE GUIDE TO NATURE will help us in finding the best literature of nature.

The Book of the Cat. By Frances Simpson.
New York City: Cassell and Company, Limited.

Cats are, generally speaking allies of womankind as dogs are of men. But it is



THE PROFESSOR CAT GIVING A LECTURE ON THE CAT FLEA.

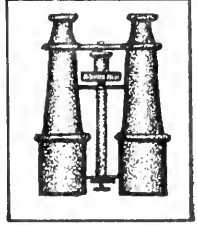
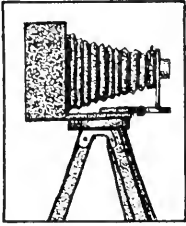
A most remarkable example of good posing in animal photography. Illustration from "The Book of the Cat." Courtesy of Cassell & Company, Limited, New York.

few things that I can read over and over and over again and they always satisfy. I wish that there were more of them.

I have often thought if some scheme could be devised so that we might know where to get what we want in the literature of nature it would be a great blessing to us. The current literature is reviewed but in all the publications of the past where shall we find what we want? I hear that "What's in the Magazines" is discontinued. Perhaps there are so many

a fact, as claimed by this magnificent book, that "many celebrities of the sterner sex have shown a sympathetic feeling for the feline race." The cat is gradually creeping into the affections of even business men in this busy world.

For man or woman with even the slightest love for cats this book is a joy. Some of the illustrations are fascinating examples of animals posing and photography. The book not only appeals to one's aesthetic sentiments but has much of practical value, showing excellent arrangements of catteries, cares of the pets, etc. It is worth while to have a knowledge of cats, to love them, as a phase of nature interests.



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EDWARD F. BIGELOW, Managing Editor

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Every great man or woman is at heart a poet, and all must listen long to the harmonies of Nature before they can make translations from her infinite resources through their own ideals into creations of beauty in words, forms, colors, or sounds.—*Luther Burbank.*

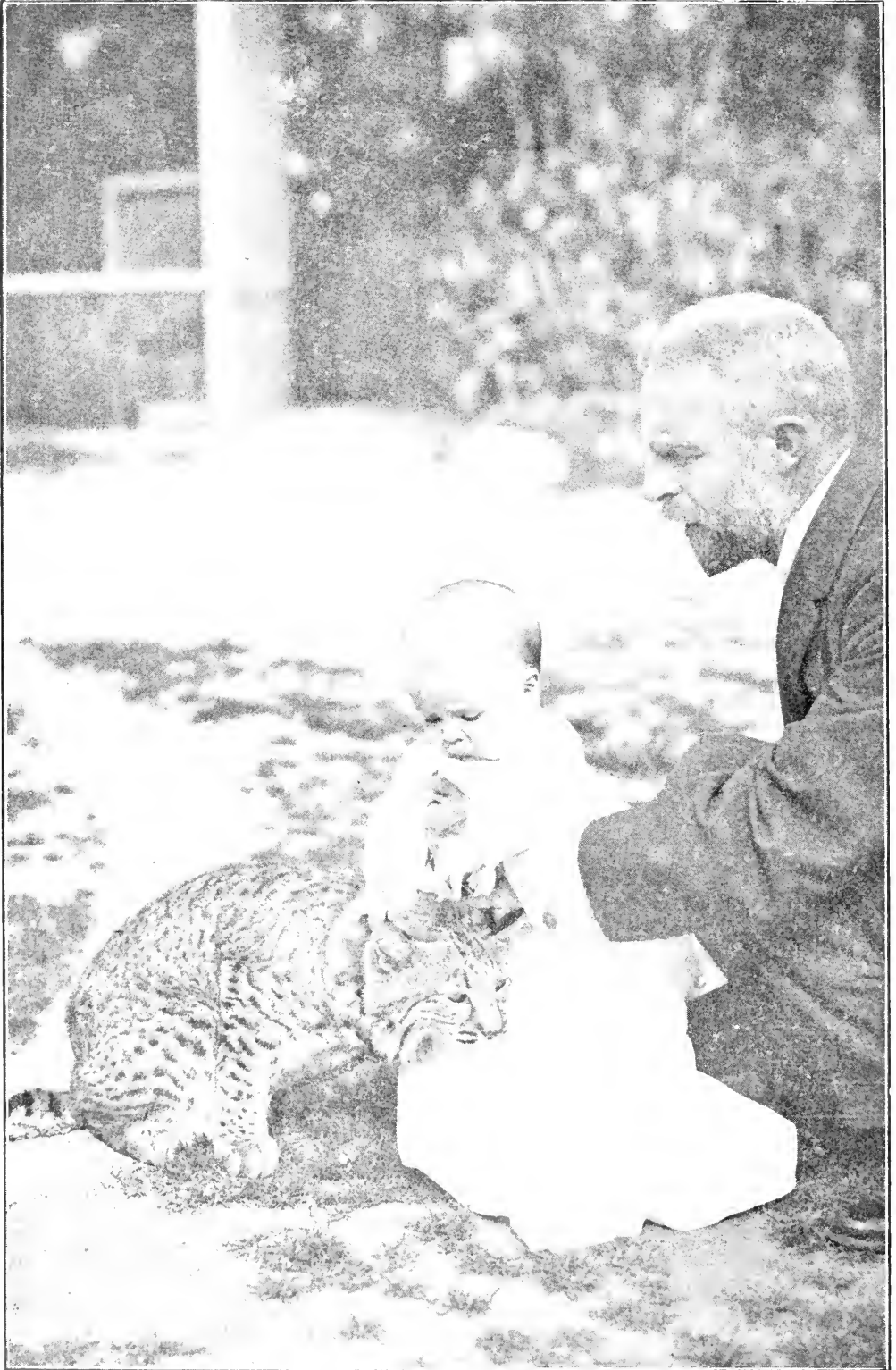
Arc adia

“INTIMATE HARMONY WITH NATURE.”

Every child should have mud pies, grasshoppers, waterbugs, tadpoles, frogs, mud-turtles, elderberries, wild strawberries, acorns, chestnuts, trees to climb, brooks to wade in, water-lilies, woodchucks, bats, bees, butterflies, various animals to pet, hay-fields, pine-cones, rocks to roll, sand, snakes, huckleberries and hornets; and any child who has been deprived of these has been deprived of the best part of his education.

By being well acquainted with all these they come into most intimate harmony with nature, whose lessons are, of course, natural and wholesome.—*Luther Burbank.*





ELSIE, DAUGHTER OF MR. AND MRS. H. A. STEARNS, 810 N. LOS ROBLES ST., PASSADENA, CAL., AND THEIR TAME WILD CAT BENGAL.

Caught in the San Bernardino Mountains when Quite Young.
(Courtesy of "The Cat Journal.")

"The first necessity for interesting nature study is an intimate acquaintance with some locality. It does not matter how small, how commonplace, how near the city,—the nearer the better, provided there are trees, water, fences, and some seclusion. If your own roof-tree stands in the midst of it all, then that is ideal."—*Dallas Lore Sharp, in "The Lay of the Land."*



THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

NOVEMBER, 1909

No. 8



A Freight Car Home Near to Nature

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT



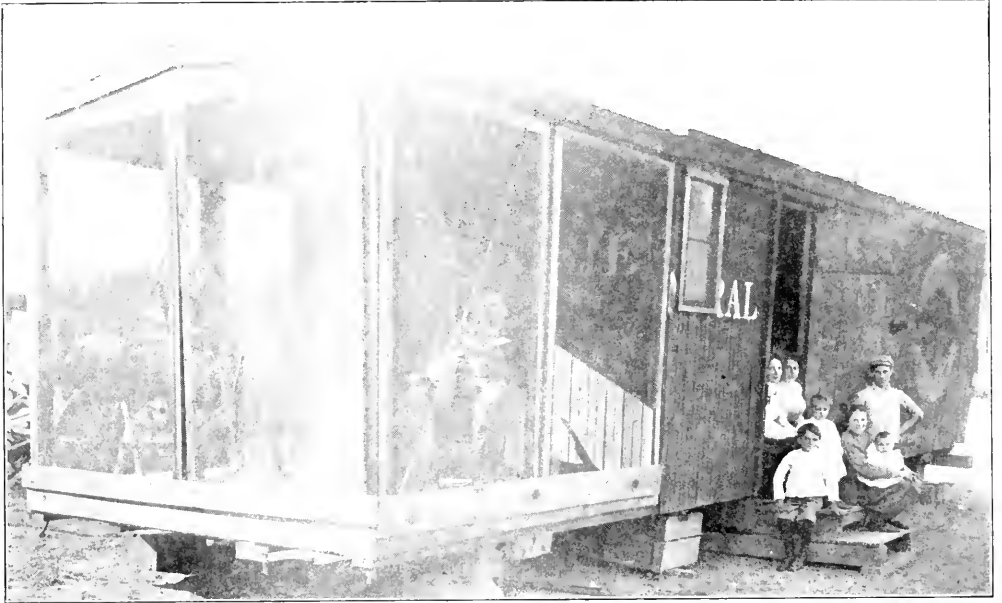
JUDGE M. C. Matthews of Dubuque, Iowa, has not only a mind of his own in matters judicial, but in the selection of an office. When not in the Court House he lives with his books in a freight car near his home in the suburbs of Dubuque. For years his decisions have been held in great respect. No wonder they have "weight" because, doubtless, many of them are brought forth in his quiet hours of contemplation in a freight car!

The judge is as genial as he is learned in the law, and no one enjoys better than he a bit of pleasantry. It is therefore quite natural that his friends have made many a jocose remark at his idiosyncratic form of study. The car is without embellishment on the outside with the exception of the addition at one end of a well ventilated

mosquito netting cage. In general appearance it is an ordinary, side-tracked, worn-out freight car. But on entering the car, one is astonished at the luxurious appearance. Mission furniture, leather bound books, a picturesque clock, a carpet and rugs make the visitor think he has entered a first-class city office. The effect of contrast has here surely been brought to its highest degree of perfection.

The judge is surely a second George Washington in one respect at least. He is a Father of his Country in that he has had twelve children, ten of whom are now living. The family residence, as stated above, is near by. The judge surely is a man of diverse talents, enjoying as he does a large family, with sudden transits of bachelor isolation.

It will be of interest to our readers to know something of the biography of this talented judge whose love of nature has induced this novel, yet effect-

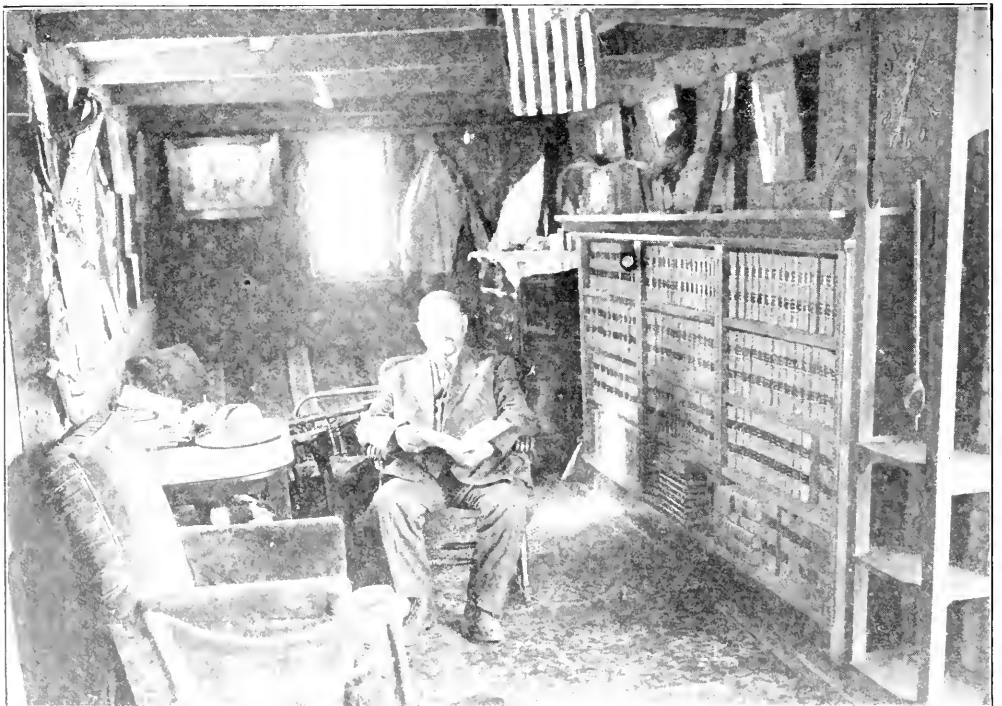


JUDGE MATTHEWS IN HIS FREIGHT CAR HOME IN THE SUBURBS OF DUBUQUE, IOWA.

ive method of getting near to her heart.

He was born in the city of Dubuque in 1862, and in his earliest days was a

student. He was thus well fitted to teach school when only sixteen years of age. He was admitted to the bar in



JUDGE MATTHEWS WITHIN HIS LUXURIOUSLY FURNISHED FREIGHT CAR.



1884, was county attorney from 1891 to 1897, and has been District Judge since 1899.

The high estimation in which he is held is shown by the fact that he has been in public office practically all his life and has served longer than any other man in Dubuque County with the exceptions of the late D. B. Henderson, Speaker of the House, and Wm. D. Allison, the Father of the Senate.

He lectures on law at different institutions and is always in demand for speeches on special occasions. He has served on the reception committee of President McKinley.

He is brother of Dr. Washington Matthews (sometimes called "Major") of Washington, D. C., who was President of the American Folk Lore Society and had charge of the Medical Department of the Army and Navy and who was considered the greatest authority in knowledge of the Indians.

JUDGE MATTHEWS AND A FEW OF HIS MANY CHILDREN WITH THEIR PET BURRO.

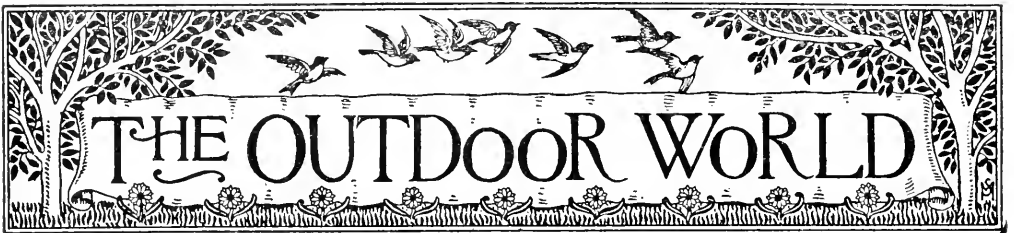


Long before the Juvenile law was passed, Judge Matthews was one of the pioneers in that work.

He is a member of the Iowa Historical Society and of the American Bar Association and will soon become a member of the American Geographical Society.

The judge spent 1887 and 1888 in Europe, making careful studies from the legal and nature loving points of view. His articles on game and fish have been published in various magazines.

Taking him altogether, Judge Matthews is one of the best examples I have met of an enthusiastic, talented, large-hearted man, leading a simple life in nearness to the heart of nature. He is an excellent guide to others in the fact that to be a man, to live on a high plane of thought, to be held in high esteem by his fellow men, one does not require luxury or ostentation. A big man can live in a log cabin or in a freight car. It isn't the coat; it's the man.



Education by Doing—"Park Life."

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT.

It has been said in all truth, in application to many places, that the modern tendency in education is to put the test upon *saying* things correctly rather than upon *doing* things efficiently.

That actions are stronger than words, and more important, must have been uppermost in the mind of Professor B. J. Horchem, of the "Park Life" plan in education, when he con-

ceived the idea which he is carrying out so successfully and about which everybody is now asking questions.

Professor Horchem, Principal of the Audubon School in Dubuque, Iowa, is regarded as one of the best (some say *the* best) of the educators in that large, growing, hustling, western city. But the ordinary work of the routine school, however well he conducts it, is not enough for him. He maintains that education is continuous—that the best vacation is not vacuity but a change of activities. And the boys under his



PUTTING UP THE TENTS, EASILY AND IN GOOD ORDER.



"THE TENTS ARE UP; NOW LET'S PUT IN THE BEDS AND ARRANGE THINGS."

charge continue as a loyal little army persistently through the vacation as well as through the school months of the year.

As an outdoor summer home for the boys Professor Horehem secured one of the choicest, most beautiful plots of ground in all the course of the Mississippi. The enterprise, public spirit and personal influence of Judge Shiras has secured for Dubuque "Eagle Point

Park," on the noble bluff overlooking the great river. Immediately adjoining this magnificent pleasure ground, which could scarcely be duplicated in a thousand miles, are the acres which have thus been consecrated to "Park Life." Here is the garden, where corn, tomatoes and potatoes grow; where fruit trees and shade trees and hedges are planted; where the boys, in light, summer garb, swing the



"CHUMS" IN ONE OF THE SMALLER TENTS AT THE LEISURE HOUR.



A JOLLY LOT OF YOUNGSTERS IN ONE OF THE LARGEST TENTS.

hoe and pull the weeds and watch the fruition of their labor. Here is their tool house, as a rendezvous. Frequently the boys sleep in their tents spread in the park or in the fields.

The professor has not forgotten that all work and no play makes Jack a dull boy and that it does not mean even the best work. The work in the fields is therefore interspersed with open air

talks on educational and "live" topics, when the boys live in tents and from time to time move from farmhouse to farmhouse, and with occasional excursions to scenes of popular interest.

Once, last summer, "Park Life" boys visited the Government Fish Hatcheries at Spring Brook, Iowa. Here they studied the living fishes in the shallow tanks spread out before



LISTENING TO A LECTURE ON CORN.

the class like the pages of an atlas. They saw the fishes just emerging from the egg; those a trifle older; those more and more developed, and then the superb, full-grown specimens. Here they heard the last word of science relating to the fish and its place in the world of nature; its structure and mode of growth; its importance in the world of economics.

Beside their tents on a rolling field, within sight of waving corn, they listened to the "story of the corn," as re-

grows apace. As long as leading men and women of America in many lines are glad to offer their best services in aid of the work, it will not lack for intellectual aid and inspiration; and since philanthropic men are disposed to aid it with the very-much-needed means, "Park Life" will enter upon its third year with the brightest of prospects.

The midsummer encampment of the "Park Life" boys is a season of special enjoyment. The boys pitch their own tents, or stake them, with remarkable



AT THE HOME OF A PROMINENT FARMER NEAR THE ENCAMPMENT.

lated by an authority of national fame. Beside a celebrated Indian mound of Wisconsin they learned the simple story of primeval life, as mutely recorded in the relics of a vanished people. Around the evening camp fire, they heard stories of the war. Under the branches of the forest trees, they learned some of the great truths demonstrated in modern botany.

The acres adjoining Eagle Point Park are to be supplemented by additional purchases now under advisement, and the excursions for the coming year are to be extended, for the scope of the "Park Life" movement

dexterity and speed, with little or no talk, with no shouting of orders. Dr. Skinner, of Chicago, who has witnessed many a competitive military drill, was most surprised at the automatic and almost magical disappearance and reappearance of the rows of tents. Divisions of labor renders labor light. There is ample time for ball games and explorations of field and forest, river banks, etc.

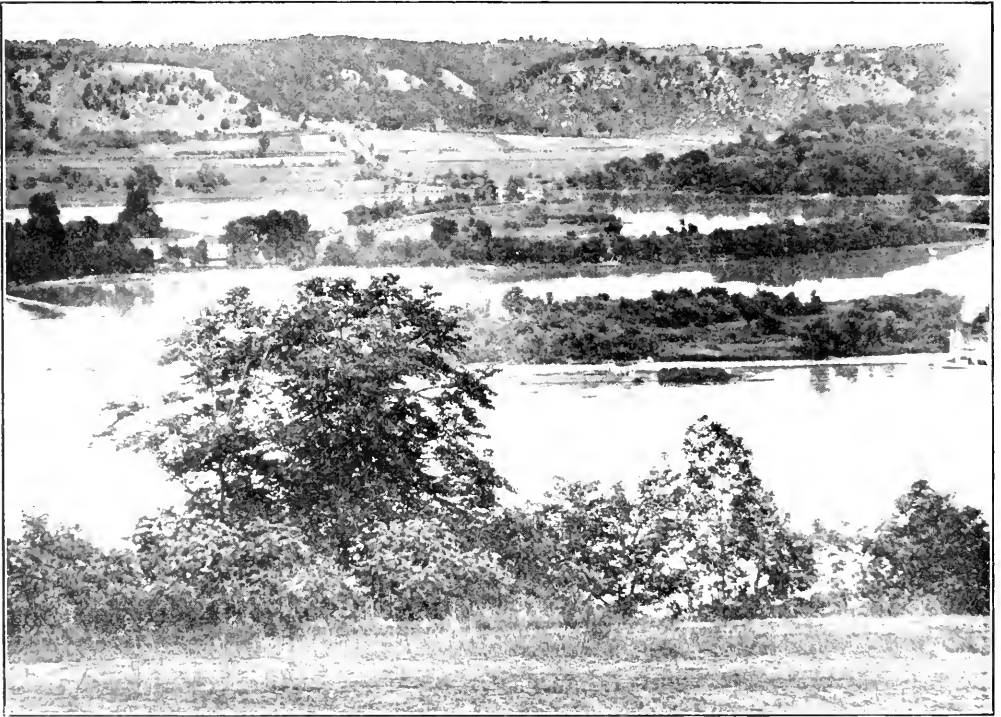
A representative of Ames College gave a most interesting picture and thoroughly scientific exposition of Indian corn, not only from the economic but also from the botanical point of

view. In all the lectures and open air talks, practically philosophy mingled with science. The Honorable George H. Maxwell, of Chicago, told the boys of the possible betterment of home surroundings; the editor of *THE GUIDE TO NATURE* added more home truth; many thinkers, writers and speakers of note contributed to the oral work of the past season.

Professor Horehem is a pioneer in a great new education. The educational

welfare of the future, a preventive of loss to the body politic in the coming generation. As such, it is deserving of the support of the public, and would be a most legitimate recipient of public funds for its maintenance. It is worthy of note that "Park Life" has to a remarkable extent attracted the attention and received the warm commendation of jurists of high rank, as well as of educators throughout the nation.

The noted Judge O. P. Shiras, of



THE VIEW OF THE MISSISSIPPI RIVER FROM THE "PARK LIFE" GARDEN.

press of the nation speaks of it in terms of highest praise. Many cities are inquiring about it. The departure is radical, in its way. It bids fair to prove as practical as Dr. Leipziger's, New York City, scheme for the education of adults, and to prove as worthy of support from public funds.

At present it rests only upon the unbounded energy of Professor Horehem and the aid generously given by public spirited private citizens of Dubuque. Judge Matthews holds that the scheme is a species of "social insurance"—a guaranty for the social

the Federal bench (retired), Judge Lacy, Judge Matthews and other jurists of eminence have joined with the educational and sociological writers and critics of the country in emphasizing the value of the ideal and of the practical results of "Park Life" for the present and for the future.

Gentlemen of means in Dubuque have come forward to aid in the work in its incipiency, supplementing the words of the eminent jurists and educators, and the future of "Park Life" seems to be well assured. But such an enterprise, as a matter of "social in-

surance," should be placed on the firm basis of public support.

The only criticism of Professor Horchem's plan thus far is that it considers the boys only. What of the girls? Are they to have no "Park Life" of their own? Assuredly not the same kind of "Park Life" as that of the boys. But Professor Horchem's plan is not yet fully shown—perhaps not fully wrought out, as yet, in his own mind. Let him perfect and exemplify to the nation his plan for the boys first, and then listen to what he may say for the girls; for they are no less the objects of his interest and solicitude.

The plan should and will be extended to girls, men and women. Nature and her education and recreation are for all. Let us have a school of "Park Life" for all in every town, city and village in the United States. The middle of the pond is the best place to throw a stone for the largest circling waves in every direction. Dubuque, Iowa, is well situated as a center for great rolling waves of the Horchem idea. May they reach even old New England. The Horchem "Park Life" idea is a fact, a success; it is growing and will spread. The whole project has been at once regarded as wholesome, eminently sane and practical.

Leaves Change Color in the Autumn.

BY PROFESSOR WM. F. GANONG, NORTHAMPTON, MASSACHUSETTS.

Despite the prominence of the phenomenon, we do not yet know the full meaning of the autumn colors of the leaves. We do know that late in the summer the tree is preparing for the leaf fall by drawing the valuable substances of the leaf into the stem. It also ceases to make chlorophyl, the green substance of the leaf which aids in the making of the plant's food, and this gradually fades away in the bright light. By fading it exposes to view any other colors in the leaf, and all leaves contain yellow coloring matters, called xanthophyl, whose function is not known, and it is these which give the yellow of autumn leaves. The red is found in a different way. In bright light and cool temperature a new sub-

stance called erythrophyl is made from sugar and tannin in the leaf cells, and that has a red color. A brown substance is also sometimes formed and, besides, the skeleton of the leaf itself turns brown as the leaf dies. It is the various combinations of these substances which give the many shades of autumn colors. Some students think these colors are a useful protection to the living protoplasm of the leaf after the green disappears, protecting it against the full blaze of light which is injurious, but others think the colors have no use at all but are simply the incidental chemical result of the processes in the ripening and dying leaf. At present the evidence seems to favor the latter view, but the matter is still unsettled. It is generally thought that frost has something to do with it; but it has not, except to hasten it. Anything which affects the vitality of the leaf tends to hasten it; for which reason an injured branch of a maple will often show red autumn color even in summer. The colors are the brightest where the leaves receive the most brilliant sunlight.

I long ago lost a hound, a bay horse, and a turtle-dove, and am still on their trail. Many are the travelers I have spoken concerning them, describing their tracks and what calls they answered to. I have met one or two who had heard the hound, and the tramp of the horse, and even seen the dove disappear behind a cloud, and they seemed as anxious to recover them as if they had lost them themselves.—"Walden."

NOVEMBER'S DIRGE.

A spirit haunts the year's last hours,
 Dwelling amid these yellowing bowers:

To himself he talks.

For at eventide, listening earnestly,
 At his work you may hear him sob and sigh,

In the walks.

Earthward he boweth the heavy stalks
 Of the mouldering flowers;
 Heavily hangs the broad sun-flower;
 Over its grave in the earth so chilly;
 Heavily hangs the hollyhock,
 Heavily hangs the tiger lily.

—Tennyson.



The Heavens for December.

BY PROF. S. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

Halley's Comet gives every promise of being in many ways a remarkable comet. That it should return according to prediction was a foregone conclusion, for mathematical astronomy admits of no mistakes. Since its re-discovery on September 11, astronomers have been carefully measuring its position in the sky, and again calculating its path in order to find out just how near it will come to the earth, and when it will pass closest to the sun. Though these newer computations are as yet but preliminary, they seem to show that early in May the comet will come very close to the earth, and consequently it should present a magnificent spectacle in the sky, a brilliant object with a long flowing tale possibly 30° in length, as long as sixty full moons, or stretching one-third of the distance from the horizon to the zenith. More than this, it seems altogether likely that the comet will cross the face of the sun, and that we on the earth will pass through the tail of the comet. This does not mean, of course, that the world is coming to an end (for there is not the remotest possibility of it), but it will add to the interest attaching to the comet; moreover, it will require no great telescope to bring this magnificent spectacle to our ken, and in May 1910, the comet will undoubtedly present a very wonderful sight which one and all may readily see. Just at the present time the average person would be keenly disappointed if a great telescope could be placed at his disposal to view the comet, which cannot now be seen in a glass smaller than twelve inches in diameter. If a professional astronomer

could pick up the comet and set the telescope on it, there would be presented no long tail, but simply a faint fuzzy star and it would probably need all the persuasion of the astronomer to convince the other person that it was really the celebrated comet that he was looking at. On October 19, Professor Barnard, using the great 40-inch Yerkes telescope, describes the comet as "not fainter than the $13\frac{1}{2}$ magnitude, about fifteen seconds of arc in diameter, indefinite brightening in the middle, but with no elongation." But the comet is rushing towards us with enormous speed, and on the first of December it is nearly half a million miles nearer than it was twenty-four hours previous.

The great interest attaching to this celebrated object caused many astronomers to calculate its path about the sun to predict its place in the sky. As is well known, the comet goes about the sun as its centre of motion for the same reason that the earth journeys once a year in its orbit, and the reason is that it is compelled to do so by the attraction of gravity. When Dr. Halley first predicted the return of the comet bearing his name little was known of the art of calculating an orbit, nor was the mathematics of the day hardly sufficient to handle the problem. In the two hundred years since then wonderful advances have been made in mathematical astronomy, so that at the present time, if an astronomer is furnished with the positions of the comet on but three separate nights he is able to calculate its orbit and predict its future path. If the comet returns to visit the earth its path is a closed curve, an ellipse, with the sun placed at one focus.

As may be readily seen, if the three

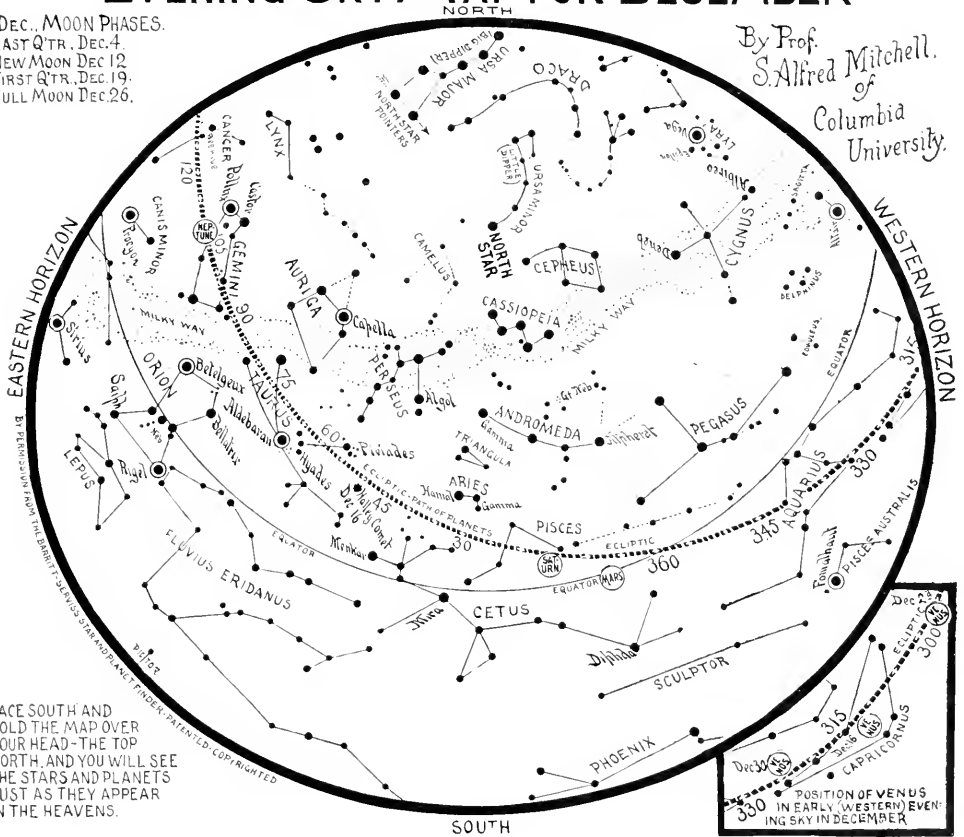
nights which furnish the observations are close together the three positions would lie almost in a straight line and the calculated curve would have no high degree of accuracy. If the observations are separated more and more the resulting orbit comes out more accurately. Amassing all the observations of the comet at its last appearance in 1835, the astronomers have been able to trace its path out into the

of these "perturbations," as they are called, were quite simple, for the 1835 return, but very difficult for the present appearance, due to the near approach to Jupiter, and the result is that the many published orbits differ quite considerably. The two that most closely represent the comet's path are one by Cowell and Crommelin, of the Greenwich observatory, the other by Dr. J. Holetschek, of France, each of

EVENING SKY MAP FOR DECEMBER

DEC. MOON PHASES.
 LAST QTR., DEC. 4
 NEW MOON DEC. 12
 FIRST QTR., DEC. 19
 FULL MOON DEC. 26.

By Prof. S. Alfred Mitchell.
 of Columbia University.



FACE SOUTH AND HOLD THE MAP OVER YOUR HEAD—THE TOP NORTH, AND YOU WILL SEE THE STARS AND PLANETS JUST AS THEY APPEAR IN THE HEAVENS.

depth of space beyond the outermost planet of the solar system, Neptune.

If the sun and the comet were the only bodies in the solar system, the comet would travel around the sun in a perfect ellipse, but Jupiter, Saturn and the other planets all exert their influences and pull the comet out of its ellipse with forces depending on the masses of the planets and its distances from them. The calculations

them giving the time of passage about the sun within three days.

The Rev. Father George M. Searle, Supervisor General of the Paulist Fathers of New York City, has calculated from the English orbit that on the night of May 18 the comet will come nearest the earth, when it will be 14,000,000 miles away. The comet will probably travel across the face of the sun, but there is no danger of the

comet striking the earth or the sun, seeing that it is so far away from both. We may, however, pass through its tail, which may cause certain imaginative persons to foretell that the earth will be visited with disease and pestilence, for, does not the comet's tail consist of hydro-carbons and are not some compounds of carbon and hydrogen very poisonous? As the tail consists of matter in a finely divided state, always directed away from the sun, it is probable that we will have no more serious a catastrophe than a shower of meteors. The ephemeris follows:

Date	Right Ascensions				Declination	Magnitude
Dec. 1	4h 26m	56s	+ 15°	52	12.0	
6	4 6	13	15	23	11.8	
11	3 44	24	14	45	11.6	
16	3 22	19	14		11.4	
21	3 0	34	13	18	11.3	
26	2 40	11	12	28	11.2	

A glance at the magnitudes shows that it will soon be visible in a six-inch telescope.

THE PLANETS.

Mercury will be invisible during the month, being too near the sun. Venus reaches its greatest elongation from the sun on the second of the month, but it still continues to increase in brightness. The planet has been so far south of the equator at this elongation that it has not been as remarkable an object as it usually is. Though Mars is increasing its distance from the earth the astronomers are still intently watching it. Early in the summer Mars showed so little detail that the British Astronomical Association feared that a catastrophe had happened on Mars, and that all life there was extinct. On the contrary, according to the observations of Jockheere, and Jarry-Deloges in Europe, and Lowell in America, a great man, new canals are appearing, and frequent changes are taking place on the ruddy planet. Mars is moving northeast, and at the end of the month will be in Pisces 3° 12' north of Saturn. The rings of Saturn now present a fine sight in a small telescope; we are looking at the southern side of them and we are 10°

from their plane. Jupiter is a morning star, not rising till after two o'clock. Uranus is too near the sun, but those who have a powerful enough telescope may see Neptune during the latter half of the night in Gemini.

CONSTELLATIONS.

As usual, the map shows the constellations, the most magnificent in the whole heavens, as they appear at seven o'clock on the first of the month, at eight o'clock at the middle and at 9 P. M., at the end of the month.

There will be an eclipse of the Sun on December 12, but it will not be visible in the United States.

The Winter Brooklet.

When you know any brooklet that runs down a hillside, be sure to go and take a look at him. You will never find him so cheerful.

As he shrank away after the last thaw, he built for himself the most exquisite caverns of ice to run through, if not "measureless to man" like those of Alph, the sacred river, yet perhaps more pleasing for their narrowness than those for their grandeur. What a cunning silversmith is Frost! The rarest workmanship of Delhi or Genoa copies him but clumsily, as if the fingers of all other artists were thumbs. Fernwork and lacework and filagree in endless variety, and under it all the water tinkles like a distant guitar, or drums like a tambourine, or gurgles like the Tokay of an anchorite's dream. Beyond doubt there is a fairy procession marching along those frail arcades and translucent corridors.

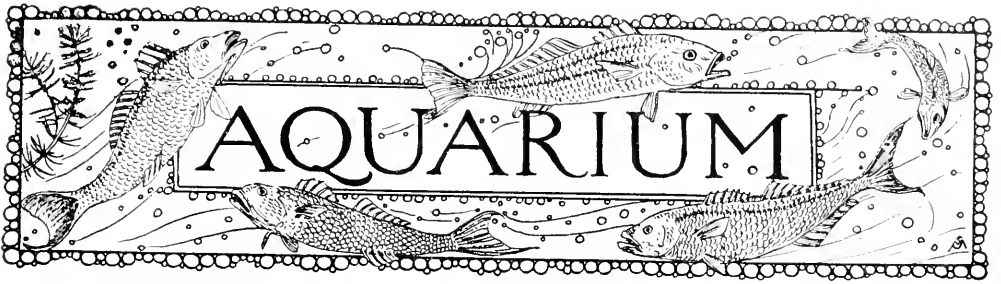
"Their oaten pipes blow wondrous shrill,

The hemlock small blow clear."

—James Russell Lowell.

Henry David Thoreau and His Views of Nature.

A man of such deep, underlying tenderness as puts to shame all surface emotionalism, and of so sweet and lofty a serenity, so exquisite a purity and so complete a truthfulness, that earth seems a fitter dwelling-place for all the virtues because he shared its life.—Mary Fisher in "A General Survey of American Literature."



Under the Auspices of The Aquarium Society of Philadelphia, Herman T. Wolf, Editor

The Household Aquarium and Its Inmates and Management.

COPYRIGHTED BY HERMAN T. WOLF,
AUTHOR OF "GOLDFISH BREEDS AND THE
OTHER AQUARIUM FISHES."

PART II.

AQUARIUM PLANTS. The purpose of aquatic plants in the freshwater aquarium is not only to add to the beauty of this miniature water garden but also to fulfill important functions in maintaining an equilibrium or balance, so that the animals will live in comfort and the aquarium be virtually self-sustaining, as is the natural aquarium, the pond and stream.

The oxygen necessary to sustain the life of aquatic animals is not that which forms a chemical constituent of water, (H_2O), but that which is in the air dissolved or held in suspension in the water. In ponds and streams, the wave motion on the water surface supplies the greater part of this suspended or dissolved air, but in the confines of the aquarium, surface aeration is insufficient and air must either be artificially admitted or furnished by the breathing of aquatic plants.

As stated in the previous article, plants in their growth liberate oxygen and take up the carbonic acid gas given off by the living creatures; and the animals, in their turn, require the oxygen and give off carbonic acid gas; so that if the plant and animal life is in balance, the quality of the water will remain nearly the same for long periods. It is better, however, to have a preponderance of the oxygen liberating element present and only as much animal life as will live in comfort.

The plants which best perform this function have been mentioned; it is now in order to briefly describe them that

they may be recognized; which will be done in the order in which they best perform this duty.

ARROWHEAD OR SAGITTARIA. A small genus of variable plants, reduced by Micheli to 13 species; perennials of easy culture, propagated by seed and runners and growing on the muddy bottom of ponds and streams.

They have arrowshaped leaves and small buttercuplike flowers, which reach above the surface of the water. In rapid streams the leaf blades are changed either to the form of a spade or lengthened into limp ribbonlike floating bands, which extend above the water only in the flowering season. Some of the species develop broader floral leaves and are submerged at other seasons. These are *Sagittaria natans* and *S. pusilla*, one broad and the other narrower leaved, and *S. sinensis* or *S. gigantea* the giant aquarium Sagittaria. They may be had of dealers. The first two are the best of all oxygenators, the latter also good but more likely to grow above the water surface, when its active and beneficial function ceases.

EEL GRASS OR VALLISNERIA. A single universally distributed species also known as Tape-grass or Wild celery, *Vallisneria spiralis*, which grows in fresh, brackish and salt water, from a rooted tuft, having the bluntly pointed narrow leaves of the same width their entire length, one to ten feet long, dependent upon the depth of the water. The young plants are most likely to survive in the aquarium. May be found in almost every stream or can be had of dealers. The cultivated variety, *V. spiralis gigantea*, having $\frac{1}{2}$ inch broad and 3 feet long leaves is more generally used by expert aquarists.

WATERSHIELD OR CABOMBA. A genus of three species, native to the warmer parts of America; a submerged weak-stemmed plant with finely divided fanshaped leaves and tiny white and yellow flowers, growing in the mud in shallow water and extensively cultivated as an aquarium plant. The species usually to be obtained is *Cabomba caroliniana*, the hardiest and easiest propagated. *C. rosaeifolia* has a red stalk and darker green, more finely dissected leaves, and *C. aquatica* is a recently introduced, more robust, tropical species.

DITCHMOSS OR ANACHARIS. A moss-like almost universally distributed American plant, known by a number of local names and so variable in leaves that a number of species have been founded thereon, but recently all have been referred to the one species, *Anacharis canadensis*. It has a thick jointed stem and leaves of variable length $\frac{1}{2}$ to $1\frac{1}{2}$ inches long, in whorls of 4 and 8 about the weak and branching stems. It grows very rapidly and is a good generator of oxygen, to be found in almost every ditch, pond or stream. *A. canadensis gigantea* is a recently developed larger aquarium variety generally to be had of dealers.

WATER MILFOIL AND PARROT'S FEATHER. These plants are common in most ponds and not too rapid waters of the middle and southern sections of the United States. Of the former, the weak stems are surrounded by whorls of finely divided bright green younger and dark green and brown older leaves, growing on a mud or sand bottom and having inconspicuous white flowerets. The three common species are *Myriophyllum spicatum*, *M. verticillatum* and *M. alternifolia*. Parrot's feather or Chilian water-milfoil, *M. proserpinacoides*, is an introduced, nearly related species which has the tendency to grow above the water and whose use in the aquarium is more for ornament than utility. It should never be used in ponds.

SWAMP LOOSESTRIFE OR LUDWIGIA. A genus of about 25 species of aquatic and semi-aquatic plants native to the warmer parts of the United States; recumbent in shallow water or rooted in swamps and the margins of natural waters. There are nine species in the Eastern

and Middle States, of which the marsh purslain, *Ludwigia palustris*, the globe-fruited Ludwigia, *L. glandulosa*, and the Alternate-leaved Ludwigia, *L. alternifolia*, are the most common and more generally used in the aquarium as they all thrive fairly well submerged, but experienced aquarists prefer the beautiful tropical species, *L. mulertii*, with lance-oblong leaves, bright green on the upper and clear red upon the lower sides, a very graceful and ornamental plant and a fair generator of oxygen.

STONEWORKS. A large family of dainty aquatic plants, all fair oxygenators and generally distributed throughout the United States. Of these *Nitella* is more likely to survive in the aquarium than *Chara*, though both are nearly related and form the genus *Characae*. They all have more or less finely divided leaves about weak stems bearing spores and fruitlets either in the axils or in the middle of the slender branching leaves. *Nitella gracilis* and *N. flexilis* have thin hairlike leaves upon delicate flexible stems, and *Chara gymnopus* and *C. crinita* more densely clustered and robust leaves and stems. Their growth is very rapid and their appearance in the aquarium interesting.

RIVERWEED OR POTAMOGETON. This widely distributed aquatic plant, of which 40 species and sub-species have been determined, has three or four which are desirable aquarium plants and thrive fairly well, though not as good oxygenators as those previously mentioned. The curled-leaved species *Potamogeton crispus*, the clasping-leaved *P. perfoliatum* and the close-leaved *P. densus*, are extensively introduced and are prized for their fine colors, languid habits and interesting appearance. They are all wholly submerged aquatics which occur abundantly in almost all natural waters, ponds, ditches and streams.

These are about all the more desirable aquarium plants, a selection of most of which may be either obtained in their natural situations or obtained from dealers. All but *Sagittaria* and *Vallisneria* will grow without roots when set in the sand and pebbles, the mentioned two should be planted in shallow pots containing soil covered with pebbles.

The other aquatics, previously mentioned, add beauty and variety to the plant life of the aquarium, but are inferior generators of oxygen, for which reason no dependence can be placed on them to maintain the required balance between plant and animal life.

An Inquiry as to Fish Ponds.

Springfield, Ohio.

To the "Aquarium" Editor:

Enclosed please find plot of three ponds. They were built last fall, October, 1908. I put from forty to sixty selected goldfish in each pond last November. The fish were from four to six inches; one pond fan tails, two ponds comets. I bought your book on "Goldfish Breeds and Other Aquarium Fishes" through a local bookstore. I enjoyed it and felt that I had a good outfit. I find now that I have no young fish. The ponds are a distance in the country and I did not visit them often; did not feed beyond a little wafer at each visit, when they did not then seem hungry. I never saw any spawn or young. The breeders have grown to one and one-half times their size last fall. The kingfishes got some of them, but I found no snakes, turtles or crawfish though I did find some frogs in the ponds. Can you explain for me the reasons why I did not get any young fish and advise me how to correct the trouble before another season or direct me to whom I shall write?

Yours respectfully,

H. N. S.

Your pond arrangement is good; shade is beneficial but not imperatively necessary; the water supply is abundant and the selected fishes easily bred.

Your ponds probably lack sufficient aquatic vegetation; you feed too little and at too great intervals and have too many breeders in each pond. A better practice would be to turn in four selected females and six males after a considerable jungle of aquatic plants has grown. Where there are so many breeding fishes insufficiently fed they will at once eat the spawn or devour the young. Where there is much vegetation they cannot so easily find these and many will survive, if no other precautions are taken. Feeding at long

intervals made the fishes ravenously hungry and they ate everything that they could swallow.

Plant abundant giant anacharis, myriophyllum, lilies, potamogeton and, if the climate is moderate in your section, cabomba; principally in shoal water about the edges of the ponds, leaving the centres clear and also part of one side or a corner for a convenient feeding place.

Young fishes require the small crustaceans of fresh water, daphnia, cyclops, cypris, etc., and for the mature fishes a mixture of corn meal, oatmeal and shredded fish boiled a long time and fed either fresh or dried.

Erect posts about four feet high around and between the ponds on which fasten muskrat traps to catch predatory birds when they alight, and patrol the ponds with a shotgun to kill frogs, snakes, minks, muskrats, etc.

H. T. W.

Some Aquarium Suggestions.

Duluth, Minn.

To the Editor:

On reading the interesting and instructive article on the household aquarium, the recommendation of snails, tadpoles and mussels recalls the classic remark that "If you like that sort of thing, it is just about the sort of thing you would like"—but some don't. The writer frequently has what might be termed a "natural aquarium" containing snails, tadpoles, mussels or crayfish, as well as the smaller denizens of local ponds and streams, and finds much pleasure in them; but when it comes to combining them with goldfish—not any in mine. And as there are some others similarly minded, the following suggestions are given for their consolation—being intended merely as a supplement to Editor Wolf's valuable instructions, and not in any sense as a criticism.

The writer has kept goldfish for over 15 years, and has had good success—the star of my present collection having been over 10 years in my possession. Of course I have lost some fish, before and since acquiring that one, but most of them last for a number of

years, increasing in beauty, if not in size. The 10-year specimen is a pearl comet, with body three inches long and a tail as long as his body; with ventral fins one and one quarter inches in length and the others in proportion, and with double anal fins; and I think any fish enthusiast, watching the fairy-like grace and beauty of that fluff of filmy white draperies, would resent, as I should, the impertinence of a wriggling black tadpole in the same field of vision. And they can be dispensed with if one has a mind to act as their own Health Department.

My aquarium is, of course, a balanced one as regards plants and fish, but contains no scavengers. Five minutes judicious use of the glass dip-tube, each morning before feeding, effectually removes all sediment, offal, etc., and there is no need to have any refuse food. A little care in feeding soon enables one to determine just what amount of food should be given each day, my own rule being never to give more than the fish will clean up in five minutes, and feed only once a day, preferably in the morning. Sunday is a fast day, with mine, as they are at present in my down-town office.

The cleaning of the glass, in the snailless aquarium, is easily accomplished with a small sponge, occasionally rubbed over the glass to take off the plant growth, rubbing carefully over a small section of the glass and then squeezing the sponge in clean water before doing the next section. This will not need to be done very often unless the aquarium is in too strong sunlight. My experience has been that very little trouble is ever had with rotifera, parasites, etc., if the water is kept slightly salt, rock salt being preferable to table salt.

If the fish are kept merely to amuse little children, the cheap common fish answer every purpose, but if they are the pastime of adults, who are willing to give the care and attention they need (and it is very little), I wish to earnestly recommend the keeping of fancy fish exclusively, both longtails and fantails, as they are not only beau-

tiful, but have the added interest of change and growth in that beauty. In a small aquarium the fish increase but little in size, and the common fish, with no tendency toward freak growth, do not change at all, merely growing old and experienced if conditions are favorable; but if one can keep the fancy fish healthy and happy, their beautiful fins increase in length, until one has fish which cannot be obtained for love or money in any small market. Occasionally one gets a fantail or longtail which seems to have reached its maximum growth of fin very early and does not perceptibly change, but these are rare and can be weeded out of the collection if they fail to "deliver the goods."

Another important item, for those having rare and expensive fish, is the quarantining of all new arrivals until satisfied that they are healthy. My way is to put them in a fairly salt bath for a short time, watching them carefully for signs of distress, and then diluting the water until but slightly salt and leaving the fish by themselves for a few days. The salt bath is an effectual, but safe, remedy for the fungus growth which is so apt to attack fish which have been over-crowded in shipping and storage, and a few days' observation will usually enable one to determine whether the fish are in condition to be safely introduced into the aquarium. It is also well to put plants in a weak salt bath for a day or so before using.

Will Editor Wolf kindly answer the query: Is the spawn of the common water snails (eggs and jelly sheath) desirable as an occasional feed for goldfish? In some localities it is more easily procured than mosquito larvae.

NELLIE B. PENDERGAST.

The commonplace is the grandest of all things; that the exceptional in any line is no finer, better, or more beautiful than the usual, and that what is really wanting is not that we should possess something we have not at present, but that our eyes should be opened to see and our hearts to feel what we all have.—Dr. R. M. Bucke.



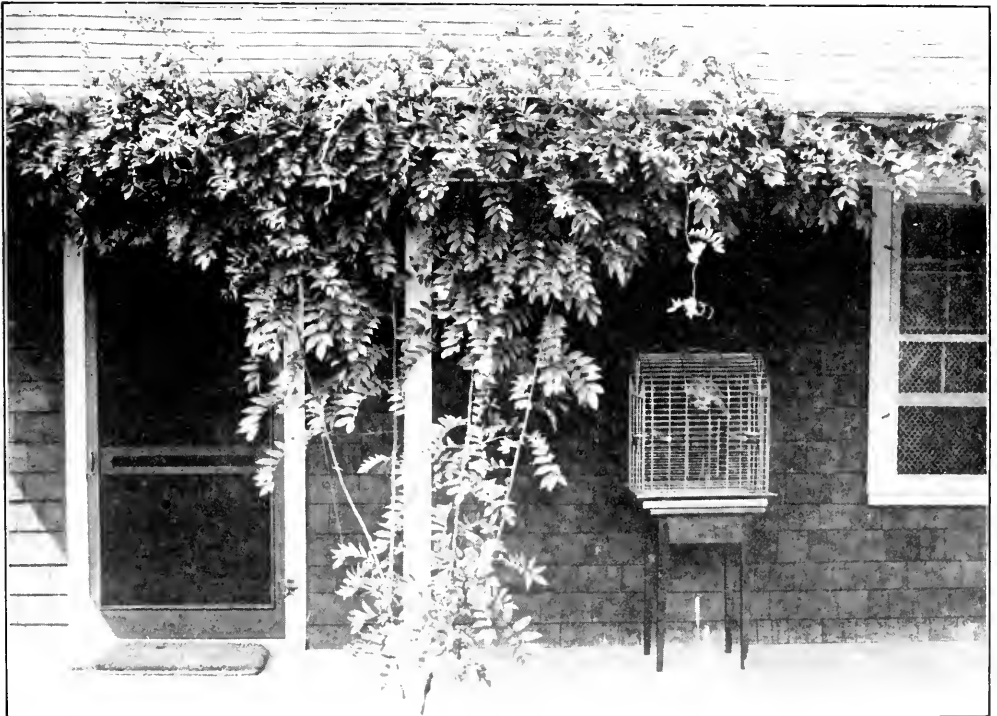
Ideal Investigation of Bird Life.

"Is it wrong or cruel to keep birds in cages?"

The wrong or right depends altogether upon the purpose, and the cruelty or the absence of it depends upon the method and care. In motives and methods the ideal has been attained by The Worthington Society of Shawnee-on-Delaware, Monroe County, Pennsylvania. Mr. Charles C. Worthington has intense love of birds and abundant means for making that love efficient. His manager, Mr. Charles W. Miller, is an enthusiastic worker, in fact a veritable hustler, whose enthusiasm is manifested in best scientific

methods. He knows how to do it, what is to be sought, and then he spares no effort to attain the desired results.

His first assistant, Miss Cheney, is as gentle and shy as a goldfinch, and comes and goes through the maze of cages as noiselessly as does the owl through the forest. Her voice is low and sweet in striking contrast to her tiny pets which she feeds as regularly and faithfully as would a mother bird. The little ones are always clamorously appreciative of the insect or the mysterious mixture compounded from a variety of bins, bottles and baskets by Mr. Miller. Even the man-of-all-work and the boy who chases insects all day long



AS ONE APPROACHES THE DOOR A PARROT CALLS CHEERILY, "HOW D'Y DO?"



A VIEW FROM THE MAIN ROAD.

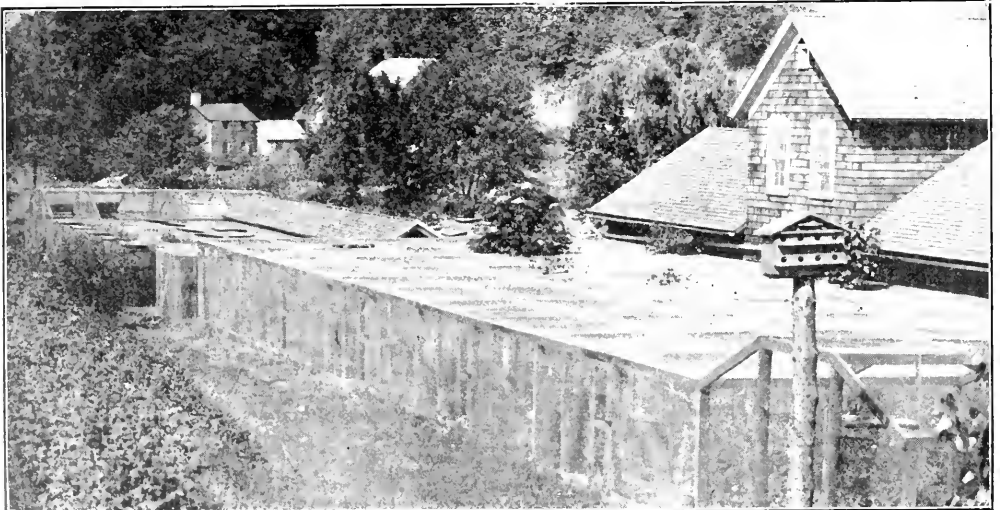
with a net fit in the perfect scheme of care and study of birds.

It was thus a busy and yet harmonious place that I found after four miles of dusty road from Delaware Water Gap (four hours from Hoboken on the Delaware and Lackawanna Railroad) up over the hills to Shawnee-on-Delaware.

Here is a bird *home*, not a bird prison. The cages are large. The ground is as grassy as that of the fields in the valley, and small trees and shrubbery grow within the cages as luxuriantly and naturally, even if not so large, as in the

supplemental grounds of ten thousand mountain acres of forest and fields. This extensive territory is utilized in the study of birds in their native habitat. The cages are the apartments of a luxurious bird hotel for the special care of those who become more intimately acquainted.

The establishment was started in September, 1904, with a nucleus of Mr. Earl Dodge Scott's private collection of live birds moved from Princeton College. Mr. Scott was curator of the Museum at Princeton. The caged birds were his personal hobby and property.



THE CAGES THAT ARE IDEAL BIRD HOMES.



MISS CHENEY FEEDING THE FLICKERS ON THE FENCE.

He had some two hundred or three hundred specimens picked up at bird stores or trapped or reared from the egg. Many of these were foreign. The plant is now devoted mostly to native birds. In July, 1905, Mr. Miller came from Clark University to assist Mr. Scott who left in September, 1906, leaving the entire management with Mr. Miller. The collection now consists of about one thousand birds comprising one hundred varieties.

The purpose of the Worthington Society may be briefly given as three-fold:

First—The scientific study of birds and bird life, embracing biological, psychological, and economic problems connected with birds.

Second—The acquisition and maintenance of as complete a collection of live native birds as is practicable to keep in captivity, thereby affording the student of ornithology an opportunity to pursue his observations and research with the

aid of live birds instead of with the dead specimens usually provided by museums for this purpose.

Third—The stimulation of a more thoughtful interest on the part of the public regarding birds and their charm and usefulness to mankind.

It is generally conceded that bird life presents a vast amount of material for investigation both from a scientific and economic point of view. The intimate bearing of bird life upon agricultural interests is now well understood and in itself affords an infinite field for the observation and research of the nature student. Bird life with its variety of forms and colors, habits and habitats, has so much to do with the welfare of man that no scientist need be at loss for problems to solve, relations to adjust, or deductions to make, with the quantity of material that this large family offers.

Important work to be carried on by this Society is along the line of experiments in evolution. One of the chief difficulties hitherto met with in this



A FLICKER GETS INTO THE DISH.



MR. MILLER FEEDING A BLUE JAY.

work has been that of keeping insectivorous and many of the seed-eating birds, in good health and spirits while in captivity. This problem is receiving the careful attention of the Society, as is also the housing of birds in all seasons of the year in surroundings as nearly like those of their natural environment as can be devised. It is pleasant to discover that, under their system and methods, the mortality among the birds is very small and the general health excellent, in striking contrast with the conditions and results observed in many of the Zoological Collections where less attention must necessarily be given to details of their care.

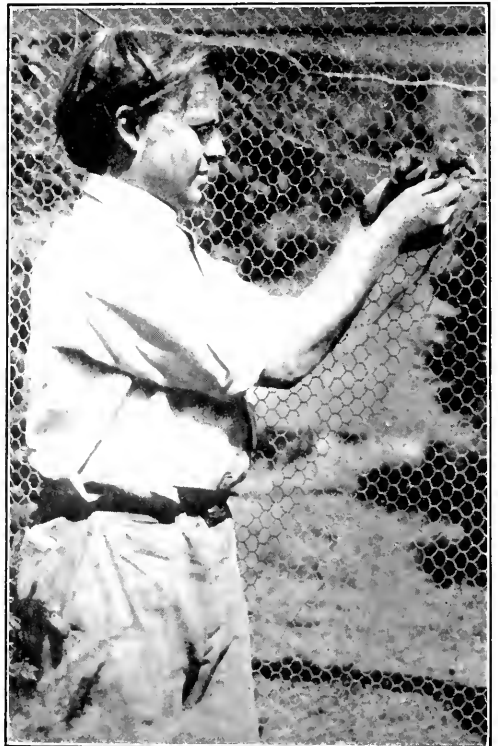
Nor is the work confined by any means to the aviaries. The migration, nesting and general habits of our native birds in the vicinity, are under observation and records are made.

While the collection of native species is by no means complete as yet, it is a

fairly representative one and is being constantly enlarged. Additions to the bird family are made in three ways: First, by trapping wild birds; second, by rearing by hand young birds taken from nests found outside; and third, by the natural increase of those already in the collection. While the rearing of young wild birds by hand entails a great deal of extra work upon the attendants, it is more satisfactory than trapping the old ones, as the birds thus raised are always tamer and more tractable.

Among the special things the Society is now investigating are the following:

1. The colonization of birds in certain regions where they have been driven out by English sparrows or other causes or have left on account of lack of breeding places.
2. The life history of a certain parasitic fly, the larvæ of which inhabit birds' nests and feed to a certain extent on young birds.
3. Hybridism and fertility of hy-



TWO VERY INTIMATE PETS.

brids.—Experiments on certain hybrid doves and thrushes they have produced.

4. The inheritance of variations.—The inheritance of a peculiar variation in the color of eggs of the bluebird.

5. Breeding and nesting habits of certain native birds illustrated by experiments within their cages.

6. The growth of birds.—A study of the growth and development of the young of a typical species with notes on the psychology of nestlings. The relation of daily food to daily body growth.

7. The popularization of the bird protection and colonization idea.

Much of the success of the experiments and the comfort of the birds have been due to the food mixtures that are carefully prepared from formulae compiled on studied theories and extensive practice. The seeds for these varied recipes are obtained from the well



AN INGENIOUS ACETYLENE LIGHT DEVICE FOR CATCHING INSECTS.

known and long established house of M. A. McAllister, 67-69 Cortlandt Street, New York City.

Rambles for Nature Interests.

Is there anything more delightful than the fatigue of an afternoon's long ramble after objects one loves? You are not tired of them, but *with* them. It is a delicious fatigue. Subsequent years of trouble cannot obliterate the charmed impressions. They are the sunniest spots in one's memory. Their recollections come, like angel's visits, to unconsciously relieve us in after-years of many a sad trouble and trial. They should be laid up in store when you are young, so that they can be drawn upon when you are old. Then the sunshine of youth is stored to gild the troubled days of matured manhood and the darker shadows of old age.

—The Playtime Naturalist

Glorifying the Commonplace.

But it is only the GREAT poet who has the courage and the power so to see things. It is only a Homer or a Whitman who will pass by the pomp and circumstance of life to glorify some mean and "vulgar" thing—as the parting sun will sometimes turn and speed over the shoulder of the world an arrow dipped in gold to set ablaze the windows of some mountain cottage, or burn a needle's eye through the slender village spire, leaving the casements of the proud palaces in the plain all blank and undistinguished.—Kennedy.



MR. WORTHINGTON FONDLING A PET HAWK.



THE MINERAL COLLECTOR

Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

Quartz.

Quartz is one of the most beautiful and widely distributed minerals. It has probably been responsible for the starting of more collections than any other mineral on account of the two facts



No. 1. QUARTZ CRYSTALS FROM HOT SPRINGS.

stated above. It is almost impossible to walk anywhere without coming in contact with it. The sands of the seashore are quartz; the pebbles found there and in the ground are mostly quartz. Almost all minerals have quartz either attached or in combination with them. Then there are a great many different varieties of quartz: rock crystal, yellow, smoky, milky, amethystine, star quartz, cat's eye, all the various agates, chalcedony, all the different clear quartz containing other minerals as rutile, tourmaline, etc., etc. Space will not permit us to give even the briefest description of all of them

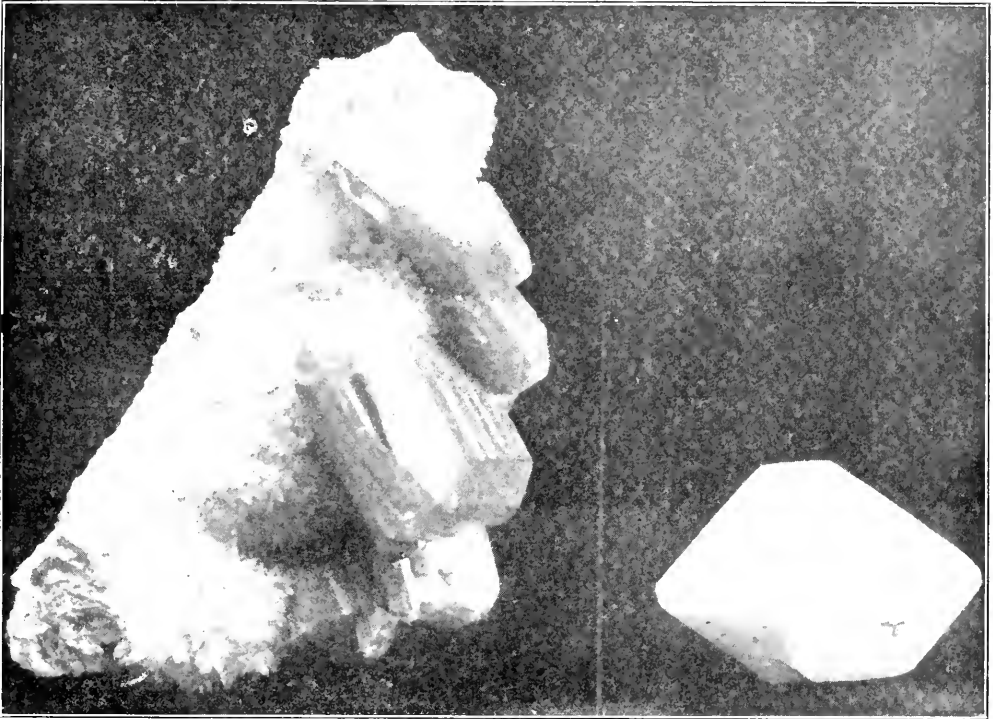
so we will give a description of only the few we have pictured here.

No. 1 is a group of transparent quartz crystals from Hot Springs, Arkansas. The sharp angles and beautiful natural polish of these crystals are superior to any lapidaries' work. They occur generally in six-sided crystals, but are sometimes modified. Their terminations are also often modified. The crystals in this group have but one termination and are known as singly-terminated crystals.

No. 2 shows a doubly-terminated milky quartz crystal from Westphalia, Germany. These crystals are entirely opaque and the color of milk. They are also mostly modified in form as this picture shows.

No. 3 is a quartz geode; that is, a nodule more or less rounded in form which when broken open is found to be lined with quartz crystals which in this case are opaque. It is in fact a miniature quartz cave. It is from the Green River, Iowa, the waters of which had gradually washed it out from the soil or softer rock in which it was formed.

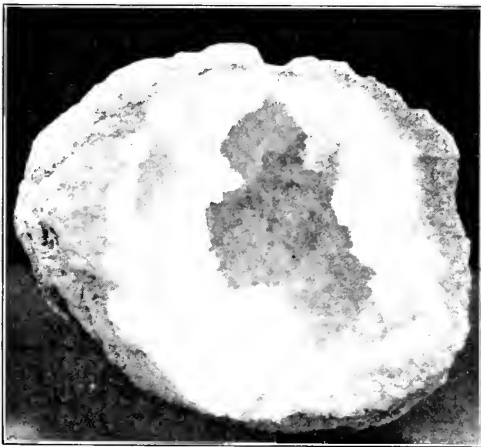
No. 4 is an agate from Brazil. This variety of quartz is probably more admired by persons who know nothing of minerals than by the mineralogists themselves on account of its beautiful colors and markings. It is also used more for jewelry than any other variety of quartz. These high colors and markings are often taken advantage of in the cutting of cameos and intaglios by cutting faces or forms so that the different layers of colors will harmonize with the subject selected. They are also cut for rings, scarf pins and watch charms so as to show two or more layers of color. When black and white are shown they



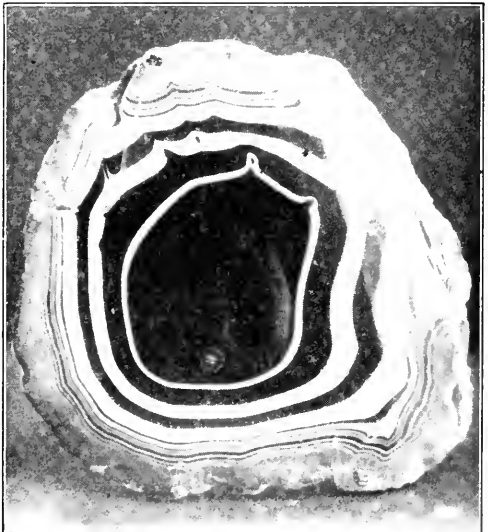
No. 2 (AT LOWER RIGHT) MILKY QUARTZ CRYSTAL.

are called onyx; when red and white, sardonyx, and when red only, sard.

The high colors seen in some agates are not always natural. Sometimes an ugly agate of an uneven or unattractive



No. 3. QUARTZ GEODE.



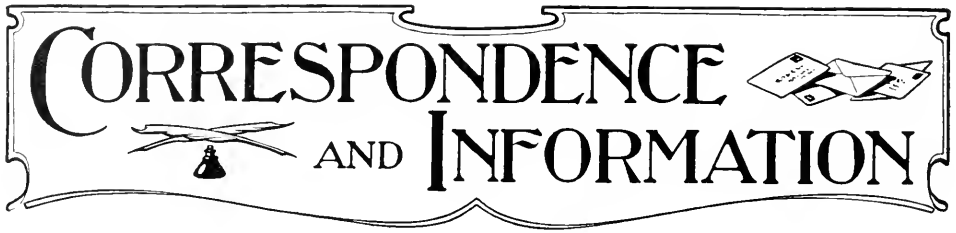
No. 4. AGATE FROM BRAZIL.

color is given a bright red or other color by boiling in honey and afterwards in acid or some chemical compound.

Grumbling Wrong End First.

“Men grumble because God puts thorns on roses. Would not it be better to thank God that he puts roses on thorns?”

CORRESPONDENCE AND INFORMATION



Cutting a Crow's Tongue to Make It Talk.

New York Zoological Park,
New York City.

To the Editor:—

I am moved to use strong language in regard to the question about cutting a crow's tongue to make it talk. That is one of the cruelest and most foolish ideas that has ever been propagated. If a crow can articulate, it can do better with the tongue in a normal condition than with the muscles at the base cut. It is a relic of medieval superstition and you should do all in your power to stamp it as absolutely unnecessary and terribly cruel.

Yours very truly,

C. William Beebe.

Protective Coloring in the Mud.

Sacramento, California.

To the Editor:

Here is an item that may be of interest. I have been collecting specimens of the Hemiptera of this vicinity, among them some of the toad-shaped bugs or *Galgulidae*. I obtained five specimens from the borrow pit of one of our dredgers in the tule marshes west of this city. The mud here is a gray black and the little bugs of the same color were almost invisible while at rest. Some time afterward I found a single specimen on an irrigation ditch-bank in the foothills. Here the soil was reddish as is common in our Northern California orange groves, and this specimen was almost the color of the dark red soil. I feel quite certain they are all of the same species. Is this not an interesting example of variation along the lines of protective coloring?

Sincerely,

C. M. GOETHE.

Strangled by Swallowing a Bunch of Cord.

Sterling, Ill.

TO THE EDITOR:

Last Sunday morning my attention was called to the body of a robin hanging from a string from a nest made on the angle of one of the water tables of the tower of the Baptist church. The position of the nest was fully twenty-five feet up, which made it very difficult to reach. The grewsome sight to leave there, was too much for the tender feelings of the young people. Accordingly, having equipped myself with a long pole with an iron hook lashed at its point, I ascended to the top of the building and, bending over the wall and reaching down as far as I could I succeeded in catching the string from which the robin was suspended and, giving a gentle pull, disengaged it from the nest, the body of the unfortunate bird falling to the ground. The nest was so firmly fastened to the ledge that I did not succeed in detaching it. I noticed it contained two greenish blue eggs. Upon examining the bird afterwards to see how it had been entangled by the string, I was surprised to find that its head was free, as also its wings, but the string was found in its throat. Pulling the string with some force I drew from its throat a bunch of the cord, batted together as large as the end of my little finger. The condition of the bird indicated that the tragedy had taken place several days before. The wind produced an eddy in the recess where the bird was hanging, causing the body to whirl around and around. The male bird was seen standing upon the ledge looking down upon the form of its dead mate, reminding one of the vigil of Rizpah.

GEORGE P. PERRY.



Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

MOST MERITS FINANCIAL AID.

The Agassiz Association solicits your financial aid in its work of nature, science and philanthropy on three distinct claims, every one of which will be proved in detail upon application or opportunity.

1. It is the oldest, most extensive and successful organization of its kind in existence.
2. Its great work of over a third of a century has been done with less money to each person benefited, each task accomplished, than has any other work that has ever existed for the uplift of humanity or the promotion of knowledge.
3. The faithful work of its Officers and Council, assistance without pay or the expectation or desire for it, is unequalled by that of any other philanthropic or educational movement.



Every Dollar is Expended, Directly and Net, for Actual Expenses.

These are not mere claims; they are facts that can be easily and gladly proven to you. On this basis the conclusion is self-evident that a money gift from you to the AA will "count" for more than to any other organization or purpose.

This does not insist that you are to give only to the AA more than it would mean you must buy only a certain kind of food if a chemist tells you that one kind has the highest food value in proportion to cost.

Other organizations are doing good work in science and philanthropy, but analyze most of them and you will find plenty of good or fair salaries for doing it. The AA has done its work for almost thirty-five years without any salary, or money remuneration in any form to its promoters and workers.

Every dollar you give goes directly to the work, and, even more astonishing and meritorious, no salaries are desired for the future. Therefore we make the claim that the AA not only merits your financial aid but that it **MOST** does so. The story is too long, the details are too many, to be fully explained here. All we ask now is **INVESTIGATION**.

We need at once a **FEW** thousands of dollars to complete the equipment and to operate Arcadia for the great work it has to do.

Again we ask you to please **INVESTIGATE**. If we cannot prove what we say, do not give a cent but publish our claims as misleading. If we prove it, give every dollar you can invest (and tell your friends to do the same) in the good of nature, science and humanity.

Contributions to Arcadia.

Mrs. Arthur Munson of Stamford, Connecticut, has contributed two loads of beautiful white cobblestones that greatly add to the six borders of the walks leading to the entrance building of Arcadia.

A liberal supply of marine specimens, chiefly from Florida, has been contributed by Mr. George W. Morgan of Sound Beach.

Liberal supply of "crazy corn" (grown by the inmates of the Insane Asylum, Brattleboro, Vermont), specimens of other varieties of corn and also seeds and books by Mr. George S. Lewis, Jr., Springfield, Massachusetts.

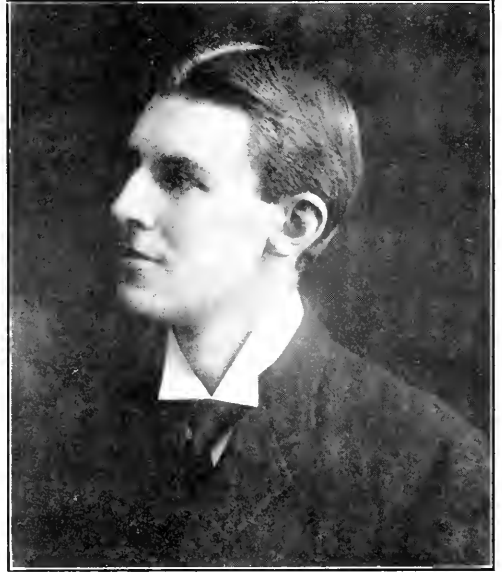
Marine specimens from Miss Emily A. Bradfield, Greenwich, Connecticut.

Mrs. Olive Thorne Miller of Los Angeles, California, well known to all students and lovers of nature as an ornithologist, is also well versed in marine algae. She has donated to the Agassiz Association, of which she is a member, a fine collection of her mounted specimens to be placed in the AA Home for assistance to our students and entertainment of visitors.

Death of E. Earl Dubois.

Earl Dubois, aged 25 years, only son of Mr. and Mrs. Joseph Dubois, 63 Hamilton street, for the past three years in charge of the silk mill office, died Tuesday night of infantile paralysis. Mr. Dubois was taken ill Friday but remained at the office until Saturday night. Sunday afternoon he went to bed, complaining of pains in the back of his head. His condition became rapidly worse until Tuesday night when death occurred. The deceased was born on his father's farm at Galilee and was graduated from the O. F. A., in 1905. He was exceptionally bright and capable and made friends of all with whom he came in contact. Mr. Dubois was a true lover of nature, and being clever with the pen, wrote many entertaining articles on nature and nature study for magazines and newspapers. He was an

exceptionally clean-cut young man, whom it was a pleasure to know. He was esteemed by his employers and every employe of the silk mill. He is survived by his sorrowing parents



E. EARL DUBOIS.

who have the sympathy of all in their affliction. The funeral was held from his late residence, Thursday afternoon, Rev. W. C. McIntyre officiating.—Newspaper Item.

Mr. Dubois, of Ogdensburg, New York, was one of the best friends of *THE GUIDE TO NATURE* and an active Corresponding Member and worker of The Agassiz Association. His death is a great loss to our cause. We extend most sincere sympathy to the parents.

If you happen to get a new idea don't build a barbed wire fence around it and label it yours. By giving your best thoughts freely others will come to you so freely that you will soon never think of fencing them in. Thoughts refuse to climb barbed wire fences to reach anybody.—Luther Burbank.

A man who hates plants, or is neglectful of them, or who has other interests beyond them, could no more be a successful plant-cultivator than he could turn back the tides of the ocean with his finger-tips.—Luther Burbank.

The Bending of Trees by Ice and Snow.

JOHN E. MELLISH, CORRESPONDING MEMBER NO. 2012 OF THE AA, COTTAGE GROVE, WISCONSIN.

I am sending you some remarkable pictures of the effects of the great storm of January 29, 1909. The photographs were all taken three days after the storm. The first two days were partly cloudy and there was a wind blowing at the rate of twenty-four miles an hour most of the time. The air was also full of snow. The

snow, rain and sleet started about dark on the twenty-eighth and by nine o'clock all that could be seen of the trees was solid ice. The next morning all the wires were down and were coated with two inches of wet snow.



JOHN E. MELLISH.

It rained some then and turned colder the thirty-first of January. The sun shone brightly most of the time so the snow thawed and packed and then froze into solid ice. The trees in the photographs stayed covered with ice for a week. The bent trees are white



THE BENDING OF TREES BY ICE AND SNOW.

oaks from four to six inches in diameter. I never saw such a beautiful sight as the woods presented for the next few days. It was beyond description.

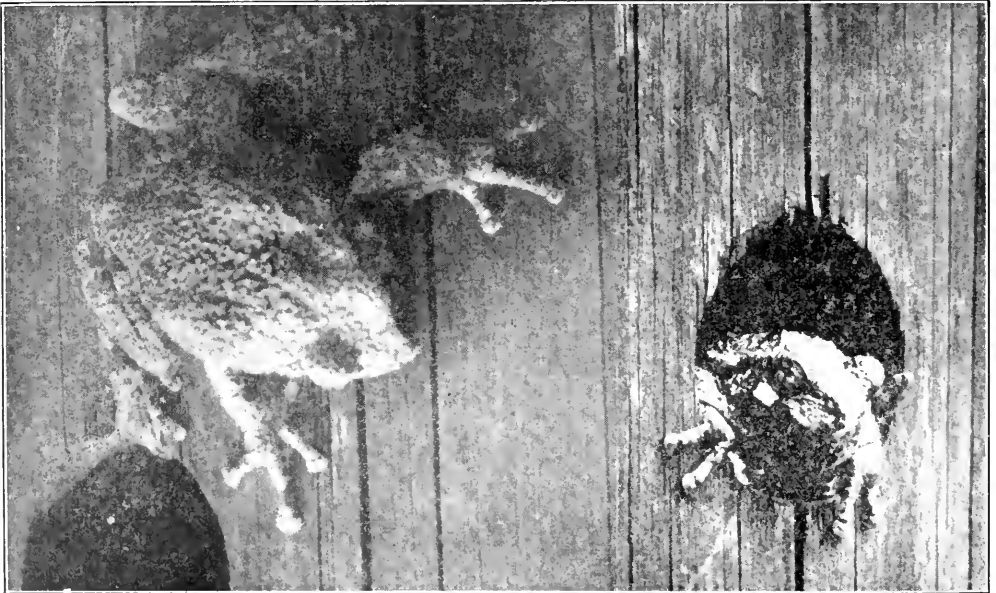
I am also sending a photograph of a good reflection in a pond. It was taken with an old plate that had been standing in the plate holder for two years, so the upper right-hand corner was light struck. (Not clear enough for reproduction in a cut.)—Ed.

Finding a Tree Frog.

BY EDMUND J. SAWYER, SCHENECTADY,
NEW YORK.

The illusiveness of the tree frog has been too often dwelt upon to need more

One day, on examining what seemed a good place for a house wren's nest, I surprised myself and the tree frog whose picture you see here. His retreat was an old auger hole in a tall post which with others supported one side of an ice house on a farm. The hole was about five feet up and went through the post; the frog was near the middle. Poking in with a stick I gently urged him to crawl out on the opposite side where my camera was focused. At the sunny opening he paused, mule-like, and it required almost a shove from the rear to induce him entirely into the light. At the click of the camera he deliberately crawled out of sight again into the hole.



THE TREE FROG I SURPRISED.

than passing attention here. In the woods, their proper haunts, I have never seen a single one, though I have often tried to steal a march on the singers. As an easy job I much prefer finding humming birds' nests. The animal I mean is the true tree frog, the strikingly black and gray, toad-like fellow that you find (?) in dark holes of tree trunks in sunny weather, outside on the bark or on the branches on cloudy days; not the spry little pinkish chaps which we often see on the dead leaves and leaf mould.

Meteoric Plants.

BY DR. WM. WHITMAN BAILEY, BROWN UNIVERSITY, PROVIDENCE, RHODE ISLAND.

It is a fact well known to flower lovers that certain plants, abundant one year, may not be found again in the same place, or anywhere else, for several seasons after. In many cases these are at times in such quantities that one cannot account for their lapse at others on the ground of injudicious picking. The phenomenon has deeper, and to the writer, unknown causes. He does not propose at this time to theorize

upon them, nor to dogmatize, which is worse.

One of these so-called "meteoric" plants is a very queer orchid of the genus *Pogonia*. This queer plant is called the whorled pogonia from the circle of glossy, parallel-veined leaves just beneath the flowers. The latter are in no way showy but strange to a degree.

They are of a purple, dusky hue, mingled with dark green, and supported on stalks longer than the ovary. The outer sepals are narrowly linear, more than twice the length of the inner, spreading from an erect base, and more or less twisted. The whole flower has an animal-like appearance. The lip, that characteristic part of an orchid, has a narrow crest down the middle, but is beardless. The flowers are generally solitary or, rarely, a pair to a stem.

Owing to its sombre colors one is apt to overlook it even in years when it is frequent. Some seasons, as we have said, it fails; at all others we have it brought in or sent from six or eight widely scattered localities. It grows in dense woods, in clumps of several or many plants, and is spoken of in Gray's Manual as "rather rare." This in the new edition is changed to the words, "not common," which indicate greater frequency than the older expression.

The fringed gentian is another instance of what we have called meteoric plants, and is even more typical than the last cited instance. Everyone knows its queer way of failing all of a sudden in moist choice localities.

Other plants might be mentioned, but these are enough to emphasize our text. Will some one hazard an explanation?

How Squirrels Transport Their Young.

BY JOHN S. FERNALD, BELFAST, MAINE.

We are all familiar with the method by which animals of the cat tribe transport their young from place to place, and most of us recall our youthful anger at the family cat the first time we saw her carrying one or her kittens in her mouth. But I doubt if many of the

readers of this magazine ever saw a squirrel moving her little ones from one nest to another. The cat seizes her kitten by the nape of the neck and lifts it as high as she can. Unless it is quite small its hind parts drag on the ground.

A squirrel, however, is wiser, or at least has a better method of doing this. She induces the little one to lie down on its back before her, when she grasps the loose skin on its belly in her mouth. It then clasps its fore legs and head around one side of her neck and its hind legs and tail around the other, thus making of itself a sort of fur scarf for its mamma. The mother and baby are then ready for a trip up or down a tree or over the ground of lawn or forest or even to make a good run from a pursuing cat or other enemy.

The Unfriendliness of Birds Toward Herons.

Brooklyn, New York.

To the Editor:

In Castleton, Vermont, where I spent the summer, I was greatly interested in watching a pair of green herons which came every day for two or three weeks in mid summer to a brook near the house. If nesting they showed no signs of being busy, for they would sit on some bare limb a half hour or more at a time, making their toilet in most thorough fashion. When stretched out, the neck, with head and bill, seemed longer than the body; but soon after alighting the head was drawn down close so there seemed to be no neck at all, and the whole bird looked as round as a bobwhite.

Most small birds did not seem to take much notice of the herons, but the herons stretched out their long necks at the small birds as they flew by. A kingbird, however, dove at a heron and snapped his bill, but the heron held his ground simply ducking his head.

Late in the season I once saw three at a time, but previously there had never been more than one or two.

CAROLINE M. HARTWELL.

The La Rue Holmes Nature Lovers League

By George Klinge, Summit, New Jersey

Explanation:—The aims of this League are in many respects the same as those of The Agassiz Association. Therefore it has been proposed that the adult interests be represented by "The Guide to Nature" and that the League co-operate, or possibly be affiliated, with The Agassiz Association.—E. F. B.

A Bird Incident.

BY EDITH L. PIERSON, MORRISTOWN HIGH SCHOOL, CHAPTER OF THE L. H. NATURE LEAGUE.

It has always been my habit to save the squash seeds, for the next year's planting. To do this I placed them out in the sun to dry before putting them away for the winter.

One night, when I went to bring the seeds in out of the dampness, I noticed that about half of them were gone. The next day I placed out more of them and the same thing happened. I was now determined to find out who the thief was and hid near by. Very soon a little nuthatch came and begun to carry away my seeds. He took nearly all there were and placed them under the bark of an old dead stump.

All that season I continued to put the seeds in the same place and the little fellow became quite tame. The next winter I examined the stored food and found that the contents of the shell had been eaten up, and each one was full of nice fat worms upon which the nuthatch had been feeding.

All that winter I placed seeds out for him, and as soon as his stock of worms had gone he would store away new seeds to replace the old ones.

One day I heard a great commotion and saw a larger woodpecker eating the worms stored by the nuthatch. This did not suit the latter, and so of course a fight followed. I feared for the life of my little friend so I went out and separated them. They flew to different parts of the tree and finished the fight in words as strong as a bird can use.

Ever since that time I have placed out the seeds, in the autumn, and the nuthatch comes and stores them away for the winter.

Those of us who desire to maintain, or increase the present population

among our bird neighbors, would do well to remember, when felling dead trees, or cutting away dead branches, that when such wood is not found in its accustomed places, our woodpeckers move on to new locations, for it is to the shafts of the dead trees, in the forests and about our homes, that the woodpeckers resort when they would choose a site for their house-keeping.

A League Report.

Dear Secretary:

I have obtained this summer some fine minerals for winter study, and have built a little palace for the caterpillar world. Two caterpillars have already built their cocoons, and I am expecting to see many beautiful butterflies and moths next summer.

I was able to bring a root of the cardinal flower home with me from the country, and the plant is verily flourishing.

I expect to be able to tell you when I come to Summit, some plans for the South Orange Chapter No. 3, of the L. H. Nature League.

I have just refused the position as Class President in order to have time for the League-work.

Is there anything better than nature in its present conditions, whatever the time of year? I just now looked out of the window and "saw," almost heard the whisper that Jack Frost is near. The trees are trying to do their final best; the birds are showing human powers—to think in their southerly journeys; the horn of plenty is yielding its fruits, in order that this may be the best season of the year. October!!—and yet we shall love the fluffy white snowflakes, the budding and awakening world of the spring, and the warm, quiet days of summer, filled with the peaceful hum of insects.

As I looked, for the past few days, on the tens of thousands of mankind, gathered in New York City, I wondered if any could be as happy as they who worship God and nature.

Sincerely yours,

Alfred Kinsey.

South Orange, N. J.

I have not plucked a wild flower this year.—Mrs. P. Z.

The American Woodcock.

BY GEORGE CHILDS, OF THE KENWOOD CHAPTER, MINNEAPOLIS, MINN.

How it differs from other members of the Scolopacidae or snipe family.

The eyes are situated unusually high in the triangular-shaped head. Because of this they are able to see over comparatively high objects, as Audubon once proved to his own satisfaction. He took a small tub, placed a captured woodcock in it, and stationed a cat near the edge of the tub. Although the rim of the receptacle was as high as the bird, the cat was immediately spied and the woodcock made its escape as quickly as possible. The large size of the eyes, also, show that the bird is nocturnal, feeding and flying, for the most part, by night.

The structure of the bill is another feature peculiar to the woodcock. The



A WOODCOCK'S NEST ON THE GROUND.

Unlike other members of the snipe family, the American woodcock (*Philohela Minor*) is strictly terrestrial. It is true that the ruff, or fighting snipe, of Scotland and the Hebrides, breeds and incubates in secluded wooded districts, but the greater part of its life is spent in marshes or on streams.

The gregarious habits of the English snipe, its strange disappearances from certain localities, and its appearance in others, are characteristics observed also in the woodcock. The European great snipe, with its short legs, long bill, and comparatively massive form, more closely resembles this strange bird than any other representative of its family. But there are a few wide differences which distinguish the woodcock from other members of his class; namely the eyes, the peculiar properties of the bill, and the nesting period flight.

upper mandible, or division of the bill, protrudes beyond the lower, and is equipped with a short, flexible appendage, used in catching earth worms, located deep in the ground. The method of procedure is very interesting. The bird thrusts its bill into the earth up to its nostrils; with the flexible appendage it prys around until it is able to grasp the worm which it proceeds to pull out of its hiding-place.

The woodcock possesses yet another striking individuality. If suddenly aroused from its nest, it flies upward in large spiral curves until it is some fifty feet above the earth. In course of time it will descend, in like manner, to the ground.

It is generally supposed that by these means it sometimes deludes hunters, who are often under the impression

that soaring is the bird's regular mode of flight.

Rarely does this bird exceed ten inches in length. In a few cases the female, which is invariably larger than the male, attains a length of eleven inches. Indeed one on record measured twelve, but such instances are rare.

In the summer months the woodcock is found as far north as Labrador, and the Hudson Bay, but as fall approaches it migrates further south until it reaches southern Virginia and North Carolina. Here it winters, and it is here that the bird has been so greatly reduced in numbers. In 1835 it was not an uncommon sight to see a hunter

return from the woods with as many as twenty woodcocks in his game-bag. Woodcock hunting was, some years ago, an every day occurrence, and even a business; the markets abounded with them, and now, as a sad result, a rapidly diminishing number exists.

The woodcock arrives in our northern latitude, about the first of April. At this time they are gregarious, and may be seen flying by night, one after the other in quick succession. Their flight is direct but low, rarely above four feet above the meadows where they congregate. In June they mate, and seek the thick brush, in preference to the field.



GAINING INTIMATE FRIENDSHIP WITH THE WOODCOCK.



THE WOODCOCK IS NOT FRIGHTENED FROM HER NEST.
(Photographs by Scott and Van Alstena.)

Their nests are constructed of grass and leaves. Sometimes in suitable locations, they line them with mud, but such is seldom the case. Occasionally they build in decayed stumps of trees, where the bird is scarcely discernible above the surrounding bark. The eggs number four or five, are light olive colored, and dotted with spots of brownish black. In shape they are less pyriform, or pear-shaped than those of the other snipes. Like the Phalaropes, the male performs incubation. There was some discrepancy of opinion over this statement, for Samuels claimed to have seen both sexes perform that function, but modern investigation has decided against him.

The young, when just hatched, are covered with yellow down. They are at once able to scuttle about in the bushes, and are an endless source of trouble to their parents, who seem everlastingly anxious about them and with their low "Peet-a-peet-a-peet," seem to be continually calling them out of danger's way.

The woodcock is often spoken of as the "gamiest of game birds." Infinite skill and precision are the requirements for their hunter. Their wonderfully developed instinctive powers enable them to "bamboozle" him in many ways, so for the benefit of the hunter, as well as the bird and the nature-lover, should not absolute present protection be given to this rapidly disappearing denizen of our woods?

Swamps.

It is not significant that some rare and delicate and beautiful flowers should be found only in unfrequented wild swamps? . . . Where the most beautiful wild flowers grow, there man's spirit is fed and poets grow.

* * * * *

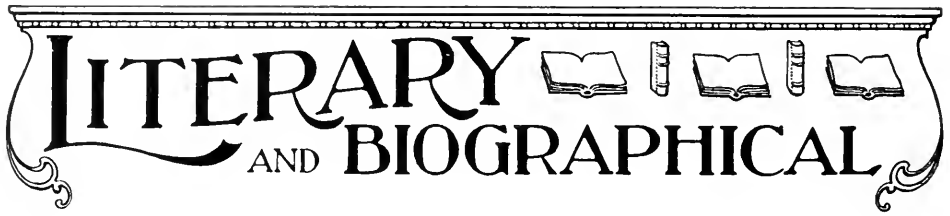
I am confident that there can be nothing so beautiful in any cultivated garden with all its varieties as this wild swamp.

* * * * *

How when a man purchases a thing, he is determined to get and gets hold of it, using how many expletives and how long a string of synonymous or similar terms signifying possession in the legal process. What's mine's my own. An old deed of a small piece of swamp land, which I have lately surveyed at the risk of being mired past recovery, says that "the said Spaulding, his heirs and assigns, shall and may from this (?) time, and at all times forever hereafter, by force and virtue of these presents, lawfully, peaceably, and quietly have, hold, use, occupy, possess, and enjoy the said swamp," etc.—Thoreau.

Beauty of the Commonplace.

After all, the great lesson is that no special natural sights, not Alps, Niagara, Yosemite, or anything else, is more grand or more beautiful than the ordinary sunrise and sunset, earth and sky, the common trees and grass.—Walt Whitman.



LITERARY AND BIOGRAPHICAL

Astronomy From a Dipper. By Eliot C. Clarke. With charts by the author. Boston and New York: Houghton Mifflin Company.

A gem of simplicity, uniqueness and utility, with charming touches of personality in quaintness and humor. The idea of the book is good and well worked out.

At the Pole with Cook and Peary. A pictorial Record of the most Important and Sensational Geographical Discovery of Recent Times. Portland, Maine: L. H. Nelson Company.

This is a series of interesting timely photographs, each with its legend occupying a page, after the style of a local souvenir book.

The Maine Woods. By Henry D. Thoreau. Illustrated by Clifton Johnson. New York: Thomas Y. Crowell & Company.

This well known classic by the great master of us all, is well illustrated by the skilled nature photographer. All lovers of the woods and of Thoreau are deeply indebted to Mr. Johnson for his beautiful photographs and interesting "Introduction."

Geology of the City of New York. With numerous illustrations and maps. By L. P. Gratacap. A. M. New York: Henry Holt and Company.

"The facts presented and the statements made have been brought together from many sources and are carefully classified, and the book will, it is hoped, helpfully develop and complete a correct geological conception of Greater New York." The author is learned and enthusiastic in his favorite science.

Laboratory Botany. For the High School. By Willard N. Clute. Boston: Ginn and Company.

The leading characteristics of this new and in many ways unique laboratory botany are (1) its presentation of a connected study of evolution for both teacher and pupil; (2) its method of thorough and suggestive direction for both teacher and pupil; (3) its concise yet adequate lists of questions for answer in notebooks after actual field or laboratory investigation; (4) its clear and accurate outlines of the specific subjects.

Thomas Alva Edison. Sixty years of an Inventor's Life. By Francis Arthur Jones. With numerous illustrations from photographs. New York: Thomas Y. Crowell & Company.

This is an interesting account of the great Edison, who according to the book has "quit the inventing business" and is now devoting himself almost exclusively to pure science. The book is readable, instructive, and well illustrated.

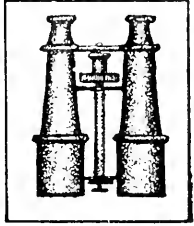
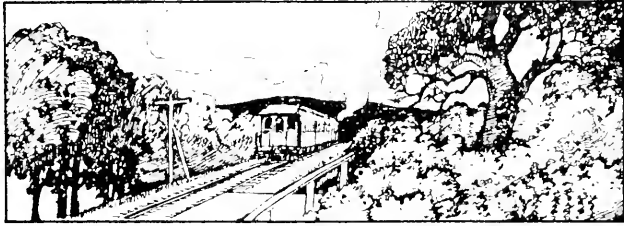
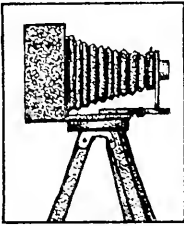
The Nursery Book. A Complete Guide to the Multiplication of Plants. By L. H. Bailey. Thirteenth Edition. New York: The Macmillan Company.

"This little handbook aims at nothing more than an account of the methods commonly employed in the propagation and crossing of plants, and its province does not extend, therefore, to the discussion of any of the ultimate results or influences of these methods."

This is a useful book for every lover of trees and shrubs. It is real nature study, that should take the place of all check list nature study. To make a list of trees identified is not so valuable as to grow one tree from the seed. Professor Bailey is an acknowledged authority.

FOR BIRD LOVERS.

The September-October number of Bird-Lore contains its usual variety of articles interesting to bird lovers. The lively courtship of a pair of Black Ducks is related by one who was fortunate enough to witness the singular performance. In 'Woodpeckers and June Bugs' are described the habits of Woodpeckers and the peculiar manner in which they prepare insect food for their young. 'A Successful Failure' treats of the nest-building habits of the House Wren, and the difficulty of providing him with a nest-box to his liking. Another article describes the methods adopted by Hawks in the pursuit of their prey. 'Two Warbler Photographs,' 'The Hanging Home in the Old Tree,' 'Blue Jay Boarders,' and Educational Leaflet, 'The Bush-Tit,' together with the usual Notes, Reviews, etc., make up an exceedingly interesting number.



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Sound Beach, Conn.

AN ILLUSTRATED MONTHLY MAGAZINE FOR ADULTS, DEVOTED TO COMMONPLACE NATURE WITH UNCOMMON INTEREST.

EDWARD F. BIGELOW, Managing Editor



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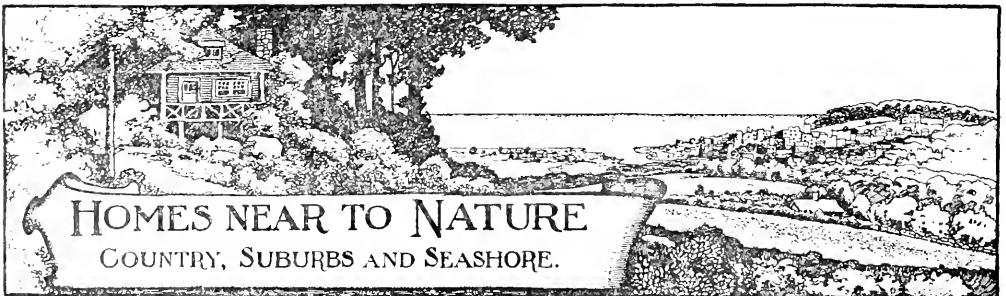
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We Are What People Call Us.

II

We are a hospital.

* * * * *

Note:—Before proceeding further, let us explain. There is an old saying, with much truth in it, that a person may be or become that in which he has implicit confidence and earnest faith. We propose to go further and say that Arcadia will accept and become everything that the people persist in erroneously calling it. It is so difficult to change public opinion that we take the easier course and accept and assume all that we are called. While the buildings of Arcadia (seven thus far) have been in the process of erection, there have been many curious remarks of misunderstanding our simple yet important purpose of leading people to a knowledge and love of nature. We have been amused; we have been vexed; now we are resigned and accept anything you persist in calling us, as will be set forth in a series of articles of which this is No. 2.

* * * * *

"Ish das de *hos-pi-tal*?"

We are informed by a resident of Sound Beach, as a supposedly good joke, that this was the inquiry of a stranger with a decidedly foreign accent as he pointed to the long rows of Arcadia buildings surrounded by an iron fence.

"Well, really," continued our jocose Sound Beach friend, "couldn't blame him after all for if I hadn't known I might have thought it was something of the kind. But I thought you would regard it as a good joke, and I made up my mind I'd tell you the first time I met you."

"What did you tell him?"

"Oh, I explained to him that this is a 'bug house' and that you had all sorts of queer things here."

"The joke is on you; not him. We are a hospital; we haven't a bug (the house is too new) and as to "all sorts," we have only a very, very small frac-

tion of even the local forms of naturalists' interest."

And so let us accept this, my reader; we are a hospital, a *hospitalia*, for those desiring cure from the stress and strain of modern civilization.

Are you tired out? Our hospital takes you to the sun parlors of the world, and bids you assimilate all its rays of beauty and interest.

Are you a little discouraged? Then as with Agassiz, Nature the old nurse, will take you as a child upon her knee,

"Saying: 'Here is a story-book

Thy father has written for thee.'"

And if you will you may wander

"away and away

With Nature, the dear old nurse,

Who sang to him night and day

The rhymes of the universe."

Yes, Nature is a "dear old nurse," the dearest possession of mankind, and as old as the universe.

Nature is also a true teacher, and rightly has Wordsworth urged us to "Come forth into the light of Things, Let Nature be your Teacher."

But teacher is only another word for doctor. So then, nature is a nurse and a doctor, and where there are a nurse and a doctor there is a hospital.

Yes, das ish de *hos-pi-tal*!

The Henry Lomb Memorial.

In the presence of the 1,800 employees of the Bausch & Lomb Optical Company, the first bronze and marble testimonial ever erected in Rochester by employees to a deceased employer was unveiled in the factory of the Bausch & Lomb Company. The bronze is a tablet resting on a beautifully polished Ionic column or pedestal of Sienna marble. The bronze tablet is attached to a scroll capital of the column.

The testimonial is in memory of Captain Henry Lomb, who jointly with

John J. Bausch, founded more than fifty years ago, the Bausch and Lomb Optical Company. Captain Lomb was known either personally or by sight to practically every man, woman and child in Rochester. He was always in the forefront in matters pertaining to the city's growth and to the spiritual, moral and intellectual welfare of the people. By his employees he was esteemed and loved as few men are, and their admiration of him as a man and a friend has found expression in this memorial.

INSCRIPTION ON TABLET.

The inscription on the tablet includes the last public utterance by Captain Lomb, which was spoken on June 5, 1908, to the directors of the Rochester Public Health Association, in reply to their request for advice. The words were: "Think of others first, yourselves afterwards." The entire inscription is as follows:

"Think of others first,
yourselves afterwards."

1828 HENRY LOMB. 1908

This tablet is given in testimony of our love for our true friend and counselor, who by his noble deeds and good life gave to us a rare example of simple greatness to study and emulate.

By unanimous vote of the employees of the
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“Love has opened our heart to the knowledge of mighty things. It has led us to the Prince of Peace.”

Then said the maiden: “Let us build a temple wherein to worship him, and make it a holy place.”

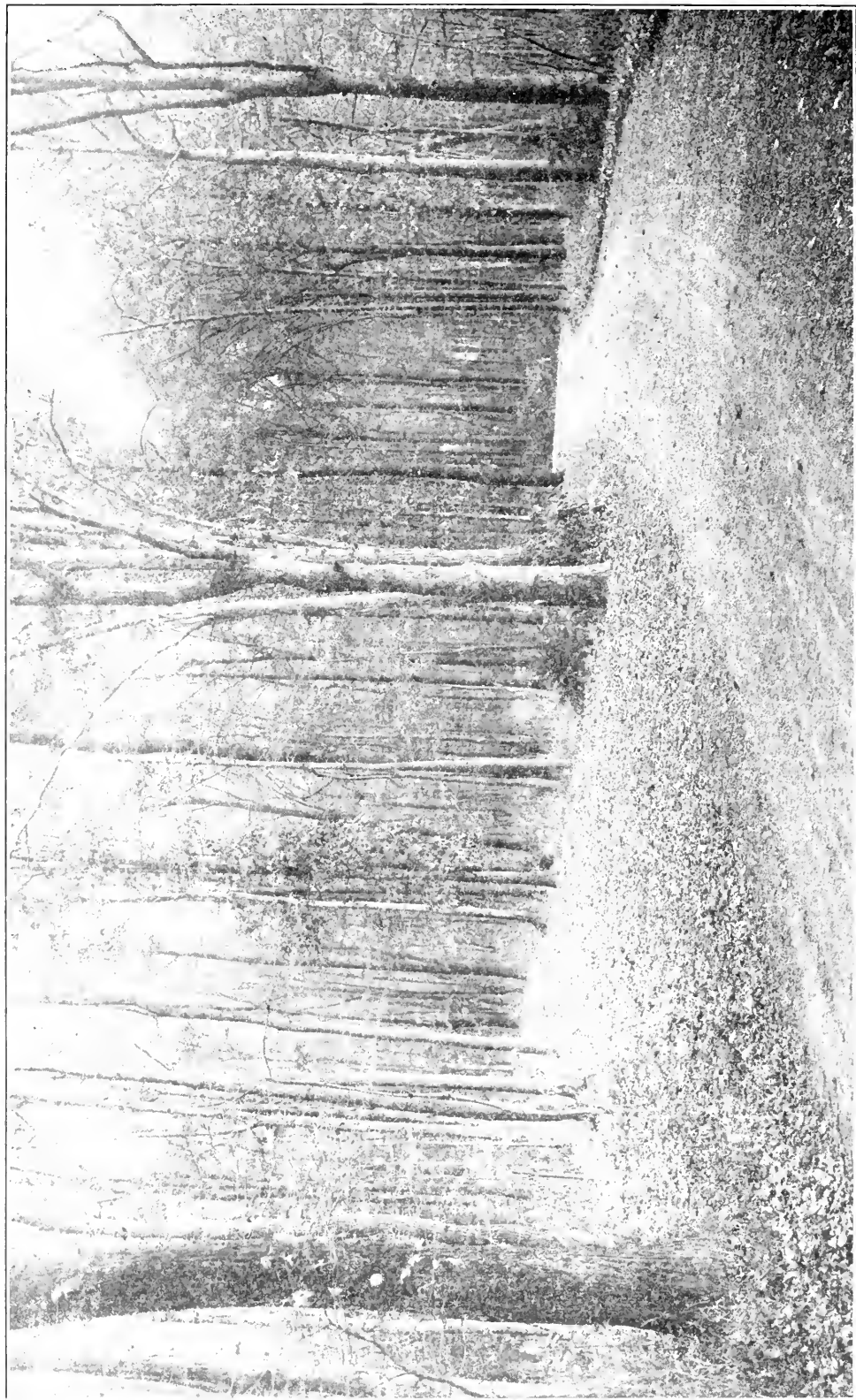
“And call it home,” said the young knight, as he kissed her.—*Irving 'Bachelier in "Vergilius."*

Arcadia

PEOPLE AND GARDEN PRODUCTS.

Gardens are all right. These things are a good deal like folks. Some grow up an' some grow down. I used to know a woman that looked like a turnip, and a gal that was like a flower, an' another that was like a pepper-plant, an' a man that was a reg'lar human onion.—*Irving 'Bachelier in "Eben Holden's Last Day A-Fishing."*





ONE OF THE MANY BEAUTIFUL VIEWS IN "THRUSHWOOD."
"The great roof of the wilderness had turned red and folded into yellow." — Irving Bacheller.

THE PROPERTY THAT WE CALL OURS.

I remember how, as a boy, I used to long for a watch-chain, and how once Uncle Eben hung his upon my coat, and said I could "call it mine." So it goes all through life. We are the veriest children, and there is nothing one may really own. He may call it his for a little while, just to satisfy him. The whole matter of deeds and titles had become now a kind of baby's play. You may think you own the land, and you pass on; but there it is, while others, full of the same illusion, take your place.—*Irving Bacheller in "Eben Holden's Last Day A-Fishing."*



THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

DECEMBER, 1909

No. 9



“Thrushwood,” Home of Irving Bacheller

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT



BEN HOLDEN” is a true love story that has touched the hearts of lovers as no other like story has ever done. It is more than a story. It is a rhapsody, a paeon, an oratorio of love—the love of the woods.

Therein many paths lead to the woods, and their hilarious, joyous, gloomy, crackling, weird, mysterious, thrilling trilling phases. The author, Irving Bacheller, is a master of the entire keyboard of the music of the woods and brings out many strains, some simple as the phrases of the white throated sparrow, some big, thunderous, Wagnerian as the song of the water-fall in “Silas Strong.”

On the first page of “Eben Holden,” the very “small boy in a big basket on the back of a jolly old man” makes his first observation in the fields and woods. Our first acquaintance with him is nearness to nature:

“He *saw* wonderful things, day after day, looking down at the green fields or peering into the gloomy reaches of the wood; and *he talked about them.*”

The author would have the young folks not only talk about and think about the woods, but he would have them rejoice—play, shout and sing as the trees do:

“*The woods were merry with our shouts, and, shortly one could hear the heart-beat of the maples in the sounding bucket. It was the reveille of spring. Towering trees shook down the gathered storms of snow and felt for the sunlight. The arch and shanty were repaired, the great iron kettle was scoured and lifted to its place, and then came the boiling. It was a great, an inestimable privilege to sit on the robes of faded fur, in the shanty, and hear the fire roaring under the kettle and smell the sweet odor of the boiling sap. Uncle Eben minded the shanty and the fire and the woods rang with his merry songs.*”



THE GRACEFUL AND PICTURESQUE ENTRANCE TO "THRUSHWOOD."
Riding away for a walk homeward.



MR. AND MRS. BACHELLER FREQUENTLY DISMISS THE AUTOMOBILE AND WALK
SEVERAL MILES HOME.
"They spend many an afternoon in the woods."

The author is almost unconsciously ever thinking of the woods. He evidently has in mind walking through the green waving grasses of the fields and entering the deep recesses of the woods when he pictures the music of a violin. In this, while the words do not say so, one feels the parallel of the echo from the woods, the hush of a summer's day, the gentle bending of the grass by an occasionally zephyr, and the calm, the gentle expectation of leaving the fields and entering the path to the depths of the unexplored:

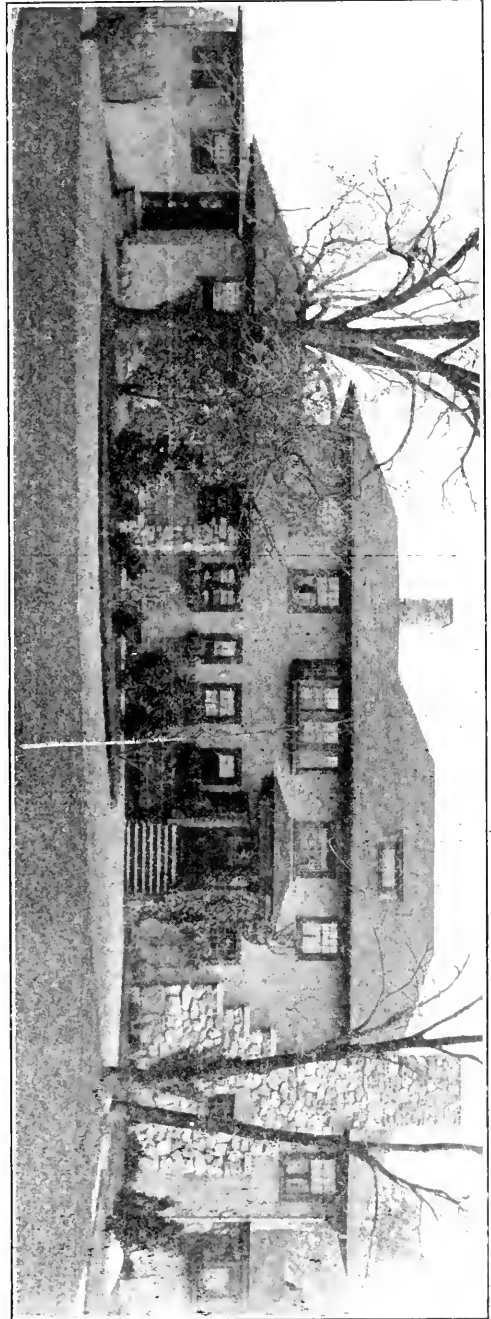
"The musician had begun to thrum the strings of his violin. We turned to look at him. He still sat in his chair, his ear bent to the echoing chamber of the violin. Soon he laid his bow to the strings and a great chord hushed every whisper and died into a sweet, low melody, in which his thought *seemed to be feeling its way through sombre paths of sound.*"

To Irving Bacheller the woods are a sacred edifice:

"The great roof of the wilderness had turned red and faded into yellow. Soon its rafters began to show through, and then, in a day or two, they were all bare but for some patches of evergreen."

And again in "The Master:"

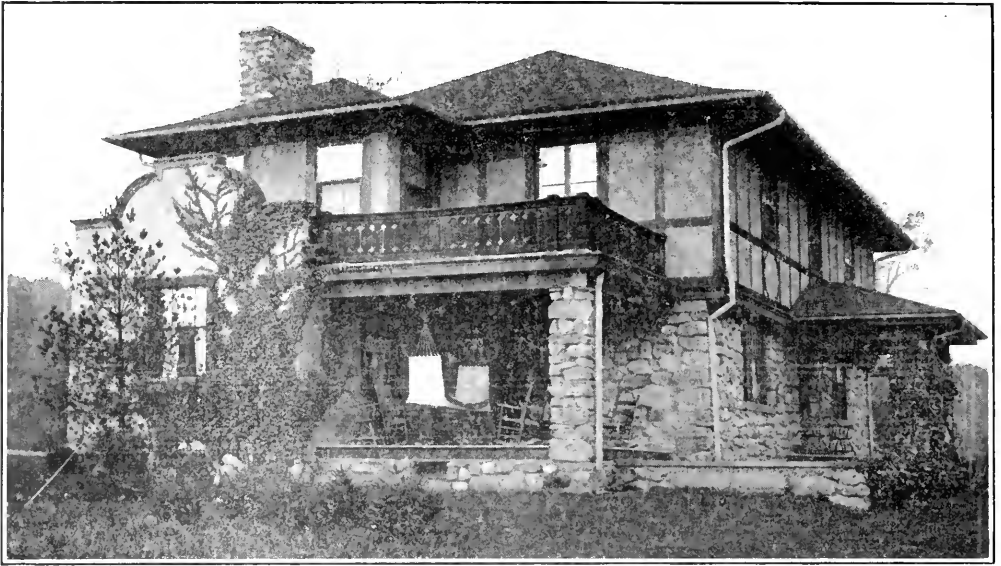
"There is a nook in the woods near the Hermitage where we love to go of a summer day and sit in cool, deep shadows and read or sing, or talk, or pray to some special saint in our calendar. We call it our cathedral, and it is very old. Before houses were made with hands or ever a man was born of a woman it was there, and unnumbered dead are in its crypt and every age has added something to its grandeur. Gray, tapered columns rise to green arches far above our heads. Dim aisles, carpeted with mosses, green and gray, hush our footsteps so they disturb not the low hymning of the pines. Rugs of linea and robin's wheat invite us, and here and there ferns and branches shake out their incense as our feet touch them. On either side is a great, memorial window when the sun is low, and you would say that be-



THE VIEW FROM THE WEST.

"When you enter a house you begin to feel the heart of its owner."

tween the tree columns there were long, golden panes, all thickly wrought with sprays and branches, to check and soften the glow."



THE VIEW FROM THE SOUTH.

And from this sanctuary he would send forth truth to all mankind:

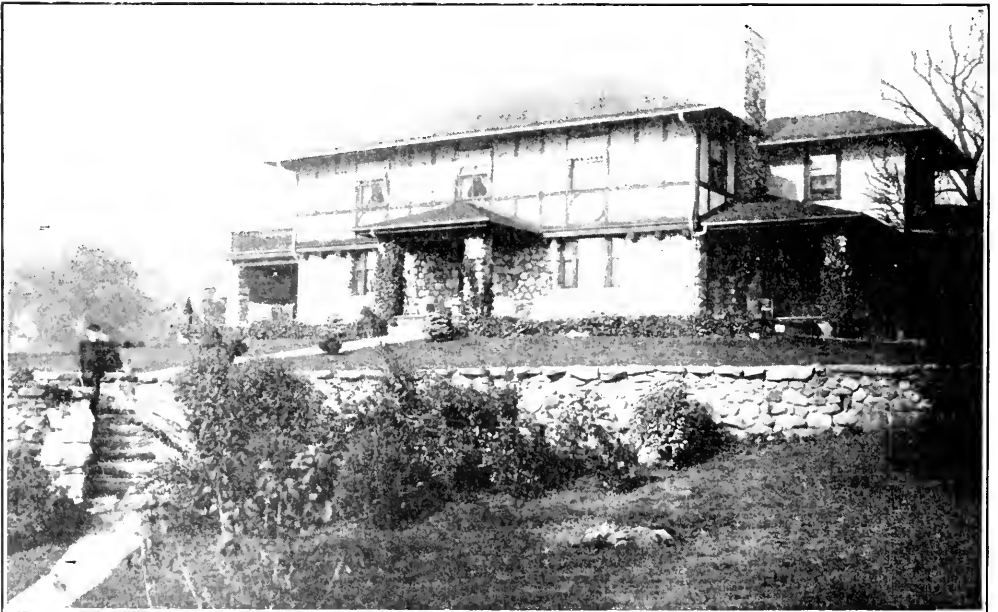
"For truth you've got to get back into the woods. You can find men there a good deal as God made them—genuine, strong and simple."

He would have the woods a great sanitarium:

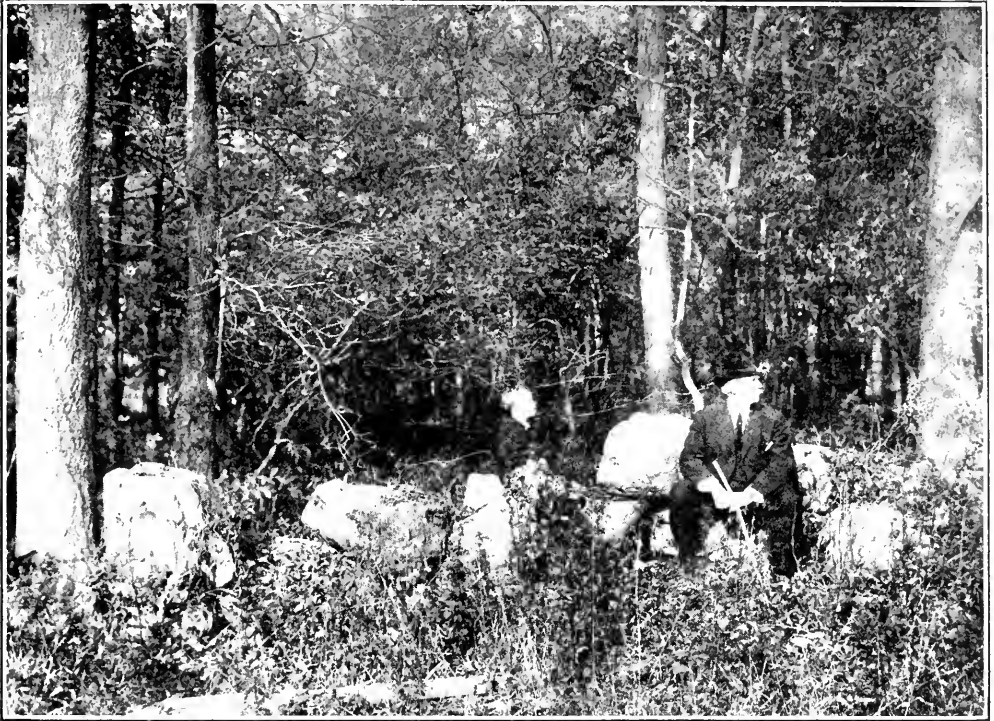
"All who were sick and weary felt the ineffable healing of the woodland breeze. It soothed the aching brain of the mill-owner and slackened the ruinous toil of his thoughts.

He would find God and Heaven in the woods:

"When you enter a house you begin



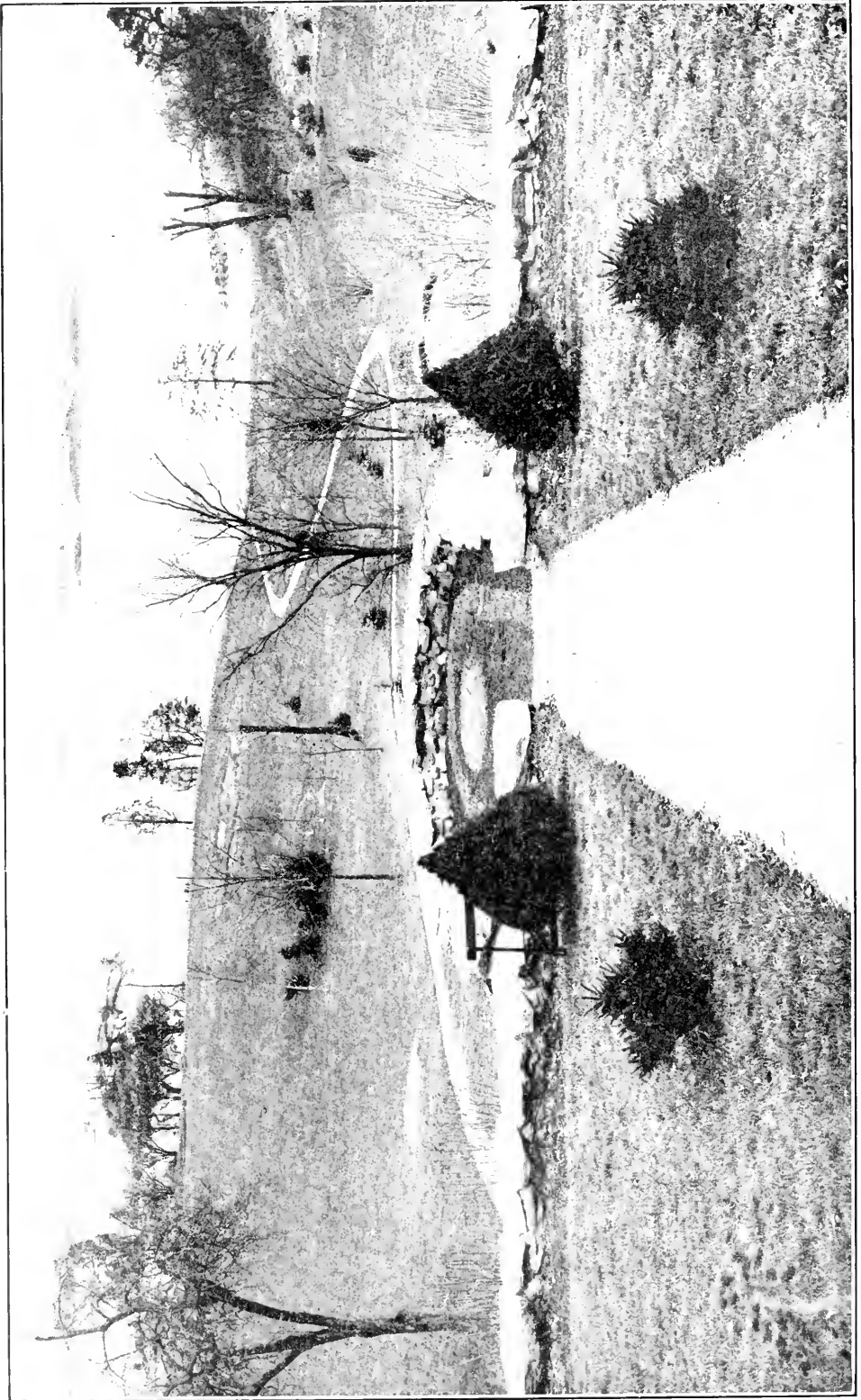
THE VIEW FROM THE EAST WATER SIDE.



PERHAPS MR. BACHELLER AND HIS SON ARE LISTENING FOR THE CALL OF THE
SWIFTUS BACHELLERUS!

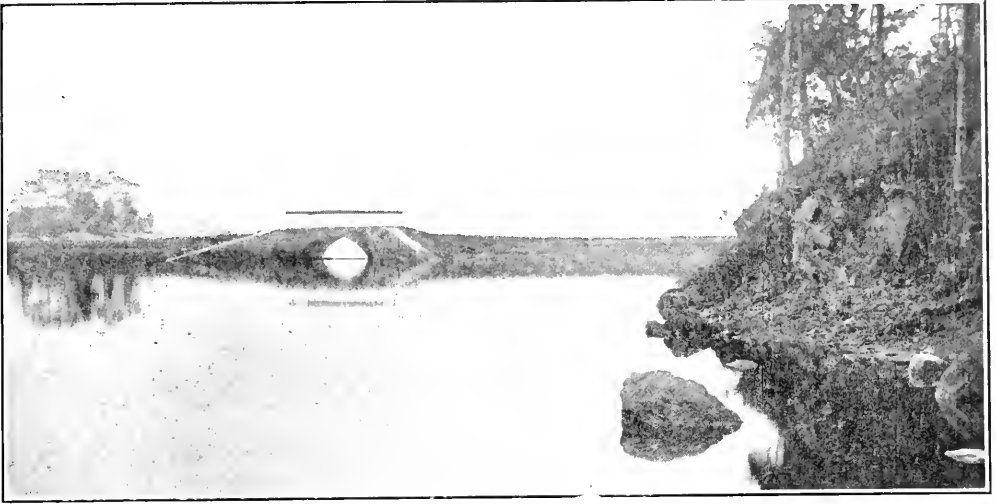


A COZY NOOK BY THE DUCK POOL.



THE VIEW FROM THE PORCH SHOWN IN THE LOWER ILLUSTRATION ON PAGE 280.

Shows houses in Sound Beach (upper left), the long, slender peninsula and the islands in the bay.



THE ROAD AND THE BRIDGE TO THE ISLAND.

to feel the heart of its owner. Something in the walls and furnishings, something in the air—is it a vibration which dead things have gathered from the living?—bids you welcome or warns you to depart. It is the true voice of the master. As Gordon came into the wilderness he felt like one returning to his father's house. In this great castle the heart of its Master seemed to speak to him with a tenderness fatherly and unmistakable."

He compares a beautiful girl to the woods:

"She was like the spirit of the woodland—wild, beautiful, silent."

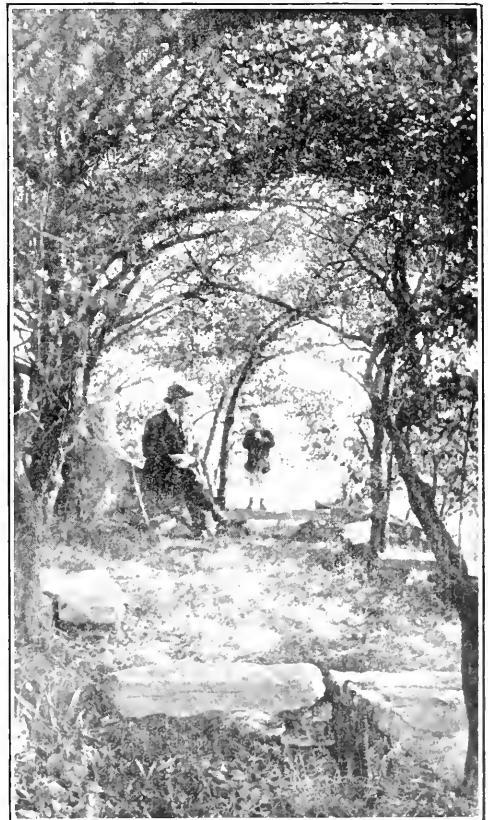
He tells us that the lives of men are like trees:

"His character," Dunmore answered. Men are like trees. Some are hickory, some are oak, some are cedar, some are only basswood. Some are strong, beautiful, generous, some are small and sickly for want of air and sunlight; some are selfish and quarrelsome as a thorn-tree. Every year we must draw energy out of the great breast of nature and put on a fresh ring of wood. We must grow or die. You know what comes to the rotten-hearted?"

To the woods we will go in the sorrow or bereavement:

"Always when we sit in our old

cathedral and hear the pines and the thrushes we think of our master and of his great work and love, and in silence



IN THE OUTDOOR STUDY ON THE PARK.



WHERE HE GETS HIS INSPIRATION. MR. BACHELLER IS FOND OF WALKING IN THE WOODS AND OBSERVING THE VARIOUS FORMS OF LIFE.

"It's the ol' man o' the woods," said Uncl' Eb. "E's out takin' a walk."—"Eben Holden."

we look out through the open door that he has set before us."

* * * * *

Thus in a few selections from his own words, I have best shown the

wide range of Irving Bachelier's love of a nearness to nature and especially his love of the woods. For such a nature lover his home is ideally located at Riverside, Connecticut. The view

of the Long Island Sound is beautiful, balanced and dreamy. The contour of the hills, the sloping ravine, the distant islands and farther on the long arm of a peninsula, are all in such perfect harmony of extent and combination as to make one exclaim: "This all has been done for artistic effect." And the more one admires the whole or studies the details, the more one feels that the words of such an exclamation state a literal truth. The Great Artist has so painted and modelled this bit of nature that it needed but little work of man for the most effective "framing."

* * * * *

The home is indeed artistic in structure and setting with its lawns, fountains and shrubbery. But the author quickly turns one's eye to the threefold beauties of nature—the ravine, the fields and, most important of all, the woods where the thrushes sing—from which the name, "Thrushwood."

He is especially fond of the oaks and beeches in the woods and loves

to stroll in its thickets, some of which are as wild as any in the Adirondacks. A clump of trees and shrubs completely roofed with interlacing branches affords an ideal outdoor study. Banks of earth and arches of stone connect two islands with the long terrace occupied by the author's residence. At the foot of the wooded slope in front is a lake for canoeing.

Mr. and Mrs. Bacheller are fond of outdoor life and spend much time in the enjoyment of this beautiful bit of nature that surrounds them. They spend many an afternoon in the woods which in spring are floored with violets and later with crane's bill rising above the ferns. In June the dogwoods are like a halted snow storm in the midst of green thickets around the author's home. He is a saunterer and loves to watch the play of the squirrels or the birds in his heronry, one of the largest and most interesting in Connecticut. "Thrushwood" is fortunate in being a haunt of the night heron and the scarlet tanager.



WHERE HE WRITES HIS BOOKS FOR THE DELIGHT OF MILLIONS.

His own words in "Silas Strong" may well be reverted on himself:

"Spent the most of his life in the woods," said Gordon. "Came in here for his health long ago from I don't know where; grew strong, and has always stuck to the woods. Had to work, like the rest of us, when I knew him . . . I have wept and laughed over his poems."

"Poems!" Master exclaimed.

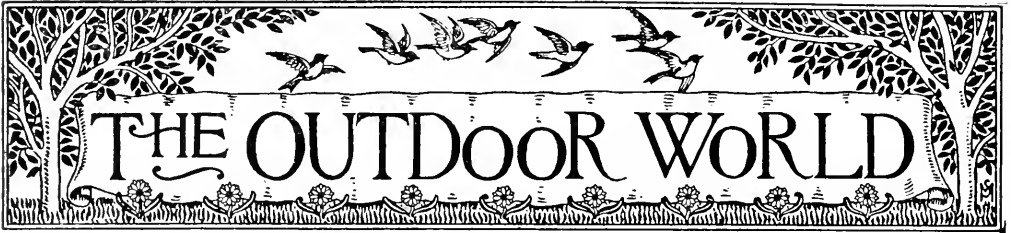
"That's the only word for it," Gordon went on. "The man is a woods lover and a poet."

BIOGRAPHICAL SKETCH.

Irving Bacheller was born September 26th, 1859, at Pierpont, New York, which is in the St. Lawrence Valley. He spent his boyhood in site of the great "south woods" and enjoyed many vacations in the wilderness with his brothers when he was a small boy. He was graduated from St. Lawrence University, B.S., '82; M.S., '92; A.M., 1900. He began work as a reporter

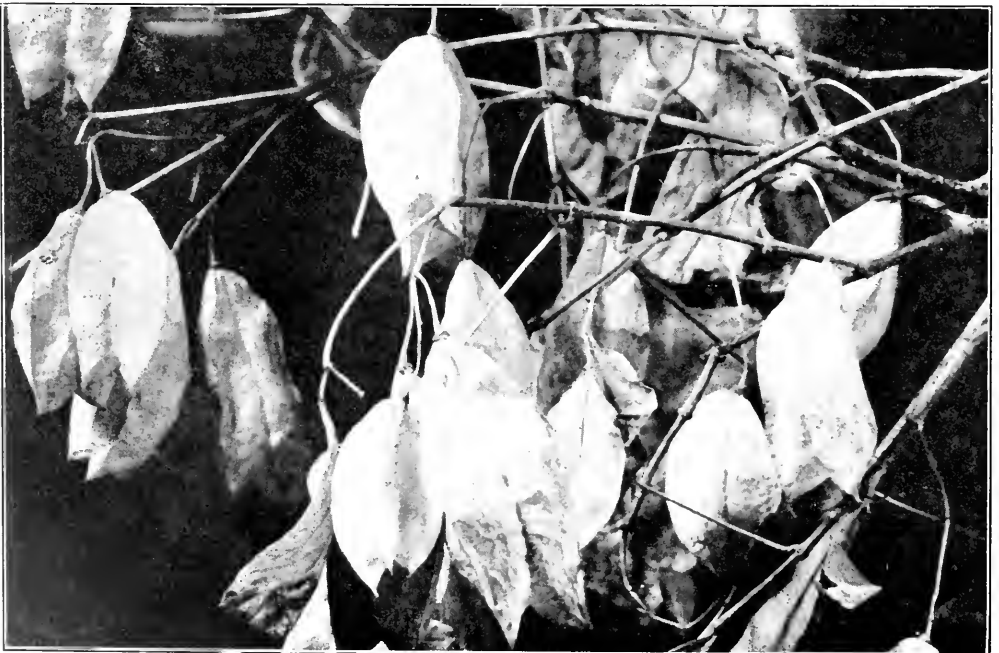
on "The Brooklyn Daily Times" in 1883. Founded Bacheller Newspaper Syndicate late in 1884. Was on the editorial staff of "The New York World," 1888 and 1889. Published "Eben Holden," 1900, which went to 265,000 in six months. The total sales have been over half a million copies.

Notices of some of his principal books will be found in the "Literary and Biographical" department of this number.

Ornamental Pods of *Staphylea*.

The fruiting capsules of the American bladder-nut (*Staphylea trifolia*) have always had a peculiar fascination for me. The shrubs are from eight to fifteen feet high and grow scatteringly with spreading branches on the borders of damp woods.

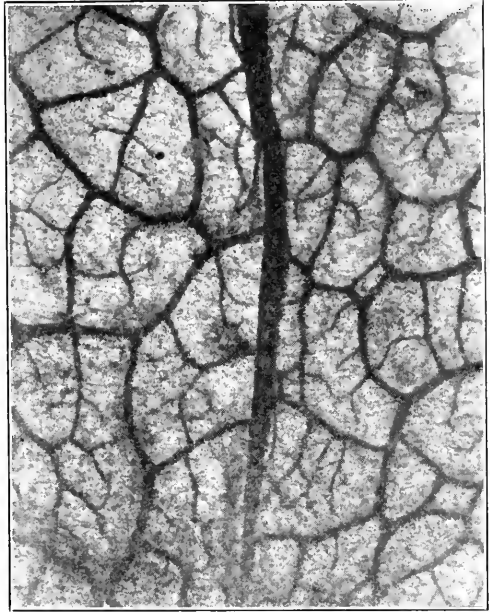
The profuse growth of attractive fruiting is tantalizing. One immediately perceives that they look good enough to eat but knows instinctively that they are not. They are, however, a feast for the eye and I like to sit in the dense shade (for usually the shade from the surrounding trees is dense) and imagine



THE PODS OF THE STAPHYLEA IN LATE AUTUMN.

that I am surrounded by primal riches—fruit, fruit, above and around, but not a bit to eat. One feels young again, and toys with the pods as he did with the trinkets of the Christmas trees in years long gone by. Nature does decorate solely for the sake of the decoration; I am sure of that; but whether or not with a more utilitarian purpose as well, I leave to the decision of the philosophers. It is enough for me not to “reason why” but to appreciate and value the fact.

When the seeds are ripe they break loose within the inflated membrane, and rattle in a fascinating way when the dry pod is shaken. The seeds are brown and glossy. The books claim that those of a European species are often strung together like beads, and used as a rosary. Not the least interesting is the peculiar membraneous structure of the pod.



THE PECULIAR, MEMBRANEOUS STRUCTURE.



THE PODS ON THE SHRUB IN EARLY AUTUMN.



The Heavens in January.

BY PROF. S. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

When will Halley's Comet be visible in a small telescope? To this question there is a very simple answer which may be summed up in one syllable, now. If one has a six-inch telescope, is gifted with moderately keen eyesight, and has good clear weather, the comet should be visible and can be located without much difficulty. Early in December the Smith College observatory reported that Halley's comet had been seen there through a three-inch telescope. Thus for possessors of telescopes smaller than six-inch, this interesting comet should prove a test of eyesight. Amateur astronomers who are not fortunate enough to possess a telescope, but who wish to see the comet with the naked eye, will probably have to wait another three months till after the comet passes by the sun in March, and comes out from the sun's rays in April. The comet will then rise before the sun, and consequently can be seen only shortly before sun rise—a much less convenient time of studying the heavens than in the early evening. The comet will then rapidly increase in brightness, and will reach a greater and greater angle from the sun till May 15, when it suddenly changes its position again and will draw in quickly towards the sun. The comet is due to cross the face of the sun on May 18, at 9 P. M., Eastern standard time. This will be 6 P. M. Pacific time, and the sun will not have then set. Whether the comet will be big enough to be seen in transit is an interesting question. There is no authentic account of a transit ever having been seen to have actually taken place, though many, notably the Biele comet in 1826, were calculated to have done so.

Of course, everyone knows that Halley's comet moves in a great ellipse,

stretching out beyond the orbit of Neptune. Of all the comets with periods less than 80 years, Halley's is the only one which moves with a retrograde motion, that is, in the direction opposite to the motions of all the planets about the sun. This is the comet's own motion, what is its apparent motion as seen from the tiny earth, which itself is in motion about the sun? The movement among the stars is the resultant of the other two motions. At the present time the comet is traveling westward among the stars, the sun in the opposite direction, eastwards. The angle between them will continually decrease till about March 25, when the sun will pass between us and the comet. By referring to a diagram giving the paths of the earth and comet, it will readily be seen that the comet becomes a moving object and increases its angular distance from the sun. On April 19 the comet is at perihelion and closest to the sun, and consequently is moving with its greatest speed in its orbit. Five days later it is headed in the direction of the earth, but the world slips by unharmed. The comet now ceases its retrograde motion in the sky, and begins to move direct or eastwards, at first slowly and then with quickened pace. On the evening of May 18 the comet comes within 14,000,000 miles of the earth, and this near approach causes a tremendous apparent motion among the stars, and in the next twenty-four hours and for several days thereafter it moves eastward as much as 15° each night. Consequently on May 19 there will be no need to ask, "Where is the comet?" All may see it as a magnificent object appearing immediately after sunset. It will be higher and higher up in the western sky each day when the sun sets. We have not had a brilliant comet in northern latitudes since 1882, and it is altogether probable that Halley's will be just as magnificent,

though of this we cannot be certain.

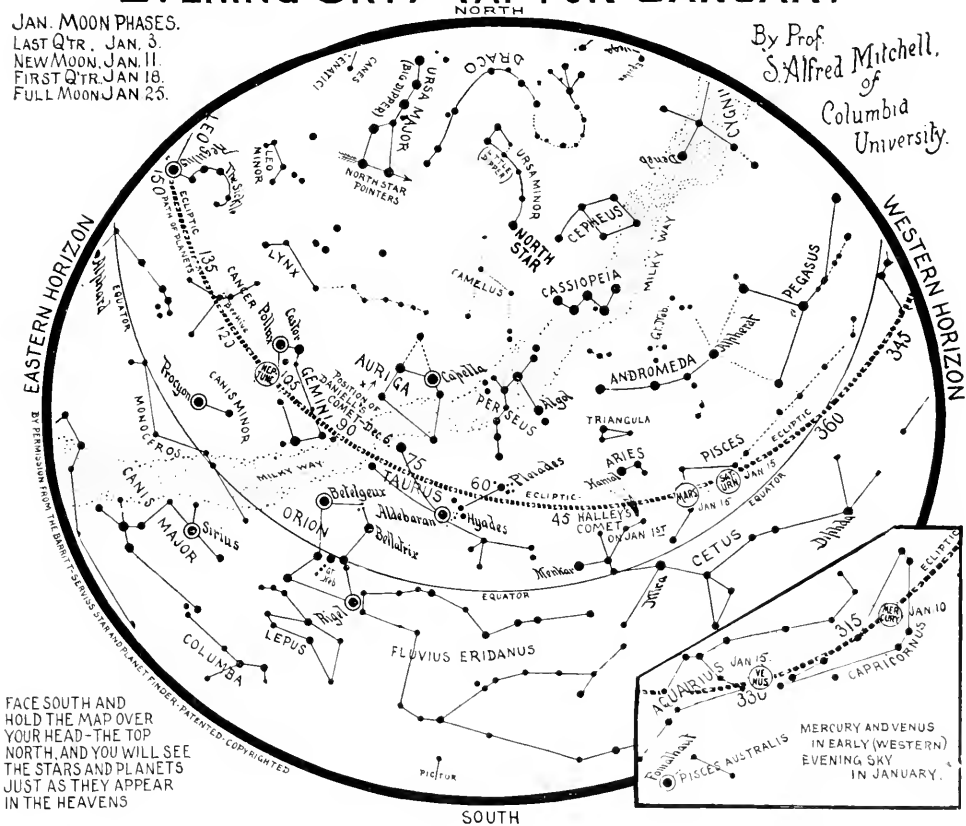
The "man in the street" has been rather disappointed with the comet because it has not blazed forth brightly long before this. The reason is not hard to find. At the first return since the "prediction was made by an Englishman," in 1759, the comet was discovered 78 days before it passed the sun, in 1835, a period of 102 days elapsed before discovery and perihelion passage. By long

Halley's is not the only comet now visible. On December 6, Mr. Zacheus Daniel, at Princeton, found the fourth comet of the year 1909, with a five and three-quarter inch telescope, and it is consequently visible in a small instrument.. Though Mr. Daniel is but thirty years old, he has discovered three comets. The new Daniel comet, which is in the constellation of Auriga, is moving northwards and has no tail.

EVENING SKY MAP FOR JANUARY

JAN. MOON PHASES.
 LAST QTR. JAN. 3.
 NEW MOON, JAN. 11.
 FIRST QTR. JAN. 18.
 FULL MOON JAN. 25.

By Prof.
 S. Alfred Mitchell,
 of
 Columbia
 University.



exposures with a sensitive photographic plate, Max Wolf found Halley's comet on September 11, no less than 220 days before perihelion passage. If the same number of days only were to elapse as in 1835, on January 1, 1910, Halley's comet would be still undiscovered. We must possess our souls with a little patience, for the comet will not disappoint us. During January the comet will move from the constellation of Aries into Pisces, and at the end of the month will set about 9 P. M.

THE PLANET MARS.

Though Mars has now passed her greatest brilliancy and is getting farther away, the interest in it has not abated. The question of the constitution of the atmosphere of the ruddy planet is most important. All astronomers are agreed that there is very little water on Mars, and this scarcity of water makes it necessary to postulate irrigating canals in order to carry the water from the polar Caps so that life may be maintained. Moreover, all are agreed that the tem-

perature of Mars is low, but differ on the degree of temperature there. Poynting, from theoretical considerations, finds that the average temperature on Mars is 22° Fahrenheit below zero. At such a degree of cold, there would be no question of canals; the water would all be frozen solid. Though 54° below freezing may be below the real temperature, all inferences we can draw from the earth points to the fact that if the atmosphere at all resembles our own, it should then be always below freezing. To have water in the canals it is necessary to assume that the atmosphere differs radically from our own. We can postulate that Mars is rich in radium, or with Prof. Lowell assume there is a copious supply of water vapor present in the atmosphere of Mars. Water in the atmosphere will act like glass in a greenhouse, will let the sun's rays in, but will entrap them as they are radiated back, and Mars may thus really have a temperature capable of supporting life. How are we going to discover the presence of this water vapor? It cannot be done by direct observation, and recourse must be had to the all-powerful spectroscope, which has already settled so many strange problems in astronomy.

The principles which enter into the application of the spectroscope to Mars are readily understood. The planet, we know, shines by reflected sunlight. Its spectrum, therefore, must be identical with that of the sun, except as it is modified by the (supposed) atmosphere of Mars. The spectrum of the sun would be continuous, i. e., without any lines or breaks, were it not for the comparatively cool layer of gases around the sun, a sort of solar atmosphere which introduces thousands of dark lines in the solar spectrum. Our own atmosphere modifies the solar light which passes through it, and adds to the solar spectrum at least 1,200 lines called telluric lines, which constitute what we may term the spectrum of our atmosphere.

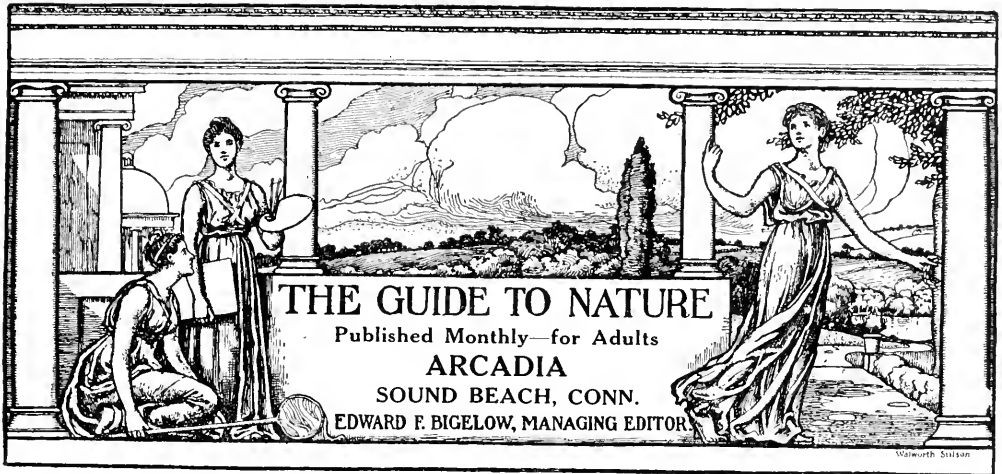
The rays or light coming into our instruments from Mars originate in the sun; they enter the atmosphere of Mars, are reflected from the surface of Mars, back again through its atmosphere, and reach us after passing through our own atmosphere. The double passage of the solar rays through the Martian atmos-

phere will cause a modified spectrum. How are we going to pick out from the enormous number of lines in the Martian spectrum those which are brought there previously by the double passage through the planet's atmosphere? Were it not for the moon, we would be entirely unable to attack the problem. The moon has no atmosphere, and if our comparison of the lunar and Martian spectrum show additional lines in the latter we should be sure they come from the Mars—but of this we are not certain until the utmost pains have been taken with the observations and the infinite variety of detail has been looked into. Without going into a summary of these details it may be said that two years ago Prof. Lowell thought he had proved that there was a great supply of water vapor present in the atmosphere of Mars. This past summer Prof. Campbell, director of the great Lick Observatory, carried to the top of Mt. Whitney, a very carefully prepared equipment, and by his observations there showed that the spectra of Mars and moon were identical, and that there was no proof whatever of the assumption that water vapor is present in large quantities in the atmosphere of Mars. Prof. Campbell is probably the greatest authority on spectroscopic matters to-day, and his opinion should carry great weight. Indeed, a planet, barren and desolate, on which life would be impossible, were it not for irrigation, but one which is wafted by an atmosphere laden with water vapor, seems to an anomaly difficult to understand!

THE PLANETS.

Mercury will be at the greatest elongation east from the sun $19^{\circ} 3'$ on January 9, and so will be visible as an evening star a week before and a week after that date. Though its great southern declination prevents its being well seen, a close observer may readily find it in the southwest, about half an hour after sunset. Mercury sets less than an hour after the sun, about 30° south of west. It is said that the founder of the Copernican theory never saw Mercury. It is an easy object to pick up, for its brightness will be relatively great.

Venus, the bright evening star, will be higher up in the southwestern sky about 30° towards the east from Mercury.



What More was Expected?

I have somewhere read the amusing account of the substitution of an unknown temperance lecturer in place of the expected and famous humorist. A great audience had assembled and was waiting anxiously and in risible spirits for the professional laugh inducer. Eight o'clock arrived but no humorist, and the committee began to be worried. The chairman was as solemn as if it were to be a funeral instead of a gathering for fun making. Eight-thirty and still no speaker. There must have been an accident. Just then a messenger rushed into the committee room with a telegram. The humorist had taken the wrong train and gone to Milton instead of New Milton, and Milton was eighty-four miles from the audience.

There was a hurried consultation. A famous temperance lecturer was spending a day or two in the vicinity. He was interviewed. He accepted the invitation. The audience would not be disappointed and, as both lecturers were equally talented in their respective specialties, no money would need to be refunded. The temperance lecturer and the humorist were strangers to the audience, but the temperance lecturer could be regarded as represented by the portraits on the placards posted about the town with no more stretch of imagination than could be the humorist, or, by the way, with no more difficulty to see the resemblance than is usually required between any public speaker and his advertised portrait.

The audience was ready to laugh; they had come for that purpose. On account of their eagerness to greet him whom they supposed to be the delayed humorist, they for the most part failed to hear the chairman's explanation, and supposed that the humorist was to give them a parody on a temperance lecture. The lecturer stepped forward and began, with the wide, embracing, text-like statement: "Ladies and gentlemen, rum is the greatest curse of the American nation."

Tremendous applause and laughter.

When the noise had somewhat subsided, the famed apostle of Gough again started in:

"Rum causes more crimes than any other . . ."

But this was lost in the applause and increased laughter.

The lecturer appealed to the chairman. But he was powerless. The audience was determined to laugh.

The lecturer started again:

"The one great topic that our voters must bravely meet and down, or be downed by it, is rum."

This brought the climax. The statement that voters must "down" rum or be "downed" by it, was too much. The uproarious laughter was loud and long.

The lecturer then lost control of his temper, and yelled at the top of his voice:

"I was invited to address what I supposed would be courteous and intelligent persons. I have had no experi-

ence in talking to lunatics and fools, and I do not intend to speak any further to that class of people."

* * * * *

While I have always enjoyed the humor of that story, it contained, until a few months ago, an element that marred it for me. It did not "ring true." It seemed "made up." The humor was there, but the truth of the art of applying truthfulness was lacking. But this has changed. I now believe it, because I have had a similar experience, except that the substitution was an imaginary one on the part of the audience (unknown to me) of a style of supposed nature study as remote from the real kind that I intended to portray as is a humorist from a temperance lecturer. I had planned to speak seriously and enthusiastically of the charms of country life and of nature study. The audience had a conception of nature study based upon certain "entertaining" books, upon "Oh, my!" stories of animals and upon certain funny anecdotes about them. I was intent upon being an instructor and inspirer of nature study. The audience was expecting entertainment. I afterwards ascertained that certain teachers, in a desire to bring out a large audience of young folks and with a misconception of the basis upon which nature study is founded in certain widely selling and entertaining fictions, had told their friends how funny a naturalist is and what "funny things" he often sees. I am not sure as to how "funny" I was, but that evening I surely saw funny things. A wave of nature study had come to the small country town, inspired originally by the reading by a few members of the women's club and endorsed by the superintendent of schools and through him the teachers, thus perpetuating an erroneous notion of what nature study actually is. So I found the whole town, from the inspiring spirit of the women's club to the youngest member of the kindergarten, permeated by a certain modern idea of nature study that only tinges or largely predominates in other communities—that is, that nature study entertains and tells amusing tales of

things that happened somewhere else.

I changed cars on the main line of railroad to take a primitive branch that for some thirty-five miles wandered through a charming country toward the "inland" village. It was the late afternoon of a beautiful day in early spring. I enjoyed the ride, for I love "wood piles" and farmhouse stations and running brooks and gracefully drooping alder catkins and even the vigorous skunk cabbage. The robins and the bluebirds were out in full force and although that branch road was in the eastern part of the state of New York, the scenery reminded me of the farm home of my boyhood in eastern New England. "All nature is new in the spring," and I was again a boy revelling in the coming of the birds, the early marsh plants and in anticipations of the approaching joys of being out of doors. I wished that I were a poet. I am not, but I could feel that poetry was being lived everywhere, and not the less true poetry although unseen and unheard—the poetry of life, if not of expression. Every clump of alders with their pendant catkins inspired a suppressed hysterical scream of delight; every unfolding leaf of skunk cabbage impelled me to leave the car and run to the brookside. I wanted to carry stones, sticks and boards, to build a dam as I had built dams half a century ago. Confined and hampered in a city as I have been for years, I revelled in the thought of being a country boy in a place so heavenly as this, and I broke at least one of the commandments by coveting the possessions of every boy and girl that I saw along the route.

"I suppose you have travelled all over the world and discovered many strange and amusing things," the committee's chairman said as he greeted me.

"Most of my travelling," I replied, "has been in a little back yard and in a neighboring ravine and a patch of woods. I don't suppose that I shall live long enough to explore even that region fully, so there is no necessity for travelling to any great distance."

This seemed to be a disappointment, and I felt I was not to be counted successful if I failed to tell of the antics

of the Nullgowampus in the Wobbilit Land.

"But," he persisted, "you have seen a great many things that ordinary people do not see."

"Yes," I replied, "I have found many beautiful diatoms, desmids and entomostraca in a tiny pool in my ravine."

"Oh, that is good. And you will tell the young folks about these queer things?"

"No," I said, "I doubt whether they come within the scope of their observations. There are many other things that I think are more profitable."

Again I felt that my recommendation from that village would never be printed at the top of a circular. But the chairman persisted. He evidently thought me not wholly hopeless, and the idea that I was Nobleau from Hullygoleaux Land stood out prominently in his introduction for he said, "Naturalists see queer things and know how to entertain in telling what they have seen."

It is evident, as I now recall it, that I had been more inspired by the scenery along the railroad track than by the conversation with the committee or with the chairman in particular, for my opening sentence arranged itself in this way:

"You, my young people, are to be congratulated upon living in a land where skunk cabbage and alder catkins bloom in the spring."

I was interrupted by applause and laughter.

"I have enjoyed my journey from the land of cities and palaces to the homes of the turtles and spring peepers."

Tremendous applause and deafening laughter. As a humorist, I was evidently in their estimation a howling success. But somehow I failed to be elated by their approval. It seemed as if they were applauding somebody else that they supposed or hoped that I would be. But I started in again bravely:

"There are no more beautiful places in all the earth than the fields, the ravines, the roads and the forests surrounding this village."

This was plainly too much for their

credulity; it was the height of exaggerated absurdity. As a parodying humorist, I evidently was a star performer. The audience went wild; the applause and laughter were intense. I was even honored by a stray catcall, several whistles and not a few stampings.

I must admit that I lost my dignity, and I too got mad. I did not leave the stage, but I said a few things straight from the shoulder as I was compelled to do before I could get even a chance to speak about nature from my head or from my heart. I talked for one hour on nature study as I understand it. I had order, but the kind of order that comes from fear, not from interest. The people had met to be amused, to be told eye opening and mouth opening stories, and I saw that I was not successful. I received my fee, but never a word of appreciation. No letter or testimonial has reached me, and no second invitation. As a vaudeville performer, as a humorist, as an "Oh, my!" story teller, I am not successful. And I have no such desire. I am only a student and lover of nature, a preacher of the beauties and the interests to be found in the uncommon commonplace. That audience did not want to be told of the "foreign lands" immediately within the territory surrounding their village. They wanted to hear from Hubblub Land miles and miles away.

Strange, isn't it, that the near, the precious in time and place, never has the attraction, never is so sacred, so interesting, so influential, as the far away something. And the time is not always in the future. Fifty years from now some boy or girl in that audience, a wanderer in some now distant land, may look back to that little village and perhaps remember, and if he does he will certainly realize, the truth which I wished to impress, that the wild territory surrounding that village is the most beautiful on earth. It is the mission of nature study to annihilate time and distance, to realize and to emphasize the charms and the beauties of the

HERE AND NOW.

"The Man With the Hoe" at the Sunrise Party.

BY PROFESSOR ARETAS W. NOLAN STATE UNIVERSITY, WEST VIRGINIA.

One beautiful morning in June I planned a sunrise excursion for my nature study class of University students.



"UMPH, HELL!" GRUNTED THE OLD MAN AND, WITHOUT FURTHER ADO, TURNED BACK TO HIS HOE."

We reached the top of a splendid hill just as the first gray light dawned in the east. We had come to see the morning and its great miracle of splendor. We sat down on the crest of the hill and waited. Gradually a ruddy light appeared in the east. A flash of

red shot up from the distant hills; the mass of overhanging clouds was streaked and splashed with fire. The great red rim of the sun appeared and the morning was ushered in with gladness.

We all arose, removed our hats and stood in silent reverence before this renewed creation. Several yards from the foot of the hill a farmhouse gave evidence of early rising. An old man, already at his hoe in the garden, had noticed our strange crowd with bared heads and suppressed excitement. He laid his hoe aside and laboriously climbed the hill to where we were assembled.

"What's the matter with you folks up here? Got something treed?" asked the old man.

We explained to him that we had come to see the sunrise and began to point out to him the glories of the morning, now in full setting.

"Umph, hell!" grunted the old man and, without further ado, turned back to his hoe.

You have no doubt diagnosed the old man's case. His heart was fuller of the sordidness of hell than it was of the splendors of heaven, and he did not see the sunrise though its glories shone all about him. The great fundamental hunger for beauty had died out of his heart and he had lost the fountain of youth forever.

Civilization has led too many of us away from the morning and the sunrise and the appreciation of nature's beauty and splendor, and at the same time it has led us away from youthfulness. If we are no longer moved by the sunrise or the sunset, if we do not hear the songs of the birds or see the sky over our heads or the clods at our feet, there is something wrong,—we are growing old too soon and we may become like the old man at the sunrise party—unable to see the morning, for the hell that is in our hearts.

GRADUALLY A RIDGY LIGHT APPEARED IN THE EAST ... THE MASS OF OVERHANGING CLIFFS STREAKED AND SPLASHED WITH FIRE.



Geo. A. King '99

CORRESPONDENCE AND INFORMATION

A Cure for Poison Ivy.

Tryon, North Carolina.

TO THE EDITOR:—

When in the woods one susceptible to poison ivy will often find that contact has been had with it. If so, on reaching home wash the parts affected and then bathe with sweet spirits of nitre and also take from a half to one teaspoonful in a little water. Repeat this two or three times at intervals of two or three hours and the poison will probably never show.

While grindelia is good, it is not always at hand. Water, as hot as it can be borne, may be dabbed onto the blisters, keeping it up for some time. This will dry them up about as quickly as anything.

H. A. GREEN.

Scratching a Toad's Back.

Plattsburgh, New York.

TO THE EDITOR:—

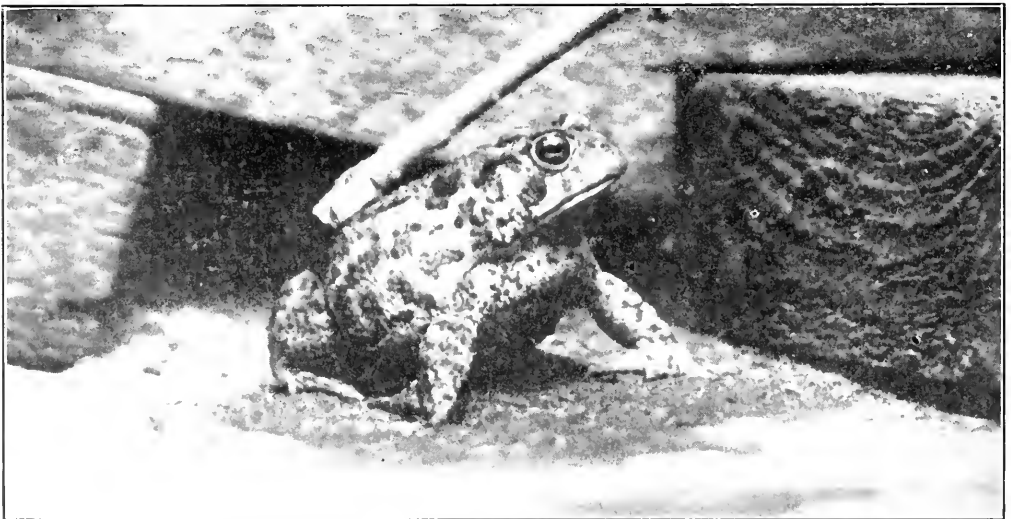
Walking about the lawn and flower garden in the early evening I found numerous toads hopping about, and having read that they would destroy

many insects harmful to plants, I was interested in their welfare. Thinking I would use my camera I put a fine specimen under a flowerpot, my daughter objecting, claiming it was unkind; but in the morning I found it had disappeared, having tunneled through the sod.

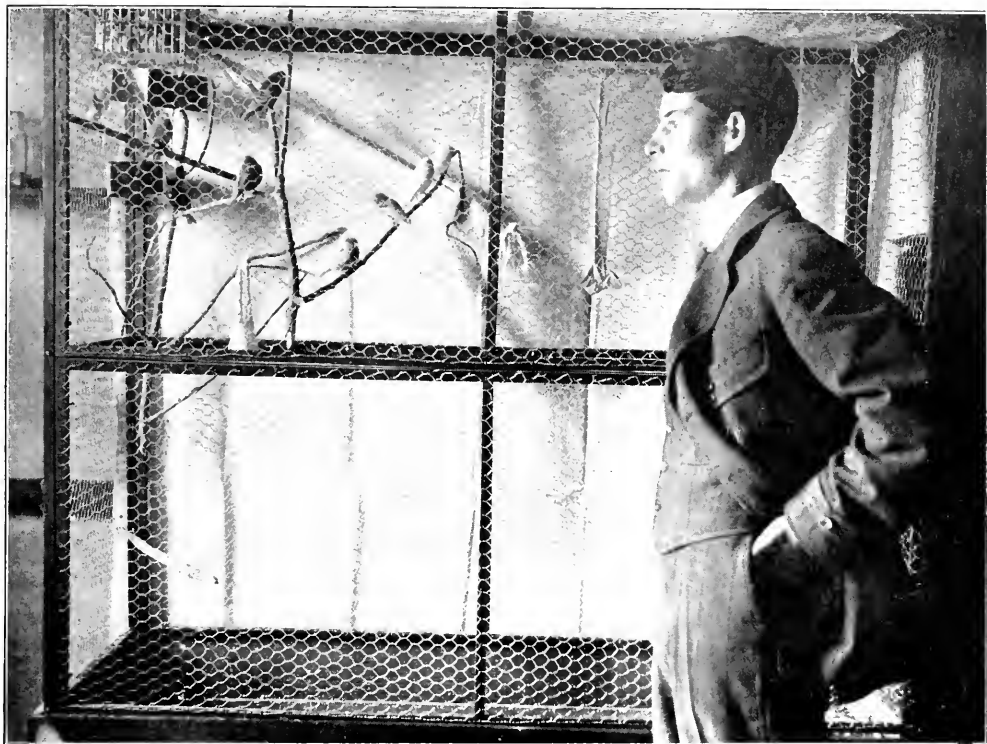
I knew nothing of their habits but happened with twig in hand to carefully approach one, and as I stroked it gently it would puff out its side with such perfect satisfaction, and when the stick touched the other side he turned the other way, remaining as long as I continued the treatment and causing much amusement to those who watched his blissful contortions.

The friend who assisted me in making the photograph, which does not do justice to the situation, said she had never before taken a toad into her hand, and I find that most people object to doing so. But why it should be any more disagreeable than fish I cannot decide.

(Mrs.) M. E. McDougall.



"AS I STROKED IT GENTLY."



An Indoor Bird Cage.

St. Albert, Alberta, Canada.

To the Editor:—

I take the liberty of sending you a snap shot of one of my indoor aviaries and you will see by its description that it is very convenient for keeping cage birds. Besides affording pleasure to the bird fancier and allowing him to keep a collection of interesting birds, the birds themselves are more comfortable than in being caged off one by one in small, unsuitable cages.

The aviary is six feet high, six feet long and three feet wide. The bottom is a deep drawer containing sand, very easy to clean out. The perches are stout natural branches replaced once in a while. The birds kept together are canaries, zebra finches, Java sparrows, goldfinches, bullfinches, Australian grass parakeets, etc., and to see them flying around is a fine sight.

There are a lot of foreign finches of beautiful plumage which are cage bred and are very happy in an aviary of that nature.

They are fed on plain canary seed, millet, rape and hemp and are provided

with good clean water for drinking and bathing, and with a liberal supply of sand thrive well.

Hoping this will interest some of your readers who are cage bird lovers, I am

Yours very sincerely,

R. C. Farrell.

The "Wrestling" Frogs.

Brooklyn, New York.

To the Editor:

Last July while I was sitting by a small pool of shallow water, a good-sized frog gave a characteristic "cher-oog," showing his bulging eyes above the water. A minute later he and a somewhat smaller frog were wrestling like two schoolboys, the nose of one close in the neck of the other, both making gurgling, froggy noises. The "arms" of each were about the other's neck, the two standing on extreme tip-toes. At length they plunged into the water in real somersault only to rise and renew the wrestling.

Soon the smaller frog swam off, the larger one resuming his quiet pose with eyes just above the water line.

He repeated an occasional deep-toned "cher-oog," but whether it was a note of triumph or a call to another round, I could not tell, and perhaps it was neither.

CAROLINE M. HARTWELL.

The Thrush Came Back.

Stamford, Connecticut.

To the Editor:

In the spring of 1898, while walking through the woodlands on the outskirts of Stamford, I chanced to see a little bird lying by the roadside. It was apparently left there at its own resource with no one to take care of it.

I picked the bird up, carried it home and gave it good care—as well as any one could under the circumstances, as the bird was four or five weeks old. I took care of it during the following summer, and in the fall decided to let it fly south with the others of its kind.

The following spring when the birds came north a neighbor of mine, Mr. Frank Merritt, came to me and asked if I had lost a bird. He said one had tried to get in my window in different ways. He caught the bird and handed it to me, and I recognized it as the same one I let fly the previous fall. To make sure of this I put it

into a cage the same as before and gave it food and water. It acted as though it had always been in the cage. I kept it there for two or three days until the weather was warmer, and then let it fly. As it soared up in the air it chirped and flew away, and that was the last I saw of my pet.

OTTO M. MAKOWSKY.

An official of the Marconi Wireless Telegraph Company of America recently informed the writer that about forty wireless telegraph instruments were in action at one time in the New York Harbor at the Hudson-Fulton celebration. This was undoubtedly the invention's severest test in a maze of wireless "waves." Although there was some difficulty, yet each pair of instruments could keep in "tune." The official compared the situation to sixty or eighty people in a room all of different voices in tone and pitch. Each couple could continue conversation, only by "ignoring" the others and centering all attention on a particular voice. While this center of "attention" might be distracted for a time, it could take up the conversation in a "lull" and go on as before.



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

Minerals of Rye, New York.

BY WM. C. BANKS, STAMFORD, CONNECTICUT.

A fairly good locality for minerals is the serpentine ridge at Rye, Westchester County, New York. In addition to the published list of minerals from there I have personally collected and have in my possession the following: phlogopite crystals, purplish color; deweylite. These two minerals are

intermixed forming a vein through the serpentine. Nephrite, yellow green to grayish in color, a reddish chrome chlorite, similar to the Pennsylvania kammererite in appearance, nodular coating chromite. There is a great deal of vein material intermediate in character between deweylite and serpentine. I have found three good specimens of an amphibole mineral partly altered to serpentine, and—there is ser-

pentine enough to go around. Aside from the minerals, this locality is of geological interest as it is a good typical example of serpentine as an altered intrusive mass among gneiss rocks.

A Few More Incidents.

BY WILLIAM C. BANKS, STAMFORD, CONNECTICUT.

Our particular passion is not always appreciated by others, but I do think one of my friends took a rather unfair way of making me move on one day. When I much preferred to stop and search for garnets. We, that is, myself and two others, had been on a walk up to North Stamford to see the water company's new dam, where we found certain geological features which I may describe later. On the way home, we passed a locality where good-sized garnets occur, and two of us began searching for them, much to the disgust of our friend, who was, I dare say, tired. Now, in this neighborhood, are two sanitariums, where the mentally afflicted are cared for, and this furnished the ammunition he used on us. After entreating, exhorting and waxing sarcastic all to no purpose, as a party of strangers was passing, he walked up to us with an air of authority and said, "Come, this won't do, you know Dr. G. said I was to bring you back by two o'clock?" and then he viewed our wrath and disgust with an unholy glee. We moved. So, you see, some at least of those we meet class us with infants, imbeciles and other irresponsible folk. But so long as we get our share of sunlight, fresh air, pretty scenery and minerals, we can disregard the carping of the unregenerate.

Grantham, New Hampshire, Minerals.

Grantham, New Hampshire.

To the Editor:

Several weeks ago I received a copy of *THE GUIDE TO NATURE* and read it with increasing interest and pleasure. I am interested in one department of which it treats, geology, especially so in mineralogy.

I have found and collected in this town, Grantham, many beautiful quartz

crystals. Some of these crystals are part green and the other part of the same crystals nearly transparent as glass.

There are ledges in this town so full of garnets that one cannot step without treading on them. Many of these garnets have become so weather-worn and broken they can be scraped up by handfuls.

In some parts of the town fine specimens of staurolite are found. Dana speaks of them as remarkably good.

Near the centre of the town, and running in a northerly direction, there is a ledge, from thirty to fifty feet in height and several rods long. This ledge is mostly agate with thin layers of chalcedony, and in places in the form of burls which, if polished, would make beautiful specimens. The agate is of several colors, and when polished these are indeed beautiful specimens, as the writer knows for he has several in his cabinet. I have also picked up in some of the roads here fine specimens of jasper.

In several places on some of the hills in town, striae may be seen on the ledges—evidence of the drift or ice period. These marks or grooves are more numerous on some of the ledges in the neighboring town of Springfield, and are quite large and deep and may be seen at quite a distance from them. Some of the ledges in that town, also are full of fibrolite, and many quite large slabs of it have been carried away for ornamental purposes.

Recently the writer helped a friend blast a rock out of a ditch he was digging. The rock, or more correctly ledge, was two or three feet below the surface of the ground, and we were surprised at the discovery made. I mail under separate cover a few specimens of it. I call it radiated hornblend. Am I mistaken? Please let me know. The specimens are not large but good, and I think quite pretty.

Yours truly,

REV. GEORGE A. TYRREL.

(Editor.—You are right. The mineral sent was radiated hornblend.)

Notes on Mineville, Essex County, New York, and Nearby Localities.

BY ALFRED C. HAWKINS,

CORRESPONDING MEMBER PHILADELPHIA
MINERALOGICAL CLUB, SEWAREN, NEW
JERSEY.

On the western shore of Lake Champlain, fifteen or twenty miles north of the southern extremity of the lake, Crown Point, famous for its historical associations, juts out from the New York side. South of the point the lake is more or less narrow and even swampy at times. There is one spot along this portion where high bluffs approach closely, and here are the ruins of the well-known Fort Ticonderoga. North of Crown Point the lake immediately widens into a bay which is three or four miles across; further north the lake reaches a maximum width of ten miles. At Crown Point the distance between the shores of New York and Vermont does not exceed a few hundred yards. Crown Point itself is relatively low, broad and flat; the opposite shore shows the same characteristics for fifteen or twenty miles east from the lake; at that distance the Green Mountains of Vermont rise like a wall, stretching with a long, irregular sky line from northeast to southeast. Crown Point would naturally be a strong vantage point for the control of traffic on Lake Champlain. The old fort, built there in Revolutionary times, though scarcely one hundred feet above the level of the lake, had full command of the water way because of its very narrowness at this point. The fort ruins consist of great embankments, arranged in the shape of a star, with a moat outside and great stone barracks still standing within. They mark a practically impregnable position.

Crown Point is composed of strata of limestone, of Paleozoic age, which outcrop with a steep dip. This brings many successive strata into view on the broad land surface here exposed. This locality is chiefly interesting for the fossils, of varying ages, which are quite abundant and often perfectly preserved. The mineral locality that appears as "Crown Point" on the labels, is near the station of that name on the railroad, and must be four miles distant

by road from the fort which is on the end of the point. The minerals are found near the contact of the limestones with the crystalline gneisses of the highlands. A sort of apatite called eupyrcroite, in mammillary, grayish green masses, is fairly abundant in the limestone here. It is indicated that the apatite found at this place has been mined but is now no longer worked. Apatite is also reported in elongated, terminated prisms in the limestone. In the same formation come fine brown tourmalines, chlorite, quartz crystals, calcite and pyrite crystals. In the gneiss, at the contact, are brown garnet crystals of good quality, wernerite, oligoclase (aventurine), zircon crystals, chalcopyrite and epidote in small, imperfect crystals. It may be added that these are not always as easily found as it might at first appear. However, the locality is evidently a good one and well worth a visit.

The Ticonderoga locality is well known, chiefly on account of its exceptional production of graphite. Other minerals are evidently not lacking, however, and it might be worth while to enumerate them as reported:

Ticonderoga. Kirby Graphite Mine, 3
M. N. W. Ticonderoga.

Graphite (crystals and folia), pyroxene (large, dark green crystals carrying inclusions of calcite), wernerite (perfect crystals), titanite (yellowish gray crystals), tourmaline (black), apatite, calcite and quartz. These seem to occur in crystalline limestone, gneiss and schist.

The other Ticonderoga locality is at Chilson Lake (Paragon Lake) where, in contact, gneiss and limestone are found: apatite, garnet, pyroxene (crystals and coccolite), Vesuvianite, wernerite, magnetite and blue calcite.

The more famous of these, the graphite locality, which we usually associate with the name, Ticonderoga, is very difficult of access, so much so, in fact, as to be visited by few collectors.

Northwest from the end of Crown Point, across the bay formed by that promontory, appears the town of Port Henry, New York. The most striking features of the town, when seen from

a distance, are a good sized iron furnace with black iron stacks and a square building of white concrete which turns out to be the power house that supplies the mines some distance away. This power house, by the way, is located along the lake shore on an exceedingly flat topped promontory that on closer inspection is found to be an old dump of blast furnace slag. Three more iron furnaces once stood along this shore line, but all have now disappeared save one which, nevertheless, is working energetically at present. Back of the shore line the hills rise somewhat abruptly. As we go from this point further west the hills rapidly increase in height and finally become the Adirondacks.

The great ore bodies of this part of the Adirondacks are located at Mineville, about six miles west of Port Henry, at an altitude of thirteen hundred feet above the sea. The ore is magnetite arranged in lenses or pod-shaped bodies in the old gneisses of the mountains. For many years these deposits have been mined. The old methods were, as usual, wasteful and failed to remove much good and easily accessible ore. This was especially true of Barton Hill, a small hill or mountain from which much ore was taken, the working in which was subsequently abandoned and became flooded with water. About two years ago a narrow tunnel was run into the hill from the valley below, tapping the old workings and running off almost all the accumulated water so that no pumping had to be done. The same tunnel keeps the mine always dry. The Barton Hill Mine deserves our special attention since it is the locality whence came the wonderful little magnetite octahedrons that have made Mineville famous among collectors. Much of the ore (magnetite) is very coarsely crystalline, and careful pounding will often disclose some grains which show a very well developed, though modified, octahedral form. The best octahedrons were, however, found in a schistose rock. The largest one of these ever found, it is claimed, is now owned by the company operating the mine. This crystal is an octahedron, one and one-

half inches on each edge, and so perfect that it is said to fit perfectly into its niche in the matrix, no matter which side goes in first.

Much of the ore at Barton Hill has fluorite associated with it, grains of fluorite and magnetite being intermingled. The fluorite is never purple but is light green in color. Apatite also occurs similarly, in quantity, rendering some of the ore quite red in color and unfit for processes in which an ore low in phosphorus is required. Much ore is also titaniferous, the titanite occurring in the ore like the fluorite and the apatite. However, the grains of titanite are quite crystalline and often very perfect crystals are formed of quite large size. One was found of more than one inch in diameter, and a fragment of another one that must have been two and one-half inches across. These titanites occur with the magnetite, augite (good black crystals) and crystalline calcite, making very attractive specimens. Scapolite appears in fine light green crystals of perfect development, often in groups several inches in length. Garnet crystals occasionally show zircon and feldspars come together.

Another opening near Barton Hill is "Mine 21," which is working a nearby deposit of similar ore. Some coarse pegmatite was encountered in this mine, in which are many zircon crystals of fine development. They show the usual tetragonal prism, but they have developed two pyramids (both of the same order as the prism), instead of one, as is usually the case. These zircons are altered to a gray color, and around each crystal in the quartz and feldspar is a slight red spot and a series of radiating cracks, such as are described by Mr. E. T. Wherry in his report on the radio-active minerals of Pennsylvania. "Mine 21" consists of a great open cut three hundred and fifty feet deep, from which branch out tunnels connecting it with the other nearby mines.

Another opening near Mineville, evidently the Sanford ore bed, produces fine large crystals of allanite, also in coarse pegmatite.

At Port Henry, on the shore of the

lake, there outcrops a belt of highly metamorphosed limestone. Limestone, naturally, was just what the iron furnaces needed as a flux for the ore; hence, there are large quarries, now abandoned, from which interesting mineral specimens have come. Some very fine calcite crystals, showing rare forms, came from here some years ago. Other minerals are: pyroxene (black crystals, and white and pink diopside crystals) pyrite crystals, pyrrhotite, graphite, amphibole, wollastonite, orthoclase, titanite and brown tourmaline. Rutile was also found, in a fine gemmy crystal an inch long. There are more

minerals at this locality than those given in the list, and some good ones are easily obtainable, making attractive specimens because of the white limestone matrix.

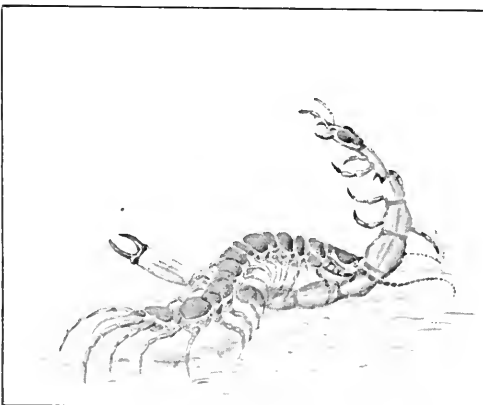
Glaciation is very prominent in this region, and many of the limestone outcrops on Crown Point are rounded and polished in a way that is truly wonderful, and covered with long, deep, parallel scratches. Hand specimens are attractive and often useful. Basalt dikes often appear in the gneisses, but they do not make good specimens because the contacts are seldom welded ones.



The Under Bark Grub.

BY S. F. AARON, REDDEN, DELA.

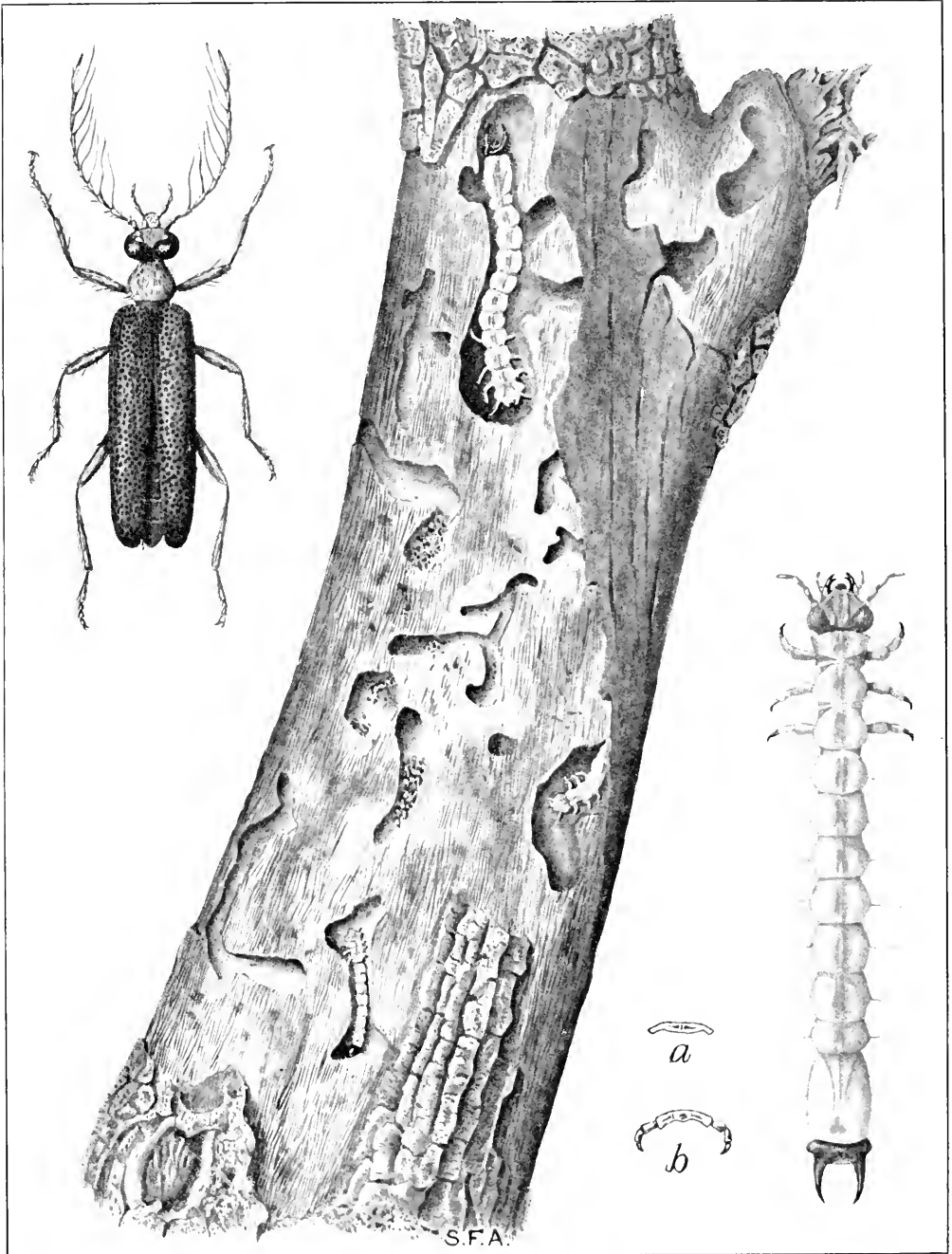
A very common larva inhabiting the northern portions of the United States



A CENTIPEDE ATTACKING AN UNDER-BARK GRUB.

and found under the decaying bark of nearly every kind of tree has been called the under bark grub. Go into the woods, find any old, fallen log or

decaying trunk, rip off the bark thereof and in nearly every instance these yellowish white, segmented larvae will be seen within the shallow borings that cut away merely the outer portion of the wood. Flatness is the characteristic of this insect stage. Nothing that the writer knows of, excepting neither the cockroach, silver bug nor elater beetle, is nearly so thin from front to back, or rather, from underneath to above, while the width of each segment is about normal in comparison to the larva of the Coleoptera. The flat head of the grub is brownish black with rather small, sharp mandibles for feeding on decaying wood. The posterior segment is dark brown and in miniature something like the horns of a cow or like a small bent forceps, the inner margin being almost circular. The use of this forcep-like appendage is not known; the points are not movable in opposition, and therefore, cannot grasp anything. The first three segments of the body have each a pair of legs, the rest of the body



THE UNDER-BARK GRUB AND ITS BEETLE. (*Dendroides Canadensis*.)

The outer bark of the dead dogwood branch, torn away to show the borings of the larvae under the bark. The beetle is less than one-half inch long, the larvae about one and one-half inches when full-grown. The pupa is white. A cross section through the seventh segment of the grub is shown at a and through the 7th segment, with the legs, at b.

is dragged slowly after. Placed on a smooth surface, as a piece of glass or varnished table top, the insect has a difficult time in propelling itself forward. In every case it reminds one somewhat of a slow train of cars, the head and first three segments representing an overloaded freight engine. Although the grub is exceedingly common, the pupa and the beetle into which it transforms are quite rare. This is because the larvae are commonly a prey to those busy little birds, the woodpeckers and nut hatches. The abundance of the larvae is explained by the fact that each beetle having, by sheer good fortune reached maturity, lays a great number of eggs, one at a time here and there, in the crevices of decaying bark.

But the birds are not its only enemy. Large predaceous beetles sometimes kill it, probably it also has a parasite. The common little red centipede, *Scolopendra*, almost as flat as the grub and a hundred times more active, sometimes attacks, kills and devours, in part, the under bark grub. Hundred-legger is a common name for this savage little creature, though actually it generally has but from twenty-four to thirty-eight legs. The centipede follows the burrows of the larvæ or

crawls at random under the loosening bark. Sometimes it will crawl over a larva without attacking it, at other times it will seize the beetle larva at once and if the centipede is about the size or less than its intended victim, there is a struggle, the grub moving far more quickly than usual.

The Cocoons on the Sassafras Tree.

BY W. E. BRITTON, STATE ENTOMOLOGIST,
NEW HAVEN, CONN.

I wonder if every reader of THE GUIDE TO NATURE has not at some time or other seen the queer club-shaped cocoons hanging from the bare branches of the sassafras tree or the wild cherry. They were made during the preceding summer, and represent the chrysalis or pupa stage of one of our commoner species of large moths, called the Promethea moth, *Callosamia promethea* Drury. The caterpillar feeds upon the sassafras, wild cherry, and sometimes the plum, and is shown in figure I.

Including the stem, the cocoon is about three inches long, and is usually formed by rolling up a leaf and making the cocoon inside it after having spun and wound many threads of fine silk about the leaf petiole and the twig to which it is attached as is shown

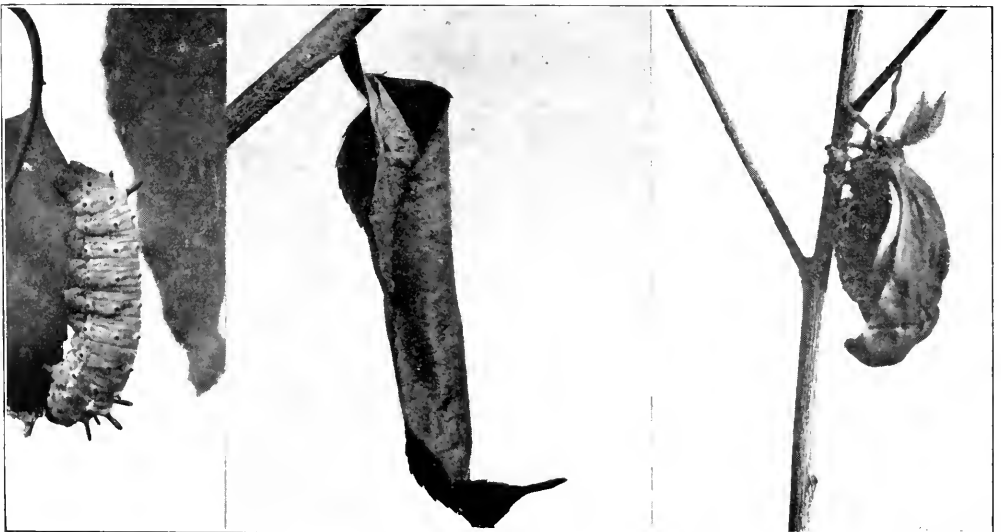


FIG. 1. THE PROMETHEA CATERPILLAR. FIG. 2. THE COCOON ROLLED IN A LEAF
FIG. 3. THE MOTH JUST EMERGED.

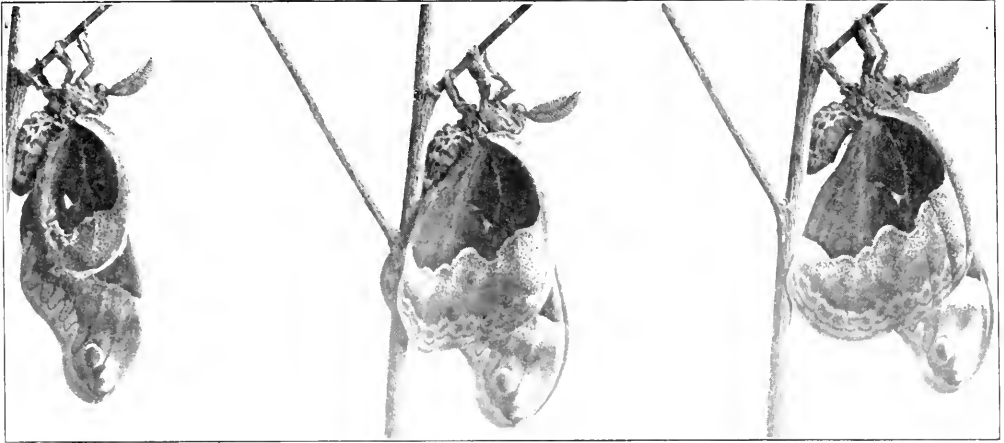


FIG. 4.

FIG. 5.

FIG. 6.

in figure 2. Such a leaf never falls like the others, but is so well fastened to the tree that it is difficult to pull it off without actually cutting the threads. The edges of the dry leaf usually break away, leaving the cocoon bare.

Each year the writer receives from correspondents, who wonder what they are, a number of these cocoons, which are usually placed in the breeding cages and forgotten. Perhaps several weeks or months afterwards a fluttering in one of the cages will remind us that the moths are emerging.

One year in June, while working in the laboratory, I noticed that a *Promethea* moth had just emerged from one of the cocoons. The camera was hurriedly set up, and at the earliest possible moment (11:28 A. M.) a photograph was taken of this soft brown crumple-winged object that hardly resembled a moth. (See figure 3.) At 11:33, just five minutes later, a second exposure was made, with the result shown in figure 4. Notice how the wings had elongated and straightened out. They had taken on form and color patterns; and all the while they kept moving slightly. At 11:50 a third picture was taken (figure 5), and by this time the wings were much broader and had assumed the usual form and color found in the species. Twenty-five minutes later (12:15) the wings were about full size and were quite hard and firm (figure 6). It proved to be a male. All the afternoon

he remained hanging downward from the twig, but after a time spread his wings. Not until after dark would he test them in flight. The last photograph (figure 7) was taken at 3:10 P. M., and shows the upper surface of the wings. All photographs were taken without moving the camera from the position where first set. They illustrate

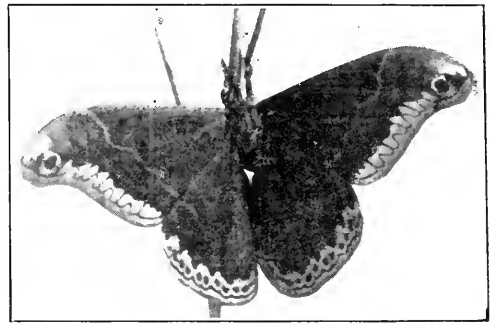


FIG. 7.

the rapid wing development which takes place in nearly every moth and butterfly on emerging from the chrysalis to assume the adult state. No one can adequately describe it, but it is easy for every one to observe. Moth cocoons can be gathered in late winter or early spring, and butterfly cocoons at almost any time during the summer. Place them in a ventilated glass or wire cage, with a twig inside for them to climb upon, and watch them from day to day. Finally you will be

rewarded by witnessing one of the most remarkable morphological transformations that occur in the whole realm of living organisms.

Observations on Grasshoppers and Ants.

Dorchester, Mass.

To the Editor:

Do you remember that several years ago I wrote to you, asking why grasshoppers prefer white dresses to darker or colored ones?

I heard, not long ago, of an interesting case where a lady found that instead of preferring white, grasshoppers were particularly attracted to a certain pink dress of hers—not all pink dresses but a certain pink one of cotton material. While she found very few on her white or other dresses, after a walk in this pink one she would be fairly covered with them, and before having the dress laundered the plaits always had to be ripped to get out the dead grasshoppers!

Isn't that strange? Do you suppose it had anything to do with the material or was it only a certain shade of pink?

We spent a few very pleasant weeks this summer in Wrentham, Massachusetts. The country about there is very pretty and interesting, and the lay of the land rather peculiar. The fields were not level or even gently rolling but full of steep, high mounds which we called horsebacks, and these were alternated with deep depressions like punch bowls. I found many flowers there which were new to me and there was a great variety of birds.

My sister saw an interesting scene one day which took place between two colonies of ants. One colony was of ordinary black ants, the other of red. The two colonies were a long distance apart, separated by the steep slope of a hill, but the red ants from the higher nest were making a raid on the nest of their neighbors below and carrying away their young, as I suppose, which were in the quiescent stage and resembled eggs about a quarter or an eighth of an inch long.

The black ants rushed madly about

not seeming to know what to do or how to defend their property while the red ants in one continuous stream carried the "eggs" from their neighbors' nest to their own and disappeared with them underground. I have heard of ants stealing the young of other species to bring up as their "slaves." Is that what these were doing?

I afterwards accidentally uncovered two nests, both of red ants I think, and found in them great heaps of these white "eggs." In one the older ants immediately set to work to carry them deeper into the earth and in an almost incredibly short time the whole mound had disappeared. In the other nest there seemed to be no full grown ants at all—only young ones, apparently newly hatched, with wings, and a small heap of "eggs." Just what were these "eggs." All the young ants we found were red. Do both species pass through very similar stages in development?

Very sincerely yours,

Dorothy A. Baldwin.

Gunning For Bugs.

Tuesday night Ralph C. Wright and a companion were out two and a half miles west of town hunting. Shortly after six o'clock they heard a buzzing and humming noise which they could not account for, until looking up they saw the sky fairly black with large beetles flying from the west toward the east. There appeared to be thousands of them and being curious to know what they were they took a few shots at them. A number were brought down and one was brought to this office by Mr. Wright. It proved to be the common black boat shaped water scavenger beetle known to scientists as *Tropisternus triangularis*. It is one of the largest beetles, being one and a half inches in length. They were undoubtedly flying from the waters of the Basin west of this city to some other body of water east of the city.—Warren Knaus, McPherson, Kansas, in "Entomological News."





Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

The Boat and Its Occupants.

Go to the bank, take the boat and pull out into the pond to gather the beautiful white lilies. You and the boat are to cooperate—the end is worth while. Neither the boat's carrying, nor your pulling will achieve the results unaided by the other.

So it is with The Agassiz Association and its members. The Home office may "carry" you on its books or you may study isolated. But it is only when the carrying capacity of the AA and your enthusiastic efforts are combined that best results are achieved. We are the boat; you are the occupant; the lilies of this world are plentiful. We can get them if only we cooperate. An empty boat floating or an enthusiast dancing and yelling on the bank will neither of them bring in many lilies.

The Audubon Societies Desire a Million More Dollars.

The National Association of Audubon Societies has now in its treasury over one-third of a million dollars. This fund enables the association to carry on its legislative work for ideal bird laws, and for the care and increase of bird reservations.

At the recent annual meeting, the President, William Dutcher, called for an endowment "the minimum sum of which should be one million dollars," to carry on the educational work of the Association.

The Agassiz Association extends most hearty wishes to its younger yet enterprising and prosperous Audubon Association that the million and more may be obtained. It is true that several millions can be devoted to good

advantage to birds alone, and much more to all nature (including birds).

The President of The Audubon Association says:

"It is the chief function of this Association to educate the whole mass of our fellow citizens regarding the value of wild birds and the intimate relation that exists between them and agriculture. If we can devise some means of imparting such knowledge to the whole mass of the people, we will most surely show them that it is to their interest to preserve birds, and when we have succeeded in doing this, the result desired, the preservation of birds, will surely follow."

Park Life Chapter of the AA.

We cordially welcome an energetic company of one hundred and sixty-one—boys, young men and a few men and women—Park Life Chapter, No. 1021, of Dubuque, Iowa.

I am personally acquainted with many of the members of this new Chapter and am confident that good work will be done.

The officers are as follows:

President—A. F. Paley.

Vice-President—A. T. Woller.

Recording Secretary—Geo. Ehmer.

Corresponding Secretary—Robt. E. Young.

Treasurer—R. J. Johnston.

Chapter No. 1021 constitutes the entire membership of the great new "Park Life" educational movement as explained in the November issue of THE GUIDE TO NATURE. With the inspiration and hard work by Prof. B. J. Horchem this new idea is sure to grow. This affiliation of his work and that of the AA is sure to be beneficial to both.

A Marine Army on the March.

BY JOHN S. FERNALD, BELFAST, MAINE.

An army of porpoises on the march was one of the most interesting sights witnessed by the party of gold hunters on board the bark William O. Alden during her voyage in 1849-50, from Belfast, Maine, to San Francisco. Although nearly sixty years have elapsed the life habits of these Cetaceans have changed but little, if any, and similar marches might be witnessed at the appointed seasons and places at the present day. Unlike their cousins, the seals, and their greater relatives among the marine mammals, the whales, and the salmon, cod, mackerel and other food fishes of the two great oceans, these denizens of the mighty deep have not been hunted very extensively by man; hence their migrations, feeding grounds and breeding places experience little change as the decades roll by.

Mr. Henry J. Woods, one of the "Forty-niners," now of Newton Centre, Massachusetts, made the following entry in his diary of the voyage, the account being the next in order after his report of leaving the island of Juan Fernandez:

"The next day we saw a school of porpoises going the opposite way from us, the army extending on each side as far as the eye could reach. They swam in regular files, like soldiers, each following his file leader, and so intent were they on the business in hand that they paid no attention to us, but simply opened the ranks, by right and left oblique movement, to allow the vessel to pass through, and immediately closed up again. We wondered, as we watched them, whether they were a great army going forth to battle under a brave and skillful leader, or were they following a natural instinct in search of food by migration to other feeding grounds."

Love Creates Beauty.

But the Poet is the master of beauty, and his mastery consists in commanding and causing things which were not before considered beautiful to become so. How does he do this? Before this can be answered we must understand

why one thing is beautiful to us and another not—why persons, combinations, etc., that are beautiful to one are often not so to another—and why one man sees so much beauty in the world, another so little. The explanation is, that beauty and love are correlatives; they are the objective and subjective aspects of the same thing. Beauty has no existence apart from love, and love has no existence apart from beauty. Beauty is the shadow of love thrown upon the outer world. We do not love a person or thing because the person or thing is beautiful, but whatever we love, that is beautiful to us, and whatever we do not love, is not beautiful.—Dr. R. M. Bucke. "Walt Whitman."

An Incident In Birdlife.

BY L. M. BRAINERD, LA GRANGE, ILL.

One warm forenoon in late August, the Idler lay in his hammock under the huge willow that made the whole backyard of the suburban lot a shady retreat. Strong winds from the south swung the lithe branches to and fro in steady rhythm and hurried great masses of white clouds steadily northward. Seven or eight young robins were running about under a row of raspberry bushes that marked the north limit of the lawn, but the Idler had forgotten them in the joy of weaving dreams among the clouds, when he was disturbed by a peculiar snapping noise, as if some crackling twig had suddenly grown actively animate.

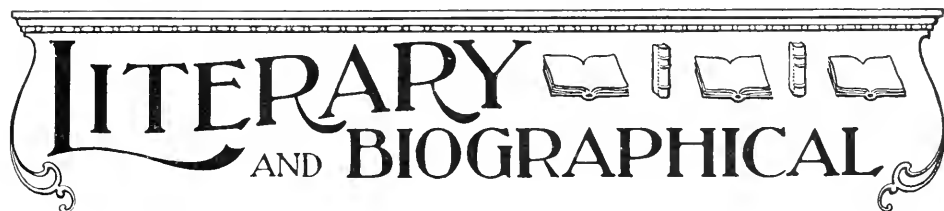
Turning quietly to find the cause, the Idler saw a young robin, not a rod away, hopping excitedly back and forth, now charging with vicious peck at some tumbling object in the grass, then retreating with ridiculous precipitation. Eager to see what prey drew forth such a violent exhibition of energy, the Idler drove Sir Robin off and picked up a luckless cicada, then able to do nothing but flop about, head down and wings persistently snapping. Deciding that the cicada was already too far along in the fulfillment of his destiny, for human interference, his observer tossed him back upon the close-cropped clover and withdrew to watch the game.

The former captor started at once for his big game, his assault watched by six other robins and the Idler. A comical charger young specklebreast was, as he sturdily resumed his original tactics of advance and retreat. At length he ventured upon closer hand to hand conflict, bestowing well-directed blows upon the struggling cicada, each blow climaxed by a frightened upward hop with uplifted wings.

By this time a brother robin, scenting a feast, ran up to join the fray, when, presto! without warning, a bolt from a clear sky shot down most literally—a blot of blue,—one hissing satirical shriek, the snap of a big bill, and away flew the robber—an impudent jay—with the doomed cicada in his beak. Startled though he was, the

rightful owner quickly recovered himself and shot off in pursuit, only to meet rout and mockery in the top of a neighboring boxelder.

But the second robin was so stunned by the enemy's charge that for fully two minutes he stood, or rather crouched, bird-fashion, close to the grass, head down in front, and flattened, every muscle tense and not a feather moving. At length, seeing no new developments, he cautiously pulled himself together and began to inspect the scene of the struggle. Back and forth across the spot he ran, examining the clover as if he thought it might hold some clew to the startling events of the past ten minutes. Apparently failing to satisfy himself as to the mystery, he finally flew away.



WAITING.

By John Burroughs, West Park, New York.
Serene, I fold my hands and wait.

Nor care for wind, or tide, or sea;
I rave no more 'gainst Time or Fate,
For lo! my own shall come to me.

I stay my haste, I make delays,
For what avails this eager pace?
I stand amid the eternal ways,
And what is mine shall know my face.

Asleep, awake, by night or day,
The friends I seek are seeking me;
No wind can drive my bark astray,
Nor change the tide of destiny.

What matter if I stand alone?
I wait with joy the coming years;
My heart shall reap where it hath sown,
And garner up its fruits of tears.

The waters know their own, and draw
The brook that springs in yonder heights;
So flows the good with equal law
Unto the soul of pure delights.

The stars that come nightly to the sky;
The tidal wave unto the sea;
Nor time, nor space, nor deep, nor high,
Can keep my own from me.

—Published by Houghton, Mifflin & Co.,
Boston and New York.

WORKING.

By Edward F. Bigelow, Arcadia: Sound
Beach, Connecticut.

(With apologies to John Burroughs
"Waiting.")

Alert, I make my life advance,
Against the wind, the tide, the sea,
I wait no more for Time or Chance,
By work I'll fetch my own to me.

I make all haste, I shun delays,
For much rewards this eager pace,
I stand amid the eternal ways,
And mine I'll force to know my face.

Asleep, awake, by night or day,
The work I seek is meeting me;
No wind shall drive my bark astray
Nor change the port I'm bound to see.

What matter if I stand alone?
I wait with joy the coming years;
My heart shall reap what hands have sown
And garner fruits without the tears.

The mill wheels know their own, and grind
By brooks that spring in yonder height,
So work will win and ever find
Success for him who strives with might.

The stars their duty never shirk,
The tidal wave uplifts the sea,
So sure shall I, by plans, by work,
Collect my own right here to me.

D'ri and I. A Tale of Daring Deeds in the second War with the British. Being the Memoirs of Colonel Ramon Bell, U. S. A. By Irving Bacheller. Illustrated by F. C. Yohn. New York: Harper and Brothers.

"D'ri and I" is a spirited tale of love and action in the war-times of 1812. Its scene is laid in the North Country, and D'ri, with his rugged strength, rough humor, and undaunted courage, is a splendid type of the time and genuine creation.

Silas Strong; Emperor of the Woods. By Irving Bacheller. New York: Harper and Brothers.

A story of the Adirondacks, replete with the spirit of the woods. "Uncle Sile" is a philosopher who thinks much and says little—a "one-word man," but a genuine humorist, with fountains of sly laughter in him. The heroine is a delightful daughter of the woodlands, and her romance breathes of the mountain air. Altogether it is the best and strongest story Mr. Bacheller has yet written.

Eben Holden's Last Day A-Fishing. By Irving Bacheller. New York: Harper and Brothers.

This is a new story of Eben Holden. It reveals him, old though he is, a true lover of good sport, and shows that time cannot change his gentle humor, his caustic wisdom, and his simple kindness. The book gives two pictures, one of fishing on a summer day, the other of Christmas-time in Eben Holden's old-fashioned country home.

Darrel of the Blessed Isles. By Irving Bacheller. Illustrated by Arthur I. Keller. Boston: Lathrop Publishing Company.

Darrell, the clock tinker, is a wit, philosopher, and man of mystery. Learned, strong, kindly, dignified, he towers like a giant above the people among whom he lives. In him Mr. Bacheller has created a character as new and lovable as Eben Holden but more fascinating.

The Master. By Irving Bacheller. New York: Doubleday, Page and Company.

This is a wholesome and unique tale of outdoor life. It has a great hero, who without a word of preaching lives a great life.

Vergilius. A Tale of the Coming Christ. By Irving Bacheller. New York: Harper and Brothers.

This beautiful and stirring story opens in Rome, is straightway transferred to Jerusalem and Jericho, and ends in Bethlehem with the birth of Christ. While depicting the momentous events of those times as they affected the hero and heroine, two young

patrician Roman lovers, the story has woven through its mazes like a thread of pure gold the growing expectancy of the coming Christ and the gradual growth of the higher conceptions of human love.

Eben Holden. A Tale of the North Country. By Irving Bacheller. New York: Harper and Brothers.

If, in the far future, our successors wish to know what were the real life and atmosphere in which the country folk that saved this nation grew, loved wrought, and had their being, they must go back to such true and zestful poetic tales of "fiction" as "Snow Bound" and "Eben Holden."—Edmund Clarence Stedman.

New Physical Geography. By Ralph S. Tarr, B.S. New York: The Macmillan Company.

This is a more detailed presentation of the science than that in the earlier book by the same author, "Lessons in Physical Geography."

Professor Tarr modestly says: "The author does not flatter himself that he has produced the ideal: his only hope is that he has done better in his third attempt than he did in the other two."

Lessons in Physical Geography. By Charles R. Dyer, M.A., F.G.S.A. Professor of Geography, Indiana State Normal School. New York: American Book Company.

In this book the best type form of physical features are treated in sufficient fullness to give a clear and definite picture. From these type forms the student can easily solve many geographical problems.

The Nature-Study Idea. An Interpretation of New School-Movement to put the Young into Relation and Sympathy with Nature. By L. H. Bailey. New York: The Macmillan Company.

Here is a book that teaches "nature-study" that is living, and for life, not for a temporary fill-a-requirement in the schoolroom. The author truly says:

"Nature-study is not synonymous with the old term 'natural history,' nor with 'biology,' nor with 'elementary science.' It is not 'popular science.' It is not the study of nature merely. Nature may be studied with either of two objects, to discover new truth for the purpose of increasing the sum of human knowledge; or to put the pupil in a sympathetic attitude toward nature for the purpose of increasing his joy of living. The first object, whether pursued in a technical or elementary way, is a science-teaching movement, and its professed purpose is to make investigators and specialists. The second object is a nature-study movement, and its purpose is to enable every person to live a richer life, whatever his business or profession may be."

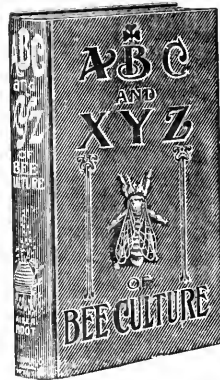
BEE-KEEPING

For Sedentary Folk

Some years ago our attention was drawn to the fact that many sedentary folk were taking up bee-keeping; some for study, some for honey, and some for money. The number has increased, and to inform those who are inquiring we have prepared pamphlets as follows:

Check
Here

- My First Season's Experience with the Honey-bee.** By "The Spectator" of the Outlook, New York. A 10-page folder detailing the experiences of this well-known writer. You will read the leaflet through before you lay it down. Free.
- Food Value of Honey.** By Dr. C. C. Miller. A 13-page folder, giving some interesting facts regarding honey as a food and some tried recipes for its use in cooking and baking. It will interest you in producing some of this delicious sweet for your own table. Free.
- Bee-Keeping for Sedentary Folk.** A 24-page booklet reciting the actual experiences of an amateur bee-keeper, showing what equipment is best, profits derived, etc. Free.
- Facts About Bees.** By F. Danzenbaker. A 64-page illustrated booklet. A practical treatise for the amateur. 10 cents.
- Habits of the Honey-bee.** By Dr. E. F. Phillips. A somewhat scientific handling of the habits and anatomy of the bee. 10 cents.
- Handling Bees.** Practical instructions on this subject, well illustrated. 10 cents.
- The A B C of Bee Culture.** A complete encyclopedia on bees of nearly 540 pages, fully illustrated. \$1.50 postpaid. Half leather, \$2.00.
- Catalog of Bee-keeper's Supplies.** Our complete catalog will be mailed free to any address on request.
- Gleanings in Bee Culture.** A 64-page illustrated semi-monthly magazine, the leading exponent of bee culture in this country. Ten cents per issue, but to new subscribers we will furnish it six months for 25 cents. \$1.00 per year.



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Morris Elmer Dailey, President State Normal School.

SAN JOSE, CAL.

Dr. Edward F. Bigelow delivered a Lecture on Nature Study before the students of this Normal School. It was *an exceedingly entertaining and instructive lecture*. Our students enjoyed it very much.

Athens County Teachers' Institute.

LULU LANE, SECRETARY, NELSONVILLE, OHIO.

Dr. Bigelow's lectures were an inspiration to the teachers of Athens County. By his able instruction an interest in Nature Study such as we have not before known has been awakened. Our teachers were delighted with his work.

W. A. Beane, County Superintendent of Schools.

ALBION, INDIANA.

Dr. Edward F. Bigelow delivered ten lectures at our county teachers' institute on the subject of Nature Study. He is full of his subject and is a very forcible speaker. His work is inspirational and grows in interest as he proceeds in the series of lectures. His work has left results. Our pupils are doing some real nature study.

Fredericksburg Summer Institute.

FREDERICKSBURG, VA.

ALGERNON B. CHANDLER, JR., M. A. RICHMOND, VIRGINIA CONDUCTOR.

I am writing to express to you in a more personal way than I had time and opportunity to do while you were with us my pleasure in your work here. **You were, beyond doubt, the best drawing card the school had.** Your lectures were broad-gauged and inspiring and they were most enthusiastically and appreciatively received, not only by the students of the Fredericksburg State Summer Institute but by the very large number of townspeople who were fortunate enough to hear you.

Athens Public School.

B. O. SKINNER, SUPERINTENDENT, ATHENS, OHIO.

Doctor Edward F. Bigelow was an instructor at the Athens County Teacher's Institute of 1909. His method of presenting Nature Study was unique and interesting and at the same time highly valuable. He has given an impetus to the work in the county which I believe it has not had before and in my opinion his influence will be felt in years to come. It gives me great pleasure to commend his work in the highest terms.

S. S. Willard, Superintendent of County Schools, Perry County.

NEW BLOOMFIELD, PENNSYLVANIA.

Dr. Edward F. Bigelow was one of the instructors at our Teachers' Institute. Physically strong and virile, earnest, forceful, enthusiastic, and withal entertaining, Dr. Bigelow, at once, secured and held the deep interest and close attention of his audience. Each period occupied by him was awaited with pleasure, and I am sure he inspired in many of his hearers a new and permanent desire to investigate more closely the secrets of Nature, and utilize her teachings in the practical work of the schools.

Woburn Woman's Club.

ALICE BOND WINN, PRESIDENT.

Dr. Bigelow gave his lecture on "The Child and Nature" before the Woburn Woman's Club. From the first sentence he held the close attention of his audience. The address was fresh, vigorous, inspiring. Personal contact with Dr. Bigelow is, in itself a pleasure and inspiration. He directs thought, in a delightful way all his own, always, toward the high and good, the great and true especially as revealed through the wonders and beauties of nature.

We would recommend Dr. Bigelow as a lecturer to all clubs who desire a delightful program quite out of the ordinary.

J. H. Riddick, Superintendent of Schools of Pulaski County.

WINIMAC, INDIANA.

Dr. Edward F. Bigelow's work as Instructor in our County Teachers' Institute was *most heartily received* and brought the teachers in closer touch with the beauties and usefulness of nature than they had ever been.

Dr. Bigelow has a style peculiarly his own, that compels attention and awakens sympathy for his subject which is brimful of interest to all.

Quishipaug Woman's Club.

MILFORD, MASSACHUSETTS.

BELLE R. MANCHESTER, CORRESPONDING SECRETARY.

The lecture recently delivered before the Quishipaug Woman's Club by Edward F. Bigelow, of Sound Beach, Connecticut, proved to be one of the most satisfactory in the entire course. Dr. Bigelow showed a thorough knowledge of his subject, "The Child and Nature," and the large audience gave the closest attention for an hour and a half. Many helpful suggestions were given by the speaker and we feel that much good may result.

Miss Low and Miss Heywood's Boarding and Day School for Girls.

STAMFORD, CONNECTICUT.

Dr. Edward F. Bigelow gave his lecture on California before the pupils of our school. It was one of a course of several lectures and perhaps the one most enjoyed. Dr. Bigelow is always full of enthusiasm for his subject and is always followed with interest by his audience. At this lecture there were several pupils from California present who listened with delight to his sympathetic presentation of his subject. The slides were extremely clear and beautiful and selected with great judgment.

Covington State Summer Institute.

COVINGTON, VIRGINIA.

JOSEPH H. SAUNDERS, NORFOLK, VIRGINIA, CONDUCTOR.

I am writing to express to you my appreciation for the services rendered in your lectures on the Pedagogy of Nature Study before our State Summer Institute at Covington, Virginia.

These lectures were both entertaining and inspiring and cannot fail to implant into the minds and hearts of the

hearers a deeper reverence for Nature and her wonders and a determination on the part of those who heard them to go to the great book of Nature rather than to the text-books of scientists for their instructions in this subject. In my judgment, any conductor of an institute or school would do well to secure your services for a course of lectures.

John Harrington Cox.

PROFESSOR OF ENGLISH PHILOLOGY.

WEST VIRGINIA UNIVERSITY.

It has been my privilege to do Institute work in conjunction with Dr. Bigelow. In my judgment, he is a master of his subject, Nature Study. He is eminently practical and his presentation is interesting, forceful and original. He emphasizes the sacredness of the child's natural bent and demonstrates conclusively the feasibility of his methods. Teachers listen intently to what he says and fill their notebooks with his words.

A. S. McPherron, Superintendent San Bernardino County Schools.

You certainly brought us all "near to nature's heart." Your lecture was an inspiration to those who are interested in nature study, and especially to those who are endeavoring to introduce their pupils to nature and to cause them to fall in love with nature. We are all glad that we were permitted to listen "to him who in love of nature holds communion with her visible forms," and hope that we may be so imbued with your spirit that nature may also speak to us in as varied a language.

"Park Life" School, Dubuque, Iowa.

BY J. HORCHEM, DIRECTOR-IN-CHIEF.

Dr. Edward F. Bigelow can supply anything in Nature Study that one can wish. He teaches the natural objects in their own environments—the stars in the heavens, the fishes in the water, the leaves and the flowers and the fruits on the plants that bear them, the bees and the ants when they are all around him, and the animals in their native haunts.

The boys in Park Life are naturally active. Work and play and eating and sleeping coming in their due time, each bringing enjoyment with it, there is an element of Crusoe life in connection

with our work. Dr. Bigelow was always ready to impart valuable instruction at the time when it was most appreciated and most inviting, whether in the field, in the woods, around the camp fire or by his lectures illustrated with this beautiful stereopticon lantern slides.

Department of Public Schools.
BINGHAMTON, NEW YORK.

J. EDWARD BANTA, SUPERINTENDENT.

Mr. Edward F. Bigelow of Sound Beach, Connecticut, lectured before the teachers of Binghamton, October 18th. It was the opening lecture in the pedagogical course for the season of '09-'10. His subject was "The Child or You."

From start to finish the audience was thoroughly interested. The lecture sparkled with wit, wisdom and good common sense. Mr. Bigelow's wide acquaintance with schools and children has given him a wide fund of illustrations upon which to draw, and these were used in a masterful way to fasten the arguments advanced.

All who heard him went away with a feeling that they had been not only entertained, but enlightened; that the child, the individual child, would receive closer attention hereafter, in the view of the teacher and the parent.

Some Interesting Books

Interesting and Instructive.

Among Green Trees. By J. E. Rogers. Bound in cloth, lettered in gold. Large quarto. Pages 202 + XXII. 25 full page and 202 small half tone and line illustrations. A very beautiful, entertaining and instructive work. Price, \$3.00.

Birds of Song and Story. By Elizabeth and Joseph Grinnell. Bound in cloth. 150 pp., 16 full page plates in color. Price, \$1.00; postage 10 cts.

Birds of Lakeside and Prairie. By E. B. Clark. Bound in cloth. 150 pp., 16 full page plates in colors. Price, \$1.00; postage, 10 cts.

Wild Birds in City Parks. By H. E. and A. H. Walter. Bound in cloth. 67 pp., and chart. Price, 50 cts. postpaid.

Constructive Work... Its Relation to Literature, History and Nature Work. By E. F. Worst. Bound in cloth. 171 pp., 325 illustrations. A very interesting book. Price, \$1.00; postage, 10 cts.

Set of Twenty-four Plates (12 x 9 in.) of Forest Trees. Printed on very heavy plate paper. A very beautiful and instructive set. Price, \$1.00 postpaid.

Games:

Game of the Birds. 52 cards in colors in heavy pasteboard box. Instructive and amusing. Price, 50 cts. postpaid.

Game of Industries. 100 cards. Interesting and instructive. Price, 40 cts. postpaid.

Game of Literature. 100 cards. Price, 40 cts. postpaid.

Game of Geography. 100 cards. Price, 40 cts. postpaid.

Minerals and How to Study Them By Professor E. S. Dana. Second edition revised. 12 mo., VI + 380 pp., 319 figs., cloth, \$1.50.

A Pocket Handbook of Minerals. By Professor G. M. Butler. 16 mo., IX + 298 pp., 89 figs., Morocco, \$3.00.

Crystals and Gold. By Reverend R. T. Cross. Cloth, \$1.00. This book will be found full of interesting reading, not only for mineralogists but all lovers of nature.

Gems and Gem Minerals. By Professor O. C. Farrington. This book is attractively bound in cloth, with lettering in gold. Pages 229 + XII illustrated with 61 half tone and line cuts and 16 full page plates of gems in their natural colors. Price, \$3.00.

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Arthur Chamberlain

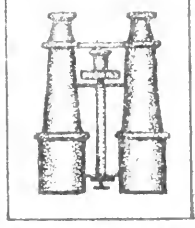
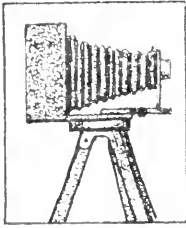
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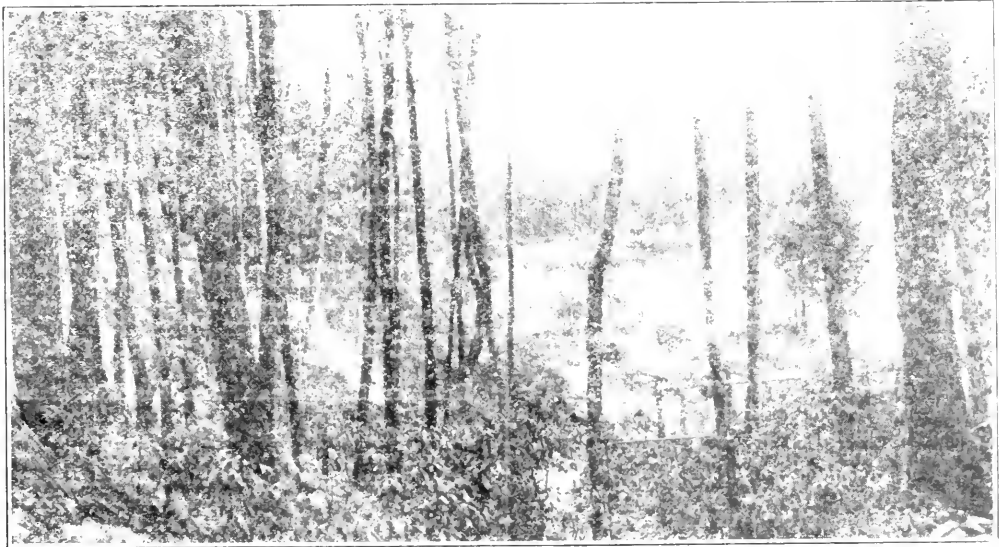
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Sound Beach, Conn.

AN ILLUSTRATED MONTHLY MAGAZINE FOR ADULTS, DEVOTED TO COMMONPLACE NATURE WITH UNCOMMON INTEREST.

EDWARD F. BIGELOW, Managing Editor

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PUBLISHER'S NOTICES

'Tis not in mortals to **COMMAND** success, but we'll do more, **Sempronius**, we'll **DESERVE IT.**—*Addison: Cato.*

When You Go to New York.

Do not forget that the Hotel Cumberland, at Broadway and Fifty-fourth Street, is ideal in location and equipment. Every convenience is provided for guests. The rates are reasonable. Try this hotel and see for yourself.

For Household Aquaria.

There is no more beautiful ornament for the household, and nothing more interesting in the study of nature, than a well "balanced" aquarium. Those in the Arcadia laboratory that are the most successful were supplied by Jacob C. Cassel, 915 Arch Street, Philadelphia, Pennsylvania. Write him for full particulars. Get the tank with slate bottom. He has nice ones with brass frames nickel plated.

The Remarkable Goerz Lenses.

It is but justice to our nature students to state that most of the best "home work" in photography by this magazine is done with the Goerz lenses. Occasionally some others are used for certain conveniences or some special purpose, but such master work as the frontispiece of the last number and of this and most of the other carefully detailed work have been made with Goerz Celor lenses.

The Dagor is probably in more extensive use among photographers, but for the nature work within the scope of this magazine, the Celor has been found most efficient.

The work in photo-macrography has been done wholly with two small Celors—a three-inch and five-inch.

You have all heard the mythical story of the man who in building a house made two cat holes—one large and one small. A passerby inquired

why the two holes. The indignant reply was, "How in thunder do you think that big cat can go through that little hole? I must have a hole for the big cat."

"But," was the retort, "Cannot the little cat go through the big hole?"

(This story is told of Sir Isaac Newton who cut the two holes in his study door, one for the old cat, the other for the kitten.)

"Oh! I never thought of that."

So it seems to me that those nature students who advocate the Dagor (smaller aperture) for "all round work" in science have forgotten that the lesser lighting of the Dagor can go through a Celor with its big aperture. But the speed of the Celor cannot be had from a Dagor. The lenses stopped down equally are supposed theoretically to be of equal depth. But in actual experience, I get greater depth with the Celor.

I do not mean to propound a new theory in optics. Perhaps I am at fault; perhaps the merit is in the Celor. I do not know. I merely state what I get in my own experience.

Let us have a little talk about lenses. Show what you get and tell us how you get it.

Anguish of mind has driven thousands to suicide; anguish of body, none. This proves that the health of the mind, is of far more consequence to our happiness than the health of the body, although both are deserving of much more attention than either receives.—Colton.

'Tis a fine thing to smart for one's duty; even in the pangs of it there is contentment.—**R. L. Stevenson.**

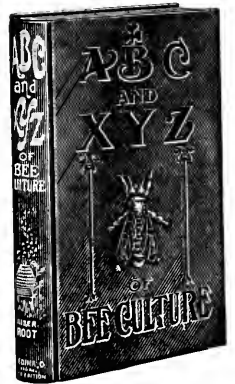
BEE-KEEPING

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THE A. I. ROOT CO., - - - MEDINA, O.



THE LAND AND THE HOME

THE GUIDE TO NATURE circulates extensively in the "homes near to nature" of the Long Island coast towns—especially Stamford, Greenwich and Norwalk—and in the surrounding suburbs and country. The magazine is thereby an effective advertising medium for business houses in these coast towns.

This business patronage is especially helpful and appreciated in building up the Nature Institution. Arcadia is open to the public on visiting hours two days a week, maintains a summer school composed chiefly of summer visitors and permanent residents, and at all times freely gives information on nature topics.

STAMFORD

Harry L. Collom, who has been living in a house owned by Mrs. J. H. Powell, on Adams Ave., the past two years, has purchased a building lot from Dr. T. V. Ketcham at Shippan, and expects to erect a fine dwelling house there in the spring.

* * * * *

The handsome bungalow being built on Hubbard Ave., by C. Y. Wilson, is nearing completion, and will add much to the collection of handsome residences which have been built in this section of Stamford during the past five years. This is one of the finest residential sections of Stamford, and the property around is being developed towards that end. Just below the brow of this part of Hubbards Hill, is Hillside Park, in which Clinton R. Fisher, teller of the Stamford Trust Co., and Charles A. Miller of the Yale and Towne Manufacturing Co., have recently erected up-to-date homes, and are living there with their families. There is plenty of room for other such houses, and it is expected that in the spring quite a building boom will be started.

The McKensie Property.

Building lots are being rapidly sold in that tract of land situated on Washington Ave., and known as "The McKensie property."

About sixty years this section of land was owned by the late Nathaniel E. Adams, who sold it to Charles O'Hara, a New York merchant. Mr. O'Hara built the large white brick house now standing on a knoll in the center of the lot.

Later the property was sold to Alexander McKensie of New York. He beautified the grounds by digging out and draining a portion of them, and he also made an artificial lake, erected a boat and summer house. There are many in Stamford today who can remember as far back as thirty years ago, the weeping willow which shaded the south bank of the picturesque little lake, and the statuary, as well as the two stately swans which floated on the surface of the lake. A waterwheel turned beneath the boathouse, and a fountain played from the center.

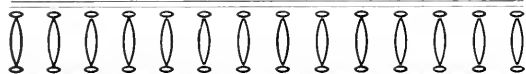
Mr. and Mrs. McKensie passed away. The property fell into other hands. The lake has been filled in. Some half dozen houses have been erected, where the swans floated. The old house still stands there, and is well preserved, but the present owner is thinking of moving it to make room for smaller houses of a more modern style.

Two streets have been cut through the property, namely, Renwick Street, and Vernon Place.

For several years Albert D. Downing lived in one of the first built houses on Vernon Place. Last summer he

sold his house, and immediately bought two lots opposite to his former dwelling, and is now erecting a first-class large house on the two lots. J. W. Hope will build shortly on his lot.

Henry L. Eckhard has recently purchased two of the best building lots in this property, and will put up two modern houses of the most approved style.



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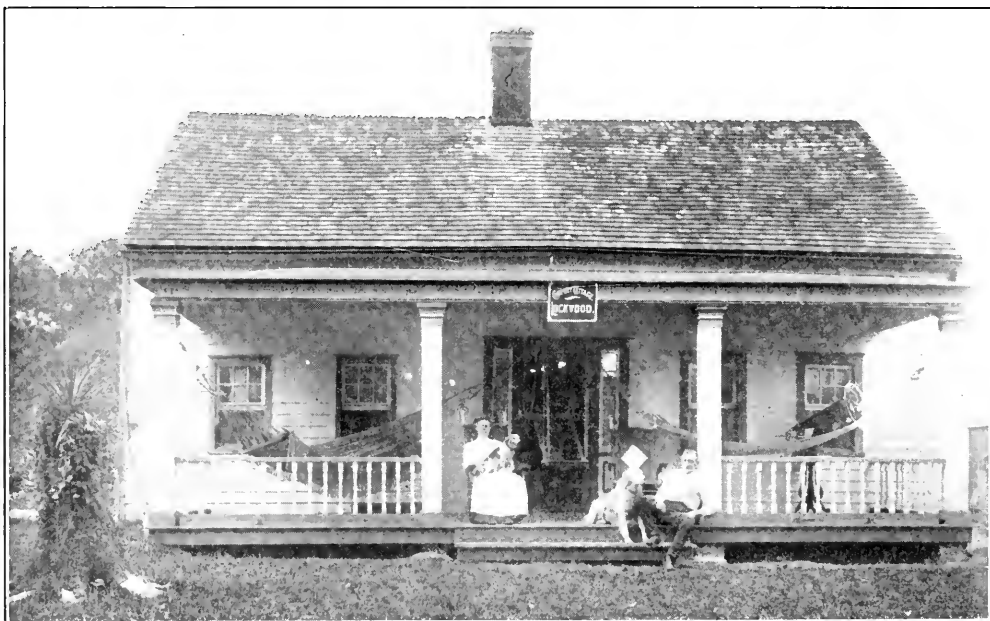
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THE EDITOR OF THE GUIDE TO NATURE.

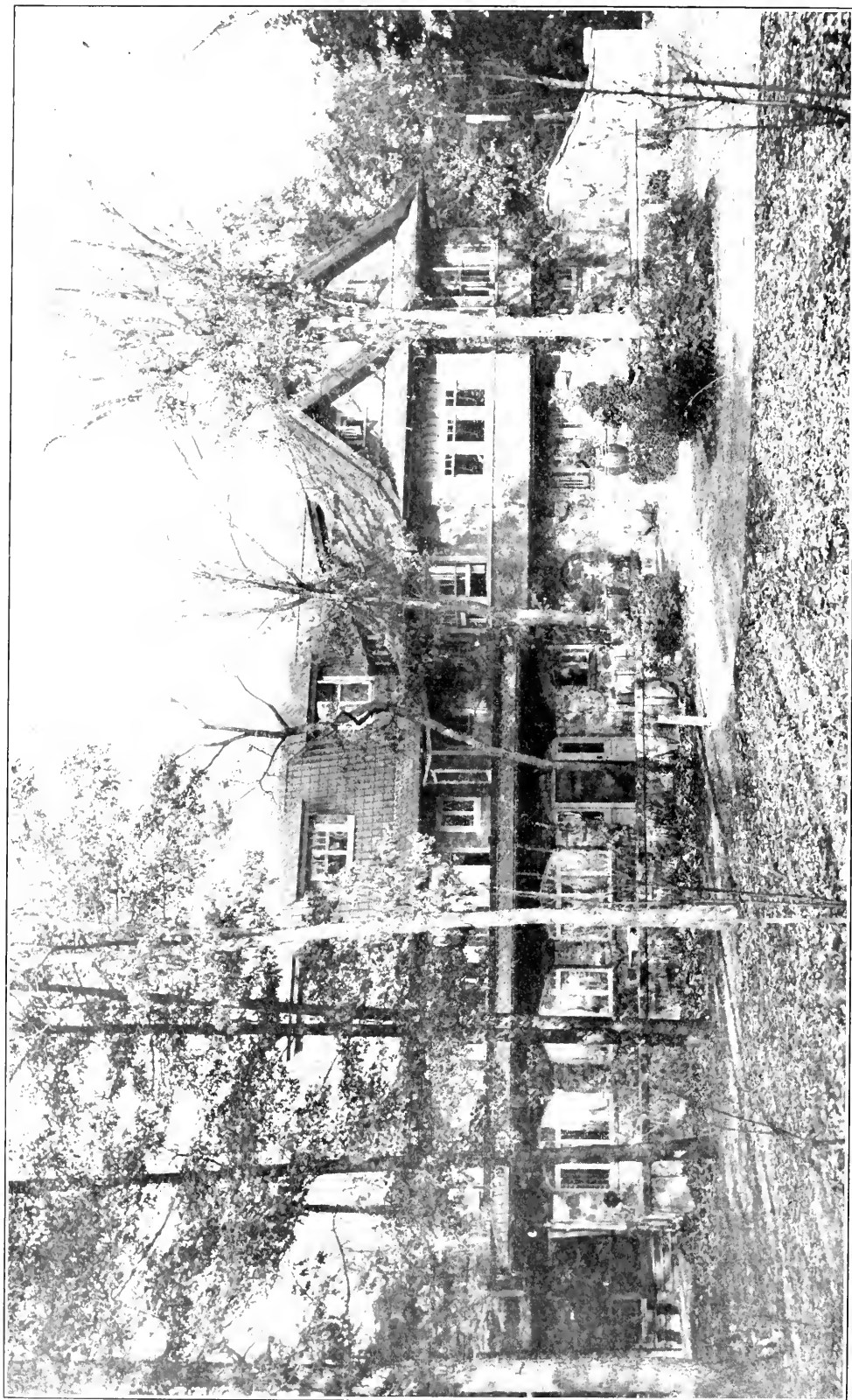


Until lately we have persistently regarded wild things as mere living targets, and have seen in them nothing but savage or timorous creatures, killing, or escaping being killed, quite forgetting that they have their homes, their mates, their problems and their sorrows—in short, a home-life that is their real life, and very often much larger and more important than that of which our hostile standpoint has given us such fleeting glimpses.—*Ernest Thompson Seton.*

Arc Adia

Just as surely as we find among the wild animals the germs or beginnings of man's material make-up, so surely may we find there also the foundations and possibilities of what he has attained to in the world of mind. This thought lends new interest to the doings of animals in their home life, and I have sought among these our less erbrethren for evidences of it—in the rudiments of speech, sign-language musical sense, aesthetics, amusements, home-making, social system, sanitation, wed-law, morals personal and territorial property law, etc.—*Ernest Thompson Seton.*





ERNEST THOMPSON SETON'S HOME NEAR TO NATURE AT COS COB, CONNECTICUT.

There was one boyhood's ambition that did not fade, but grew with my strength; it was to own a bit of land no matter how small, so long as it had on it a tree that I might save from all axmen and on which the birds might live in peace.

Here were rocky hills, sloping green banks, noble trees, birds in abundance, squirrels in the woods, fish and turtles in the pond, a naturalist's paradise in truth and all was mine.
—Ernest Thompson Seton in "Country Life in America."



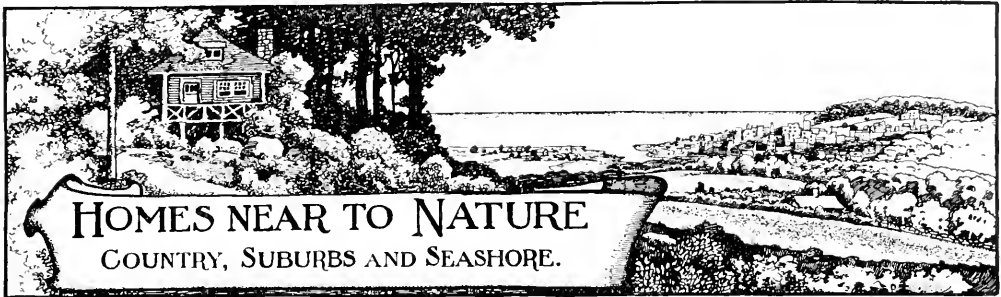
THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

JANUARY, 1910

No. 10



“Wyndygoul,”

Home of Ernest Thompson Seton

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT



ILD Animals I Have Known” was an epoch making book not alone because it departed from the time-honored custom of depicting the general habits of animals, but in that it related the life history of certain “distinguished” individual animals, and furthermore because it was the first book to make the study of nature fashionable.

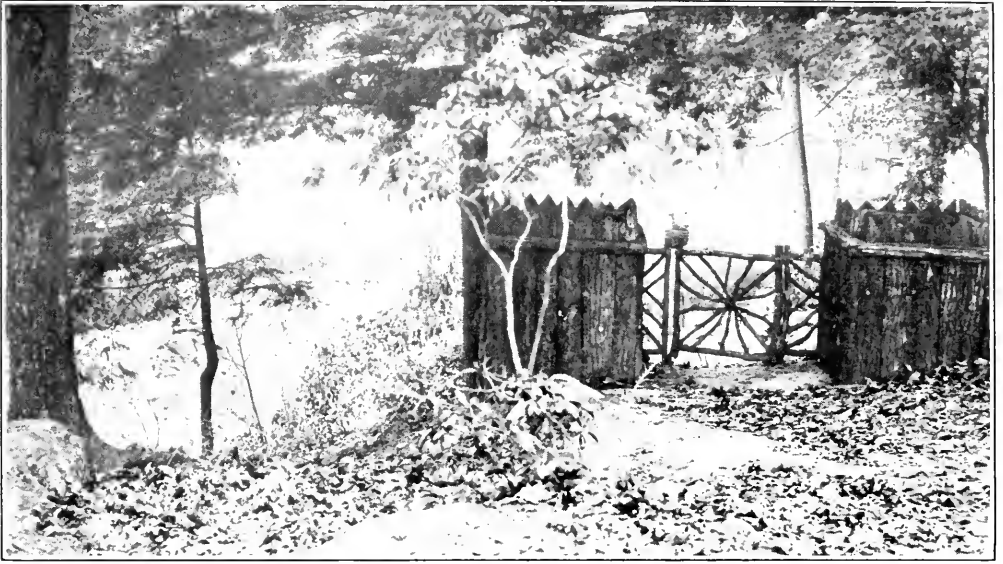
After the publication of that book in 1898 all else went more easily. Even the work of the technical biologist was looked upon with greater favor, and organizations for the study of nature prospered. Not only seriously, but as a fad, nature study entered a new era.

It is true that the critics railed, some naturalists said it was not true, and many coveted the success; but in

spite of all edition after edition appeared and the intimate affairs of nature attracted more attention.

In the life of the author it was even more than epoch making. Heretofore he had in limited circles been known as a naturalist, and to certain publishers as an illustrator of various forms of animal life, of more than ordinary merit. Now he suddenly blazed as a new star of first magnitude into the zenith of the Pond agency, and to the lecture courses throughout the country. Fabulous honoraria, rivaling those of Beecher's day, were paid for engagements.

Writers of natural history looked to the Seton articles as to high ideals. Imitators arose from all points of the compass. Only among the illustrators did he still stand peerless and alone, for the simple reason that his delicate and skillful touches with the



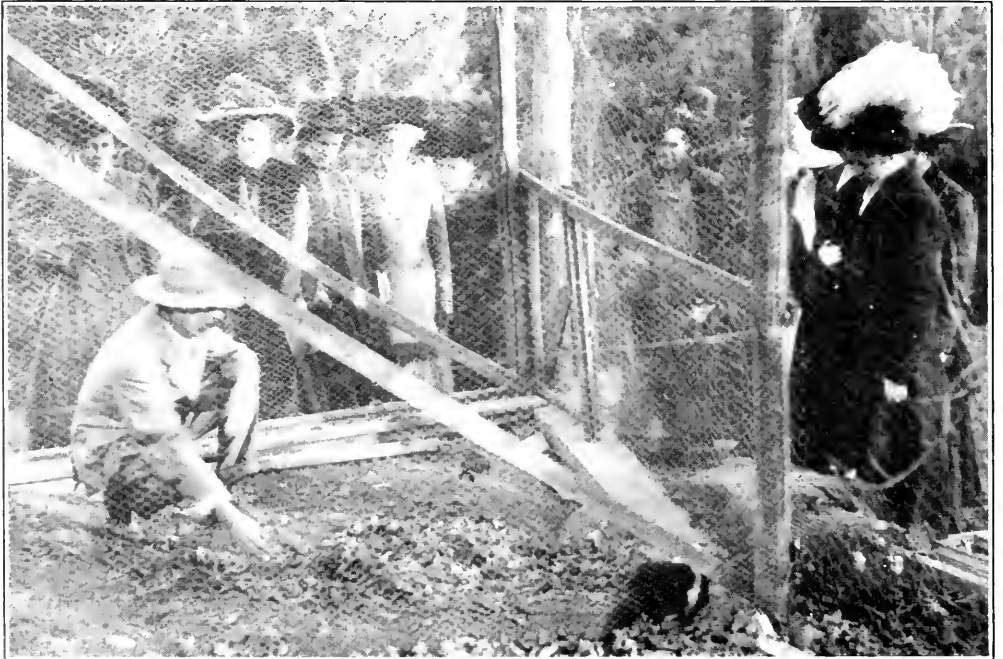
A VIEW OF THE ITALIAN GARDEN FROM THE ROAD.

brush were so far beyond the ability of all others as to forbid imitation.

In the writer's opinion it was not in art, which is Mr. Seton's best developed talent, nor even in his ability as a naturalist, but rather in his skill as a writer and lecturer, accomplish-

ments discovered somewhat late in life, for which the public honored and remunerated him.

Mr. Seton's greatest talents, those of the artist and the scientific naturalist, would never have brought him the gold and the fame that were brought



MR. SETON EXHIBITING A SKUNK TO A CLASS IN NATURE STUDY.

to him by a little side issue whose existence was unsuspected. He is like a skilled miner who in working faithfully and efficiently for ordinary metals discovers a vein of pure gold of whose existence he had not even dreamed.

But that gold enabled him to achieve the ambition of his life, that being, as he tells us in a magazine article, to live in the wild where he could experiment and observe as he wished.

himself, not the public, and all these may be observed at Wyndygoul.

There he has dreamed and planned and dug with his enthusiastic wife as helper or "partner," as he is fond of calling her, and has made an ideal home close to nature. In that home Mr. and Mrs. Seton have a prime essential—a loving, gentle, obedient, graceful child. Even a casual reading of his books shows him to be a lover of children, and we can but congratulate



MR. SETON AND HIS DAUGHTER, ANN, ON A LEDGE NEAR THE HOUSE.

His readers and his audiences know only the smaller "side issues" of Ernest Thompson Seton. To know him as he really is, one must see him surrounded by his beloved nature, must see him at his studies and influenced by his special enthusiasms; must know of the things he does to please

late him (and the "partner") upon having such a lovely specimen in his own home.

The location of that home in its nearness of nature is ideal. Upon this basis has been artistically expended much hard work. When the property was purchased it consisted chiefly of



HE DARED TO MAKE A STRAIGHT ROAD.
It is artistic and pleasing, even if there are no curves.



AT THE EDGE OF THE LAKE.



A VIEW OF THE DUCK POND.

a swamp, a meadow, a brook, a ledge and some bits of forest. The brook and the swamp have been changed into a beautiful lake, the banks into a graceful Italian garden; the ledge has become a picturesque site for the house, and the meadow is beautiful in its primitive, unaltered condition. The famous naturalist knows how to improve and how to let alone.

He is not bound down by time-honored customs. In good taste and for convenience the road to the house plot has been made straight. He has demonstrated that a straight path can be beautiful, and that it is not neces-

sary to go a mile to gain a half. The makers and keepers of country roads may well go and study his lessons. He teaches too what it would seem that every one should know, yet few seemingly do know that bushes, just ordinary bushes (not those trimmed and cut and carved), may be beautiful.

Yet he has formalism, the most formal of formalism, but placed where it is needed and where it becomes beautiful by contrast.

The Indian Camp is well located by the lake, and is the central college from which have come thousands of accessory camps in all parts of America



THE ITALIAN GARDEN AS VIEWED FROM THE NORTH.



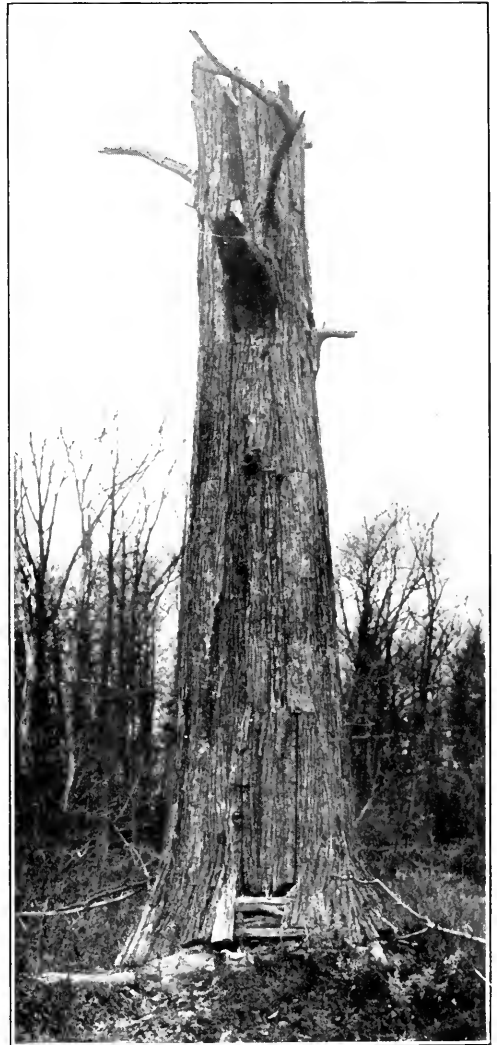
THE NATURE CLASS AND "WILD" (CANADA) GEESE.

as well as the Boy Scout movement in England. Here the boys gather in summer and have games of hunting, and here they dance, swim, whoop and follow the trail to their heart's content. With the external organization of an Indian tribe and all the charms of outdoor sport and picturesque ceremonial and dress, the boys are led along a pleasant path that, as only the wise and experienced realize, ends in good citizenship.

At the upper part of the lake is the stump of an old tree that for great size astonishes an eastern man and would do credit to the land of the Sequoia. Though made of slabs on a framework, it is so good an imitation as to please even the owls and squirrels, as well as the eye of man, so

picturesquely does it fit into the landscape at this upper end of the lake. Rowing to the island on which it stands, one feels as if journeying to the wilds of Canada, though it is but a few minutes since the boat left the land of civilization and of Italian gardens. A little farther northward in the wilderness is Ann Island, so named from the little daughter who, in a little rustic cabin all her own, may here fancy she is a Robinson Crusoe.

To the northward and eastward and westward the scenery is as wild as in the days when the Siwanoy and Mo-



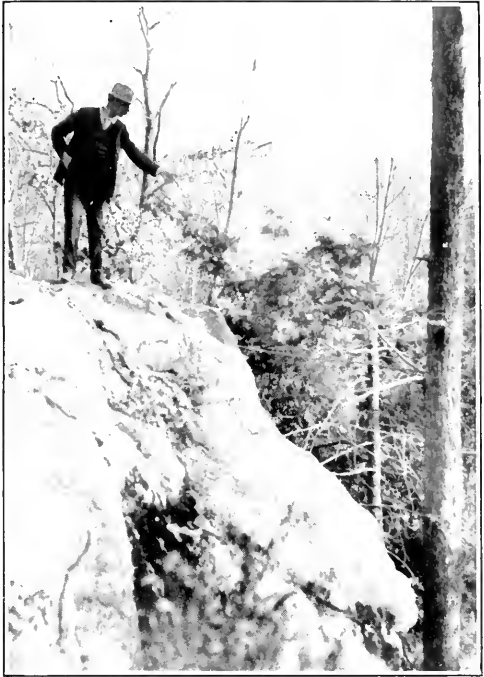
THE HOLLOW "TREE."

This was made of a frame covered with slabs.

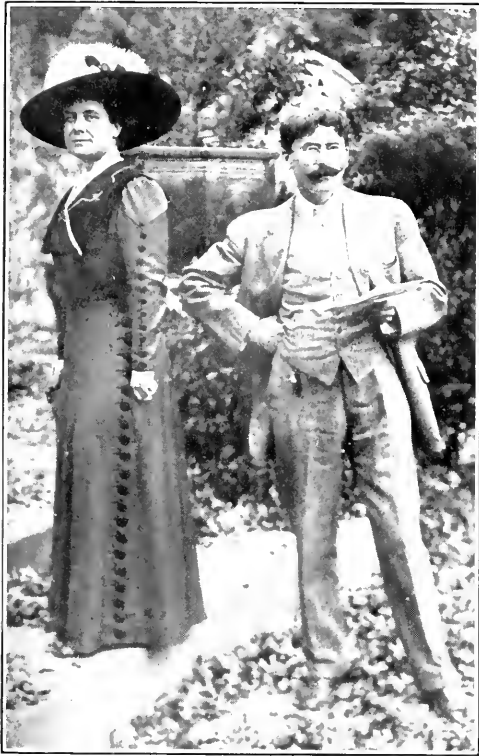
hegans held it for their exclusive hunting ground. Mr. Seton is fond of standing on Indian Rock and telling the story of the old chief, Ab Cos Cob, the last of his race, who lived and died there in his wigwam some seventy-five years ago.

In the autumn, while standing near this rock with my camera, I exclaimed, "Hear that flock of wild geese going south."

"Yes," replied Mr. Seton, "those are mine, born on this lake. They fly



STANDING ON INDIAN ROCK.
Telling the story of the old chief.



MR. AND MRS. SETON ON THE DOORSTEPS.



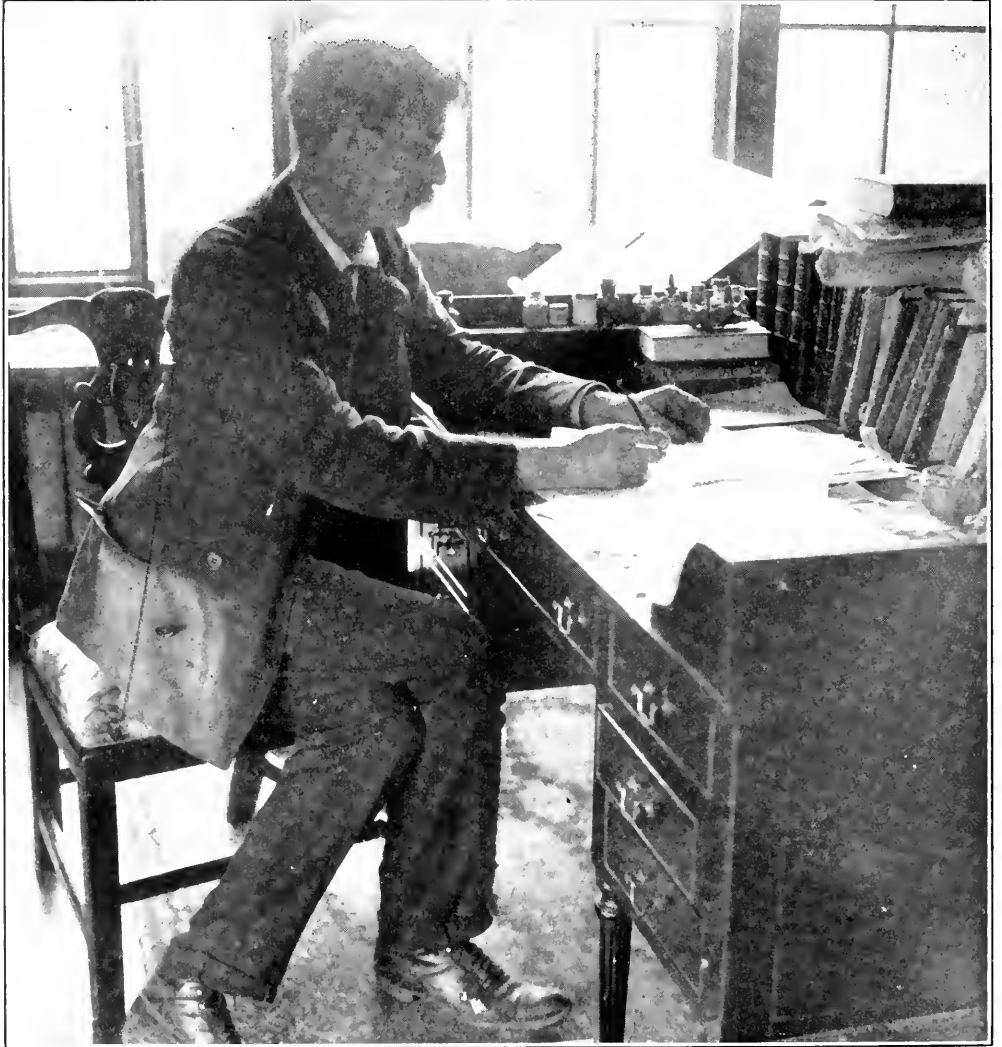
THE SKIN OF LOBO, THE WHITE WOLF, IN THE STUDY.

much and far in the spring and fall, often going to the Sound, but the two oldest birds are pinioned. They cannot fly and always call the family back again. The wild ducks are free and fly at will but never leave the Park."

And neither would I, if I had such a home in such delightful proximity to nature. Wyndygoul is good enough for geese or for any other bipedal form of animal life with one particle of the "wild" in its nature. Twenty species of wild animals and some seventy-five

species of birds live in wild security in and about the acres of Wyndygoul for it is a sanctuary as well as a chosen resort. Even snakes are not molested, only the snapping turtle is viewed as an enemy and sentenced to banishment as a disturber of the peace.

People no longer desire to see and hear him out of mere curiosity, as the author of a book that was in the list of "best sellers," but because they have a real interest in nature; and he has won the respect of even those naturalists who denounced his books as "animal fiction." The recent publication



WHERE HE WRITES HIS BOOKS AND MAGAZINE ARTICLES.

Though Mr. Seton's popularity no longer flames so high nor so wide as in the three or four years when he could with difficulty find dates for lecture appointments, in all parts of the country, his work nowadays is in saner demand.

of "Life Histories of Northern Animals" has emphasized and made secure his fame as a real, hard working naturalist.

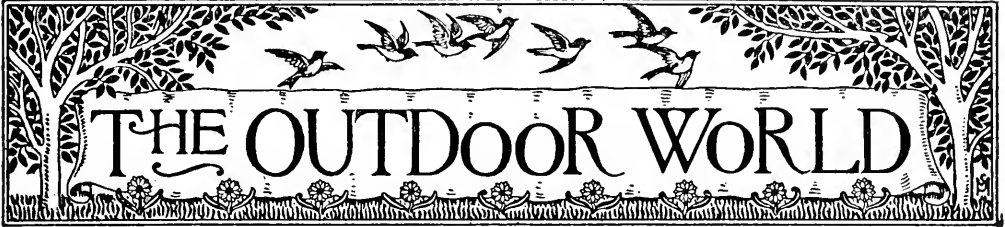
In popular esteem he has earned the right to enjoy "Wyndygoul"—the most

elaborately and luxuriously equipped home of a naturalist that the world has ever known.

Long may he and his family enjoy it, and from there call the attention of the people to real animals, to a genuine love of nature, and through these

to the ultimate purposes so well expressed by Professor Hodge:

"Nature study is learning those things in nature that are best worth knowing, to the end of doing those things that make life most worth living."



The Greatest True Fish Story.

BY S. F. HARRIMAN.

Note:—The term "fish" is used figuratively, because the blackfish is not strictly a fish, but a species of whale. While there is no record of larger stranding of blackfish, there have been made larger and more valuable catches of fish.—E. F. B.

November 17, 1884, on the shores of Cape Cod, Massachusetts, occurred the greatest catch of fish known in the annals of American fisheries, Cape Cod fishermen, celebrated for their vigor, skill and alertness, discovered a large school of blackfish off the inner shore of Cape Cod, where they had been attracted by the great abundance of squid and herring, on which they feed. With dorys and fishing vessels the fishermen drove the huge monsters of the deep, as the farmer drives a flock of sheep, for two or three days and nights, until they succeeded in forcing them up Blackfish Creek Bay, in South Walflect, Massachusetts. The fish would go on until they stuck fast and were stranded on the shore. They were then lanced by the skilled fishermen and died on the beach. It happened that the shore was reached at high tide, just as it began to ebb; hence the whole school of fifteen hundred blackfish were soon on the dry sand.

The slaughter was very exciting, some three hundred fishermen participating. A three-pound fish has been known to make a "scene" when being landed; imagine, if you can, the death-throes of fifteen hundred fish weighing from five hundred pounds to three tons each. Many of the fish when dying

would utter a plaintive moan, not unlike that of a human infant, and which proved rather trying to the nerves even of the hardy Cape Cod fishermen. The accompanying illustration shows them at low tide.

I saw them both at high and low tides. At high tide nearly all were under water, lashed together, and at low tide they looked like a black log yard—an extraordinary sight and one never to be forgotten.

By the unwritten law of the fishermen all were sold at auction on the beach and were purchased by Provincetown, Truro, Wellfleet and Eastham parties at an average price of ten dollars each, or \$15,000 for the 1,500 fish. It was estimated that when the blubber was rendered into oil and the bodies into fertilizer the entire value would be about \$25,000 at wholesale prices. The yield of oil from each fish varied from ten gallons to ten barrels. The jaw yields a fine quality of oil, highly prized for oiling clocks, watches and other delicate machinery. There were about 400 shares, a boy drawing a half share, a man a full share, a dory two shares and a fishing vessel six shares—this, too, being unwritten law among the fishermen.

The blackfish, sacred to Apollo, the mythologists and poets will remember, is known by various common names—deductor, social, bottle-head or howling whale—and to the ichthyologists by the scientific name, *Globicephalus melas*.

The "blackfish" is, strictly speaking, not a fish at all, but a jet-black carnivorous, viviparous, warm-blooded mammal of the Cetacean order, a member of the Dolphin family, from eight to eighteen feet long, weighing from five hundred pounds to three tons, and

shaped very much like a small sperm whale, the head having the same square-ended, sawn-off appearance. For the protection of their flesh and vital organs from the cold of Arctic waters, these fish are completely enveloped in a thick layer of blubber from two to



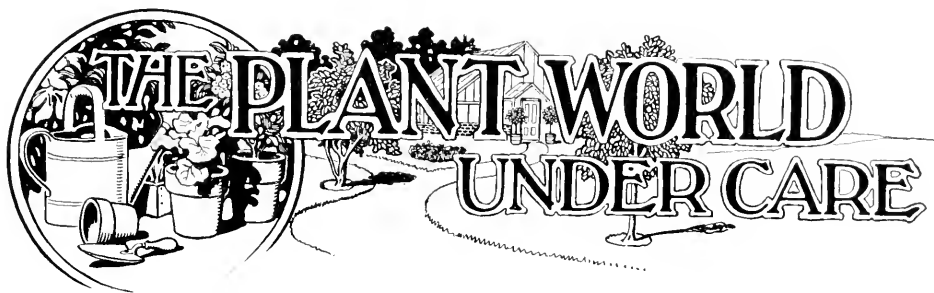
THE STRANDING OF FIFTEEN HUNDRED "BLACKFISH"—A SPECIES OF WHALE. This took place on the beach near Truro, Cape Cod, Massachusetts, in 1884, and is the largest stranding of whale ever known. (Cut by courtesy of "The Boy.")

six inches thick, which lies under the skin and is impervious to cold. The skin is shining black and as smooth as plate glass.

As many as 1,500 blackfish have probably been captured during an entire season, but it was never recorded, except in the case here cited, that at any one time were so many caught. So it

may be truthfully said that in three particulars—number, size and value of fish caught—this is the greatest American fish catch.

Since seeing that great catch of fish, I have never been interested in watching a cork bob on a small stream or lake.—The Boy.



A Nursery as a Nature Institution.

BY EDWARD F. BIGELOW, ARCADIA: SOUND BEACH, CONN.

More than to "check" a list of "one hundred and twenty-seven birds" or ninety-two trees" is to know even one bird or one tree. More than to know the habits in general of one class of animals is to know one individual animal with all its personalities and idiosyncracies.

We need some one to write a "Silver-spot" or "Lobo" story of an oak or a maple, a "Redruff" or a "Bingo" story of a spruce or white pine. It is illogical and not conducive of the best benefits to note the germination of peas and beans in the springtime, the blooming of lilies in the summer, and to examine the nuts of the hickory in the autumn. If we would really know that bird, that flower or nut, let us know



THE ENTRANCE TO A TREE-LOVING INSTITUTION.

it from the beginning and to the end. Let us not limit attention to seeds, bloom or fruiting, but take into consideration the full life histories. I thoroughly agree with Professor L. H. Bailey in his statement:

"I dislike to hear people say that they love flowers. They should love plants; then they have a deeper hold. Intellectual interest should go deeper than shape or color."

Nowadays we hear much of Forestry and the doctrine of tree Conservation.

down; but when he says, "I played under that tree when a child; it has seen generations of this family come and go," there is not the slightest danger of the removal of the tree, though it even be an inconvenience and shades the ground where crops should grow. So I firmly believe that neither the boast of the naturalist, "I've learned the names of so many trees this year," nor the forester's alarm of "lumber famine" are sufficient to ensure the safety of our forest. After all love is the mightiest power in this world, and



A WALK TO THE NURSERY OF INFANT TREES AND SHRUBS.

The cry, conservation, is good; but consecration would be better. If you argue dollars and cents for the public in saving the forest because to destroy it is detrimental to future public interests, you are putting into the hands of the owner the sharpest axe for him to wield—individual dollars and cents for the present.

When a farmer looks upon a tree in a field and balances in his mind the worth of that tree for cow shade and its value for lumber, he may cut it

love is the outcome of knowledge and intimate acquaintance. The way to have that intimate, extended acquaintance is to grow trees or to see them grown. The place where trees are grown is a tree nursery.

So, to my mind, the greatest factor in the future knowledge and preservation of trees is a nursery.

I have not had the acquaintance of any other tree and shrub nursery, so attractive and so well equipped, so inspiring, as that of The Elm City Nurs-



IN THE AISLES OF SHADOW-LAND.

ery Company at New Haven, Connecticut. I am not saying this as an advertisement, because it is not at the request, suggestion, or even knowledge of the owners. To visit this nursery is to have intimate, cordial acquaintance with trees in all stages of development. Nearly all the varieties are grown from the seed. One may there see perfect trees—maple, white pine, arbor vitae and many others not so large as your little finger. Think of the joy of holding in the hollow of your hand an entire arbor vitae. Heaven lingers around and above even a tree in its infancy.

I shall leave for others to tell of the careful business management and the ideal location that have been the upbuilding of this nursery. The location is self-evident, and the business details are supposedly attended to. But there would probably be at least a fair degree of success with only the love and enthusiasm for trees of the manager, Mr. Coe. He is a nature student and lover of nature. He believes that a living and growing plant, shrub or tree is a miracle, and that it is a joy and privilege to care for it.

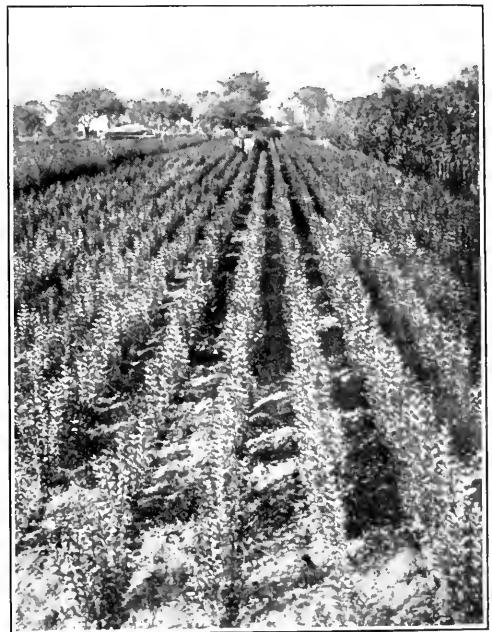
Would you be a tree lover, do as

he does. Never mind your check list; that will take care of itself. Get some tree seed, make a frame, put on the slats, get the seeds to growing, and then watch with tender and loving care. All else will follow.

I am not concerned here with The Elm City Nursery Company as a business house. This is a matter for our advertising pages, and any magazine eulogy along that point of view would be given under the head of "Publisher's Notices."

But right here, in the body of this magazine, where we are to talk of guidance to nature, I want to say and to say with no uncertain words that this establishment is more than a business house; dollars and cents fade away into insignificance; it is a Nature Institution of the best kind. The manager is more than a good executive of business affairs; he really lives in this world and puts himself in tune with infinitude of plants under care. Down deep in his heart I am sure there is a sympathetic response to the words of Henry David Thoreau:

"Every creature is better alive than dead, men and moose and pine-trees, and he who understands it aright will



ALL ROWS LEAD TO THE WORKERS.

rather preserve its life than destroy it.

"Is it the lumberman, then, who is the friend and lover of the pine, stands nearest to it and understands its nature best? Is it the tanner who has barked it, or he who has boxed it for turpentine, whom posterity will fable to have been changed into a pine at last? No! no! it is the poet; he it is who makes the truest use of the pine,—who does not fondle it with an axe, nor tickle it with a saw, nor stroke it with a plane,—who knows whether its heart is false without cutting into it,—who has not bought the stumpage of the township

over all the rest of the forest, I realized that the former were not the highest use of the pine. It is not their bones or hide or tallow that I love most. It is the living spirit of the tree, not its spirit of turpentine, with which I sympathize, and which heals my cuts. It is as immortal as I am, and perchance will go to as high a heaven, there to tower above me still."

Thoroughness.

A great deal of the joy of life consists in doing perfectly, or at least to the best of one's ability, everything



AN EVERGREEN MEMORY.

Here Thoreau would have exulted in the beginnings of the lives of "the immortals."

on which it stands. All the pines shudder and heave a sigh when that man steps on the forest floor. No, it is the poet, who loves them as his own shadow in the air, and lets them stand. I have been into the lumber-yard, and the carpenter's shop, and the tannery, and the lamp-black factory, and the turpentine clearing; but when at length I saw the tops of the pines waving and reflecting the light at a distance high

which he attempts to do. There is a sense of satisfaction, a pride in surveying such a work—a work which is rounded, full, exact, complete in all its parts—which the superficial man, who leaves his work in a slovenly, slipshod, half-finished condition, can never know. It is this conscientious completeness which turns work into art. The smallest thing, well done, becomes artistic.—William Mathews.



The Heavens in February

BY PROF. S. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

The year 1910 has centered in it Halley's comet, and beyond a few comparatively uninteresting eclipses of sun and moon, nothing else looms up in the astronomical horizon. The question of where the comet is needs no further comment, but what it is brings us to another story. The most important observations to be made will not be those which give us the position of the comet in the sky by visual measurements, nor yet, those obtained by the sensitive plate and photographic camera. Such observations will be of enormous value, but those of greatest service to the scientist will be some which will not appeal very much to the public mind, as they will be little understood. The spectroscope is to be the important instrument of investigation, for Halley's comet promises to be the very first bright comet that has visited the earth since the modern spectroscope has been devised. By its means we will probably be able to decipher the enigma of the comet's tail, the puzzle to astronomers of all ages, why it always points away from the sun. How science changes its point of view and adopts new hypotheses as occasion demands is splendidly illustrated by the story of these comets and their tails. Since the first explanations given three hundred years ago, even before the foundation of the law of gravitation, there have been plenty of theories propounded, and earlier ideas have been gradually discarded on becoming untenable through improved knowledge of the laws of matter.

The life history of a comet, indeed, seemed to contain a riddle which no astronomer could fully read, and as such, it was regarded as one of the "problems of astronomy." Newton's

law of universal gravitation itself appeared to be set at naught by comets, for instead of pointing toward the sun, as being attracted in this direction by gravity, their tails pointed in diametrically the opposite direction, just as if under the action of a solar repulsion. Could this be a case which showed that gravity was not universal? Or, if gravity did act, what was the nature of the force centered in the sun, which actually repelled matter so as to form the tail? Various theories of comets' tails have resulted from attempting to find the nature of this force.

After investigating planetary motions and giving to the world the three great laws of motion bearing his name, Kepler turned his attention to comets. After carefully observing in 1607 the comet, which proved eventually to be Halley's, he announced that to the best of his knowledge the head of a comet becomes vaporized by the heat of the sun, and that particles are driven therefrom to form the tail by a force of repulsion that was explained easily enough by the then accepted theory of light. According to this theory the sun is continually emitting particles of matter which travel through space at enormous velocities. On reaching the comet a portion of the energy of these corpuscles becomes imparted to the cometary material, and there results a tail pointed away from the sun.

Newton, the great founder of the law of gravitation in 1687, did not entirely accept this explanation. While believing implicitly in the emission theory of light, he tried to prove that gravity was universal, and consequently that all celestial motions must be the result of gravitation, and, therefore, he thought, the repulsions pro-

ducing comets' tails could be apparent only and not real.

The Planets.

Mercury is at its greatest elongation west on the nineteenth of the month, and is a morning star, but its great southern declination of 19° will prevent it from being well seen.

The evening star, Venus, which has been such a magnificent object in the southwest in the early evening has

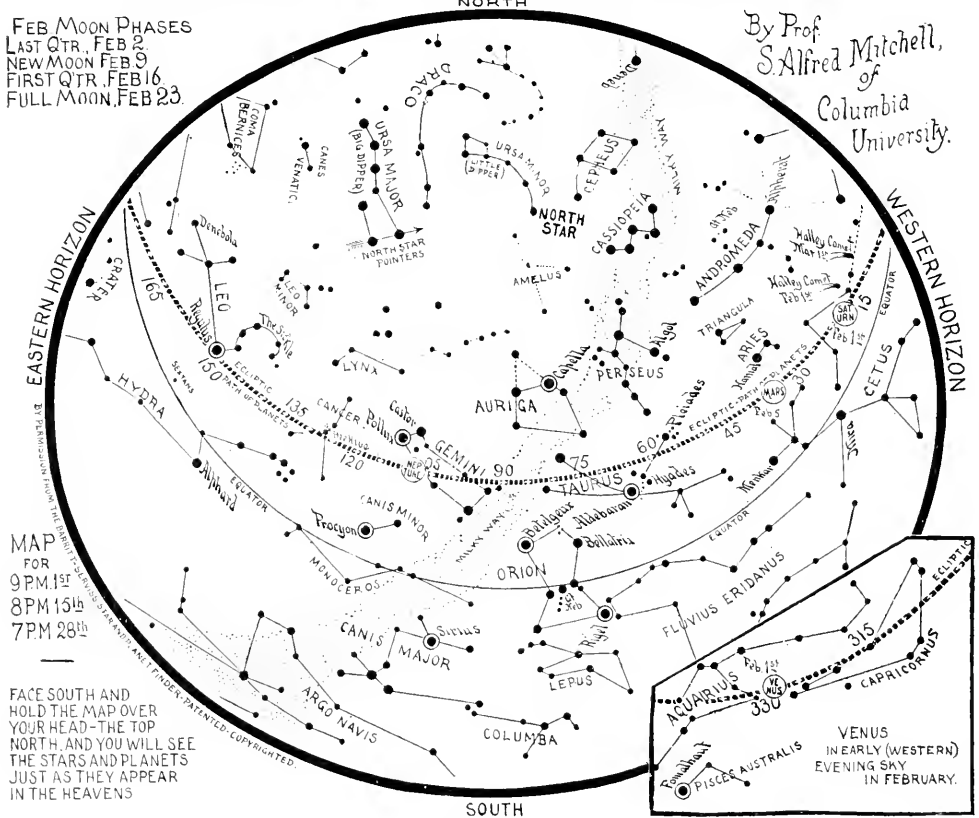
watching for a few nights only. This motion is almost as rapid as the sun's eastward motion among the stars and as a consequence Mars and the sun apparently approach each other in the sky very, very slowly. In fact, Mars is an evening star for months yet to come, to September 22. How different is this motion to that of Venus, an inferior planet.

Jupiter is becoming more and more conspicuous and rising earlier and

EVENING SKY MAP FOR FEBRUARY

FEB MOON PHASES
 LAST QTR, FEB 2
 NEW MOON FEB 9
 FIRST QTR, FEB 16
 FULL MOON, FEB 23

By Prof
 S. Alfred Mitchell,
 of
 Columbia
 University.



MAP FOR 9PM 1st 8PM 15th 7PM 28th

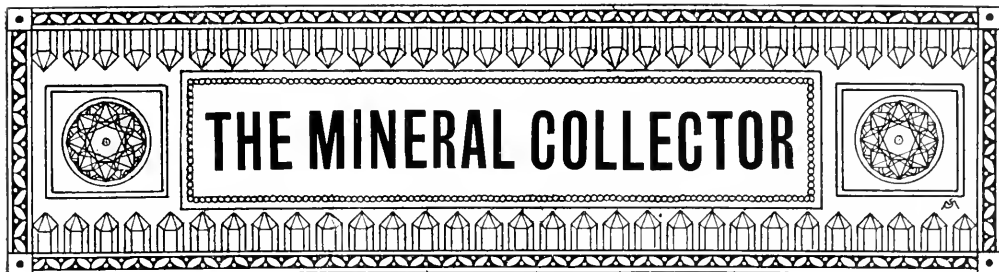
FACE SOUTH AND HOLD THE MAP OVER YOUR HEAD—THE TOP NORTH, AND YOU WILL SEE THE STARS AND PLANETS JUST AS THEY APPEAR IN THE HEAVENS

rapidly approached the sun and will be at inferior conjunction on February 11. Thereafter it will appear as a morning star quickly getting out from the sun's rays and becoming as brilliant in the morning sky as it has been during the past few months.

At the beginning of the month Mars is on the meridian at sunset and sets shortly after ten o'clock. The motion of the ruddy planet to the east among the stars can be readily noted by observing the stars near the planet and

earlier each night. At the first of the month it rises at about ten o'clock, and at the end of February comes up two hours earlier. It will be a fine object throughout the spring and summer.

Saturn is not moving east nearly so quickly as Mars, and the distance between them is rapidly increasing. Those who watch the skies know well where to find Mars and Saturn. Uranus is too near the sun to be seen and Neptune is on the meridian at 9:33 P. M. on the fifteenth of the month.



Address all correspondence to Arthur Chamberlain, Editor, 56 Hamilton Place, New York City

Some Beautiful and Interesting Minerals.

Part I.

The editor of *THE GUIDE TO NATURE* recently spent a very enjoyable half day in the department of minerals at The American Museum of Natural History, New York City. Time can be spent to excellent advantage in this department—not only to the lover of nature but of the beautiful.

A few photographic souvenirs were brought away to be shared, in two arti-

1. Chalcopyrite and Quartz, Redruth, Cornwall, Eng.

The specimen here shown is a very handsome one; it measures about four by seven inches, and shows tetrahedrons of chalcopyrite prettily arranged with white quartz crystals. The largest of the chalcopyrites is one inch in diameter and has a raised rim of crystal growth around two sides. Most of the crystals are somewhat tarnished, but this gives them added beauty, as they exhibit a pleasing combination



1. CHALCOPYRITE FROM REDRUTH, CORNWALL, ENGLAND.

cles, with the readers of this magazine. The descriptions were written by Mr. Alfred C. Hawkins, a most enthusiastic student and admirer of minerals, who is connected with the department which has been brought to a high degree of excellence by the curator, Mr. L. P. Gratacap. To him this magazine is gratefully indebted for various courtesies.

of purplish reds, greens, blues, and, in portions that are not tarnished, fresh yellow surfaces. Where fragments have been broken from the crystals there are flashes of the typical bright brass-yellow of chalcopyrite.

The matrix is a slaty or cherty siliceous rock. The quartz crystals, which are numerous, are long, prismatic,



II. PYRITE FROM CENTRAL CITY, COLORADO.

slightly tapering and terminated by pyramids which show an abnormal development of three alternate faces, almost eliminating the other three. The chalcopyrite crystals are deeply implanted among the spires of quartz; and though the former fit tightly around the latter, and even partly enclose them, in no case are quartz crystals found implanted in the chalcopyrite, in this specimen. This proves to us that the quartz is of the first generation, and the chalcopyrite of the second, that is, that the quartz formed before the chalcopyrite.



III. PYRITE FROM FRANKLIN, NEW JERSEY.

Chalcopyrite crystals very similar to these have been found elsewhere. Many of the English specimens are very fine, the crystals being, in many cases, large and untarnished. Some years ago, mines at Ellenville, N. Y., produced some very fine large chalcopyrite crystals, which were associated with quartz crystals, as in the English specimens. Many of the Ellenville chalcopyrites, though often associated with quartz crystals of considerable size and beauty, were so badly tarnished as to be almost black, which detracted much from their beauty.

The tiny tetrahedrons of chalcopyrite, on dolomite, which come from the vicinity of Joplin, Missouri, are well known to all who are familiar with minerals. A number of very fine ones of larger size have been found at the French Creek Mines, in Chester Co., Pa., now long since closed. Chalcopyrite is found in a great many places, and in its usual massive form is an important ore of copper. It is the principal ore of copper at the Cornwall mines.

II. Pyrite, Central City, Colorado.

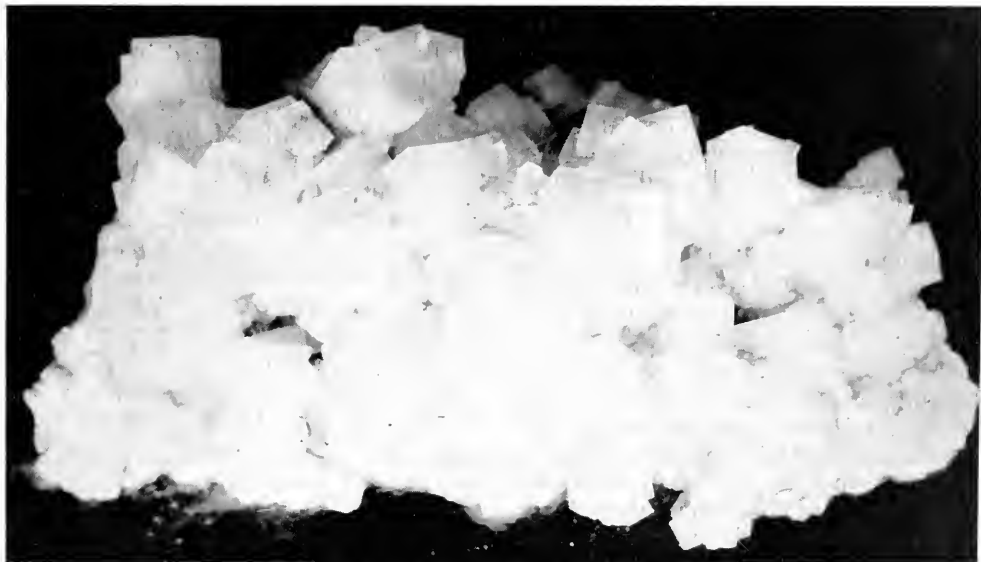
In the handsome group of cubes here shown we have a typical example of pyrite as found in the state of Colorado. It is a group of cubes, very simple in form and perfect in development, with faces typically striated. The cubes are promiscuously scattered over a matrix composed of the same min-

eral. They have a bright brassy-yellow color, and a very brilliant lustre, which makes them exceedingly attractive.

Pyrite is a very widely distributed mineral. Few ores, of whatever kind they may be, are entirely free from it. It is often present in sufficient quantity to serve as the basis of extensive mining operations. Though on iron compound, it is not suited to use as an iron ore, for the sulphur in it amounts to 53.4 per cent., while the iron constitutes only 46.6 per cent. Notwith-

mines at Franklin Furnace, N. J., in the northwestern corner of that state. It has the usual bright brass-yellow color and brilliant lustre. Its faces are deeply striated in places, showing a tendency to form cube faces; other forms are also present on the crystal.

The white limestone which contains the pyrite was probably at one time a simple sedimentary rock, a consolidated lime-mud. Together with other elements, this new rock contained iron. When the great Appalachian mountain system was in process of formation,



IV. HALITE FROM BORAX LAKE, SAN BERNARDINO COUNTY, CALIFORNIA.

standing this, its sulphur content is valuable. It is of increasing importance as a source of sulphuric acid fumes for the manufacture of vitrol.

Pyrite is classed in the isometric system, in regard to its method of crystal formation, its principal forms being the cube and the octahedron. The cube is well shown in the Colorado specimen, and the octahedron in the one from Franklin, N. J., elsewhere described. Wonderfully perfect octahedrons were also obtained from the old French Creek mines in Pennsylvania.

III. Pyrite, Franklin, N. J.

The large octahedron of pyrite here shown came from the famous zinc

this limestone was crushed and metamorphosed in the mountain building; the limestone, pure calcium carbonate, crystallized, and the impurities in it separated from it, forming new compounds, which crystallized in their turn. Thus the pyrite crystals were formed, as the familiar garnets were formed in the metamorphic schists of many regions.

The pyrite is not a common thing in the limestone at Franklin, and lately it has been becoming scarcer and scarcer. This crystal is an exceptionally large one. The crystals from Franklin seldom show simple forms; there are many complicated and interesting ones that have been found from time to time.

IV. Halite, Borax Lake, San Bernardino Co., Cal.

Although quite familiar with common salt in its every-day aspect, we are probably not so well acquainted with it in the form here shown. Its chemical composition is sodium chloride; it is luckily a mineral frequently found in nature, and is naturally of great economic importance. It is widely distributed over the world, Germany, (Prussia), Spain, Switzerland and some places in the United States as New York and Kansas, are the leading localities. The salt is found in arid regions or in regions that once were arid, often occupying the bottoms of ancient lakes that have gradually dried up and disappeared, just as the Great Salt Lake is doing at the present time. In these old lake bottoms many other salts were deposited with the sodium chloride, and from them have formed many beautiful specimens of such minerals as colemanite, borax and thenardite. San Bernardino Co., Cal., is one of the principal localities from which such specimens are obtained.

This is an exceptional specimen, showing, as it does, free cubes that are many of them more than an inch in diameter. This mineral, like pyrite, is isometric, and its common form is the cube. Many of the cubes here shown are composite—built up of several smaller ones, in parallel position. Some have little cubes in parallel position, on their corners.

Halite is not commonly found in free crystals. In the great mines of Prussia it is often found in transparent, cleavable masses, but seldom are the crystals free. At Rochester, N. Y., the salt is in a layer of rock that is a great distance underground. It is obtained by drilling wells, pumping up water that is charged with the salt, and evaporating it in tanks. Natural salt springs occur in many parts of the world.

“Agnes sat playing bridge all the afternoon with her back to a glorious mountain view.”

“Yes. She is president of our Back to Nature Club.”—Life.

CORRESPONDENCE

Insect Color Preferences.

New York City.

To the Editor:

In the December number of *THE GUIDE TO NATURE*, is a letter calling attention to the apparent preference exhibited by grasshoppers for light dresses, and particularly for a pink one of cotton material. It seems that this preference is shown by other insects as well, for Lounsbury in “*The Standard of Usage in English*,” pp. 230-231, makes the following statement in regard to Fanny Kemble’s “*Records of Later Life*,” published in 1882. “In it she denounced with vigor the black beetles which overran the rooms in her residence in Philadelphia. They were especially attracted she tells us, ‘to unfortunate females by white or light-colored muslin gowns.’”

While the above is used by Lounsbury in an entirely different connection, it seems advisable to make a note of it in connection with your correspondent’s letter.

Sincerely yours,

EDWIN W. HUMPHREYS.

Autumn.

“In the early autumn, Nature will love you better than at any other season, and will take you to her bosom with more motherly tenderness. How early in the summer, too, the prophecy of autumn comes! Earlier in some years than in others; sometimes even in the first weeks of July. There is no other feeling like what is caused by this faint, doubtful yet real perception—if it be not rather a foreboding—of the year’s decay so blessedly sweet and sad in the same breath.”

Soon, very soon, our brief lives will be lived, and our affairs will have passed away. Uncounted generations will tread heedlessly upon our tombs. What is the use of living, if it be not to strive for noble causes, and to make this muddled world a better place for those who will live in it after we have gone?—Winston S. Churchill.



Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

An Agassiz Association Course in Elementary Botany.

Alex. E. Wright, of Wellesley Hills, Massachusetts, will continue his laboratory course in botany. His usual fee is ten dollars, but a reduction is made to Chapters and Members of The Agassiz Association. Write to him for particulars.

"Common Sense Knowledge."

The president of one of the largest and most successful banks in Stamford—a man who is generally recognized in that city as one of the best and most successful of financiers—recently visited Arcadia, and made a careful investigation of the outfit, the work and the financial needs of The Agassiz Association. He spoke with encouraging commendation and rendered pecuniary aid.

As he was taken through the various departments of nature investigation and was shown the salient things of interest, he frequently said:

"This is common sense knowledge; the schools should teach this instead of much of the 'stuff' they now pack into the heads of the pupils."

The substance of this statement was repeated, in different words, at various times. He emphasized the fact that the study of nature is common sense and that much of the teachings of the schools is not.

I quote the bank president especially not only because of his prominence and business sagacity but because he is most unprejudiced and impartial in this oft repeated statement. Many school teachers, especially science teachers, and many parents have expressed the same idea. I have

not quoted the science teacher lest the reply be, "It is his business to teach that and of course he advocates it;" nor have I quoted the ordinary parent with children now in school lest some one say, "Oh, he has been inoculated by the modern nature-study fad."

But our bank president has no children in school, he is not swayed by fads or hobbies, he is simply a capable long experienced, skillful, efficient business man who knows how to take care of his own money and that of others to the best possible advantage.

His verdict is, "Success in business needs common sense knowledge, and a knowledge of nature is common sense."

Suppose you had come from Mars, eager to learn something of your new environment. Would you not be surprised if you should enter a school-room and find so much thought and labor devoted to the distant in time and place, so much investigation of theories remote from the actual experience of the pupils, and so little to the thoughts and objects of the present?

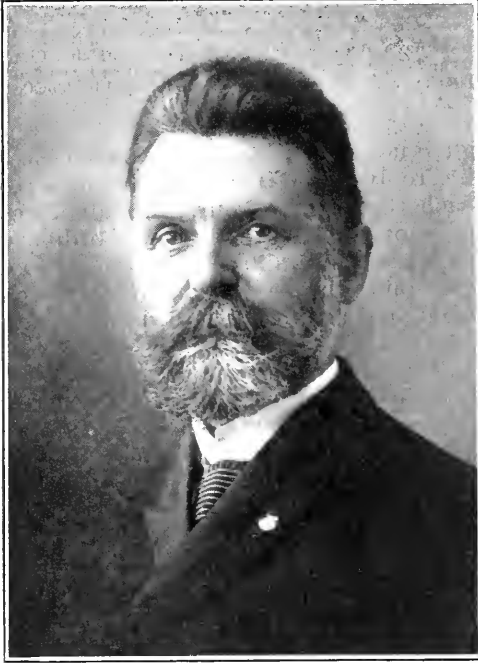
Yes, it is "common sense knowledge" to know the stars, the trees, the plants, the life forms—all the things near at hand. It's a University of Common Sense Knowledge that we are trying to build up. Do you believe in common sense knowledge for all people? Then do as did the bank president—speak a good word for it and emphasize your words by substantial aid. Come with us. We are going the right way.

Now is the time for your membership. Begin 1910 aright. You will not live this year again.

The Boy That Is Worth While.

BY E. M. HUNTSINGER, PRESIDENT HUNTSINGER'S BUSINESS SCHOOL, INC.,
HARTFORD, CONNECTICUT.

(Editorial Note: Mr. Huntsinger has probably prepared more boys for business and



E. M. HUNTSINGER.

An expert in business, and a genuine naturalist.

had more dealings with business houses in the employment of boys than has any other man in the State of Connecticut. He tells us that a boy full of enthusiasm for nature is really "worth while." An interest in nature is practical, and the enthusiasm and energy that produce it are the fundamental elements of success in business.—E. F. B.)

Usually the nature lover is born, but he is also frequently made by cultivation. First and foremost he has the keen appreciation of seeing the beautiful where it is least expected. He sees beauty in the way-side flower, in the tumbling brook, in the battered and wind-beaten pine; and the shapely beach tree which is built more nearly on the human form than any other tree in the forest, always charms him. He hears music in the seashells, a glimpse of a distant view charms him, and the note sung by some "brother in the air" stirs his soul. Everywhere and at all times his heart is in harmony with the

voice of nature. The nature lover never wilfully destroys anything that the great Creator has provided for those who know how to appreciate them.

The nature lover feasts his eyes upon the reflections in the water, and revels in the fine atmosphere of the In-



ONE OF MR. HUNTSINGER'S STUDIES OF BIRCHES.

dian summer. He also rejoices in the power of the raging storm which lashes the mountain pine. He believes in his achievement as much as does the artist in portraying with pencil or brush—a flower, a bird, a tree, a bit of scenery, or even the leaf of an oak. He sees the greatness of his Creator. In short, he bows before the newly fallen snow which has hushed the earth with its pure mantle. He sees the elemental forces in the ice storm with its millions of diamonds sparkling in the rising sun. His eyes and his ears are feasting upon what the grand Archi-

This sort of boy will sit for hours waiting for a bird and watch with eagle eye every motion to study its peculiarities. This boy does not destroy birds' nests or steal eggs. He learns all he can about the flowers of the air as well as the flowers of soil that others may enjoy its pleasures with him. For hours he will sit by the babbling brook and watch the sun-fish pile up pebbles in which to hatch the brood. He is the boy who has sufficient patience to watch the snail in its slow habits—he has learned patience.



MR. HUNTSINGER WOULD LEAD ALL HUMANITY TO SUCH BEAUTIFUL REALMS OF NATURE.

tect of the Universe has provided for us in color, form, and sound.

Happy is the boy or the girl whose innate being calls for nature, who is strong of body and able to walk and to endure. Such a boy will make sacrifices to study nature untrammelled. He is willing to sleep upon a bare floor so that sleeping lightly he may rise betimes to walk four or five miles at break of day to see a particular bird rise from her nest, to study its architecture or see its offspring while the mother is absent seeking her breakfast.

The nature lover is an artist and sees with a clearness of vision that startles the average boy. A walk in the country furnishes him numerous opportunities for profitable reflections. He remembers with keen delight certain trees he calls his friends, certain brooks which sing to him, certain flowers which bid him good morning. He knows most of the beautiful nooks in the woods and the artistic turns in the road. He finds his way in the woods by instinct. Happy the boy who becomes his friend that he may

learn at first-hand some of the great secrets of nature. The ledges speak to him and the hillside brings its quota of things that have transpired. The nature lover is eager for new fields to conquer.

In the solitude of his home he is not alone for he has the satisfaction of contemplating what he has seen, re-classifying his knowledge, drawing conclusions and making new plans for further excursions. He is not only a lover but an expositor perhaps of nature, a geologist, a botanist or a scientist. He has learned to see clearly with his own eyes, to reason with his own head.

The particular boy I have in mind is more than an average student, for he looks carefully at things, weighs their importance, measures cause and effect, and usually draws proper conclusions. This boy is an ornament to any community, a promoter of the beautiful of science and he deserves encouragement. He is the boy that is worth while.

The boy who loves out-of-doors can no more be kept from going into the woods than you can keep a duck out of water.

The boy I have in mind is tuneful in the upper notes of his make-up and his life shines because he can't help it. He has more than a dash of enthusiasm in his make-up, hence it is much harder for him to sit still than to climb trees, for he simply can't be idle. There is no remedy except actual out-of-door life. He wants to see things that move and have a being and they alone satisfy his enterprising nature.

He hopefully starts at dawn of day and walks and looks and listens until the fading sun in the west comes all too soon and the shining stars alone will light his way home, his heart filled with joy, "peace and good will toward men."

A thrill of spring in the atmosphere calls this boy to the woods. He cheerfully faces bleak winds and low temperature. He gallops through the woods with a new inspiration the first spring morning he is allowed the freedom of the fields. He is dissatisfied with books and abstract knowledge—he wants it

first-hand, uncontaminated. The woods are to him an irresistible attraction. They are his college—his without hazing, no shirking of lessons, no dissipation. He is willing to forego the song of the nesting birds for the zest of watching the slinking fox and listening to the cooing doves. In the autumn the woods everywhere are eloquent with color and in his rambles the snap of a twig arrests his attention as would the crack of a gun. When he starts out on his tramp with a tired mind, how quickly his nature responds to the speech of the woods. They influence him as gently as the shadows of the summer clouds on the hillside farm. The grinding load of business cares which brought the careworn expression of face is quickly lightened by smiles of nature. The real out-of-door life can be compared with nothing but itself.

A JAPANESE SPANIEL.
YO SAN. ..

Her little life came into mine
As larger things absorb the small;
And through the mists and maze of time
She well holds me her all in all.

She nestles close to me at night,
And plays about my feet by day;
While in her large eyes' wonder-light
I read what her sweet soul would say.

Her mother-instinct nightly shows
In kisses on my hand and arm;
And on my sleep her spirit throws
A mantle guarding me from harm.

She brings her little treasure troves
For me to hide and watch and keep.
Her spicy breath, as sweet as cloves,
Falls on my senses, soft as sleep.

I know the world holds her to be
A little dog and nothing more;
And yet my heart holds her to me
As oceans hold their lips to shore.

I see her soul in wonder strive
To make my larger soul more wise
With love where primal virtues thrive
And shine in light from her brown eyes.

I cannot bear the thought that we
By time and space shall suffer loss,
Or severance of this mystery
Of golden love without its dross.

I cannot think that we could part
This pleasant comradeship and peace
And perfect trust of heart to heart,
Or what our union e'er could cease.

The La Rue Holmes Nature Lovers League

By George Klinge, Summit, New Jersey

Explanation:—The aims of this League are in many respects the same as those of The Agassiz Association. Therefore it has been proposed that the adult interests be represented by "The Guide to Nature" and that the League co-operate, or possibly be affiliated, with The Agassiz Association.—E. F. B.

The wild flower known by the greatest number is the yellow adder's tongue.

Those identifying the largest number of wild flowers: Frederick Ford, Emery Brown, Ellen Smith.

Names of members identifying the largest number of birds: Annie Mollitor, Charles Parse, Robert Pollard.

In reports from L. H. Nature League Chapters, concerning the most birds and wild flowers identified, the Chatham, New Jersey, Public School Chapter leads.

Establishment of a Bird Refuge.

It gives me pleasure to state that a result in behalf of bird protection coveted by members of the L. H. Nature League, has been attained, and the deeds, giving possession of an island on the coast of New Jersey, hereafter to be known as The L. H. Nature League Bird Refuge, are in the hands of the General Secretary.

The movement, under this name, for nature-protection, was but just organized, in 1906, when Mr. Wm. Dutcher, President of the National Audubon Society, who is ever alive to the requirements of our little feathered friends, directed attention to the fact that New Jersey stood among those states delinquent in the matter of providing a coast-bird refuge, and that unless action were soon taken to secure breeding grounds the gulls would eventually be exterminated from the borders of the state.

Later on Mr. Dutcher kindly consented to negotiate for the purchase in the name of the L. H. Nature Lovers League, the island near Stone Harbor, off the coast of Cape May County,

which has been the nesting-place of gulls, and other birds for centuries.

The demand, by the thoughtless among American women, for the plumage of gulls, inaugurated a slaughter on the island, some years ago, through which thousands of the birds perished, and had not the National Audubon Society gone to the rescue, and undertaken a competent warden-service, the wings of the gulls had ceased to sweep across New Jersey waters.

The L. H. Nature League now takes up the matter of appropriation for warden-service, and is pleased in being able to state that the birds are again increasing in numbers, about fifteen hundred now occupying the island.

If it be asked what is the especial utility in the preservation of this form of bird life, we would hasten to remind the questioner that the gulls are the protectors of humanity in two ways. They are the scavengers of the coast through whose agency the waste matter of cities is largely disposed of and diseased conditions prevented. To the presence of gulls many a seaman owes his life. The wings of the gulls sweep through fogs and storms, when lights, and other warnings, fail amidst the obscurity and roar of the tempest, to give notice of approach to land. For the fisherman, the gulls do friendly service, for when the gulls stoop to the waters, there, are congregate the schools of fishes.

The gull is one of nature's endowments which man needs to cherish as a friend whose wings sweep on for utility, as well as for service in the realm of poetic nature.

The only two breeding grounds of the laughing gull, on the coast of New Jersey, are located at Stone Harbor, the L. H. Nature League Bird Refuge, and at Little Egg Harbor. Our



LAUGHING GULLS FLYING OVER THE WATERS AT THE LARUE HOLMES NATURE LEAGUE BIRD REFUGE, OFF THE COAST OF CAPE MAY COUNTY, NEAR STONE HARBOR, NEW JERSEY.

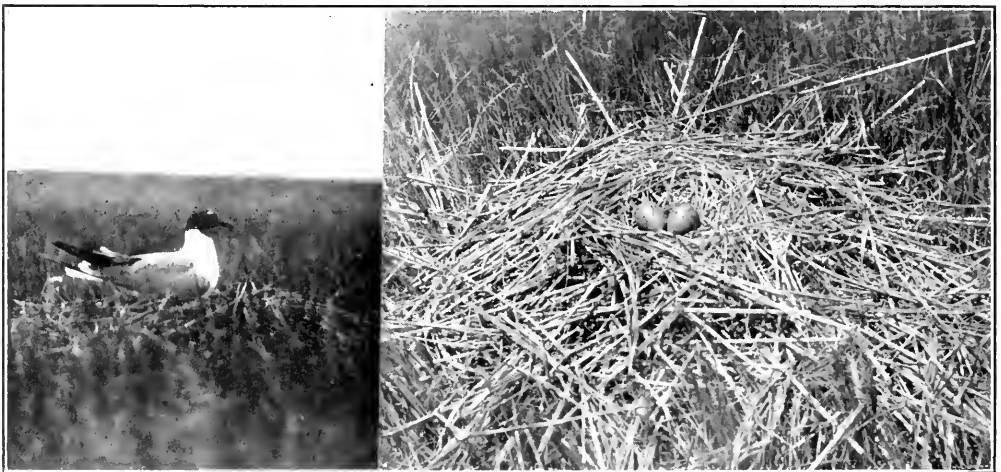
Photographed by Mr. B. S. Bowditch.

winter visitant, the herring gull, breeds on the coast of Maine and further north. This species also have breeding grounds at Lake Champlain and in the Adirondacks.

Though our proteges of the summer migrate to warmer shores about the fifteenth of September, the island is not deserted, for it is then that the gulls from the arctic climes, come to winter with us, but are away again as April approaches, and the migrants from the south return to start nest-building in May.

The island recently acquired, embraces a level area of about one hundred and fifty acres, where sedges and the company of bog-grasses hold sway, affording just the conditions for successful homes for these birds of the sea, and yet there are sometimes periods in mid-June, when tides run high, when nests located close upon the waters, though built up of stubble and grass raised from sixteen to eighteen inches above the ground, are swept off by the tide.

When such a calamity befalls the



GULL ON NEST AT THE LARUE HOLMES NATURE LEAGUE BIRD REFUGE. ALSO NEST AND EGGS OF THE LAUGHING GULL RAISED EIGHTEEN OR TWENTY INCHES ABOVE THE GROUND FOR SAFETY AT PERIODS OF VERY HIGH TIDES.

Photographed by Mr. B. S. Bowditch.

gulls they at once undertake home-building anew, though we will find only one or occasionally two greenish-gray eggs, with their brown splotches, in the new nests, rather than the usual compliment of two or three.

The two sexes share the labor of nest-building and incubating, the one occupying the nest at night, the other by day.

This nest-strown expanse of many acres, with its brooding wings which have grown a bit tame, through protection, in the last two or three years, is a sight worth seeing, by the bird-lover, especially if he happens to look upon it as evening deepens, and he sees the little flocks, of from three to twenty, wing out across the waters to spend the night cradled upon the sea.

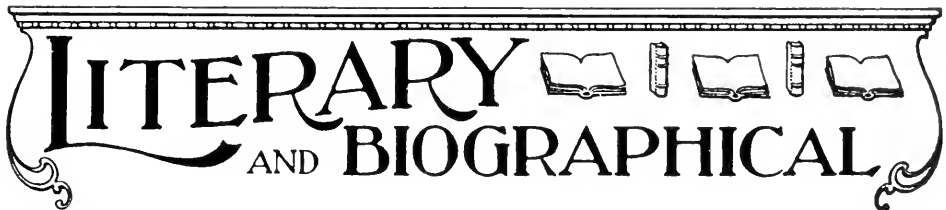
Pupils in school-chapters, whose annual League dues have formed a material part of the fund for the purchase of the island, where not only gulls but meadow larks, ground sparrows, and other birds are now in possession of a home of their own, will

take pleasure in feeling a certain amount of ownership in the poetic wings sweeping joyously through the air, which had it not been for a protecting hand, might today have stood still and lifeless, as mistaken adornments for the persons of the vain and thoughtless.

"In August the grass is still verdant on the hills and in the valleys; the foliage of the trees is as dense as ever and as green; the flowers gleam forth in richer abundance along the margin of the river and by the stone walls and deep among the woods; the days too, are as fervid now as they were a month ago; and yet in every breath of wind and in every beam of sunshine we hear the whispered farewell and behold the parting smile of a dear friend. Not a breeze can stir but it thrills us with the breath of autumn.—"B."

In the letter from Alfred Kinsey, in the November number, "God and nature" should have read "God through nature."—Ed.

LITERARY AND BIOGRAPHICAL



The British Journal Photographic Almanac and Photographer's Daily Companion 1910. Edited by George E. Brown, F. I. C. New York: George Murphy Inc., Pa. per 50c; postage 27c. Cloth \$1.00; postage 37c.

This is a huge volume of 1320 pages, and contains a vast amount of material of interest to the photographer. The formulæ and descriptions of new apparatus are especially helpful.

The Fly-Aways and Other Seed Travelers. By Francis M. Fultz, A. M., Superintendent of City Schools, Santa Barbara, California. With illustrations from photographs by the author. Bloomington, Illinois: Public-School Publishing Company.

This is a book to be read by children. It has the attractiveness of the most interesting stories and the charm of the familiar

out-of-doors. Yet it directs observations and suggests classification in a way helpful to scientific thought. It seems to us an ideal nature reader for children in about the third year of school, and for the youngest readers of library books.

Flying Plover, by G. E. Theodore Roberts; 125 pages; illustrated; Boston; L. C. Page & Co., \$1.00

Flying Plover, and People of the Plains, both deal with our Indians. In Flying Plover, Theodore Roberts has written down some of the stories which "Squat-by-the-fire," little Flying Plover's grandmother, told him in the long winter evenings. They were legends of his tribe, which lives far north in Labrador. "How Fire came to the Mountaineers," "Why Old King Walrus went away from the Mountainous Country;" "The Adventures of King Bear,"—to these and many others the little Indian lad listened breathlessly.

"You cannot sit by the old woman's fire, and smell the herbs she was always steeping, and play with the figures which she carved so cleverly, as Flying Plover could," says the author, "yet I hope you will like her stories, for all that." And we think you will and that you will also like the beautiful drawings by Charles Livingstone Bull.

The Marvellous Year. Quarto, decorated boards, \$1.25 net. Introduction by Edwin Markham; Essays, anonymous; Portraits from paintings by Gertrude Huebsch. Published by B.W. Huebsch, New York.

This volume supplies the most effective memorial to the year in which the centenaries of so many remarkable men are celebrated that could be devised. What a year it has been! Literature has paid tribute to Poe, Tennyson, Johnson, Holmes, Fitzgerald, Gogol; Music to Haydn, Chopin, Mendelssohn; Science to Darwin; the stage to Fanny Kemble; Statesmanship to Lincoln and Gladstone, and Theology to Calvin.

There is a fine spiritual quality about Mr. Markham's Introduction, in which he considers the great captains of humanity and interprets the leader's place in the progress of man. The poet speaks. The voice that once thrilled the world with a single song still rings loud and clear.

The reader's keenest interest, however, centers on the anonymous writer of the biographical essays. Four pages are devoted to each subject, four pages of concise, telling English that may serve as a model of style. The author has made no attempt to write "Lives," but has told what each life meant to Art, Literature, Science, Music, or the particular field in which his hero happens to be placed.

Life-Histories of Northern Animals. An account of the Mammals of Manitoba. By Ernest Thompson Seton. Naturalist to the Government of Manitoba. Volume 1. Grass-Eaters. Volume 11. Flesh-Eaters. With 68 maps and 560 drawings by the author. New York City: Charles Scribner's Sons.

Here is a book that was needed, and the supply has been laboriously, enthusiastically, magnificently, indeed one might almost say over-whelmingly provided.

On birds, on plants, on insects, on trees, we have had publications follow in rapid succession—some of them magnificent works—but on four-footed animals there has previously been but little other than popular handbooks and stories.

Mr. Seton's popular stories are well known to everybody. These sumptuous books of details and careful investigation show that the author not only can write popular stories, anecdotes and personalities, but can also write popular natural history on a strictly scientific basis.

It is the first time that a natural history has been offered to the public with a complete and careful map of distribution for each species. How much work has been put into these maps will be realized when it is stated they were begun in 1897, and worked on almost continuously until the date of publication. For example, the Elk map No. 4, required the looking up and copying out of passages in some 500 ancient books to give the primitive outline alone. To look up these books required visits to the Lenox and Astor Libraries, to the American Museum, New York, to the Congressional Library, to the British Museum, to the Zoological Library of London, as well as the acquisition of some 50 volumes for the author's own library, and all of this labor appears in the simple black outline which forms one element only of the map. The shaded portions which indicate the present range of the species called for only a little less labor.

It is interesting and important to notice that this book, though in many respects revolutionary and disposing effectually of some established notions, has nowhere in its covers any severely critical word of any other man or his ideas. Contrary theories are merely announced, then face to face is set an overwhelming body of facts.

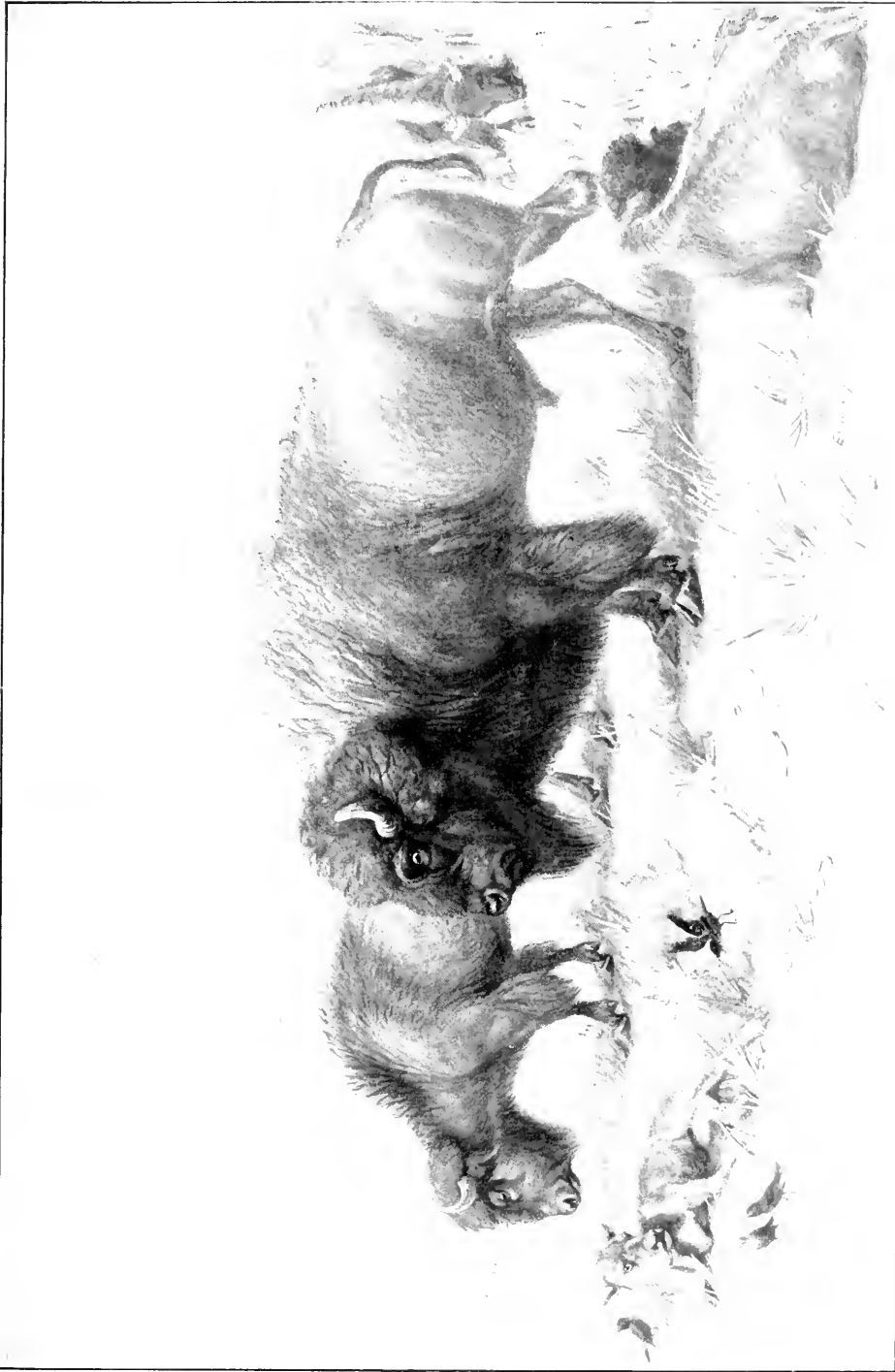
These 60 chapters are 60 elaborate monographs. Each gives an exhaustive account of the life of the creature in question. We have several times been favored with monographic accounts of interesting animals; for example, H. W. Elliott's "Fur Seal," but never before two whole volumes with 60 monographs each of which actually gives all that has been put on reliable record concerning the lives of the species treated.

The methodic plan of approach as set forth in the introduction, pages 22-34, is bound to be the model for all future natural histories. Why the plan was not adopted long ago strikes us now as a mystery. We would recommend every student of wild life to familiarize himself with this "general plan" and try to fill it out for each of the species he is studying. No matter whether it be mammal, bird, reptile or insect, the schedule will be found applicable and helpful.

While the maps date from some twelve years back, the illustrations are yet more historical. The earliest that we have noticed are dated 1880, (p. 700) and the years from then to now are represented in this life-long work. Those who know Mr. Seton will understand that over 500 of his most important drawings were tied up with copyrights and other control, so that he could not embody them in this book.

It is not too much to say that in future all work on the life-histories on our northern animals must take Seton's work as its point of beginning and model of method.

It is not easy to select any one example



A BUFFALO HERD IN THE EARLY FALL.
From "Life-Histories of Northern Animals."

for special mention. In our opinion the Wapiti article, the Buffalo article, the Mule-deer, Red squirrel, the Beaver, the Pocket-gopher, the Blackbear, the Snowshoe-rabbit,

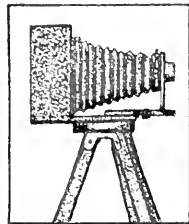
are as exhaustive as they are interesting and satisfactory, besides having the charm of complete illustration and polished literary presentation. The Greywolf is evidently



PLATE VII.—MOOSE FAMILY IN EARLY WINTER.

a favorite with the author, and we are safe to say that no man—living or dead—has ever before succeeded in penetrating so far into the home life of this interesting animal. A depressing note is sounded when we are shown that most animals are more or less diseased, but the keynote of the whole book is one of intense loving enthusiasm. It can-

not fail to give a scientific and lasting basis to the interest which Seton aroused long ago through his wild animal stories, and we join with the numerous critics who have endorsed Frank M. Chapman's dictum—"Seton has done for the mammals what Audubon did for the birds, but has done it better."



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EDWARD F. BIGELOW, Managing Editor

WILLIAM J. LONG NUMBER



WILLIAM J. LONG GETTING NEAR TO NATURE
(See Page 349)

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Full particulars upon addressing this magazine.

THE LAND AND THE HOME

A LOCAL DEPARTMENT

Real Estate and Home Supplies Along the Connecticut Shore

Stamford and Vicinity.

Stamford is not only growing now, but the pretty little city is going to continue to grow at a rapid rate. Judging from the present outlook, the real estate business during 1910 will be unusually good, in fact far better than it has been in several years, not excepting the spring of 1906. The local demand for property is especially good, and there are frequent calls from out of town parties for acreage. There are indications that there will be many large transactions consummated, and much building contracted for.

An important real estate transaction recently concluded is that of the transfer from the East Branch Corporation to the Tidewater Coal Company, of one hundred feet of dock property. The property acquired by the company adjoins that which it already occupies, and will enable the coal company to extend its business. It is understood that the transaction involves \$10,000.

Charles Swanson has erected a house on Clark's Hill, recently. It is a frame house, provided with all modern conveniences, and arranged for one family.

W. P. Mosely of Stamford, is building a handsome residence at Shippan, from plans drawn by E. M. Stratton of Boston. The house will be of wood, 30 x 40 ft., three stories high with a shingled roof. The rooms will be finished in hard woods, with hard wood floors, mantels and fire places, and the house will be provided with steam heat.

A one family house is being built for Paul Kost, on the corner of South and harbor streets. It will be 24 x 28

One of the many handsome residences which are being built on the out-

skirts of Stamford, is the future home of Dr. W. D. Tracy, on the Roxbury Road. The house will be 40 x 27 ft. in size, built of stone and wood, with a shingle roof. A stable, 32 x 27 ft. will also be built.

Work will be started in the Spring on a new building of wood with a gravel roof, two stories high and 25 x 76 ft. in size, for Baer Bros., at their plant on Canal street.

When completed the Stamford Lodge of Elks, will have one of the best club houses in Connecticut. The plans are by a New York architect, Paul Allen, a resident of Stamford, and a member of the Stamford Lodge.

The building of the I. O. O. R. M. has been undergoing extensive changes. An addition has been built on the rear, and the structure arranged for doctor's offices, club rooms and banquet hall on the first floor, with an assembly hall, dance hall and lodge rooms above. It has been fitted out with new plumbing, and steam heating. It has been provided with every convenience, and finished throughout with hard wood.

Springdale, a suburb of Stamford, is getting to be a flourishing little hamlet. Some twenty or thirty houses have been erected during the past year but the supply is not equal to the demand, as there is not a house to be found for the applicants, who are daily demanding the small house with modern improvements. One of the real estate agents in this section believes that in the near future the building in Springdale will far surpass any other of Stamford's suburbs. This is especially true of the West Hill section the inducements here being the excellent view from the high elevation, and the purity of the drinking water. This spring there will be 150 acres of land opened for building lots.

Among those who will build in Springdale the coming year are A. J. Krimbill, who will erect a residence for himself and family. Gilbert Knapp is building a one family frame house with conveniences. Conrad Lund and Edward Crouch are also building similar houses.

Glenbrook is about to have a Real Estate boom. A handsome residence is being built for H. E. Page. The plans show a frame house 40 x 30 feet, with stuccoed sides and shingle roof. The interior will be finished in hard woods, with hardwood floors, mantels and fireplaces. It will be furnace heated.

A syndicate of well known Stamford business men, as well as men who have long dealt in real estate, have recently purchased a tract of land, composed of about sixty acres in Glenbrook, extending from Cortlandt ave., eastward and bordering on the Noroton River. These men are Robert Anthony, Everett Raymond, Garry Raymond, Arthur Raymond, E. P. Jordan, E. M. Ayres, and H. M. Ayres.

Work on the tract will commence in the early spring. The property has been cut up into several streets—Terrace Drive, Midland Ave., Tremont Ave., and Fairmont Ave., and two hundred building lots have been laid out.

The owners of this beautiful property intend to build several pretty bungalows, which will make ideal summer residences. The surroundings and the locality are all which can be desired.

The streets which are to be laid out will be wide and durable. The side walks will be of concrete and electric lights will be erected and the eight houses proposed, will be fully equipped with modern conveniences.

The property is within a few moments walk of the N. Y. N. H., Railroad Station also of the Stamford and Norwalk trolley lines.

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Revonah Manor Park.

This spring work will recommence on Revonah Manor Park, and new streets will be opened. This property was purchased over a year ago by H. Henneberger, and Henry M. Jevne, from the heirs of the estate of the late Alfred Hoyt, one of Stamford's oldest residents. The estate comprises one hundred and eighty-nine acres running from Fifth St., north to Simsbury, then northeast and east, opening out on Strawberry Hill Avenue. The present owners have opened up twenty five acres of this fine property into building lots. They have already built three streets, which are macadamized, and bordered by cement walks. Sewer, water, and gas pipes have been laid. The plots are sold only in two or more lots, thus affording enough ground for a broad lawn and practical garden.

The three streets which have been laid out, are Chester St., and Urban St., running parallel with each other, east to west, and Revonah Avenue, which runs north, and will eventually open on Strawberry Hill.

The old homestead on the hilltop,



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ALFRED HOYT HOMESTEAD AT REVONAH MANOR.

Is one hundred and fifty years old and has housed three generations of Hoyts.

Photographed by Julie Adams Powell.

nestling as it does, in a cosy nook, sheltered by the tall pines on its north west, is a typical New England farm house of one hundred and fifty years ago, at which time it was built by the paternal grandfather of the late Alfred Hoyt. It has been the home of three

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generations, and the foundation is of the old time building, and is as firm as a rock.

When the owner was asked by the writer, if the old house was going to be torn down, he answered, "No indeed, the house is too good to tear down."

Several acres of this estate is valuable woodland, and aside from this, "Alfred Hoyt's woods," have been the delight of the school children of a generation, as here were to be found the darkest blue violets, the modest hiding hepatica, the spicy winter green berries, the appetizing water cress and along by the old stone fences, the soft and ever popular pussy-willows, have never ceased to show themselves in the early spring time. And here the small boy always hid himself, early in the morning after a frosty night, to be the first to bring home a bag of big brown chestnuts.

There are many men living in Stamford to day, who have pleasant boyhood recollections of this farm, which is now being turned into one of the most delightful of residential sections. And they cannot fail to be glad to see that the old place has beautiful surroundings and is restricted against everything detrimental to home and community life.

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bungalows in the park, all of which are well equipped with electric lighting, telephones, steam heating apparatus, sanitary plumbing, and every modern convenience.

Tokeneke is named from the Indian chieftain, who, several hundreds of

years ago, owned this large tract of land, where he hunted and fished, and enjoyed a life of freedom.

The land is undulating, and the boldness of its shore front, is most attractive to the artistic eye. The massive bold rocks, and heavily wooded

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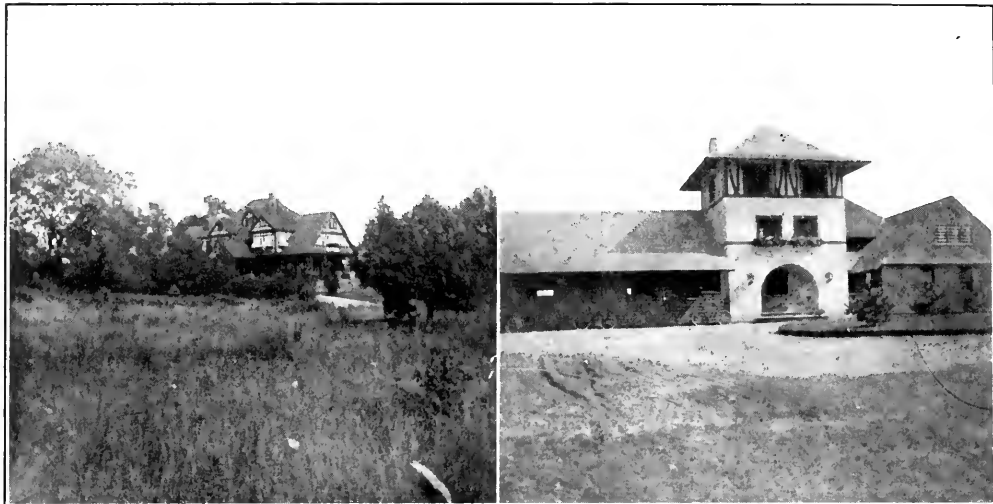
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land, project into the waters of the Sound, and when the wind is rising for a storm, the water lashes the rocks, and the foam sends its crest to their tops.

Many of the most attractive homes in the park were originally farm houses, which have been remodeled by their present owners. Among the most charming of these are "Shing-wak," the residence of Mr. Thomas Alsop. This old farm house was built in 1771, and was remodeled in 1906. Very little change was made to the outside of the house and the interior has only been made more convenient, and furnished with full sanitary equipments. The owner's idea was to leave the style and plan of house as nearly Colonial as possible.

"Wayside" is another of the renova-

ted farm houses, and it is the home of Mr. and Mrs. Gerrit Smith, who are so well known in musical circles. This house was built in 1749. The Colonial scheme of furnishing and decoration is carried out in this house in the most ideal and comfortable manner. In the summer time the old-fashioned

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flower garden, in front of the house lends an added charm, such as nothing else could do.

Tokeneke Inn is pleasantly situated on a knoll in a small grove of trees, overlooking a broad sweep of well-kept land, with a good view of the Sound in the distance. The guests who sojourn here during the summer months find much to amuse them. The tennis courts are of the best. The bathing facilities the finest. The bathing beach is safe, and sandy, and free from all sewage. The bath houses are pleasantly situated and commodious. Running along on the east side of Tokeneke is Five Mile River, where there is a deep harbor anchorage.

The automobile roads are built to stand the wear and tear of the machines which pound over them daily. There are delightful driveways across rustic bridges, and romantic walks through wild woodland.

For the accommodation of commuters, many of the express trains stop at Darien station which is not over a ten-minute drive from Tokeneke Park, and the Norwalk trolley which passes one of its gates, will carry one to the beautiful Wee Burn Golf links, in fifteen minutes time.

In Tokeneke Park we find the handsome home of Edward Hope Norton, a New York banker. This is "Shorewood," and it is happily situated on

one of the highest knolls, and commands a fine view of the Sound.

On the main driveway, is "Cedar Cliff," a Dutch Colonial house of attractive appearance. "Heartsease," the summer home of Mr. Joseph Sawyer, Jr., nestles cosily in a cluster of tall chestnuts, close to the water's edge.

Situated so boldly on the shore of Long Island Sound, and its grounds laid out so artistically by the Tokeneke Land Company, a visitor to the Park cannot fail to see that its future will be a colony of handsome homesteads for the retired banker, broker or merchant, and one of the finest residential parks that we have in this part of the country.

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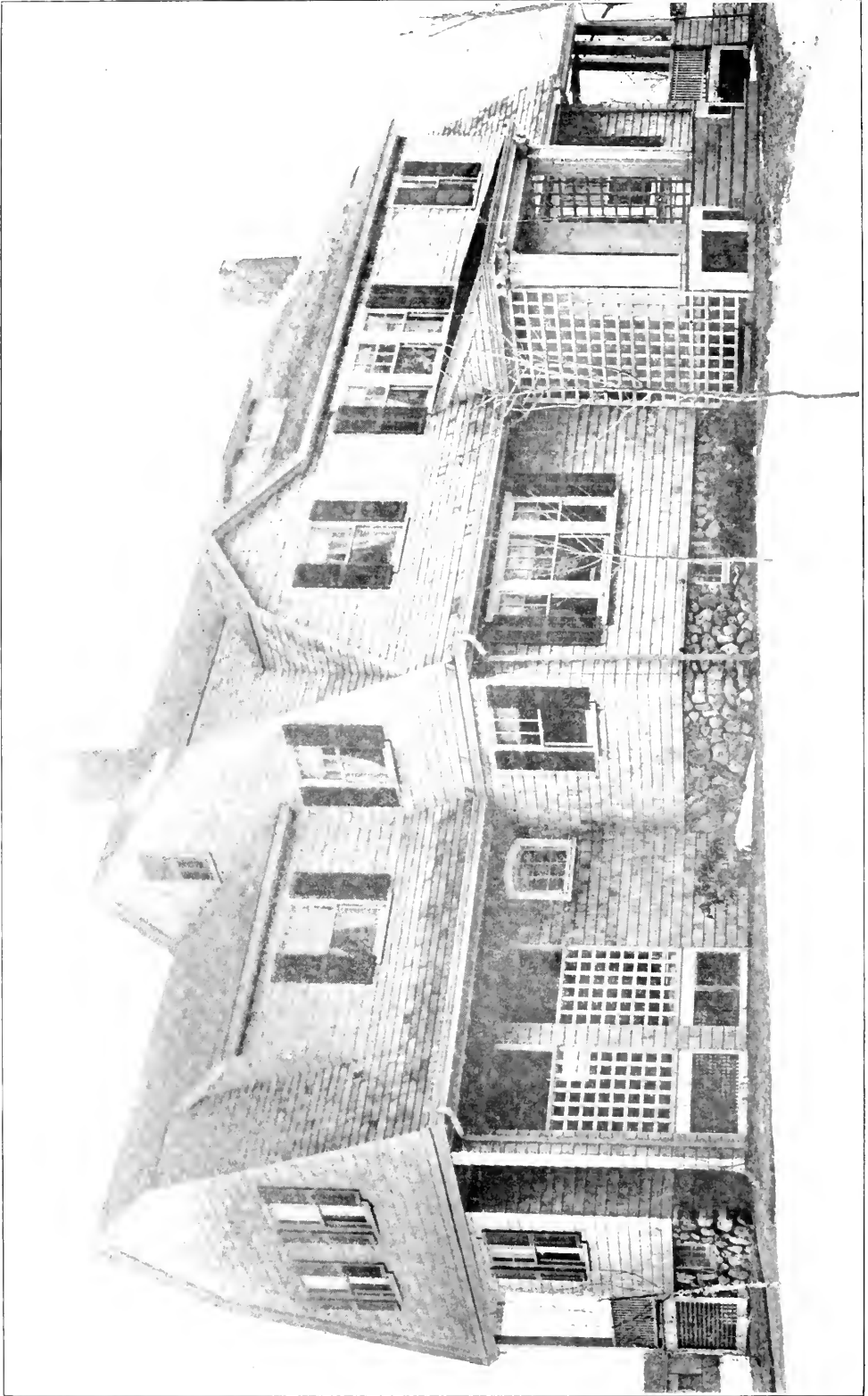


Nothing but an ideal ever endures upon earth. It is therefore impossible to overestimate the practical importance of literature, which preserves these ideals from fathers to sons, while men, cities, governments, civilizations, vanish from the face of the earth. It is only when we remember this that we appreciate the action of the devout Mus-sulman, who picks up and carefully preserves every scrap of paper on which words are written, because the scrap may perchance contain the name of Allah, and the ideal is too enormously important to be neglected or lost.—*William J. Long in "English Literature."*

Arc adia

Perhaps the real reason why we see so little in the woods is the way we go through them—talking, laughing, rustling, smashing twigs, disturbing the peace of the solitudes by what must seem strange and uncouth noises of the little wild creatures. They, on the other hand, slip with noiseless feet through their native coverts, shy, silent, listening, more concerned to hear than to be heard, loving the silence, hating noise and fearing it, as they fear and hate their natural enemies.—*William J. Long in "Secrets of the Woods."*





"WORKADAY"—THE HOME OF THE REVEREND WILLIAM J. LONG, ON NOKOTON HILL, STAMFORD, CONNECTICUT.

This recently completed house of Dutch Colonial architecture is on the same road, the old Boston Turnpike, as the owner's birthplace, but about two hundred miles to the southwest.

HOMES NEAR AND HOMES FAR AWAY FROM NATURE

There is little difference between a man and a rabbit; the rabbit lives in a brier patch, and his philosophy makes his little world a good place; the man lives in an excellent world, and by his philosophy generally makes it over into the worst kind of a brier patch, either for himself or for his neighbors.—*William J. Long in "Brier-Patch Philosophy."*



THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

FEBRUARY-MARCH, 1910

No. 11



Rev. William J. Long's Homes and Work

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT



WILLIAM J. LONG is a scholar and a naturalist, —two men, looking at life from two different points of view, yet with the same eyes. He has recently taken possession of his new home, near to nature,

in the suburbs of Stamford, overlooking a magnificent view of the Cove and Long Island Sound, and also farther northward across a picturesque valley, the distant wooded hills.

Here in this home of modern architecture he has his formal study and well-equipped library. Here all is order and neatness, even to perfect adjustment of the angles of every book upon shelf or table. Here there is a polished air of finish and of classicism. Here William J. Long is the clergyman and scholar, the learned doctor of philosophy, the graduate of Harvard and of Heidelberg. It is here that he

delves as carefully into classic lore as, he tells us in his Introduction to "English Literature," every Mussulman preserves scraps of paper on which words are written because the scrap may perchance contain the name of Allah.

The wood work and furnishings of all the rooms blend most harmoniously. There is an air of luxury, yet of simplicity, of refinement, quietness and good taste.

In a business block in the center of Stamford, in a front room on the noisiest part of the city square, is Dr. Long's natural history study. Here he revels in a delicious confusion and disarrangement. Newspapers, letters, books, photographs, notebooks, souvenirs of days in the big woods, are everywhere, not even excepting the floor. In fact, the floor seems to have taken up all the odds and ends of overturned wastepaper baskets. One feels



WILLIAM J. LONG, THE CLERGYMAN AND THE SCHOLAR.

as if wending his way through a forest of broken trunks, quantities of leaves, and crumbling debris of all sorts. To make more realistic the impression that one is in the path of a tornado is the rumble of trolley cars, the toots of automobiles, the clatter of horseshoes and iron tires on the pavement, and the calls of drivers and peddlers.

I began to express sympathy for his having to work under such adverse conditions; but my sympathy was lost. He even apologized because the littered room was too formal for a workshop. Said he: "When at work I like the sounds of the street, the noise and confusion of busy life. It brings me closer to humanity, to the men and women who daily bear the burdens of the world. Far from disturb-

ing me, the sound of their coming and going is a stimulus to good, honest work. As a workshop this room is fine, but a bit too civilized, too luxurious. The den I tried to get was on top of a primitive kind of shack, in an alley as busy as a beehive, with a kite-maker next door, a printing press under me, and a blacksmith over the way. The blacksmith was the chief attraction. For a good, wholesome, inspiring sound, suggesting at once toil and cheerfulness, give me the "cling clang" of an anvil. I'll have that room yet, just on account of the blacksmith."

I accepted the apology and withdrew abruptly from the sympathetic frame of mind.

But here in this study is the chaotic

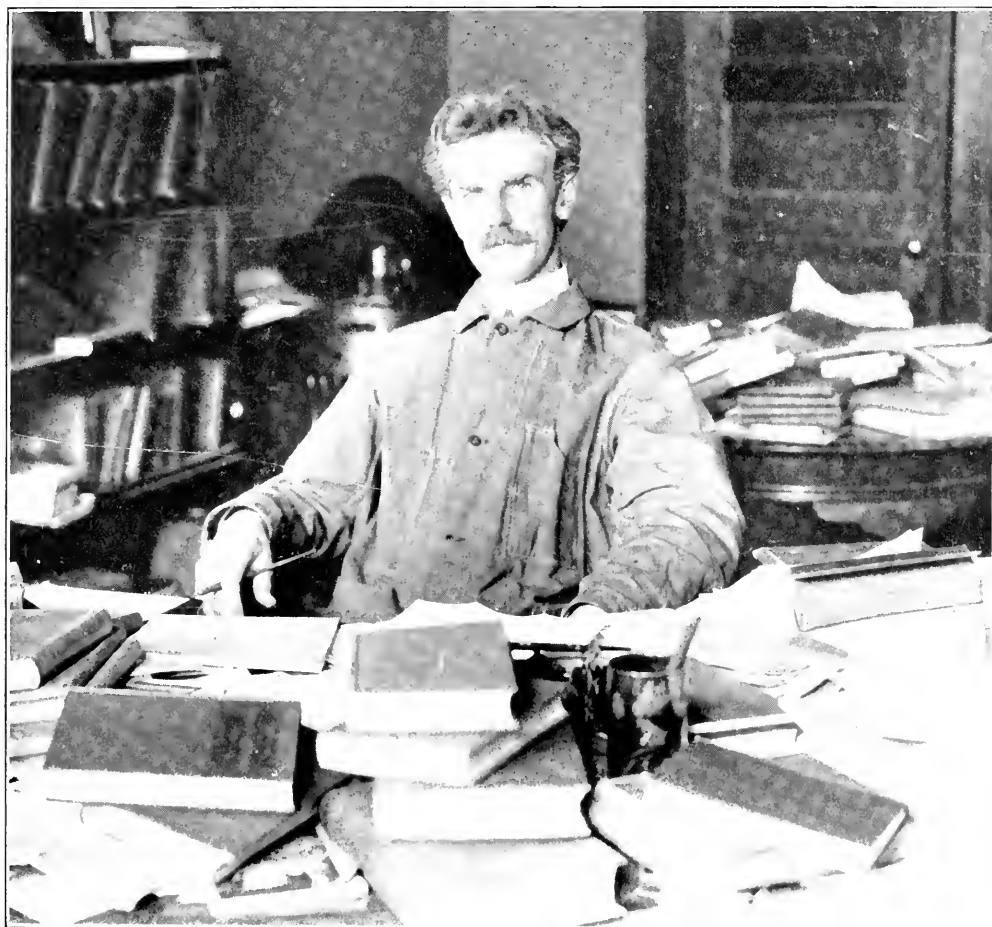
revelry that explains the naturalist let loose from the formal work of the scholar. Conditions here, while writing his books, are like the primitiveness and abandon of his camp in the wilderness, and work seems a play, not a profession. Though his literary and scientific playings, like the investigations that preceded them, have been so extensive as to seem professional, they still retain the playful point of view. It is this spirit, and the sharp contrast in his work, that have sometimes made Dr. Long's natural history misunderstood.

In his literary work, as in his professional and philosophic studies, he has been a thorough, painstaking student of facts, and it has been his aim to make these facts interesting

by showing their direct bearing upon human life. As he says in the preface to his "English Literature," "From beginning to end, this book is written upon the assumption that the first virtue of such a work is to be accurate, and the second to be interesting." It seems probable that these lines were written in the home study.

But his nature writings have been, like the observations upon which they are based, his play and recreation. To an outsider it may seem as if he had unconsciously transposed his basic principle of literature and said, "The first object of such work is to be interesting and the second to be accurate."

When I suggested this theory to the naturalist he shook his head doubtfully. "Truth is always the first in-



WILLIAM J. LONG, THE NATURALIST WRITER.

terest of a scholar," he said, "whether one studies life or death, a man or a blackbird, a creed or a political platform. And truth, by the way, is seldom found upon the surface of things. When one writes, however, interest must be added to accuracy, and whatever virtue appears first is merely a matter of emphasis. In my natural-history studies, though the work is all play, it takes far more time and effort to verify an observation than to search out original sources in literature. To illustrate the matter specifically: a professor of literature wrote me that I

or how a muskrat opens unio shells without breaking them; and this, though good fun, is neither easy nor simple. It requires skill, patience, stoicism, a knowledge of animals, and, most of all, good luck before one can be either interesting or accurate. When I write of such things, I leave out all the difficulties and give you only the fact, and the fun I had in getting it. And some hard-headed fellows doubt the interesting observation simply because they do not appreciate the time and effort spent in making it accurate."



WILLIAM J. LONG MEASURING A WOLF'S JUMP UPWARDS FROM LAKE TO BANK.
From fourteen feet below to ten feet up on the bank.

had made a mistake in the title of Baxter's famous work, "Saints' Rest," saying that it should be singular, not plural. The matter was of small consequence, but I searched the libraries of Boston and New York, and hired an English scholar to go through the British Museum in the effort to get the title right. All of which was simple and easy. But I have watched for hours at a stretch, on a hundred different lakes and streams of the wilderness, trying to find out how a beaver puts the dome over his lodge,

This explains both the naturalist and the literary man perfectly. Dr. Long goes to nature for the kind of play that interests him most after scholarly work. In the woods he lets himself loose from the routine of scholarship, and tries to make his record as interesting to the reader as the observation was to the naturalist. But behind that record are the long hours of watching alone in the wilderness; and the facts as he sees them are never misrepresented.

One can write or read statements of



CAREFULLY STUDYING THE WOLF TRAIL.

fact so matter-of-factly stated as to be devoid of all interest, and a skilled writer like Dr. Long may so cull, so select, so charmingly portray the interests of nature as to cause one to exclaim, "Can these be facts"! The interesting fact need not be misrepresented but may be so attractively dressed as to seem no longer a prosaic fact. And it is not prosaic, and it should not be; the interest should be uppermost.

Undoubtedly this naturalist puts into his play the same painstaking care-

fulness that the scholar does into literature or theology. As every little scrap of paper may contain the word Allah, so every form and action of the wild creatures may throw light on the work of the Maker. He searches in both fields intensely.

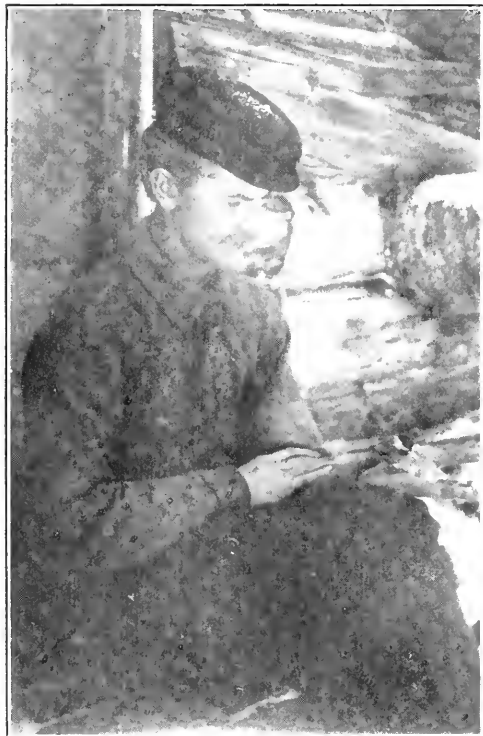
Dr. Long's interest in nature began, he thinks, the first time he crept out of doors into the sunshine. One of his earliest recollections is of trying to share his bread and molasses with a toad that lived under the doorstep. Finding his good food rejected, he



WHERE THE DOG DOES MOST OF THE WORK.

In the far north on the way to the trout lake for fishing through the ice.

crept about on hands and knees, following the toad and trying to find out what the queer thing did eat. Another recollection, which goes back almost to babyhood, is of throwing himself upon a big hawk which had



A CHICKADEE EATING FROM DR. LONG'S HAND.

In the Woods of the Far North.

pounced upon a chicken behind the grape arbor, and of getting well scratched and thumped in trying to drag the hawk into the house. As soon as he could walk alone he rambled off into the nearby woods, where rabbits and partridges and squirrels were a source of infinite wonder. He kept pets, of course,—chickens, owls, crows, coons, foxes,—but soon gave them up because, as he says, a caged animal is the most unnatural thing on earth. At twelve years he spent a glorious summer in the woods tenting in a pine grove on the shore of Miramichi Pond. From all of which it may be inferred that he was, and still is, a country boy. As he says himself, he still lives on the same road on which

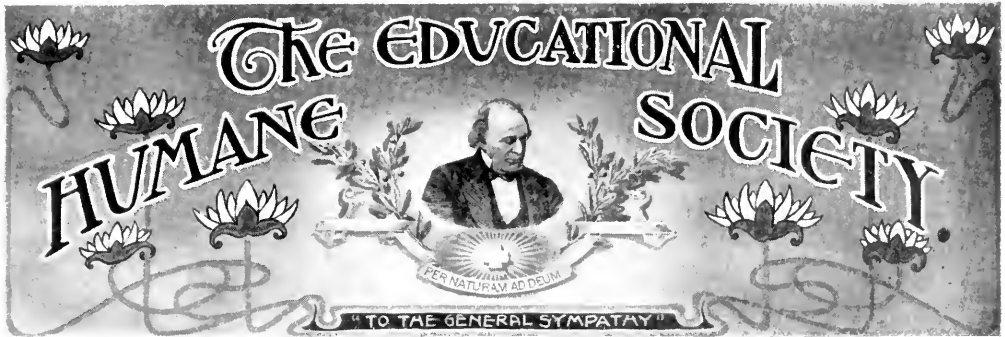
he was born (the old Boston Turnpike), only he is now two hundred miles away, and altogether too near to what New Yorkers call civilization.

As the boy grew up and became acquainted with every bird and animal of the Massachusetts woods, the great North was calling him, as he tells us in "Northern Trails" in a significant chapter called "In Quest of Waptonk the Wild". At seventeen he found himself alone, one terribly stormy day in midwinter, at the far edge of civilization in northern New Brunswick. He had never before seen the big woods or a snowshoe, but that afternoon he tramped fourteen miles through dense forests, with a pack on his back and five feet of snow under his snowshoes, landing long after dark in a lumber camp on the Renous River. Next morning at daylight he was following a caribou trail, and within an hour was hiding in a fir thicket watching a herd of the big animals resting in the snow. The last incident is most characteristic as showing his love of the big woods and of animal life, which has been almost a passion ever since he can remember. And the love shows itself in all his writings.

Another curious characteristic of the man is that until he was thirty years old he refused to write of nature, and he even protests against doing so nowadays, because, as he explains it, he sees and feels so much more than one can ever express. His first article was sent to a magazine at the earnest solicitation of a friend who had heard him speak to some young people on "The Unknown Habits of Our Common Wild Birds and Animals". The magazine immediately called for more, and he was practically forced into writing. He has done his writing as a part, according to his own words, of the joy of life. "I have a theory," he says, "that a man never does his best work unless he has the spirit of play in him." His work has been play and recreation for 25 years.

(Continued in next Number.)





A Chapter of the Agassiz Association. (Incorporated 1892.) "The Law of Love, Not the Love of Law."

The PURPOSE for which the corporation is constituted is the promotion of scientific education.—*From Charter of the Agassiz Association.*

Scientific investigation in our day should be inspired by a *purpose as animating to the general sympathy*, as was the religious zeal which built the Cathedral of Cologne or the Basilica of St. Peter's.—*From a Report by Louis Agassiz.*

We speak for those that can speak for themselves, if we will only take the trouble to learn their language and listen to what they say, and also to put ourselves in such relation to them that they will desire to speak to us.

Our "dumb" animals are not so much dumb as we are deaf or negligent of listening to what they say.

Science and Sympathy.

It is real knowledge, not compulsion, that puts one in tune with Omniscience. To know nature is to love her. Therefore it has been the work of The Agassiz Association for more than a third of a century to augment human virtues by education, not by law.

The Educational Humane Society of the A.A. stands for intelligence, liberty and love, not only to four-footed animals, birds and the lowest creatures in the scale of life, but to man himself. Thrashing a man legally may be as bad as illegally thrashing a horse. It is not the action that counts, nor the absence of action, so much as it is the spirit of the action. A manifestation of the right spirit should include not only the man and his horse, the woman and the dead bird on her bonnet, the boy and his dog, but also the ruthless plucking and destroying of flowers by the girl.

A company of children who attend a Band of Mercy meeting, sing the songs, repeat the pledges, read eulogies of the horse, dog or cat, have not been taught to feel nor to exhibit the right spirit, if, on the way home, they whip down a beautiful flower, crush the head of a garter snake or stamp on a big spider in the path.

Not even if they see a man pounding an overloaded horse, are these Merciful ones wholly right if their sympathy is solely for the horse. The horse is afflicted by the club and the burden; the man by ignorance and wrong point of view. To relieve not only the cruelty, but the ignorance, which is the greater affliction, has always been the first essential in the work of the Educational Humane Society. Its higher and better object is ever what Agassiz called, "A purpose as animating to the general sympathy, as was the religious zeal."

"Humane"-ness and the Worm.

A well-known periodical, the official organ of several humane societies, has for many years carried on its first page, as a motto, the following quotation credited to Cowper:

"I would not enter on my list of friends,
Though graced with polished manners and
fine sense,
Yet wanting sensibility, the man
Who needlessly sets foot upon a worm."

And the curious fact is that in all these years as a diligent reader of that estimable periodical, I have never seen in itself? Is its only value immunity the worm or of the worm's interests. Did Cowper laud only the refraining from stepping on the worm?

Has the aforesaid worm no interest in itself? Is its only value immunity from crushing steps?

Or, perhaps, if the magazine should devote space to telling us why the worm should not be stepped upon, showing that even that lowly form of life is interesting—aye, even lovable, it would no longer be a "humane magazine" but a "bug magazine." Strange that the things that are, are not; and that are not, are.

Perhaps the magazine would have us think that Cowper would banish from his list of friends a man so "wanting sense-ibility" as to have anything to do with worms, especially one so "lacking" as to get a "nasty" worm "squashed" all over his shoe!

"What are They Good For?"

These cavies in the cage, these rabbits in the hutch, these goldfish in the aquarium, these turtles in the vivaria, these—but why continue the list to which so many visitors apply the question, "What are they good for?"

Good to be themselves, to take you out of yourselves into being less Ptolemaic. You in general, your pocket-book and your stomach in particular, are not the center of the universe. Things in this beautiful world are good even if you cannot eat, nor wear, nor buy, nor sell, nor hoard them.

"But I suppose you study them, find out their habits and experiment in heredity, etc.," continues the persistent visitor.

"Yes, I do that," and as I busy myself with something else, as I turn away with a dish or to get food for my pets, the better part of the answer is not audible, "and by them learn of you, find out your ideas and experiment in your cupidity."

They are only tools with which to experiment on you—to put you aright. If the experiments with you are successful, you will have a new

point of view in your "What are they good for?"

Love By Licking!

Several street urchins were playing on the sidewalk. One held a small dog by a rope. A venerable, kind-hearted man hobbled slowly down the street, and stopped to watch them.

Patronizingly he said to the leader of the dog, "Sonny, does your little dog love you?"

With a saucy wink to his mates, the fellow replied:

"You 'bet your sweet life he loves me, or I would lick the stuffin' out o' him."

* * * * *

We all see in this an element of humor, and we smile either at the boy's peculiar method of eliciting love or at his "slangy" form of expression—perhaps at both. Some one has defined humor as "a juxtaposition of incongruous concepts." Surely the kindly manner of the old man and the licking propensities of the street gamin are humorously incongruous, as is the juxtaposition of lickin' and lovin'.

I wonder why it is that maudlin sentimentalism and legal "lickin's" are not more humorously incongruous than they are, and why they should not be less successful in eliciting money.

If our boy of the sidewalk was really earnest, the old man could have spent much time to good advantage in educating him into the knowledge of the fact that the love which comes from lickin' is not the loftiest nor the most enviable form.

The Japanese Spaniel.

BY DR. R. H. BELL, NEW YORK CITY.

This is a breed that, until the last few years, was seldom to be found in England (or America), except in some of the homes of men who had lived, or had friends in the East. On account of the difficulty of rearing the puppies few small ones are to be found; . . . it is difficult to find any one who will part with the small ones, which are commonly known as sleeve-dogs.—Dalziel (1888 Edition).

Little Jap reigns supreme in the toy-dog world. And well deserves the

honor, for he is lively and highly bred, with dainty appearance, smart compact carriage and profuse coat . . . Japs vary in size from 3 to 10 lbs., the smaller being the most valuable, and much sought after. But they are very scarce, and fetch high prices in consequence. . . . The colors are . . . black and white, (lemon-yellow, brown and white). . . . The coat: long, profuse, and straight, without curl, but with a tendency to stand out and form a distinct frill round the neck, and with

found them most affectionate, and faithful to a degree unobservable in other dogs; and in case of illness their gratitude is touching.—The Twentieth Century Dog.

Yo San (i. e., Miss Yo) is brown and white in color; weight, about six pounds; age four years; has color-sense well developed; prefers pale blue, and is fond of silks and of watching the landscape for hours when traveling by rail. In France last year she begged every day to go riding through the



A JAPANESE SPANIEL.—YO SAN.

See Poem by Dr. Bell, page 336 of the number for January.

abundant feathering on the tail and legs. The head large in proportion, with broad, dome-shaped skull. The nose is quite flat and level with the forehead. (Large, expressive and tender eyes usually brown).—Miss Serena.

Japs are the cleanest and nicest dogs I have ever known. Mine eat, drink and sleep with me, and I never find any offensive smell from them. They appear to thrive better when treated as children, and mine are very sensitive when scolded, and most affectionate particularly the bitches.—Geo. Liddell.

Having kept the breed for very many years I can now fancy no other. Their ways are so sweet. I have always

forests in her little basket attached to the handle bars of a bicycle. She has all the fine and many of the rare "points" of her breed. She is fearless and will attack other dogs and animals three or four times her size. She is very intelligent, is extremely affectionate to her master and is bad tempered toward others.

Fondling a Wild Skunk.

BY GEORGE W. LOCKWOOD, LONG RIDGE,
CONNECTICUT.

That even his Satanic Majesty is not always of as somber a hue as represented is a well known saying, and the object of this little sketch is to show that other and less prominent

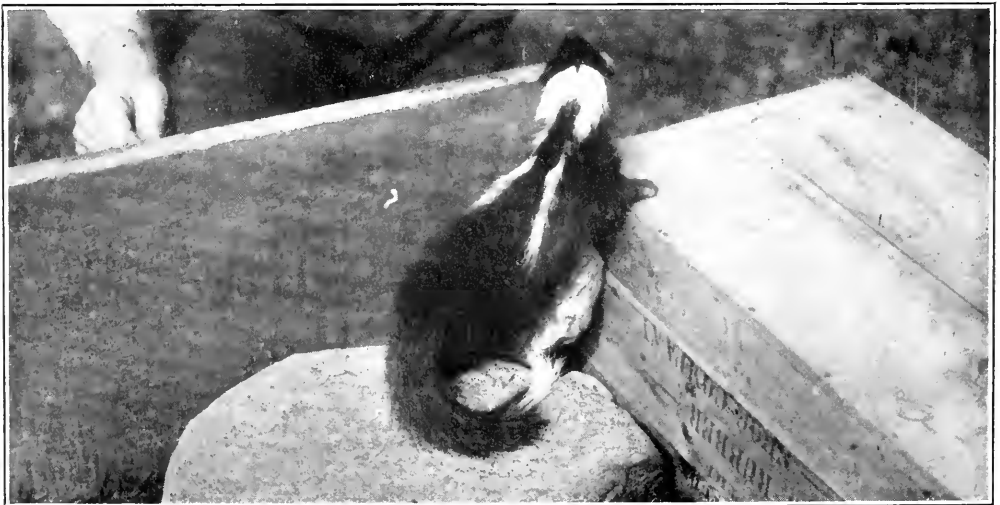
beings have had the shadowy side of their character overdrawn by those who were entirely free from maliciousness and simply had not understood. Many who look at the accompanying illustration will hardly believe that it is taken from a photograph of a real man and a real skunk which forty-eight hours before the photograph was taken had so far as known never seen a man nor known that such an animal existed. In the face of these facts the photograph is not the result of a miracle but simply the judicious use of a little charity and a little understanding.

A trap set for a woodchuck first introduced his skunkship to my notice, and knowing that my friend, the editor, wished to secure a photograph, I took it to the house and placed it in a barrel where it spent a couple of days waiting to have its picture taken. When the time came, it presented a problem; of course it could not be taken in the barrel—but how to get it out. Several suggestions were made but none were acted upon.

I have trapped a great many skunks during my lifetime and as a rule have found that it is a most harmless and peaceful animal when left to itself never attacking, and using the weapon with which nature has provided it only as a protection from a real or supposed attack; for instance, one can walk very

close to a skunk in a trap with perfect safety but must walk slowly and avoid any quick motion whatsoever or disaster will surely follow. So quick are they in anticipating an attack that while it is easy to shoot one at short range and distract its aim, it is totally impossible to kill one even in this way so quickly that it will not bring its defensive organs into play and make at least one effort to obtain revenge. When these facts are considered it is not strange that the skunk is not afraid of man or anything else.

This then was the situation in a nutshell; the skunk still remained in the barrel and was likely to do so for all time unless something more practical than talk was employed. It was then I determined to put the results of my studies of skunk nature to a test. Telling the others to stand back I walked up to the barrel, placed my hand inside and very slowly advanced it toward the skunk. At the least sign of uneasiness on the skunk's part I stopped and waited until it again became quiet. At last my hand was within six inches of its head, and then came the crucial test. Raising its head it met my hand. Would that skunk bite? Knowing the general belief that a skunk's bite means hydrophobia, one can imagine that I was a much interested observer. In fact I was "between the devil and the deep



THE WILD SKUNK IN ITS TEMPORARY "PHOTOGRAPHING GALLERY."



"THE SKUNK SNIFFED MY HAND CURIOUSLY."

sea," for if I dodged I knew perfectly well what would happen. But no! The skunk sniffed my hand curiously for a moment and then, apparently satisfied, dropped its head which I followed with my hand. I began stroking it with my fingers in about the same manner as one would stroke a kitten, and this it seemed to receive with much the same satisfaction as would a kitten. This was repeated several times until it became accustomed to the performance and seemed satisfied that no harm was intended. I then picked it up by the nape of

the neck and carried it out on the lawn where a stone had been placed in readiness.

Now my only trouble was to get it to remain on the stone as it insisted on rambling around, but this was no more than would have happened had it been any other animal as it had apparently accepted me as a friend and showed no desire to make things unpleasant. At last I picked it up in my lap and the deed was done.

I then carried my little pet down to the orchard, near where it was captured, and gave it its liberty. It seemed in no hurry to take advantage of this, however, but took a few steps, stopped and looked at us and then started on again until at last it reached its burrow and disappeared.

I am sure that this little animal, ordinarily despised, is amenable to kindness and understanding. If sometimes it makes itself disagreeable without, from your point of view, sufficient excuse, it may not be due to "pure cussedness" but to a slight misunderstanding on its part. And why should that be so much more serious a matter with a skunk than with a man?

The Joys of Caring for Pigeons.

WILLIAM E. BUTLER, GLENBROOK, CONNECTICUT.

Writer's note:—These articles are written for three reasons:

I. Because so many persons are uninformed, or misinformed, or both, in regard to the varieties, habits, etc., of pigeons. (I have had people ask me how many eggs I got a day!)

II. To endeavor to create an interest in pigeons among those who have heretofore allowed the subject to pass unnoticed.

III. To further and maintain that interest by some practical hints about the care and breeding of pigeons.

Inasmuch as there are vast numbers of varieties among pigeons which are classified at our leading shows, and still more varieties which from their scarcity will not warrant classification, it is evident that the general subject covers a very extensive and varied field. Also, having specialized fantail pigeons for some twenty odd years, I do not feel qualified to write specifically on any other variety. However, as I have kept several others at dif-

ferent times as a side issue, and have observed still other kinds at the shows, I will in a following article attempt to describe briefly some of the better known forms. Following that, I will take up more specifically that, to me, most charming variety of pigeons, the fantail.

For the present let us consider in a general way, some of the duties and pleasures which come to the breeder of fancy pigeons. To the true fancier,

clean hobby. The amount of time required to care for a loft of from fifty to one hundred birds is not so great as to become arduous. I spend on an average possibly half an hour a day in the loft, and would be reluctant to miss this little "oasis" in the day's routine.

True there may come troubles, and disappointments, but (to one who has the true fancier's spirit and the pluck to persevere) these are soon forgotten,



A PHOTOGRAPHIC STUDY OF SOME OF MR. BUTLER'S FANTAIL PIGEONS.

the duties are also pleasures, which is the key to the claims that I shall make for this hobby as an ideal pastime and recreation, for as some one has well said, "Change of occupation is true recreation."

I say "hobby" with no apologies for the word nor all it implies. Moreover I am inclined to believe that "there is something wrong with the man without a hobby." It is at least true that any one who is as busy as he should be needs just such relaxation, recreation and whole hearted enjoyment as may be derived from a

except as we may profit by such experiences. That there is need for study of the subject if one would succeed, is well known to old fanciers, and soon becomes apparent to those just starting in the pursuit. I do not say this to discourage the boy who would keep pigeons, but for those who are older and are willing and eager to study whatever they attempt to do. As for the boy who "grows up with the birds," his "study" of the subject will be both natural and most valuable, derived chiefly from that greatest of teachers—*experience*.

I want these articles to be of special interest to boys. Some of the "boys" in the fancy are not less than three score years and ten, but they are still boys in spirit. Every boy loves pigeons. Why should he not be allowed—and encouraged—to indulge that natural longing? I can remember my first pair as well as if it were but yesterday that a friend of my fathers, who seemed to take an interest in me, brought me a pair of fantails in a box! And yet it was twenty-five long years ago! I was the proudest and happiest boy in the village that day, and those delights are still fresh in my memory.

The fantails were "tail marked," i. e., brown bodies (or properly called red) and white tails, which I thought very wonderful, and thinking so made it so to me. The cock bird had a pointed crest on his head, with brilliant, iridescent feathers which in the sunlight reflected all the colors of the rainbow. The hen had a "smooth" head and was less "shiny" on her neck.

It was early spring, when the first warm days swell the buds on the trees and start the green grass in sheltered places, and I can still smell the spring in the air, as I busied myself "rigging up" a box for the newcomers on the inside of the barn, and cutting holes through the south side toward the house. Incidentally I remember that the latter was done without my father's permission! But I believe he forgave me. With what delight I watched the cock bird strut about proudly, and coo to his mate! Soon they began to gather straws from the ground in front of the barn doors, and carry them to their new home, and, as seen through the crack in the door of the box, they began carefully to build a nest!

Then something happened; boy fashion ("just my luck!") I had the measles! And in spring vacation, too! A week in a dark room and then when no one was around I crept out on the veranda to get a glimpse of my beloved pigeons! I saw them, as I can see them in my mind's eye now, and I returned for another week in bed. I knew why, if the others didn't!

As for the birds, they lived happily,

if not "ever afterward," at least a number of years, and increased and multiplied. That was the beginning, and the end is not yet. To me the enjoyment of taking care of the birds, watching the young develop, etc., is just as keen and fascinating as when I was a boy, and if any one should ask me where to seek "perpetual youth," I would answer unhesitatingly and confidently, "out in the pigeon loft."

The Herons of the Isle of Pines, Cuba.

McKinley, Isle of Pines, Cuba.

To the Editor:

The little blue heron, *Florida caerulea*, is a fairly common bird here. In early evenings or mornings they may be seen flying to or from their feeding places, and between times they can be found feeding if one goes quietly through the jungle along the arroyos and rivers. From my observations it is rather solitary, only one being seen at a time most of the time and never more than two. It feeds, like the rest of the herons, upon minnows, small fish and little green frogs.

The snowy heron, *Egretta candidissima*, is also found here but rarely more than one at a time. It is quite wary because it offers a mark for the winter visitors who shoot them for the sake of shooting and then let them spoil. It becomes attached to a certain locality and even after it is cleared up still retains its favorite feeding ground.

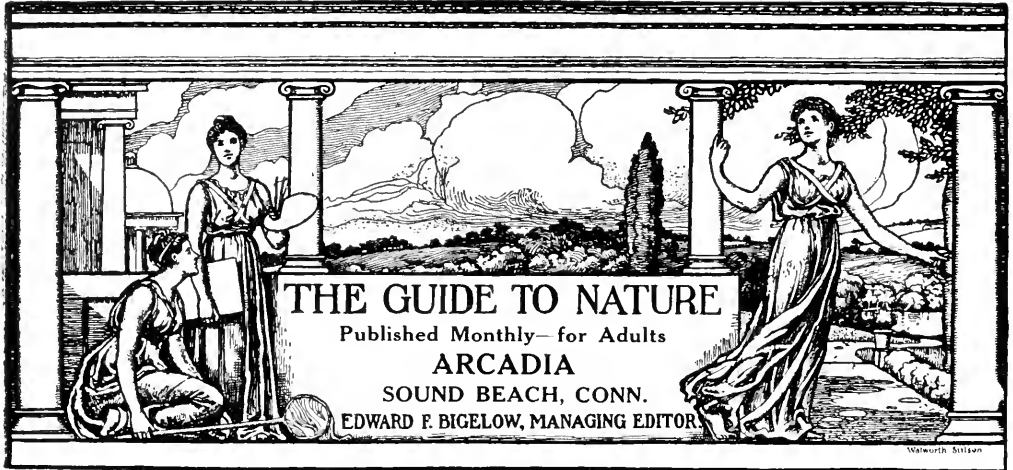
The Louisiana heron, *Hydranassa tricolor ruficollis*, is not seen as often as the two preceding but I saw several in a small lake or marsh together with a couple of great white herons, *Ardea herodias*.

I have but one record of the American egret, *Herodias egretta*, and that was brought to me on June 27, 1909, to preserve. It was a fine male.

The Ward's heron, *Ardea herodias Wardi*, is rather rare, but I have seen it several times along the river. It is extremely wary.

During the winter the green herons, *Butoridis virescens*, are very common and the least bitterns, *Ardea exilis*, are fairly so.

A. C. READ.



Mistakes.

Realize with all the intensity of your being the importance of any great cause, enter heartily and enthusiastically into its work, devote yourself to it in season and out of season with all the power you possess, and you unavoidably make mistakes. The only sure way to keep clear of error is to do nothing. The dead make no mistakes.

In overeagerness to obtain or even to appreciate the things attained, you may make the mistake of disappointing or displeasing your best friends. Your mistake may be of commission or of omission; you may do too much or too little.

Let a friend do you a favor, let a cooperator render aid, or an appreciator make a gift, and you at once are balanced on an edge, you become a center of attention. What will you do? Will you be impetuous, energetic, thoroughly in earnest and appreciative, and consequently want to do too much, or lethargic, and not realize responsibilities, or not "rise to the occasion."

Here in one mail is a letter of complaint from a scientific friend who did not want his name published in connection with information on some difficult point, on which he wrote only as a personal favor and not for publication; and another who finds fault because he was not given full credit in a great work accomplished. One man thinks us too persistent in urging active work in nature, and another shows

a tinge of disappointment at not more definite instructions and assistance.

Yes, the work is worth doing and mistakes are made, but our real friends know the importance of the work, they understand, and so in time may the others. All know that mistakes must be made, and you may be sure that the more numerous the errors the greater the activity.

Above all mistakes of enthusiasm or methods, rise high the ideals of The Agassiz Association; they shall come out more and more clearly, distinctly and effectively, though the mistakes are scattered in every direction by the management, as chips are scattered by the sculptor in bringing the statue clear and beautiful from the block of marble.

Looking Up at the Stars a Huge Joke.

I recently entered a Stamford business house and found the proprietor engaged in reading the local daily paper. After a kindly "How do you do!" I handed him a copy of *THE GUIDE TO NATURE* with the remark, "If you must read, there is literature of real merit about real things, not town gossip." While I was speaking, he opened the magazine by chance to the star map and at once inquired, "What is that thing?" I explained that it was our monthly map showing the location of the stars visible at about 9:00 P. M.

His reply was, "And do you think that I am interested in that? "Well,

if this isn't the limit! Do you think I would be so foolish as to leave my business in the evening to go out and look at the stars? "Why, I don't believe that I ever looked up at the stars in all my life. I am too busy for such foolishness."

I started to preach a little sermon on that text, but I believe there is no need of doing so, because to the readers of *THE GUIDE TO NATURE* the sermon that I would preach permeates every word and embraces his remark around, above and below. With ever-increasing amazement, I can only repeat my text, "Why, I don't believe I ever looked up at the stars in all my life."

Poor man! and yet, he is regarded as a rich man, a very rich man. But from ever becoming rich at such a sacrifice, please, O stars, deliver me.

Getting Our Money Back.

Last autumn nearly a car load of nursery stock, worth about two hundred and fifty dollars, was set out in Arcadia. There are no two shrubs or trees alike, the purpose being not altogether for ornament but more particularly for the instruction and convenience of visitors who may thus be inspired to set out for themselves one or more that may take their fancy. A rustic fence has been run around the experimental garden, cold frames have been built and the grounds laid out. All has been donated for the good of *The Agassiz Association* and the building up of this Nature Institution.

But by at least one resident it appears that Arcadia is regarded as some sort of mysterious business venture, for here is the manner in which we were one morning interrogated by a passerby.

"Now, I've been by here a good many times and have seen you at work. It all looks very nice but I've been wondering how you make it pay. If you won't consider me impertinent I'd like to ask how you get your money back."

"Pay?" Why bless you, dear sir, we are overpaid. We are guilty, conscience stricken, in having so much more than some others. We have all

the universe; our property is so extensive that we have time to examine but little of it—from stars to diatoms—the days go round so rapidly.

"Pay?" Why the wealth comes rolling in so fast that we have no time to make records nor to store away even a little of it.

"Pay?" It is true the actual money for those shrubs and trees may never come back but we shall be well paid in our consciousness of having done the best possible for every friend of *Arcadia*, for every student of the *Agassiz Association*, for every reader of *THE GUIDE TO NATURE*.

"Pay?" Wouldn't you like to join us and get some of the real pay of this world—not of course in exchange for the superfluities and luxuries of life, but the wealth that is REAL, the opulence that makes LIFE actually worth living? And as you gather this harvest, you will remember that "Nature never did betray the heart that loved her."

Contributions to Arcadia.

A liberal supply of plate glass, for special, original, photographic apparatus for certain scientific experiments, has been contributed by Mr. W. W. Heroy of Stamford, Connecticut.

It will be remembered that Mr. Heroy, a few weeks ago, contributed some specially made mirrors for another department of experimental work.

Our Zoo department has received a contribution of a Connecticut opossum from Mr. Paul Lockwood, Stamford, Connecticut; a pair of sparrow hawks from Mr. Benjamin Davis, Sound Beach, and Japanese rats from Mr. John H. Isbell, Union City, Connecticut.

Brady & Chadeayne of Stamford, Connecticut, have kindly completed the laboratory equipment of working tables.

Mr. Benjamin F. Palmer, Sound Beach, has contributed marine specimens. Among these is a starfish of peculiar formation.

Captain Hezekiah P. Newman has donated to the laboratory remarkable specimens of kelp which he recently found in Long Island Sound.

CORRESPONDENCE

AND

INFORMATION

A Big and Ravenous Mink.

Roxbury, Connecticut.

To the Editor:

Here is a mink that has sprung into fame from extraordinary size and appetite.

To his "credit" there is the slaughtering of twelve chickens in one night. Much has been said of the slaughtering propensities of Sir Reynard; but he is an amateur compared with this sturdy legged hunter, and a great injustice is done the farmer when a

veniently to the larger stream. On the other shore of the larger stream a brooklet flows through an old meadow which for years has been the happy hunting ground of a colony of muskrats that live in the banks. Here along the shores of the smaller stream could be seen in great number the runways of the muskrats as they had gone from the stream up into the meadow for their winter supply of calamus and roots. They are a thrifty lot these days and little time is lost in play. Where



THE "BIG AND RAVENOUS MINK" IN ARCADIA'S GALLERY.

bounty is placed on the fox while the mink is protected by law.

After visiting a nearby farmer's hen-roost and feasting on the blood of twelve chickens this mink sought new fields of adventure, and three nights later became a victim of his own greed and eventually landed in Arcadia's laboratory to be photographed.

The henroost which he robbed is located near a small stream that flows to the "river," and it was here that he found the roost and had his retreat con-

there are no banks in which to dwell they have built their homes high and dry with sticks, mosses and mud. These are truly a work of art. Each way one turns there may be seen new signs of their industry. There are no family quarrels in these little homes, and all are workers. Where one muskrat leaves off, another takes up the task with the same perseverance. Civilization has yet to learn the very rudiments of success from these little workers to whom brotherly love and

industry are natural. Our social system is good, but one must stroll from the crowded streets of the city to some old, boggy, swamp hole to find where it is truly carried out to perfection and where no by-laws are necessary.

It was upon these little workers that the mink sought to prey, using the brooklet as his means of entrance and

(The mink and skunk are of the marten (*Mustelidae*) family.—Ed.)

An Oak Seed-Gall.

Morton Park, Illinois.

To the Editor:

I am sending you under separate cover something that is to me "of uncommon interest." When found, the



THE OAK SEED-GALL BROKEN APART TO SHOW "FLUFFY" CHARACTERISTIC.

retreat to and from their homes. The steel trap was concealed in the brook under water, as the mink has a keen scent and is very suspicious.

The first night a muskrat got into the trap and being unable to get away was caught and partly devoured by the mink. This performance was repeated the second night. But the third night the mink had been over eager while the muskrat had become suspicious that something was wrong.

The mink measured twenty-seven and three-fourths inches in length from tip to tip; was nearly six inches across the shoulders, and his pelt would have stretched nearly thirty-eight inches had he not been sent to the taxidermist to be mounted.

The mink is a relentless hunter and travels over an area of five miles in his search for food along streams. Strange as it may seem, it belongs to the same family as the skunk.

PAUL LOCKWOOD.

"pompon," for that is what it resembled in shape, was almost spherical and was a trifle larger than at present, as in examining we detached small portions of it.

I can understand the empty shells but the woolly growth with its regular, pointed tips is beyond me. The "pompon" was found on the ground on the Des Plaines River bank.

I have been an "all around" nature observer for some years, but never before saw anything resembling this "bunch of wool from a black sheep."

Very sincerely,

ORPHEUS M. SCHANTZ.

The specimen you send is an oak seed-gall (*Audricus seminator* Harr). It is common on the twigs of the white oak.

There is no nobler sight anywhere than to behold a man quietly and resolutely put aside the lower that the higher may come in to him.—Phillips Brooks.



The Heavens in March.

BY PROF. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

Seldom has the astronomical world been so completely taken by surprise as it was by the brilliant naked eye comet that each and every one of us saw. A month ago the professional astronomer was beginning to devote his energies more and more to Halley's comet, for nothing else of an unusual nature loomed big in the astronomical horizon for the year 1910. This interesting periodic comet discovered as it was by Prof. Wolf two hundred and twenty days before perihelion passage has been brightening gradually, but so slowly that the "man in the street" had begun to lose interest in it, for it was not merely a "nine days' wonder." The new comet, or as it is technically known, Comet A, 1910, apparently caught the comet-seekers napping, and as a result these guardians of the celestial sphere have lost somewhat of their excellent reputation for carefully and sleeplessly patrolling the heavens, looking for these stray visitors from outer space which come in to disturb the quiet and equanimity of our peaceful lives. Comets have always been looked upon with fear and dread even as far back as Homer, who in the Iliad speaks of "the red star that from his flaming hair strikes down diseases, pestilence and war." On account of their bad reputations, and their unusual appearances, astronomers have been most assiduous in searching for them, and it is a matter of no little chagrin that the citadel has been approached and stormed by the enemy without having been seen by the sentries. Comet A, 1910 was discovered on January 17 by Innes at Johannesburg, South Africa. At the time it was only 2 degrees west and 4 degrees south of the sun, and it was bright enough to be seen even after sunrise.

As it was then almost at perihelion, it changed its position in the heavens rapidly and quickly increased in brilliancy and in a few days rivalled in brightness the evening star Venus. Continued cloudy weather throughout the United States deterred us from seeing it for nearly a week, but what splendid object it was when we did see it! Even in the city where we had the dust and smoke the glare of the city lights and the lack of horizon to contend with it showed up beautifully! For the benefit of amateurs who think they possess keen eyes a few measurements of the length of the tail are given. On Sunday, January 23, the tail was 10° in length, (we may remind those who have forgotten it, that the distance between the "pointers" of the Dipper is about 5°). The tail increased greatly in length and by the end of January had reached the enormous length of 35° as measured by Prof. Douglass of the University of Arizona, over one-third the distance from horizon to zenith. It quickly faded after that and on February 3, when it was practically invisible in New York City, due to smoke and lights, Prof. Barnard estimated its length at 20° . The tail was then very broad, widening out rapidly from the head, and an excellent photograph of it obtained the same night showed in addition to the main tail another much shorter tail or extension pointing in the opposite direction and extending twelve minutes of arc towards the sun. The last time this phenomenon was noted in the great comet of 1882; and the great comet of 1910 is the most brilliant comet we have had in all that time.

It likewise is the most remarkable comet in that period, judging from its spectacular appearance, the length and brilliancy of its tail, and its curious composition, for the spectroscope

shows in addition to the cyanogen bands found in all comets the bright lines in the yellow part of the spectrum due to luminous sodium vapor. This constituent of common salt is very seldom seen in a comet, and we recall it in the Wells comet and the great comet of 1882. It is probable that the closeness of the comet's approach to the sun caused the appearance of the sodium lines. As a result, it shows with a yellowish light. Comet A, 1910, was but 4,000,000 miles from the sun

like tails of hydrocarbons; and third, short, stubby tails of metallic vapors.

The Planets.

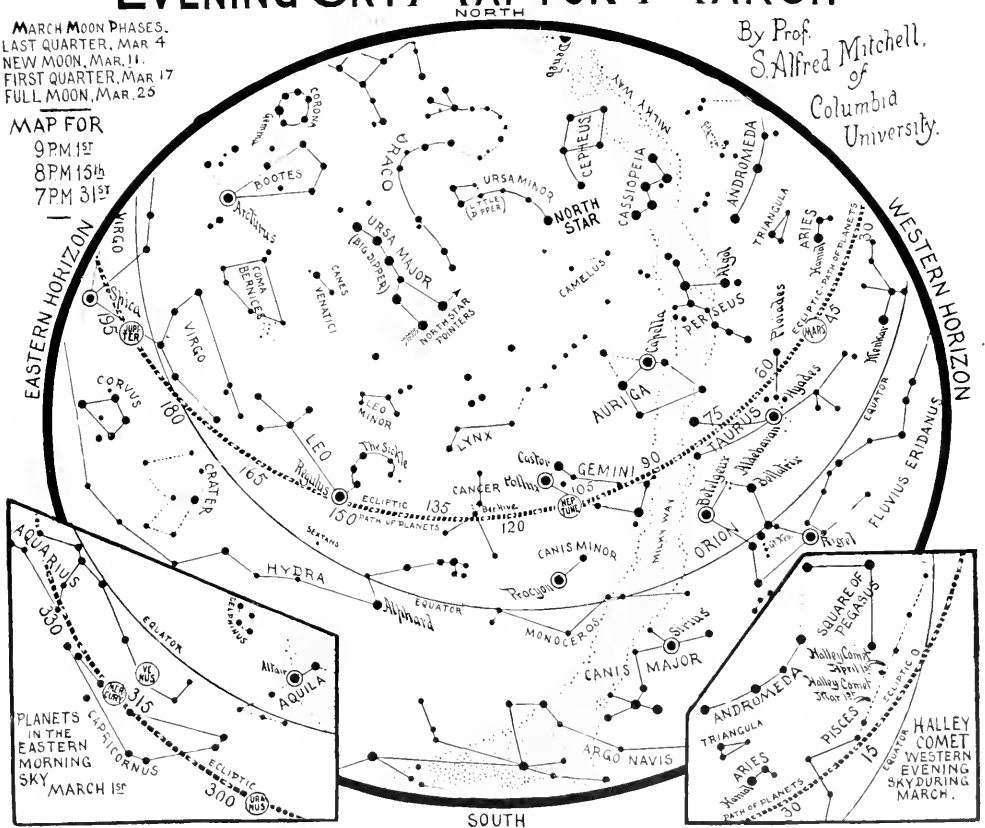
Venus passed between the earth and the sun on February 11, and is now a morning star, rising before the sun. On March 18 it attains its greatest brilliancy. Mars is gradually getting fainter, and may be seen towards the southwest in the early evening. About March 10 it will be directly south of

EVENING SKY MAP FOR MARCH

MARCH MOON PHASES.
 LAST QUARTER, MAR 4
 NEW MOON, MAR 11
 FIRST QUARTER, MAR 17
 FULL MOON, MAR 25

MAP FOR
 9 PM 15^h
 8 PM 15^h
 7 PM 31^h

By Prof. S. Alfred Mitchell,
 of
 Columbia University.



when nearest it, and it moved at the rate of 1,000,000 miles per hour!

That its tail pointed directly away from the sun was very evident. A comet's tail, however, is also curved in the direction away from its motion. The curvature of their tails has been carefully investigated by the Russian astronomer Bredechin, who found them to be three main types: first, long straight tails, which he imagined consisted of hydrogen; second, plume-

like tails of hydrocarbons; and third, the Pleiades. On the first of the month Jupiter rises shortly after eight o'clock. It is at apposition March 30, and so is on the meridian due south on that date at midnight. It is then nearest the earth and consequently brightest. It will therefore be a magnificent object all this month. Saturn is seen low down towards the southwest in the early evening.

Spring begins March 21 at 7:03 A. M. Eastern Standard time.



THE AGASSIZ ASSOCIATION

Personal Explanatory Note:—Only the adult interests in nature and the business details of organizing Chapters are represented by this department. Original observations and inquiries from young folks (under eighteen years of age) are referred to my department ("Nature and Science") in the "St. Nicholas" magazine, published by The Century Company, New York City.—Edward F. Bigelow.

The Agassiz Summer School.

Nineteen hundred and ten is here. Now is the time when we think forward more than backward. The summer vacation will soon be a matter of the present. Now is the time to make plans for it.

The attendance of the first session (1909) of The Agassiz Summer School,

year, the buildings of Arcadia were found to be far too small for lectures and the class work of the general adults' and children's classes. This year the use of the laboratory will be confined almost wholly to the professional students who will work from 9:00 A. M. to 4:00 P. M., five days a week. The general, popular, adults'



A VIEW OF THE ARCADIAN COUNTRY ACROSS THE ROAD FROM THE AA HOME.

though held under almost overwhelming disadvantages, showed a demand; the contributions from the members showed appreciation. This year everything will be in readiness and the plans will be made far ahead. We request all prospective members of the school to enroll early. Many new features are to be added, some of which we are not yet at liberty to announce. Even with the attendance of the first

and children's classes will be held in tents and in the woods and fields. It is quite probable that a dining tent will be provided. Provision will be made for camping parties who bring their own tents and appliances.

In making application please state what you will bring in tents, beds, etc. Also state what scientific apparatus you have.

Collecting cases, bottles, nets, mi-



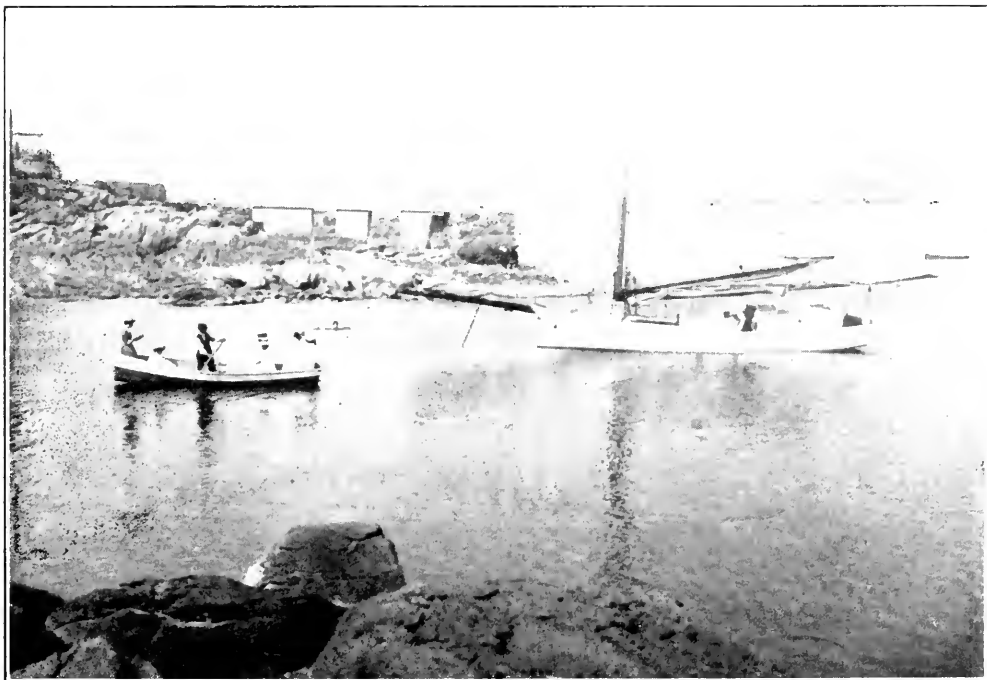
A BOTANY CLASS IN A LAND RICHEST IN FLORA.

croscopes, field glasses, etc., are recommended. There will be evening popular lectures and entertainments for all.

* * * * *

Arcadia as the home of The Agassiz Association, "Nature and Science" of "St. Nicholas," and allied interests is

a group of seven buildings, with experimental grounds, located in the center of the village of Sound Beach, Connecticut,—next to the post office and a few rods from the railroad station. Trolley cars pass the door, those going north connecting at Adams Corner with the trolley line east to Stamford



PART OF THE ZOOLOGY CLASS GOING OUT TO THEIR SAILBOAT ANCHORED IN THE BAY



A GROUP ABOARD THE SAILBOAT EN ROUTE TO THE DREDGING GROUNDS.

and west to Greenwich, while those going South go directly (or with change at some seasons of the year) to Stamford and other near by seashore resorts.

The waters of Long Island Sound are only a few rods distant. Power launches, rowboats and sailboats are easily procured. The opportunities for popular pleasures at the seashore are unexcelled. The biological interests are extensive and varied.

In a short walk, north, east or west, the country about Arcadia is easily accessible in marvelously picturesque

wildness or in the beauty that accompanies cultivation. Within five minutes' walk from Arcadia's front door are tangled thickets, lofty forests, deep ravines, rugged hills and impressive ledges with all the untouched native beauty of the days of the Indians. Within a short distance are pastoral scenes that would have gladdened the eyes of the original Pan and caused him to pipe more merrily than ever. In the remotest farming sections of New England, there are scenes not more complete in agrarian simplicity than may be found a few rods from The Agassiz Home. Here neither automobiles nor horses have driven out the patient oxen that chew their cud as they work in the fields, nor the cows that wander lazily homeward at twilight to the tune of the tinkling of the classic bell.

To the northeast, swans glide on the lakes and pools in a way to delight the poetic muse; to the southwest sea fowl innumerable float and fly and soar, while the forests and fields to the northward and westward are vocal with the music of innumerable varieties of feathered songsters.

Last year a member of the school from Schenectady, an enthusiastic ornithologist, reported with delight the large number of birds in many varieties that she had seen and studied. Nesting birds allowed cameras to be



AN ARCADIAN OCCUPATION NOT MANY RODS FROM OUR ARCADIA.



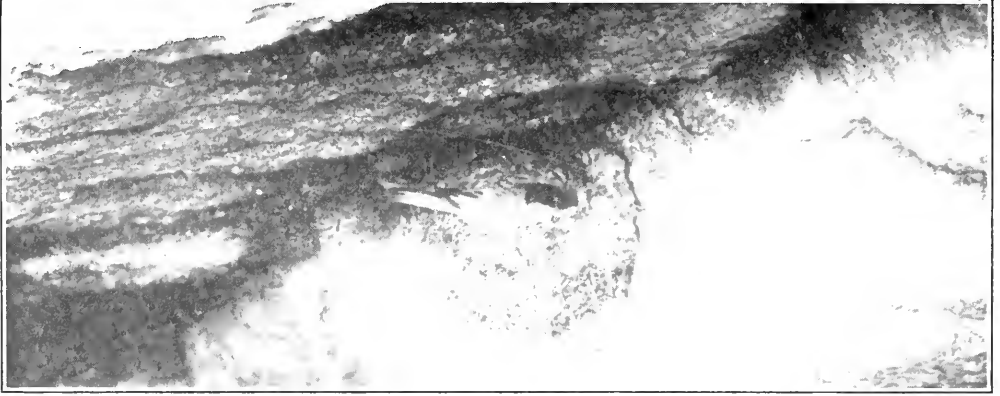
A GROUP OF THE CHILDREN'S CLASS ON AN OUTING.

placed within five feet without alarm, and a company of young folks studied and chattered within eight feet of the confident mother on the nest. Cottontail rabbits bound from the hedges and leap along the paths ahead of a merry party as if they would entice us farther into the wilderness. Even in the winter, when most hunted, they seem to know a naturalist and will permit a camera to be set up within a few feet of a sheltering nook to have their photograph taken while they enjoy the winter's sun.

"The marine fauna and flora have lacked only exploiting to have achieved fame greater than that of the Catalina Islands." This remark was made by a man well versed in the life of Long Island Sound, who had also studied in the glass bottomed boats and aquaria at Avalon. The laboratories of Arcadia, though limited in room, are well equipped and may be used by professional students. The water table would do credit to the larger laboratories. The gallery, dark room and photo-micrographic appara-



AT WORK IN THE LABORATORY, EXAMINING THE SPECIMENS.



THE PHOEPE NEST UNDER THE LEDGE. OBSERVED SEVERAL DAYS BY THE CHILDREN'S CLASS.

tus will enable the student to produce such photographs of enlargements as have delighted the readers of *THE GUIDE TO NATURE*.

In the experimental gardens will be found various kinds of plant growths of more than ordinary interest. The work in Elementary Forestry will be especially beneficial.

Many forms of animal life in "The Zoo" will make zoology attractive, available and really significant.

The Apiarian Laboratory is well equipped in every respect for teaching, demonstrations and experiments with

honeybees. Work with honeybees is an important part of the Summer School. With the popular classes this last year the work at this laboratory met with especial favor.

Sound Beach is on the beach of Long Island Sound, hence the name (do not get it something else), about thirty-three miles from New York City, and is easily reached by the New York, New Haven and Hartford Railroad. The fare from New York City is sixty-five cents.

The Agassiz Association and its home, Arcadia, has laboratory facili-



IN ALADDIN'S ROCK FARM. A SHORT DISTANCE FROM ARCADIA.



ORNITHOLOGICAL POETRY IN THE ALADDIN ARCADE.

ties for only a few professional students. The popular classes will be held mostly in the fields and if necessary, in tents.

We have no boarding places of our own, but intend to provide sites for camping parties with tents, and, if the demand is sufficient, to supply on near-by grounds tents for sleeping, for the auditorium, and to the Summer School caterer who will furnish meals for the students. We can provide along these lines whatever is required, but must know these requirements not later than June the first, preferably much earlier.

In addition to these special plans, we will arrange for board as may be required in homes, boarding houses and hotels in Sound Beach or nearby places.

Residents in neighboring places can easily reach the Summer School by train or trolley each day of the session.

Already a part of the arrangements have been made, and a few members of the Faculty have been engaged, and several pupils have enrolled. Enroll now so as to give plenty of time for all arrangements.



THERE ARE MANY VIEWS LIKE THIS RESTFUL AND INSPIRING.

Good Work Done; Plans for the Future.

REPORT OF THE JOHNSTOWN (PENNSYLVANIA) CHAPTER, NO. 1011 OF THE AGASSIZ ASSOCIATION FOR THE YEAR OF 1909.

Another year has passed; a year full of joy for the members of Chapter 1011. Some of us have begun to realize how blind we are; how we have gone along in complete ignorance of the pleasures we can get from nature close about us. It is worth a year's study to realize that.

The first part of the year was spent in the study of our common moths and butterflies. This was followed with a study of the dragon flies. Miss Dixon, who is making a special study of the ferns of this locality, has given us many interesting talks.

In October the Chapter purchased an aquarium. It has given us much amusement and interesting information, for it has been stocked with several kinds of fishes and tadpoles. At one meeting one of these tadpoles was chloroformed and the circulation of the blood in its tail was microscopically examined. This was very instructive.

With the approach of Halley's comet, astronomy seems to have taken a strong hold on some of our members. This is not without a good result, for the general discussions we have at our meetings bring out many interesting facts.

Our meetings are now held every Monday afternoon at four o'clock and usually last until 5:30. We cannot accomplish a great deal in an hour and a half, but it is enough to stimulate us to more scientific study, more intelligent and consistent study. If we can always do that it is all you can ask.

The members of the Chapter have at last realized, after two years, that they must work on a scientific basis. They realize that they cannot study butterflies at one meeting and comets at the next and know much about either.

Our plans for 1910 assure us it will be a notable year for Chapter 1011.

P. W. WOLLE, *Secretary*.

Winter Pastimes in New Hampshire.

Grantham, New Hampshire.

To the Editor:

"There's iron in our northern winds,
Our pines are trees of healing."

When I was preparing (after a visit to my home in the city) for a return to the north land in midwinter, a friend remarked, "How dull and desolate the country must be in winter." For the benefit of others who may have the same (mistaken) idea this article is written.

What is there in the city to compare with a tramp across the fields and through the woods, on the snow crust, with a cloudless sky of deepest blue above and miles of unbroken whiteness stretching away as far as the eye can reach, even to the mountain tops which glisten in the brilliant sunshine as if covered with precious stones. How fragrant the pines and fir balsam are, and how still and pure everything seems. Little brown cones give touches of color to the snow, while tiny tracks mark the wanderings of the shy woodland creatures.

I especially enjoy following the frozen course of a brooklet, that I may study the wonderful ice formations. What perfect crystals, stars, mosses, ferns and pure flowers! This morning, March third, I found pussy willows, a cocoon of the *Cecropia* moth (which I brought in and placed in a sunny window that I might watch the handsome inmate emerge from its home) and some rare fungi. What a picture the tree trunks made, covered with lichens in red, gold and the richest shades of green.

One walk I shall not soon forget. I was struggling up a steep hillside, on the slippery crust, by clinging to the branches of the spruces, when a limb broke and I slid swiftly down the hill, lodging at last in a tree, fortunately uninjured.

For company one has the birds. I have been feeding them, and often have ten blue jays on the lawn together. How pretty they look in their suits of blue and grey, running about on the snow. Sometimes a little red squirrel joins them. What a saucy, mischief

loving creature he is! After eating his fill he will take a whole cracker in his teeth and scamper away to his home—probably in the trunk of a decayed tree. One who studies these little wild neighbors closely cannot fail to discover that in many ways they are very much like “folks.”

There are the sleigh rides over the hills, sometimes with the mercury below zero; but with plenty of furs and warm soapstones one does not mind the cold. One brilliant afternoon, a party of fifteen, in a large sleigh drawn by strong horses, drove a distance of three miles to a lumber camp in Corbin's Park. We followed the “logging road” across pastures and through pine woods where the trees were loaded with snow. What views we had of snow covered mountains! Reaching the camp we left our horses and climbed three quarters of a mile up the mountain side, sometimes falling on the slippery path and sliding downward until rescued and helped upward amid the shouts and laughter of the more fortunate ones who had reached the summit. Here we saw another high mountain towering above us. Down its steep side is a chute used for bringing trees cut on the top of the mountain down into the valley. This chute is built of logs, and is seven hundred feet long and four feet wide. It requires about eight seconds for a tree to descend. The trees are “pushed off,” and it is frightful to see them come dashing down the chute, with a noise like heavy thunder, and rush some distance across the plain, throwing the snow high in the air.

We reached the hilltop overlooking our little village just as the golden sunset light was flooding it with brightness, and were reminded of the words of a stranger upon his first entrance into our peaceful village:

“It seems to me Grantham has neither entrance or exit, but that the people just flew over the mountains and settled down in this quiet valley.”

KATE A. JONES.

Woods in Winter.

BY EMMA PEIRCE, NEW YORK CITY.

Not alone in summer weather,
When bees and blossoms flock together,
When birds are nesting in the trees,
And odors sweet come down the breeze,
Not alone on sultry days,
To flee the sun's too ardent rays,
Are woods beneficent to men;
But in the winter season, when
Snow hides the needles of the pine,
And clings to boles, a winter vine,
Spreads ermine carpet o'er the green
Fit for the tread of Nature's queen.
No life is found, of flower or bird,
No faintest whispering is heard,
A hush is over everything
That waits the magic of the spring;
But purity and peace are there
And in our hearts an unbreathed prayer.

The Race of the Leaves.

It was small tyranny for a respectable wind to go wreaking its vengeance on such poor creatures as the fallen leaves, but this wind happening to come up with a great heap of them just after venting its humor on the insulted Dragon, did so disperse and scatter them that they fled away, pell-mell, some here, some there, rolling over each other, whirling round and round upon their thin edges, taking frantic flights into the air, and playing all manner of extraordinary gambols in the extremity of their distress. Nor was this enough for its malicious fury; for not content with driving them abroad, it charged small parties of them and hunted them into the wheelwright's saw-pit, and below the planks and timbers in the yard, and scattering the sawdust in the air, it looked for them underneath, and when it did meet with any, whew! how it drove them on and followed at their heels.

The scared leaves only flew the faster for all this, and a giddy chase it was; for they got into unfrequented places, where there was no outlet, and where their pursuer kept them eddying round and round at his pleasure; and they crept under the eaves of houses, and clung tightly to the sides of hay-ricks, like bats; and tore in at open chamber windows, and covered close to hedges; and in short went anywhere for safety.

—Dickens' “Martin Chuzzlewit.”

A great Cause, backed by persistence and faith, shall succeed.

Experiments With the Wonderberry.

Athens, Ohio

To the Editor:

Your letter of inquiry regarding my experiments with the wonderberry is received. I hesitate to reply for fear of adding to the confusion already existing regarding this plant, but I wish to ask if much of this discussion would not be eliminated if some one plant could be agreed upon as the real Burbank wonderberry. For this locality there are at least three plants that go by that name; however, this distinction is based only on the size of the berry. The berries that grew on my experimental plot were about as large as a medium sized grape. The soil was by no means good.

You remember the size of the plot (five by forty feet). Well, we gathered nine gallons or thirty-six quarts of berries. We are well pleased with them and have had a number of persons try them in several ways. They did not become edible when raw, but after cooking were fine; some say excellent, but perhaps that is a little too strong. I have never seen any statement as to how to cook them, but we found that tartaric acid (about a teaspoonful to a quart of berries), or lemons, were necessary, also much sugar, plenty of water and from one to two hours in cooking. If you find a better way, would be very glad to know it. We will try different plots next season.

W. F. COPELAND, PH.D.



The La Rue Holmes Nature Lovers League

By George Klinge, Summit, New Jersey

"THE GUIDE TO NATURE" is the official organ of the LaRue Holmes Nature League. It is important, for the general League interest, that the magazine be liberally supported, through the active cooperation of League members.—George Klinge.

I. II. Nature League Motto: "Self-sacrifice; heroism for another."

What Can You Do About It?

The birds of this country are the natural protectors of vegetation. It is said that without bird-life vegetation would eventually cease to exist.

Women persist in wearing wings, and other parts of plumage, on hats though we know that while even the feathers of the domestic fowl are worn, and the plume trade kept alive, birds of all countries must perish.

Men destroy bird-life for "sport" and to meet woman's demand for the feathers of her friends whose brief lives are spent in protecting vegetation upon which she largely subsists.

Parents present air-guns to boys who emulating their fathers' example, soon become "good shots."

Men of science feel it necessary to make private collections of the vanishing species.

Statistics show that hunters, and dogs trained for expert service, as well

as the perfected rifles of the present, are vastly increasing in numbers.

Railroads and automobiles carry the hunter to the heart of the forest where are the hitherto unmolested homes of the living things of the wild.

To these increasing enemies of the bird-world, add the fact that bird-life could not more than be maintained, without decrease, if man were entirely out of the arena.

The existing supply of bird-life is insufficient for the protection of vegetation. It is estimated that more than eight millions of dollars in annual loss obtains, in this country, at this time, through insect ravages because of the destruction of the protectors of vegetation.

For this reason the trees of this, and of other countries, are perishing. Mark the dead shafts of the white birch; of the conifers, and many another, on lawns and amid the forests.

Our trees are the protectors of our water-sheds. While trees are perishing the population of the country is increasing; the needs for water multiplying.

What can you do?—actually do, even if it requires thought and effort—to stop the use of air-guns; to stop the horrors of the plume trade; to save the remnants of our natural protectors while we have them?

The Kenwood Chapter, Minneapolis, Minn.

Dear Secretary:

We are so busy with our studies this year that we have very little time for nature-work, but do not think we are losing our interest in the birds.

Yes; we had a couple of columns in every issue of the evening paper, for six or seven weeks, but do not have it now. We were very glad of the chance to help the cause, when it was offered to us, and put considerable time into the matter; it is quite a task to prepare a readable paper in the interest of the birds, every day for a number of weeks.

I am glad to know that the League is growing, and am sure we will do all we can to aid the protective movement.

Sincerely yours,
MORRIS E. MOORE, *Secretary*.

Hunting with a Camera.

BY FRANK P. DANIELS OF THE KENWOOD CHAPTER OF THE L. H. NATURE LEAGUE.

One of the bird student's most valuable assistants is the camera. What better way could there be of representing a nest, its site, the eggs, the birds on the nest, or the growth of the young, than by photographs from life?

A photograph gives a far better idea of the various situations, than any words could do. Through it we have a detailed picture of birds, nest-construction, of eggs and their markings, which latter cannot be described accurately by words. A more perfect record of a bird-family can be kept by the use of a camera than in any other way.

Most people seem to think that a good bird photograph can be made only

with an expensive outfit. Of course a good lens is to be desired, but an expensive one is not a necessity; under favorable conditions, an outfit costing thirty dollars or even less, will give satisfactory results; hence it will be seen that cost is no greater obstacle in hunting birds with a camera than in hunting them with a gun.

For general bird photography a long focus camera, for use from a tripod, is the most desirable, and any of the several excellent makes, now on the market, will meet all requirements.

There is a greater charm in hunting birds with a camera than there can be in hunting them with a gun. We need but compare the rewards of these two kinds of hunters to realize the difference. For one, there is a bag of mutilated flesh and feathers that, in a few hours is gone forever; for the other, a lasting trophy of his skill as a photographer; a trophy that cost no life and left nature undisturbed.

Does The Bird Need An Umbrella?

BY ALFRED KINSEY,
OF THE SOUTH ORANGE CHAPTER OF THE
L. H. NATURE LEAGUE.

Sitting at the window and watching the pelting rain, I saw the beauty in the banks of heavy clouds, and in the million drops that stimulated a million fountains in the stream, and I wondered what had become of the feathered world, till, as the rain again leaped against the pane, there came the "Here, here, here, he-r-r-e I am" of the "Sweet Singer," the song sparrow. Out in the road, splashing through the water and mud, was the cheerful songster; more than a fair weather friend indeed.

But later, as wrapped in old clothes, I waded out to see whether or not the chickens had been washed away, an unusual sound reached me. It was the Catbird in most unearthly of cat-cries giving vent to her rage at the condition of affairs. So here then there was a bird, who wished from the crown of her head to her outermost tail-feather, that the "wise" old owl had thought to invent at least a better rain-coat than oil; as well as the bird who never thought of an umbrella.

These observations tend to disapprove any general idea that on rainy days all the birds of forest and field, are huddled in protected spots. Put on clothing appropriate for a rainy day, and make a visit to Birdland; you will, perhaps, learn new things.

Many times have I heard the Belted Kingfisher shaking his rattle, but never so continuously as on a rainy day. The Sandpiper, as he "teters" from stone to stone, seems likewise to know that rain is best for fishing.

Some birds are seemingly unconscious of "bad" weather. The swamp Sparrow sings as lustily in the rain as did the Song Sparrow; the Starling's whistle is still heard with the storm. The larger birds of the Falcon tribe, are more often seen in rough weather than at other seasons. If we observe at the sea-shore, or near the larger bodies of inland waters we shall find birds fairly enjoying the wet days.

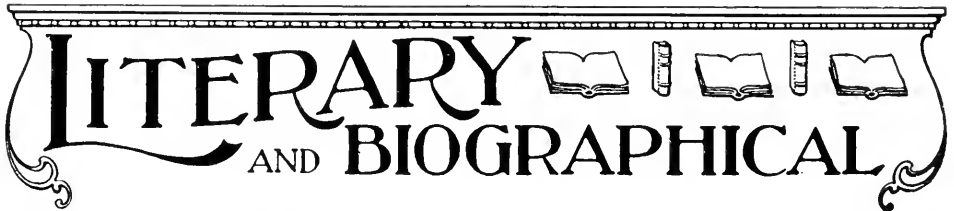
Some birds seem to wish that rain

was never sent, but, like the Catbird appear to be unable to find protection. With dejected looks the Ruby-crowned Field Sparrows still hunt their food. The usually undaunted English Sparrows are forced to utter only half chirps, and frequently to huddle in forlorn looking groups.

"When the swallows fly low, expect rain," is a popular saying containing much truth; for we are told that the air, just before a storm is so heavy with moisture that the small insects, which the birds feed upon, are unable to rise high, thus making it necessary for Swallows and Swifts at such times to fly low.

We need to remember that all the wonders of a storm are not in the clouds; in the rain-drops, or even in the multihued sky following the rain; that the woods-folk are then often abroad in most interesting fashion. There are more rainy-day birds than we have mentioned; "Seek and ye shall find."

LITERARY AND BIOGRAPHICAL



Guiding Voices. By Sarah A. Jenison. Decorated by Emma M. Moseley. Grand Rapids, Michigan: Seymour & Muir.

This is a dainty rhapsody of a maple seed with other objects in nature that ministered to the seed in fanciful relations.

Bird-Lore for February publishes some startling figures in relation to the destruction of birds for millinery purposes.

According to Consular Reports over 1,500,000 white herons were killed for their aigrettes in a single year in Venezuela, while 253,000 pairs of wings have just been found in the possession of the Japanese Poachers arrested in the Hawaiian group.

Cumming's Nature Study for Lower Grammar Grades. By Horace H. Cummings, B. S., formerly Supervisor of Nature Study, State Normal School, University of Utah. New York, Cincinnati, and Chicago: American Book Company.

Earth, air, water, fire, plants, animals, birds, insects, minerals, and many other subjects, are interestingly and helpfully discussed; so that the pupil gains an intimate understanding and appreciation of the world of nature. By means of the simple illus-

trations, directions, and experiments under the guidance of the teacher, the abstract consideration of a subject is immediately made concrete, and its connection with the practical activities of life established.

The American Annual of Photography, 1910.

Volume XXIV. Edited by John A. Tennant. New York City: George Murphy, Inc., Sales Agent, 57 East Main street. Paper cover 75c, postage 15c; cloth bound \$1.25, postage 20c.

This magnificent volume contains over two hundred fine illustrations, reproducing the work of well known photographers. There are thirty-two pages in colors.

Every one who uses a camera in artistic work (not merely to "snap" souvenirs of "dog on doorstep" or "Johnny in his first trousers") will be sure to get a copy of this Annual. And then perhaps the dog and the boy will not be lost in the indefiniteness of under exposure but in a hazy fog, and that will not be called an imperfection but high art!

But, seriously, the pictures of this aforesaid book are not all impressionistic, but contain many really good and clear photographs well worth the price of the book.



PUBLISHER'S NOTICES

'Tis not in mortals to **COMMAND** success, but we'll do more, **Sempronius**, we'll **DESERVE IT**.—*Addison: Cato.*

DOUBLE ONLY IN NAME.

This number is named February-March but is the regular single number—the MONTHLY issue for February, and so counts to subscribers and advertisers. The April number will be published the last week in March, and so on for the following months.

The "Syntor" Lens

There are many photographers who want an anastigmat but do not care to make as large an investment as such a purchase usually involves. At the same time they do not want to sacrifice quality and thus defeat the very end they seek. It would seem the requirements of this class are fully met in the "SYNTOR," the inexpensive Goerz lens. For further particulars see the Goerz advertisement in this issue.

We Are What People Call Us.

III

We are a bug house.

* * * * *

Note:—Before proceeding further, let us explain. There is an old saying, with much truth in it, that a person may be or become that in which he has implicit confidence and earnest faith. We propose to go further and say that Arcadia will accept and become everything that the people persist in erroneously calling it. It is so difficult to change public opinion that we take the easier course and accept and assume all that we are called. There have been many curious remarks of misunderstanding our simple yet important purpose of leading people to a knowledge and love of nature. We have been amused; we have been vexed; now we are resigned and accept anything you persist in calling us, as will be set forth in a series of articles of which this is No. 3.

* * * * *

"Please let me off at Arcadia," politely requests the passenger on the trolley car en route from Stamford or Greenwich.

"Eh, e-wha-where-Arcadia! What's that? * * * * Oh, yes, yes; certainly, certainly. I know—forgot just for the

moment. You mean down at those 'bug houses'!" And the conductor laughs heartily as if it were the joke of the season.

And so it undoubtedly is in the estimation of the conductors (and of some others) because it seems as if at least fifty of the visitors who have arrived at Arcadia have with some hesitation and courteous reluctance told us their experience with the conductors, beginning gently and with due respect for our supposed sensitiveness on the point, "You won't mind, will you, if I tell you what they call you here?" And of course they laugh, hesitatingly, experimentally, "just to see how we are going to take it."

"Mind?" Of course not. We are delighted to have afforded so much happiness. "We" does not mean the editorial "we," but refers to several of us in the office. One hundred and fifty laughs we've had, fifty more or less of conductors' resibilities, and an equal number of tender mirths on the part of our visitors. We have not existed in vain. Arcadia is successful in adding to the jocular happiness of Sound Beach—even though it be bug-ular and at times, we must confess, a trifle trite.

* * * * *

But, seriously, what is meant by this term, "bug," so often used in reference to a naturalist who frequently is known as a "bug man?" And what is a "bug house?"

Webster's dictionary says of bug, "As a general term it is used very loosely in America and was for-

merly used still more loosely in England." (Those Conductors are surely not English! They have never changed their habit in spite of several telephone messages from this office to the superintendent of the company as to what and where is Arcadia.)

"Strictly speaking," says Comstock, "only the Hemiptera are bugs." Of course it is well known that conductors are obliged to speak and act "strictly" (according to the rules of the road), so it is logically (or perhaps conversely) proved that the aforesaid conductors and their emulators insist that this entire establishment shall follow the methods of the Hemiptera.

But how are the Hemiptera constructed and how do they act? Again referring to Comstock (an excellent authority) we find that Hemiptera are "common," and that the "mouth parts are formed for piercing and sucking." In other words, they are adapted to securing delights from commonplace things which most of us would not recognize as treasures because they are so "common," nor for a similar reason take the effort to explore and to bring back. But Hemiptera have learned to pierce and to suck out the delightful juices—the very quintessence, the life itself, of "common" things.

Come to think of it, the principle of the bugs is exactly what Arcadia is for—to act, to teach and to help in getting our "life," the highest and best from the life of the "common" things. Let us learn to emulate the Hemiptera and pierce through our own coating of callousness due to constant polishes of familiarity, and imbibe the wonderful life giving tonic so abundantly developed in the common things surrounding us. First let us learn to know that in common things are sweets; let us endeavor to make those our own; let us thereby rise to a higher, fuller, more royal life; let us hear the words of that great piercer and sucker of common things, Ralph Waldo Emerson, who tells us so truly:

"He who knows the most, he who knows what sweets and virtues are in the ground, the waters, the plants, the heavens, and how to *come at* these enchantments, is the rich and royal man."

On November 3, 1853, Henry David Thoreau expressed this same idea of

effort and enrichment. He then wrote in his Journal:

"I make it my business to *extract* from Nature whatever *nutriment* she can furnish me, though at the risk of endless iteration. I milk the sky and the earth."

Oh, let us all laugh—laugh with joy because this "common" world is so full of "sweets and virtues," laugh that we know how to imitate the bugs and how to pierce and suck," for the good things. Let us (gently and depreciatingly); but you will not feel offended if we steal your joke—Oh, ho, ho; hah ha, ha, ha; he, he, he,—hurrah!

We are a bug house.

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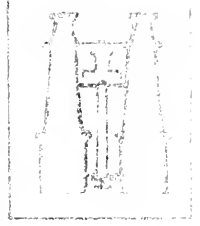
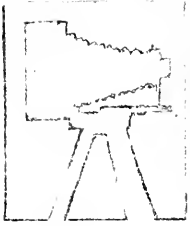
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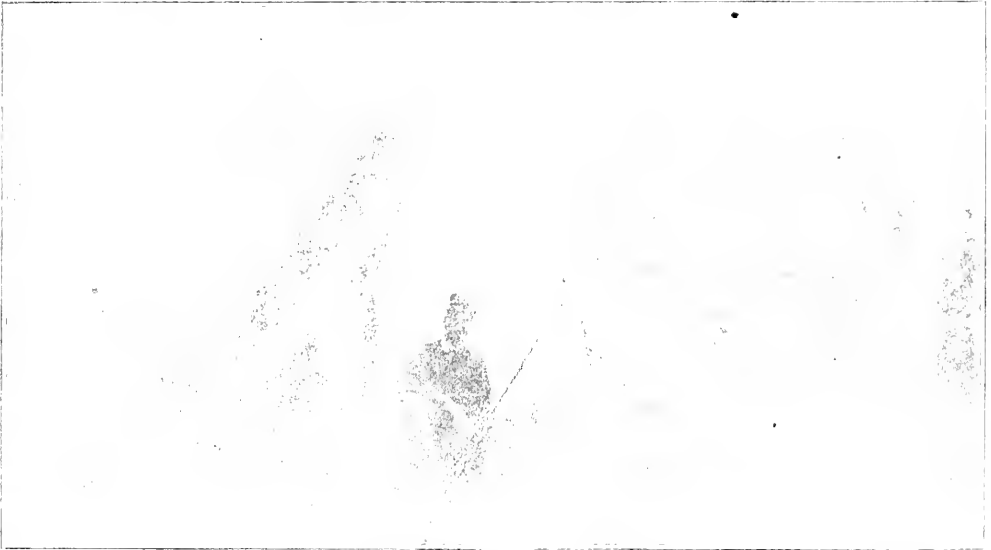
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EDWARD F. SWELOCH, Managing Editor

WILLIAM J. LONG - Part II



IN THE SUMMER - WINDY BEACH

PUBLISHED BY THE AGASSIZ ASSOCIATION
Subscription, \$1.00 Per Year

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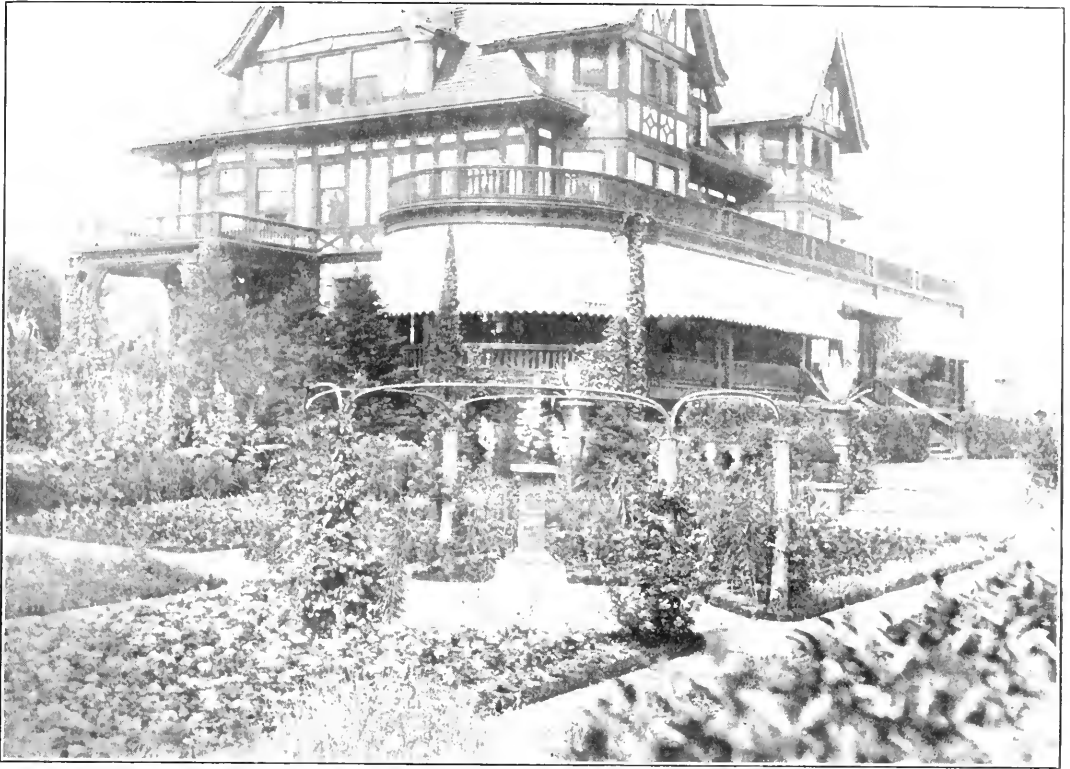
Do you wish to live near our beautiful seashore and near by Arcadian country? Do you want to remodel a grand old house and put on a little paint and paper? Do you want the fun of doing it—of one of the finest pieces of colonial architecture in the State of Connecticut?

The house has seventeen rooms, an old fashioned fireplace, handmade woodwork and trim with original brass knobs. It's a little worn down but could easily be restored and refurnished with antique furniture to make a most attractive place.

There are four acres of land with orchard, vegetable garden, barns, chicken house, etc. Just the kind to show "before" and "after."

Full particulars upon addressing this magazine.

Well Located Land and a Magnificent Home Near to Nature



FAIRHOLME.

The country residence of the late Nathaniel Witherell at Belle Haven, Greenwich, Conn., is offered for sale.

The property has a frontage on Mayo Avenue of 352 feet and is 660 feet deep; the rear faces on an avenue 75 feet wide; this rear would make extremely desirable building lots if desired.

The entire plot comprises about 5.3 acres; the house, on the highest ground in Belle Haven, has an unobstructed view of Long Island Sound; there is a yacht landing about half a mile away.

The first story of Fairholme is of stone, the upper stories of cement and hardwood timbers. The entrance hall is 18 x 40 feet, wainscoted, beamed and pannelled ceilings; large fire place, and staircase all in oak. Library, oak wainscoted, beamed and pannelled ceilings, mural in Byzantine carving, Tiffany stained glass windows, bay windows. Dining room 17 1/2 x 28 feet, colonial in style and finish, open fireplace, stationery china closets with mabogany sashes, bay with large landscape window, commodious butler's pantry. Parlor daintily decorated in white and gold; open fireplace and bay windows. Den, oak, wainscoting and ceiling. Toilet room.

Basement: well-lighted kitchen 17 x 27 feet, pantries, servants' sitting room, and laundry, with tubs and toilet.

Second floor: two large and two medium

sized bedrooms, three dressing rooms; three tiled bath-rooms; three open fireplaces; sewing room. One of these rooms is 23 x 24 feet, with bay window.

Third floor, billiard room, three guest rooms, tiled bath room, one open fireplace, six servant's rooms and servant's bath.

House is lighted with electricity and Springfield gas machine. Burglar alarm equipment; hot water heating; open plumbing throughout. House was built by day's work. It has an unusually large number of good-sized closets throughout.

Stables has eight stalls, large carriage room, and harness room. Storage ice house. Coachman's cottage; five rooms and bath; laundry. Gardener's cottage, six rooms.

Buildings are in same style of architecture as the house. There is a good sized green house on the grounds. The gardens contain a large variety of beautiful trees and ornamental shrubs, there are strawberry beds, asparagus beds, raspberry; currant; gooseberry and wineberry bushes in the garden.

The gardener of the property, Mr. Drummond, is occupying the basement of the house, and will show it to any party who presents a real estate brokers card. The property is free and clear. The price is \$150,000. Very liberal terms will be made to the purchaser. For particulars, address,

THE LAND AND THE HOME

A LOCAL DEPARTMENT

Real Estate and Home Supplies Along the Connecticut Shore

The Ashton block at Noroton Heights, which was burned last Fourth of July, is being rebuilt, and, when finished, will be a store and dwelling.

Mr. John B. Phillips, of Glenbrook, has recently purchased some half dozen building lots from Patrick Larkin, on his Springdale tract.

Mrs. Harry L. Collom's house on Fairview Ave., at Shippan, is nearing completion. It is a frame building, 39x34 1-2 feet in size, and is finished with stucco work.

Stamford is going to be better lighted in the near future, as the following incandescent lights have been ordered placed, five on Ocean Drive West, three

Pacific Street South, and two on Rock Spring Road.

This winter, the residents at Shippan took the waiting room matter into their own hands, and without appealing to the rail road people at New Haven, and probably being bluffed off, they have erected a comfortable little public waiting room at the terminal of the Shippan trolley car line. The waiting room is enclosed, and is about 8x12 in dimensions. It affords a shelter from the cold, the rain and winds of winter, as well as the hot sun of summer.

In real estate circles, Spring has been ushered in by two big deals in Atlantic Street property. The first was negotiated through the agency of Frederick



RESIDENCE OF THE LATE THOMAS GARDINER RITCH ON ATLANTIC STREET.



RESIDENCE OF THE LATE WELLS R. RITCH ON ATLANTIC STREET.
Built in 1835.

on Van Rensselaer Ave., one on Verplanck Ave., one on Stamford Ave., one on Sound Ave., and one on Fairview Ave., all at Shippan. Others to be placed are, one on Green Street, one on

Atlantic Street, and one on the corner of Atlantic and New Streets, by Dr. Amos J. Givens. This block is considered the best structure of its class in the city. It

is a four story brick building, with an attractive front, and is a substantial structure, with all modern lighting, heating and sanitary arrangements. There are three stores on the ground floor, and the other floors are used for dwelling purposes. Dr. Givens has every confidence in Stamford property for investment. He believes that the city has a wonderful future before it and money invested in Atlantic Street property will not go astray, as development on this thoroughfare has only just begun. People are looking for a further building boom, and it may be safely predicted that during the present year, a number of additional business blocks of the best style of construction, will be erected upon Atlantic Street.

The other large transfer of Stamford property is that of the Ritch estate on Atlantic Street, to Frank B. Gurley of Stamford, and Thomas N. Cooke of Greenwich. The new owners have already placed the property on the market, and among those who have purchased lots, and who contemplate building at an early date are, Silas E. Elliott, and E. F. R. Varick. These lots are situated on the new street which the promoters propose opening through the property from Atlantic to Pacific Streets.

This new street will be fifty feet wide, will be built of macadam, and will have concrete side walks. It is expected that the buildings on this street will be principally apartment houses, while the property fronting on Atlantic street will be used for business houses.

In the course of the coming summer, a four story brick is to be erected at the corner of Atlantic and State streets, and another brick block will go up on the corner of the new street and Pacific and State Streets.

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SOUTH NORWALK

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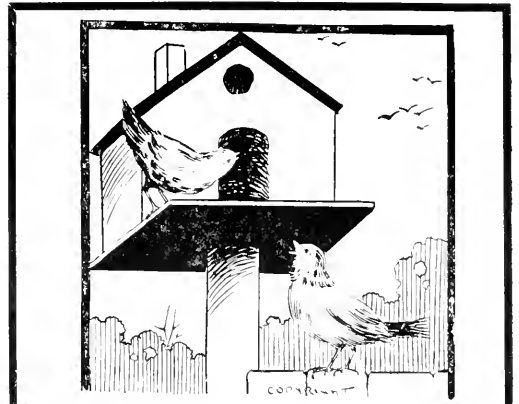
PORT CHESTER

Mr. Gurley sees a great future for this property. The enlargement of the Yale & Towne plant, will increase the demand for apartments. In the other manufactories, conditions are growing better, and as they add to their force of employees, there will be more need of the up to date apartment.

Stamford is growing every day, and the next few years will show an impressive increase in the population. The most pressing demand will be for the twelve room apartment on the fifty foot lot, such as Gurley and Cooke are planning.

The old Ritch homestead, was built in 1835, and is a well built roomy habitation. It was the home for three generations of the family of the late Wells R. Ritch, and is now occupied by the daughter of Mr. Ritch, Miss Cynthia W. Ritch. Adjoining the homestead, is the residence of the late Thomas Gardiner Ritch. These two houses are to be removed by the new owners, and business houses built in their places.

Gothic Hall, which stands on the proposed site for the new Stamford Library, is one of the old landmarks of



A Small House

Big enough for a couple of canaries wouldn't do for you and your wife.

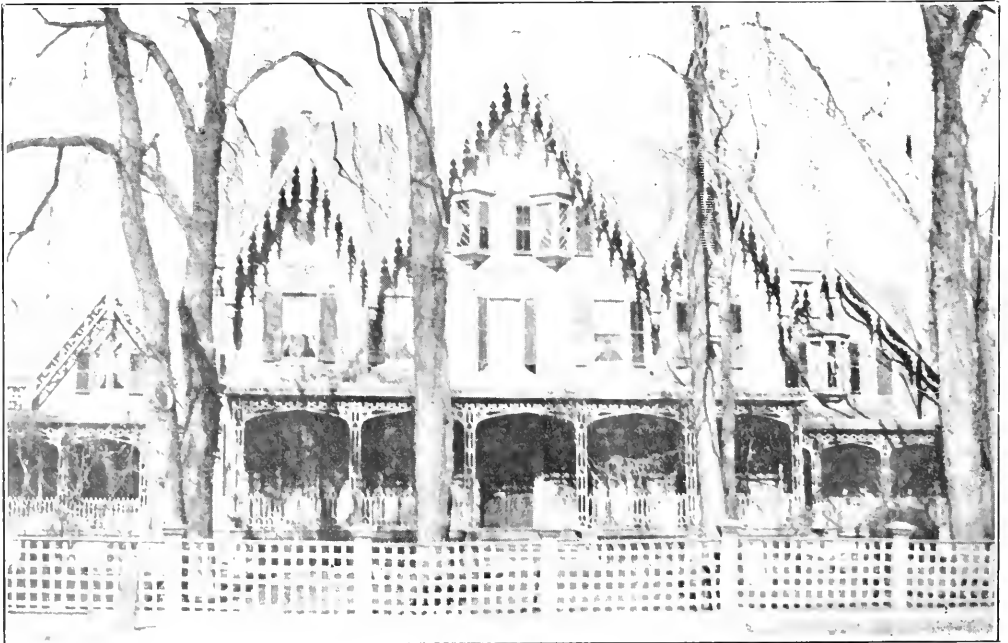
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four generations ago. It was erected in 1830 by the late George E. Waring. In those days it was considered quite



GOTHIC HALL.

Built in 1830 by the late George E. Waring, the founder of the Stamford Foundry Company. On this site is to be erected the Stamford Library, and at the same time will one of Stamford's old landmarks disappear.

a fine mansion, with its imposing gateway, and high posts, and the broad hall through the center of the house, with its handsome winding staircase. It was the first Gothic architecture introduced into Stamford. For many years Gothic Hall has been the home of Mr. John A. Brown, the President of The Stamford Trust Co.

Work is progressing rapidly on the new house that C. W. Maury is building on the Noroton side of the Cove Pond. It is situated in a very attractive spot, overlooking the pond, and will show up finely to passers by on the Post Road.

The view over the pond from this point, is very beautiful in summer, and during such seasons as the past winter has been, the picture is further increased in beauty by the pond being covered with ice, and converted into a place where the gayeties of skating, iceboating, and other winter sports have been enjoyed.

On the Stamford side of the pond are the new houses of Miss Mary Scofield, and William C. Hoyt. Arthur G. Jessup is contemplating building near here this spring.

Across from them on the Noroton side of the bridge, Robert Purdy has

DR. GIVENS' SANITARIUM

FOR NERVOUS AND MENTAL DISEASES

AT STAMFORD, CONNECTICUT

is arranged on the cottage plan and has separate departments: separate cottages, for the treatment of a limited number of drug and alcoholic patients.

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TRUST DEPARTMENT—This Company is authorized by its charter to act as Executor of Wills, and Administrator of Estates, and as Guardian.

SAFETY—The Statutes of the State of Connecticut have for some years required the Trust Companies to keep a reserve equal to that required by the Federal Government of National Banks.

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THE BELATED MARCH SNOWSTORM ON THE RIPPOWAM RIVER.
(WOODSIDE PARK.)

Photographed by Julie Adams Powell.

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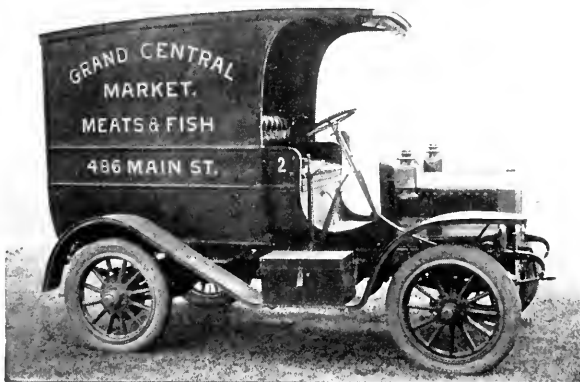
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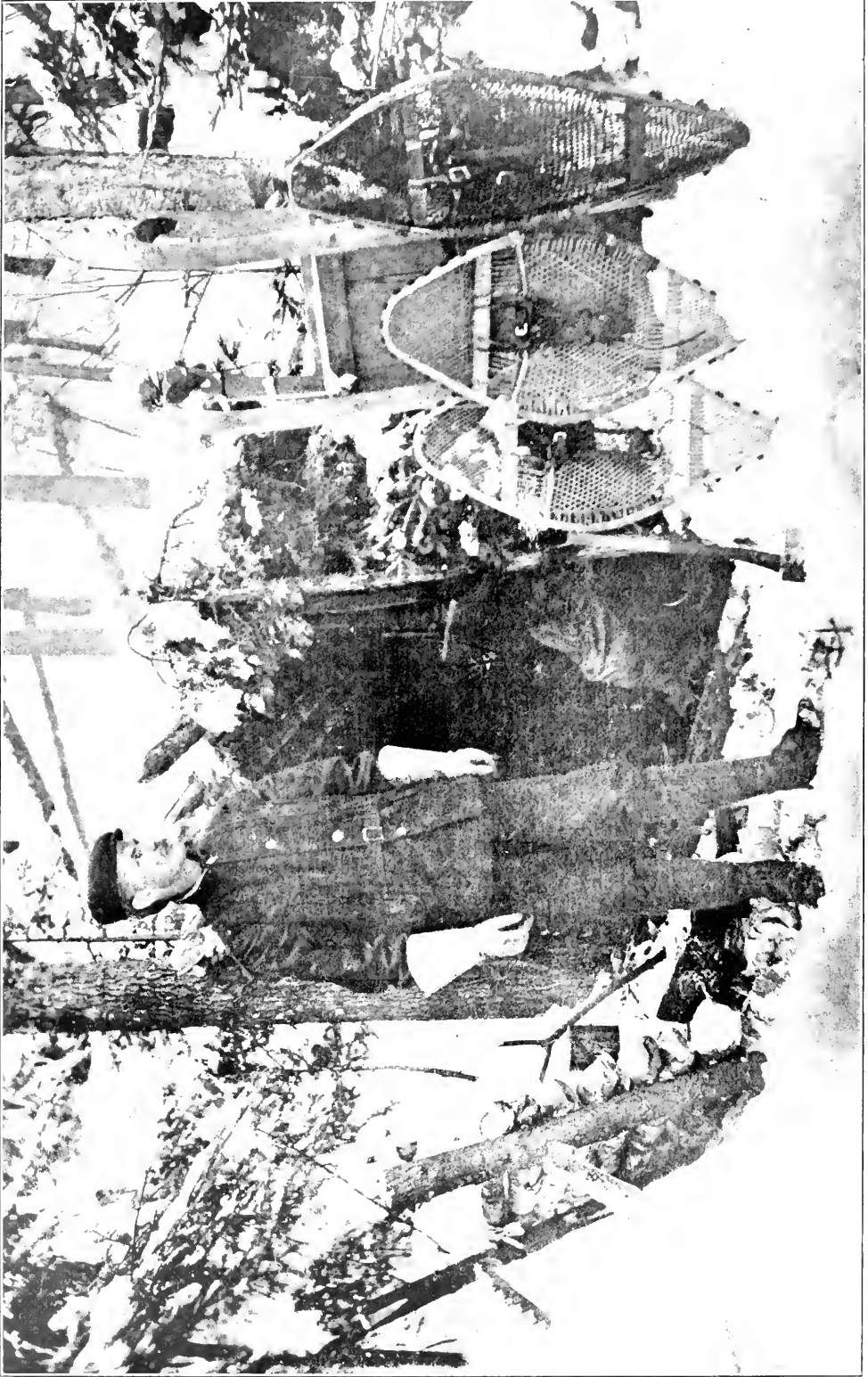
The Arcadia of Wild Animals.

Neither is there any terror, usually, but rather an exultant sense of power and victory in running away. Watch the deer, yonder, in his magnificent rush, light and swift as a hawk, over ground where other feet than his must halt and creep; watch the partridge in that clean, sure, curving plunge into the safety and shelter of the evergreen swamp. Hoof and wing alike seem to laugh at the danger behind, and to rejoice in their splendid power and training.

Arcadia

This simple fact, so glad in itself, so obvious to one who keeps his eyes open in Nature's world, is mentioned here by way of invitation—to assure the reader that, if he enter this school of the woods, he will see little truly of that which made his heart ache in his own sad world; no tragedies or footlight effects of woes and struggles, but rather a wholesome, cheerful life to make one glad and send him back to his own school with deeper wisdom and renewed courage.—*William J. Long in "School of the Woods."*





DR. LONG AT A WINTER COMMOUSE IN THE NORTHERN WOODS.

This is usually a one night camp made on the trail at sundown.

REGARD WOOD FOLK'S HOMES NEAR TO NATURE THE SAME AS OUR OWN.

We would not feel comfortable if a big barbarian came into our quiet home, broke the door down, whacked his war-club on the furniture, and whooped his battle yell. We could hardly be natural under the circumstances. Our true dispositions would hide themselves. We might even vacate the house bodily. Just so Wood Folk. Only as you copy their ways can you expect to share their life and their secrets.—*William J. Long in "Secrets of the Woods."*



THE GUIDE TO NATURE

EDUCATION AND RECREATION

VOL II

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No. 12



Rev. William J. Long's Homes and Work

BY EDWARD F. BIGELOW, SOUND BEACH, CONNECTICUT

(Continued from Last Month)



It has been his custom for many years, in a life of constant hard work, to go to the great north woods every summer or winter for his vacation. "You study there, of course?"

I suggested, thinking of his long training as a student. "If I do, it is unconscious," he answered, "and I never think of it as animal study. In fact you cannot go to nature with a gun and hold her up, and make her give you a fact or tell you a story. When I go to the woods I go for a vacation, and then I write for others my vacation interest. Life there is simple and very quiet, and as close to the ground as possible. It may seem the wildest kind of a theory to you, but I never like to wear rubbers which are non-conductors, be-

tween me and mother earth. The point is, that a man must get the spirit as well as the body of a thing before he understands it. And to get the spirit of a man or an animal, or even of mother earth, is not so much a matter of observation as of keeping one's heart open, that the spirit may enter in."

"Rather pantheistic," I suggested.

"I suppose so," he said, "but to me all nature is alive and responsive. Even the trees seem half conscious. In fact, I cannot bring myself to cut down a good tree. In the winter, when I am off in the far north and a fire means life, I never cut a living tree if I can find a dead one. With nothing but trees for a hundred miles on every side of me, I often go poking around for half an hour before I can find just the useless trees that will do



"IN A BUSINESS BLOCK IN THE CENTER OF STAMFORD, IN A FRONT ROOM ON THE NOISIEST PART OF THE CITY SQUARE, IS DR. LONG'S NATURAL HISTORY STUDY."

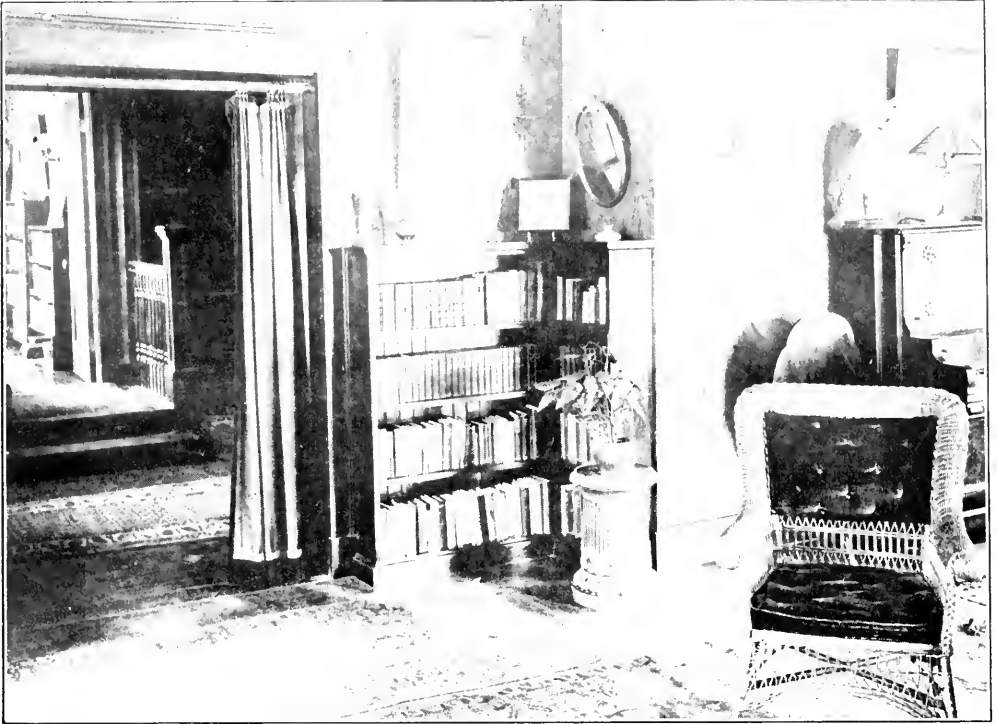
for my fire. An Indian or a woodman takes his axe and drives into the first good birch he sees, and I never can make him understand why he must let that tree alone and take a poorer one."

There in the woods, though he lets himself loose in play, as he has por-

trayed of the animals in his chapter "The Gladsome Life," he still sticks to his text,—that "every scrap." Not a track but is worthy of careful examination; not a motion but must be followed to its source; not an action but must be watched to see what it may tell of the life of the woods. He has



EXAMINING THE FIELD NOTEBOOKS.
Dr. Long often writes standing at the desk in the corner.



A VISTA FROM THE DRAWING ROOM AT "WORKADAY," THE NOROTON HILL HOME.



A COSEY CORNER IN "WORKADAY" DRAWING ROOM.

carefully studied the characteristics and habits of wild animals, thus enabling him, as the recent years show, to write so interestingly. He has a right to stir up all these facts of his long years of watching, as he does the papers on his floor—to kick away those he finds of no interest and pick up only those for which he has good use.

Many of the facts of nature seem useless because life is not long enough to utilize them. Many of the facts of literature do not benefit us because

fer you to your own good teachers whenever you doubt or hesitate to follow his leading. He only ventures to suggest timidly that all races and tribes of men have almost unconsciously chosen the twilight hour for their time of worship, expressing thereby the sad conviction that their religion like all their knowledge, is part light and part darkness. It is not well, therefore, to grow dogmatic or to be too sure about a thing so tender and beautiful, yet so immeasurable, as the twilight.



DR. LONG'S OUTDOOR BEDROOM ON SECOND STORY OF "WORKADAY."
(Photographed from the ground by telephoto.)

they lack human interest. Even the dogmas of religion may lack in benefit because not inspiring; even doubt therein, if not annihilated, may be turned to inspiration. Listen to what the Reverend Doctor says of dogmas and doubts in his charming allegory, "The Question of a Rabbit's Religion":

"Our next step into the unknown brings us to the beginnings of that human religion of which we are both thinking, and here the Rabbit must re-

And again, after Mr. MacGreggor's reference to Adam, he says: "Now the trouble with Adam was that he never was a boy, and so missed the most interesting part of his life, to say nothing of the knowledge and experience which only a boy can accumulate. That is precisely the trouble with Mr. MacGreggor's idea of religion, and indeed with most of your established religious standards. You forget that religion had a boyhood; that instead of being rational and theological, and



AT "CHIKPEK" (THE INDIAN NAME FOR "ALL STILL") CAMP IN THE NORTHERN WOODS.



AN INTERIOR VIEW OF "CHIKPEK."
Dr. Long mending a snow shoe.



A MIDDAY REST ON A LONG EXPEDITION.



EXAMINING A FINE SPECIMEN OF BEAVER.

therefore full of doubts, it was at one time natural and spontaneous and gladly sure of itself, as only boyhood knows how to be."

His message is always uplifting, inspiring, joyous. It rings true. In literature he says: "To read and enjoy good books is with us, as with Chaucer, the main thing; to analyze the author's style or explain our own enjoyment seems of secondary and small importance."

In nature he sees the gladness of life: "The fact is, nature takes care of her creatures so well—gives them food without care, soft colors to hide them, and nimble legs to run away with—that, so far as I have ever observed, they seldom have a thought in their heads for anything but the plain comfort and gladness of living."

The author of "school of the woods" regards the winter woods as even more fascinating than the woods of summer. Often in midwinter, when he takes a brief vacation, he goes far north and follows on snowshoes wherever the wild tracks lead, often making camp alone wherever night overtakes him. His special interest then is the big timber wolves, which he regards as the wildest and the keenest of animals.

"But isn't there danger of freezing

without a blanket, or of being attacked by the wolves?" I questioned.

"Not a bit," he answered. "With a good ax, such as I carry on my belt, and with a compass and waterproof box of matches, which are always in my pocket, a man can be at home and fairly comfortable anywhere in the woods, no matter how cold it is. As for the wolves, the ferocious stories we hear about them are just hunters' yarns. Oh, yes, I have had them howling around my camp, and have had them follow my trail; but I have yet to find one that seems to me as dangerous as a house dog. Like all

and on their own basis as one of them. He is as much at home in the woods as they are. When a swift river or thin ice is to be crossed and the trail grows dangerous, he never lets another man go ahead of him; and when the lake is wild and white-capped and a journey must be made, it is generally his canoe that slips out past the sheltering point. So the guides have long since accepted him as one of the craft. He chuckles now when he tells of how he stopped at Kineo, one day on his way to his summer camp, with his ax and "turkey," and the hotel man sent him off to feed at



DR. LONG'S SUMMER CAMP, "KILLOOLEET" THE WHITE-THROATED SPARROW.

He dedicates "Wilderness Ways" to "Killooleet," Little Sweet-Voice, who shares my camp and makes sunshine as I work and play."

other wild animals, they are curious about you when they find you quiet in the woods, and like all others they run away, if they can, when you approach them."

In earlier years Dr. Long went to the big woods alone, or with a single companion, and learned how to do things by doing them. Of late years he is often accompanied by guides and Indians, though he still prefers to go with a single companion who loves the woods and the work as he does himself. He is much loved by the guides in the great north woods, because he meets them as man to man,

the guide's table. Of course this familiarity brings about some amusing situations. The guides greet him with a hearty "Hello, Doc" after a half hour's acquaintance, and both they and he understand the matter perfectly. But once a good old Bishop who followed his trail was shocked by such familiarity, and maintained that a clergyman should always keep up his dignity. Imagine the Bishop's consternation when one of the guides, meeting him, called out cheerily: "Hello, Bish, how'd you like to try the trout this morning"?

Upon inquiry as to which of his

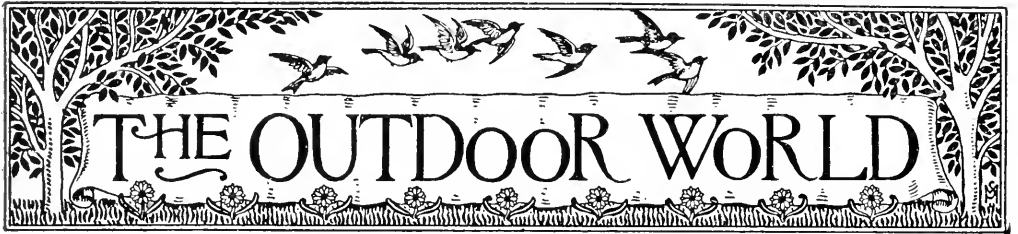
books he likes the best I was glad to hear him reply, "An author is seldom a good judge of his own works, but personally I like "Brier Patch Philosophy". That book, of course, is not to be read for the story, but for the thought that is in it."

It is probable that his readers like best "Beasts of the Field and Fowls of the Air," with "Northern Trails" and "School of the Woods" as close seconds.

As preacher, as scholar, as naturalist, he has done and is doing a good work. His home has always been near to nature, and would be though the anvils were ringing across the street.

Every mail brings to him appreciative letters from children, old and young, in all parts of the world, who are reading his books, but in no place is he so much appreciated among people of all ages as in Stamford and vicinity where he is best known.

Long may he live to tell us the interests and inspirations of good literature, the joys and refreshments of nature, the hope and cheer of life, and even of death, as portrayed by his philosophic Rabbit in the meditation upon "Immortality": "It would be most irrational, even for a Rabbit, to suppose that Nature has told him truth every hour of his long life only to whisper a falsehood at the last moment.



The City Park an Educational Medium.

BY J. J. LEVISON, M. F., ARBORCULTURIST,
BROOKLYN, N. Y., PARK DEPARTMENT.

Municipal parks are not, as is generally supposed, the mere pleasure grounds of the people. In many respects they play as important a part in the development of the future citizen as any other educational institution. What a wonderful training school the parks could be turned into for the development of character, for the training of the observative powers and the aesthetic judgment, for physical improvement and for inspiring the youth with a love for nature.

Nature in all its aspects and through all its seasons, never fails to elicit our admiration and always tends to convey emotions that are in accord with the highest refinement of the soul. One would therefore suppose that these beauties of nature gathered in a park and spread out in the heart of a busy city, would supply a void in the existence of every child that would be much appreciated and taken advantage

of. Still this is not always so and we often hear the cry that our city boys and girls are not interested in such subjects. In fact, I find many of them showing a malicious regardlessness for the shrubs and trees of our parks. Boys will often trample on valuable shrubs, remove tree labels, cut the bark of trees and break the leaders of young pine and spruce specimens. And still the fault is not altogether theirs for they have never been taught to observe nature; and these gifts of public munificence have not gained their appreciation. Living away from nature, how many of them were ever taken to the parks and fields and brought in closer touch with the trees or birds that may be found there? How many of them know the names of the simplest trees in their neighboring parks? How many of them have been induced to visit the parks at different seasons and asked to discuss their observations in the class room or at home?

In the earlier days, the child was a child of nature and there was no call

for such special efforts to bring the child in close touch with nature. Education then meant a knowledge of the classics. But today, with surroundings purely cosmopolitan and educational methods strongly scientific and with the increased interest in agriculture and forestry, we must take steps to give the children a better understanding and appreciation of what they can find in their parks. Once you interest them and train them to see the hidden treasures around them, the rest will take care of itself. You just set the pace and they will soon flock to the parks of their own accord and unconsciously utilize every spare moment in the highest form of development.

Now, how can that be best accomplished? Principally by a close cooperation between teachers, parents and park authorities. The teachers and parents must induce the children to use the parks frequently and the park officials must take the proper means of making these places attractive to them and of facilitating every opportunity for studying the trees and other natural objects. The duties of the teachers and parents need very little comment. Let the trips to the parks be as frequent as possible. Let all observations be made in the field. Discard all books, and follow the rambles with discussion or composition.

The program for the park authorities is a much untried one and I can only cite my own practices by way of suggestion.

First: Have the representative trees, labelled in bold type, giving the common and latin name, the general locality and the family to which the species belongs. In case of small parks it becomes practical to draw up a map showing the exact location of each tree and shrub and to accompany that with a list of names and distinguishing characters of each specimen. A list of this sort was published by the Children's Museum located in Bedford Park, Brooklyn, and proved a great help to the pupils of the neighboring schools.

Second: Attractive circulars showing the interesting parts of the parks, are very helpful in acquainting one

with the best there is to be seen.

Third: Lectures on the local parks, illustrated with stereopticon views will go a great way to stimulate a desire to visit the places shown on the screen. In New York City, I have the opportunity to present these lectures through its Board of Education and through private organizations.

Fourth: Cooperation with the schools on Arbor Day. Arbor Day is the principal day in the year when the child and the local tree department can work in unison. In Brooklyn we plant trees in the front of the different schools on that day, and invite the children to take part in the planting and other ceremonies. I address them from their school platform and distribute appropriate literature through the press and other sources.

Nature's Drum-Corps.

BY FRED E. BROOKS, MORGANTOWN, W. VA.

Among all the musicians of our eastern woods the male ruffed grouse ranks as the leader of the drum-corps. His rigid pose when "at attention" and his military bearing while beating his roll leave little need for other insignia of office, but, when in the early spring from a tent of underbrush his mellow reveille sounds forth over hill and vale we unquestionably salute him as the duly commissioned captain of the band. Another drummer of no mean ability is the nighthawk. In the spring when the white oak leaves have grown to the size of a gray squirrel's feet is the time, and a hilltop in a partially wooded locality the place, to look and listen for this performer. About sundown the birds are apt to appear, perhaps half a dozen at a time, scattered far apart, high in the air, moving in graceful but erratic flight. Noiselessly they come but soon from one of the distant birds will be heard a sharp, rasping note like that made by a woodcock as it ascends into the air during the peculiar spiral flight of its twilight performance, which is familiar to many country boys. The note of the nighthawk is likely to be repeated three or four times at short intervals. Then will come another period of silence, when again a series of the rasping



THE FLICKER.

"The woodpeckers are adepts at this sort of music making."

notes will be given. Just after such a series of notes, if your eye is fixed upon the bird, you may see it curve its wings beneath its body and shoot downward through the air like a meteor. The course of this flight is usually in the direction of another nighthawk flying at a much lower level. Down, down it goes, passing the other bird, and, when you have about made up your mind that it is coming to earth to be crushed by the impact due to its terrific speed it begins to describe a beautiful curve and to again mount upward. Just as it turns in its course there resounds from the bird a bugle-like drum-roll that to my mind is one of the most weirdly musical notes in nature. The sound is

said to be made by the flutter of the wing feathers as the air passes through them. Usually it is not heard many times during an evening, even under the most favorable conditions for the birds are somewhat chary in displaying this talent.

The male Wilson's snipe is also something of a drummer in his way but it seems to me that the most resourceful and perhaps the most interesting of all this class of musicians are the birds and other animals that beat a tattoo by striking upon some solid substance foreign to their bodies. This method of drumming is practiced by several species of birds, mammals, reptiles and insects and the sound may be made, either as a love call, a warning, a challenge to an enemy or an expression of fear.

The woodpeckers are adepts at this sort of music making. There are several species that during the mating season will select a resonant dead limb or the hollow shell of a tree and make the welkin ring with the long-drawn rolls which they beat with their beaks. Last spring a pair of flickers nested in the decaying limb of a tree growing on the campus of the university at Morgantown. On the roof of one of the school buildings nearby is a piece of ornamental sheet metal which was selected by the male as his favorite drumming place. Nearly every morning when the weather was fair he would take his perch on this piece of metal and entertain the public with a concert of tinny-sounding rolls interspersed with nasal "kee-yers" from his own vocal organs.

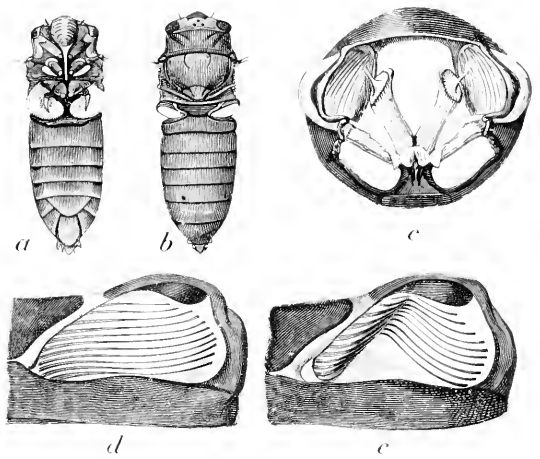
We have at least one proficient drummer among the mammals. This is the little white-footed mouse, or "deer mouse," or "woods mouse" as it is variously called. I first heard its drum in the summer of 1924 while camping in the Allegheny mountains. We had some boxes of provisions piled in one corner of our camp which the white-footed mice soon found and began to visit nightly. It happened that in sleeping my head rested against one of these boxes and every night I could hear the mice running about, squealing and making other sounds

within the box. One sound which was frequently heard, a peculiar, subdued drum-roll, I did not understand until some years later when I saw and heard it made by mice of the same kind which I had in captivity. The captive mice were kept in a cage made of wood and woven wire. Among them were two males which seemed to be jealous of each other, and when one was feeding and the other would approach too near the one that had the food, would lift its dainty forefoot and beat a lively rattle, usually on a thin board that formed a part of the cage. Very often

been as many as two hundred of the caterpillars, a few feeding on the green leaves but most of them resting on the dried remnants of leaves with which the nest was filled. Suddenly, as by a common impulse, every caterpillar raised the front half of the body and began in unison to swing the head rapidly to the right and left. At each beat most of the caterpillars struck the dried leaves with sufficient force to create a rustling sound. The sound was heard as a succession of beats like that made by a dog or fox trotting over dried leaves and was loud enough to

The musical apparatus of the periodical Cicada: *a*, view from beneath, showing the plates (light colored) covering the sounding disks; *b*, dorsal view, the timbals showing as light-colored areas; *c*, section at base of abdomen, showing attachment of large muscles to timbals; *d*, timbal greatly enlarged, in normal position; *e*, same drawn forcibly in by the action of one of the muscles, as in singing.

The noise of the cicada is a drumming, and is really like an extremely rapid drumming upon the bottom of a tin pan. The membrane at the base of the abdomen is corrugated and by muscular attachments is pulled in and out rapidly so as to produce the effect of driving in and out the bottom of the tin pan in question. In fact, the name of one of the Indian genera of cicadas is *Dundubia*, coming from the old Sanskrit word "dudub" (a beautiful descriptive word, by the way), which means a drum.—L. O. Howard, Chief of Bureau of Entomology, Washington, D. C.



Cut from U. S. Department of Agriculture.

the other mouse would respond in the same manner and the challenge would be given back and forth several times.

Several species of insects are known to attract their mates with a sound made by striking upon some object. The little "death-watch" whose tick is often heard coming from the wood about old buildings is a familiar example. The ticking sound is made by the male beating its head against the wall of its burrow in the wood and instead of making the sound to warn those who hear it of impending disaster it is simply tapping a serenade to its lady love.

I was once watching a colony of caterpillars, of the species commonly known as "fall web-worm," as they rested on the leaves of an apple limb which they had enclosed in their large, loosely-woven tent. There must have

been audible several rods away. After the motion had subsided I tried to startle the caterpillars into repeating it, but, try as I would, I could not induce them to perform again. Just what prompted the strange action I have never been able to understand but the measured beat of the caterpillars and the rhythmic sound which they made clearly entitles them to a place in the drum-corps.

When a small boy, I was one day teasing a blacksnake which I had found in the woods. As I thrust at it with a long stick I was surprised to hear what seemed to be the whir of a rattlesnake. At first I thought I might be mistaken as to the kind of snake with which I was playing but a little later the sound was explained when I saw the rapidly vibrating tail of the blacksnake beating on a dried leaf and making thereby a

very good imitation of the rattle of the venomous species. As I continued to follow the snake the rattling was repeated so often that I was half inclined to the belief that it intentionally placed its fluttering tail against the dried leaves on the ground in order to imitate the sound made by a rattlesnake and thereby to frighten away its enemy. I have since noticed that several of our common harmless snakes have this same habit of fluttering the tail when excited.

The list of animals that make such mechanical, drumming sounds, in order one way or another to promote their well being, will be seen to be of considerable length and to include species of widely separated classes. It is an interesting accomplishment and the naturalist who is so fortunate as to live in the country or who can take occasional rambles through the woods and fields will be interested in looking for recruits to enlarge the corps of drum-musicians as given here.

Opossums, Moving Northward, Are Found in Connecticut.

BY GEORGE W. LOCKWOOD, LONG RIDGE, CONN.

During the past year that rather cute little animal, the opossum, has been brought forward into the lime light of publicity in a degree hitherto unknown. By some it is prominent as furnishing the entree to a Taft dinner; by others it is regarded as an animal peculiar to the South. To a comparative few it is known that the opossum has of late years wandered as far north as Connecticut, but such is the fact. As a buyer of raw furs during the winter season, I have had an opportunity of following its movements in this section to better advantage than most persons. Thinking the readers of THE GUIDE TO NATURE might be interested I hereby present them with the results of my observations.

It is about twelve or thirteen years ago since I first bought an opossum of a Connecticut trapper, a man named Hawley, who lived just outside New Canaan. Needless to say it was regarded as a great curiosity both by Mr. Hawley's neighbors and by my



A CONNECTICUT OPOSSUM.

Captured by Mr. Paul Lockwood at Long Ridge, Connecticut, and now in Arcadia's pet house.

own, the general opinion being that it must have been a pet that had managed to escape from captivity only to meet its death in a trap set for a skunk.

Four or five years from that time I received through the mail an urgent request to come to Bedford, which is in New York just over the state line, a young lad having caught a silver fox. This latter animal which is very valuable is entirely unknown in this section, so I immediately came to the conclusion that the lad had caught a gray fox which is common and very cheap. Nevertheless I made the trip to Bedford and found that the lad's capture was an opossum. From that time to this I have known hardly a season in which these animals have not been found, and in increasing numbers, so that during the past season some twenty or thirty pelts were bought besides a couple of live ones which I brought home and sold to neighbors who were interested.

One of these persistently refused to eat until at last it died from starvation, while the other, evidently of a more

philosophical trend of mind, settled down contentedly in its new home and became so tame that the children took it to school with them. For weeks it was allowed to run at large, making its home in the barn and coming regularly for its meals, but at last it probably wandered too far afield and the taste of the wild became too strong to be overcome for it never returned. Several weeks later, however, a trapper in the neighborhood found an opossum under a dead fall set for a skunk, and this, I presume, marked the end of the drama.

An opossum makes a very interesting pet. With its parchment-like ears, rat tail and pig-like snout and face, it is a never ending source of amuse-

ment. It is the greatest bluffer on earth. Aside from its feigning of death, which I did not find so confirmed a habit as report had led me to expect, it will upon being approached by man give an ugly snarl and wicked look, usually from the corner of its eye as unlike most wild animals it will seldom face one, and opening its mouth give an excellent view of an extremely white and needle-like set of teeth with altogether so vicious a look on its whole countenance that a stranger would think at least twice before hazarding any attempt at familiarity. But all this is pure bluff for I have never seen one make a single, genuine effort to bite or in any way inflict an injury.



Orchids.

(From *La Rue Holmes League*.)

BY JOHN E. LAGER, SUMMIT, N. J.

Many persons go into ecstasies when looking at cut orchid flowers placed in handsome vases in the florist's windows or when seeing an orchid plant in full bloom in a greenhouse, but comparatively few people know where and how these strange plants grow, and of the methods employed to bring them here to our greenhouses for cultivation.

In this short article we will speak only of exotic orchids. A number of these occur, beginning with Mexico and throughout Central America and southward to the mainland of South America proper, where the most gorgeous kinds are found on this hemisphere, for here is where the beautiful and unrivalled *Cattleyas* grow. The different species are scattered over wide areas of the mountain chains of Colombia, Venezuela, Guiana, Ecu-

dor and Brazil. Numerous and beautiful kinds are also found in the East Indies, Java, Borneo, Madagascar and the Phillipine Islands.

An erroneous impression is that these plants grow in swamps. This is not the case for no plants are more particular than the orchids in regard to pure air. Most of the species sought after are epiphytes or air plants; that is, the plants are usually found growing on trees where they attach themselves to the trunks or limbs in light and airy positions, rarely in dense shade. They do not take any nourishment from the tree which serves merely as a means or object to which to cling, the roots spreading and clinging over the surface of the bark and absorbing their food from the atmosphere.

The orchids are found chiefly along the edges of the forests or along the banks of streams and rivers, in fact anywhere where openings in the forest occur.



A NATIVE OF BRAZIL.

The *Cattleyas* rarely occur below two thousand feet above sea level and seldom go beyond forty-five hundred feet elevation. From the last mentioned elevation up to eight thousand feet and nine thousand feet a great number of species of orchids are found, some of which are very beautiful, such as *Miltonias* and *Odontoglossums* and many more. All of these love a cool and moist temperature. Still higher up in the colder climate many more exquisitely beautiful kinds are found, such as the *Masdevallias*. These however, although very beautiful, are rarely brought to this country owing to our hot summers. They grow in a continuous low temperature and it is almost impossible to imitate conditions here to make them thrive.

The collecting of the orchids proper is more or less the same in all the countries where they grow. Parties go out into the forests in twos or threes or sometimes more, carrying food for a week, also shotguns and ammunition, stringbags and the indispensable "machete." The latter is man's constant companion in the tropical for-

ests. Without it little could be accomplished. A camp is now selected and a ranch built of a few poles covered with palm leaves. During the day the men go about looking for the particular kind of orchid wanted, and when any are discovered the trees are as a rule cut down, the plants are stripped from the trunks or branches and put carefully in the string bag, the latter being first lined with green palm leaves so as to keep the plants fresh and to protect them from the sun.

The plants are now carried on men's backs to the village where a house of some kind is secured to store the plants in such a way that they are kept dry, shady and airy. After a sufficient quantity is accumulated the plants are packed in boxes made for the purpose from logs sawed into boards by hand. The boxes are well ventilated, and the



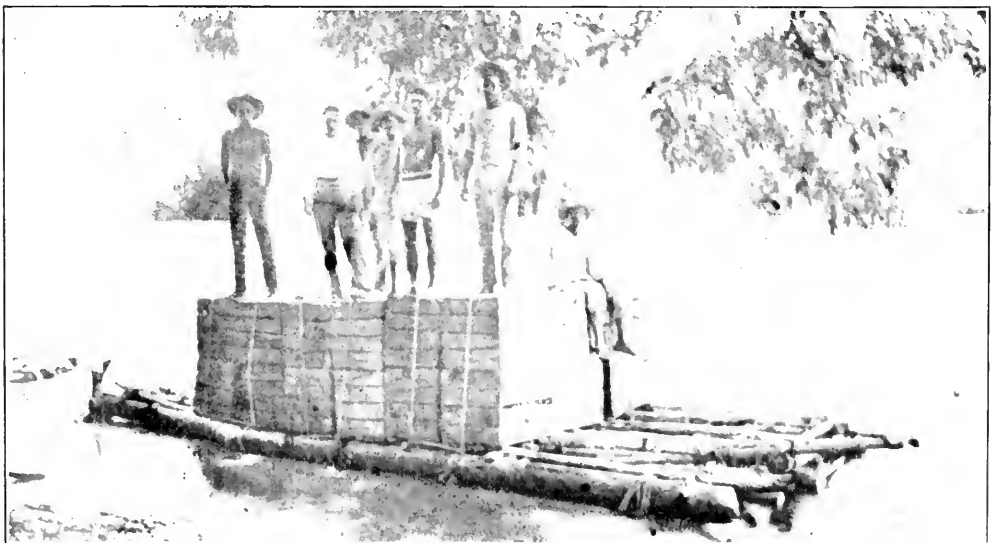
A DAINTY ORCHID FROM COLOMBIA.



A CATTLEYA FROM VENEZUELA.

plants packed in dry shavings to keep them from rotting in transit. They are now loaded on mules or oxen and transported to the nearest river and, if the journey takes several days or weeks, care must always be taken to see that the boxes are under cover when unloading—in the middle of the day to protect them from the burning sun, and at night from the rain. For this purpose tents are carried. Once

at the river the boxes are loaded on specially built rafts or in large canoes and floated down the river, sometimes with great danger, until a place is reached from which transportation by steamer can be obtained down to the coast where they are again embarked for Europe or the United States, where if the plants arrive in good condition they are made under proper culture to produce their beautiful flowers—some-



TRANSPORTING ORCHIDS ON A RAFT ON ONE OF THE RIVERS IN SOUTH AMERICA.

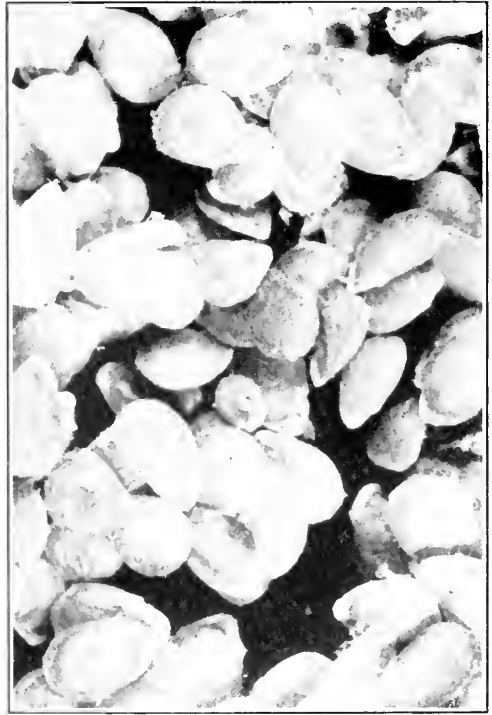
times in less than one year from the time the plants were taken from the trees in their native forests.

Many details and interesting incidents connected with this work must of necessity here be omitted, space not permitting any extensive treatment of the subject.

Some Rare Seeds.

In the year of 1892 while I was director of the first session of the nature study school at The Connecticut Agricultural College, Storrs, Connecticut, one of the teachers, Professor Gulley, horticulturist, made the statement before the class that he would give twenty-five (\$25.00) dollars for every potato ball found in the state of Connecticut. While I supposed he made this statement more as a matter of emphasis than to express actual commercial value, I at once thought to "turn the tables" on him. I took my hat and started for the potato field and tramped up and down between the rows searching in vain for even one ball.

To say I was surprised expresses it mildly, because it seemed but a day since as a boy in the potato field I picked up the balls by the quart. And I remember particularly how we used to have a game of throwing them at one another from the end of a pointed stick. But I could neither claim the twenty-five dollars nor prove the professor guilty of exaggeration. The statement that surprised me and the members of the class seemed useful as an illustration before other audiences, so for the last seven years, in various parts of the state of Connecticut, and at Teachers' Institutes in various other states from Maine to California, I have repeated the statement and have made requests for a supply of the balls. In the whole seven years only one response has come from the state of Connecticut, and that in the form of a little vestigial ball sent to me by a friend in Southport. The sender admitted that it could hardly claim the twenty-five dollars or discredit the fact that potato balls are never produced in Connecticut, because as is readily seen it

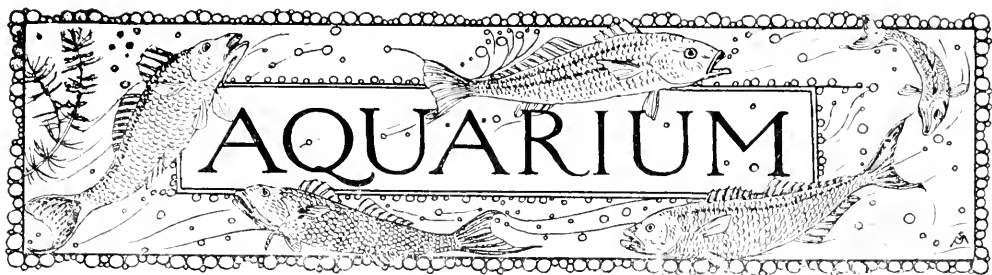


THE RARE SEEDS OF POTATOES.

is simply a memento of a forgotten past, since potatoes long ago discarded this as a usual method of seeding.

A few weeks ago, however, my request met with another response and a liberal supply was sent to me by Mr. J. J. Asper, Newport, Pennsylvania. I washed out the seeds from the tomato-like balls and spread them to dry on a glass. I took a few and photographed them slightly enlarged as shown in the accompanying illustration. These few were selected from the large quantity that I had, and placed separately on the glass, but imagine my mortification and disappointment when upon visiting the laboratory the next morning I found that I had only the few from which this photograph was made, because all the others had been eaten by mice. So the reader will see that my material for potato seed experiment is limited. Will not some one please come to my assistance and send me a further supply?





Aquatic Gardens in the Back Yard.

BY HERMAN BURGIN, M.A., M.D., PRESIDENT OF THE PHILADELPHIA AQUARIUM SOCIETY.

PHILADELPHIA, PENNSYLVANIA.

Most people have an idea that it is not within their reach to have aquatic gardens in their house yards, but almost any one having a good sunny exposure can at small cost and with moderate attention secure satisfactory results in the cultivation of pond lilies and a number of other aquatic and semi-aquatic plants. In addition, if it is desired to keep and breed goldfishes, some or all of the miniature ponds can be arranged to suit such purposes; in fact for several reasons it is better to always have the ponds in suitable form for the habitation of fishes, and this article will treat of such conditions only.

For convenience the subjects spoken of will be taken up in the following order: the containers in general; the plants; the fishes; the construction of the tanks; the making of ponds.

The following three sizes of tanks are desirable:

No. 1. Thirty-six by twenty-four by eight inches, holding about twenty gallons. This is a good size for the young fishes after they are hatched, as it better enables their examination and permits the easy discovery of any enemies. It is also the best depth for certain plants such as water poppies and other small aquatics.

No. 2. Thirty-six by twenty-four by twelve inches, holding about thirty gallons. This will do very well for about sixty fishes from one to two months old. As the stronger outgrow the general run they should be removed to larger tanks. If not kept crowded they then grow very fast if properly fed.

No. 3. Sixty by twenty-four by sixteen inches, holding one hundred gallons. This will be large enough for adult fishes and deep enough for any of the ordinary aquatic plants.

It is best to have at least one each of Nos. 1 and 2 and two of No. 3, so as to have of the latter one for the growing fishes and one for the adult fishes. They can be arranged in a parallelogram, taking up a space of about five by seven feet. However, each person can find various ways of arrangement that will be pleasing to his or her own sense of fitness.

If a tank is placed above the level of the ground an ordinary rubber hose can be utilized as a siphon to draw off the water; but for thorough cleaning it is more convenient to have an opening in the bottom. When the tank is embedded in the ground, which for many reasons is preferable, the latter is the only method that can be used. In this case a fairly deep well should be dug under the tank to facilitate the emptying.

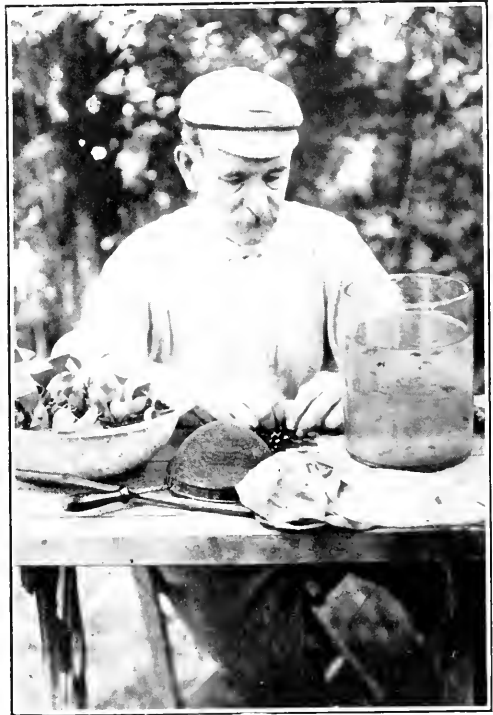
The pictures accompanying this article indicate how an arrangement can be made of tanks to present an attractive appearance. One can see an admixture of nearly square, oblong and round containers. All are spaced so as to be easy of access and yet grouped to be effective. The tanks are of sizes mentioned in this article with the addition of half barrels and hogsheads. The angular spaces between the tanks and barrels are planted with what is commonly called "moneywort," a hardy, running plant that is always green and also gives a perfect show of yellow blossoms in June. The tall plants are semi-aquatics—the calamus or sweet flag and the so-called umbrella plant. The leaves seen floating are mostly

water lilies, though there are also water poppies.

The plants that most persons would desire are few in number. First, water lilies of different varieties are desirable. Certain of them are hardy and would live over winter in the deeper tanks if the earth does not freeze. Certain effective ones though are tender, so it is better to arrange to not expose any of them. Water lilies are gross feeders and require the richest soil procurable: a good formula is one quarter each of well rotted leaf mould and cow manure and one quarter each of potting soil and swamp muck. For pots I used the tin buckets that certain crackers come in. They are eight inches high and eight inches in diameter. The bails are kept on for convenience in handling and the tins are given inside and out a coating of asphaltum varnish. Experience has shown that the plants do well and bloom quite freely. They should be planted so that the sprout is just at the surface of the soil and, at starting, better not too deep in the water; later they can be placed about eight inches below the water surface. In a tank five by two feet four lilies will do nicely, but it is possible to crowd in five. As the leaves get old and as the flowers fade they must be removed, both for appearance's sake and to encourage new growth. In the late fall lift the pots out and place them in a cellar where the plants cannot freeze, keeping the soil just damp, and the lilies with few exceptions will carry over well. The ordinary white, the yellow, blue and Cape Cod are little trouble, but the pinks and reds are very uncertain. In the spring separate the plants, using the rhizomes with strong eyes, and proceed as before, giving the excess to start some one else on the hobby.

For the smaller aquatics, such as poppies, etc., use smaller tins, painted in the same manner with asphaltum, and grow in the more shallow tanks. It is not worth while to try to keep most of them over the winter, as success rarely comes. The expense is trifling to renew a plant or two and the increase is rapid. Of the semi-

aquatics, such as the umbrella plant, etc., the pots should be just below the surface of the water. Those that are not hardy can usually be kept in the



DR. BURGIN EXAMINING RECENTLY HATCHED GOLDFISH IN HIS BACK YARD AQUARIA.

house during the winter if the pot (tin bucket) be kept full of water all the time. There are many wild semi-aquatic plants that are handsome additions and easily obtained each year. Water hyacinths are very effective and can be grown in the shallow tanks by having an old agate ware pot of such depth as to be about an inch below the surface of the water and half filling it with rich earth; the hyacinths will soon root and repay with handsome bloom. The so-called "parrot's feather" is also easily grown in the same manner, and a patch of it is beautiful. Both of these latter plants will not winter and must be renewed each year; but, as they increase rapidly, only one or two starting plants are necessary. The use of tin receptacles is peculiarly my own idea, and it is largely because of their lightness and

of the small space occupied that they are preferable. At the pleasure of each person earthenware pots or wooden boxes can be used.

It is policy to prevent the breeding of mosquitoes, to have goldfishes in all aquatic gardens. And it is better to have fancy, Asiatic fishes rather than the common ones, as little more care is required. Of course I do not mean that any one, not a goldfish expert, shall start out with the expensive, fine fishes; but fair specimens of fringe tails, nymphs and telescopes can generally be obtained at moderate cost. Having four tanks, two large and two small, one can start with two pairs of fishes. Place a pair in each of the larger tanks, say in May, and have some plants that float in the water and at the same time possess many fibrous-like roots or foliage. The water hyacinths, myriophyllum and the so-called Washington grass, all usually sold by fish dealers, answer the purpose.

Some morning very early you will notice quite a commotion amongst the plants and upon inspection you will find small, semi-transparent globules adhering to them. These are the spawn of the fishes. Take out the plants carrying the eggs, adding additional plants in case more spawn should be deposited, and place them in one of the smaller tanks where they will hatch in about a week. The fishes usually deposit the eggs at intervals during a couple of hours, and if the eggs are not removed many will be eaten by the parents. The young fry after hatching do not require food during the first five days; after that for two weeks rice flour very sparingly dropped on the surface of the water will usually furnish sufficient food. Yet if access can be had to very green pond water containing minute animal matter, it is well to add a couple of quarts of it every day. In fact, when obtainable, the minute animal life from ponds is during the whole raising of the young fishes the best food for development.

When the fry is about one-half or three-quarters of an inch long the feeding of cooked oatmeal can begin, feeding daily but always removing an excess to prevent fouling the water by

the decomposition of the excess oatmeal. A good plan is to place the food in a fairly deep bowl which daily can be lifted out, water and all, and cleaned before putting in a new supply.

As the young fishes grow, put the adult fishes together in one large tank and place the larger of the young ones in the other. If there is much difference of growth use the second smaller tank as an intermediary, and shift them as required. This is necessary, as the larger often eat the smaller.

Usually tanks are made out of wood, and those commonly called the best are of cypress. There is no doubt that under conditions of moisture cypress is the most durable wood available, but durability is not the only quality required in fish tanks. Many occasions present themselves when it is necessary or desirable to empty the water for considerable periods of time. Under such conditions cypress is disappointing for it does not act well in changes from wet to dry; it will shrink, warp and crack, so that leaks are sure to occur when the tank comes in use again. It has also a gummy sap that does not disappear for a long time; in fact, it is this very sap that largely gives it the durability it possesses. In addition, for an amateur a serious objection is that it is a rather difficult wood to work. If, however, a cypress tank is kept filled and allowed sufficient time to become seasoned for fishes, it makes an excellent container.

White pine is easily worked and is comparatively little affected in changes from wet to dry. The sap, too, is rapidly extracted from it by water. Taking everything into consideration white pine is the best material for the construction of all wooden tanks. The quality should be fair for small boxes and very good for large tanks. It should be kiln dried but naturally seasoned and, if possible, lumber from rafted logs should be procured. This latter lumber is particularly suitable for fish purposes as the long soaking has already taken out most of the sap and we are thus enabled to utilize it much sooner for fishes. Whilst it is preferable to have planks without knots, still

it is not essential if the knots are solid and tight.

Spruce and Hemlock can be used when there is no likelihood of the water ever being emptied, and it is surprising how long both will last. But as they ought not to be allowed to dry out they are not convenient.

There is some diversity of opinion to fishes; but the majority idea seems to be that sheet zinc is not injurious to either plant or animal life, and that properly supported boxes made of it will give good tanks. With the required bracing they will weigh about the same as wooden tanks of similar size, and they have the advantage that they can be emptied and filled at pleasure without even the small leaks that always occur when a wooden tank is refilled. It has the objection that neither confervae or algae readily grow on the surface of the zinc or, if they grow at all, some condition generally causes them to become brown and die early.

Both cast and rolled iron tanks are obtainable, and no doubt if properly covered with a protective varnish will do quite well. Asphaltum, spar and boiled oil varnishes are probably the only ones that will prove satisfactory. These tanks are rather objectionable for the following reasons: first, they are quite heavy; secondly, if much rust is present the plants suffer; thirdly, to avoid rust constant attention is required in varnishing; fourthly, the algae will not attach itself to the freshly varnished surfaces. Notwithstanding all these objections they have been used with success.

Both slate and soapstone make excellent tanks as far as the healthful condition of plants and fishes are concerned. They both, however, have the very serious objections of great weight and (unless obtained second hand) considerable original expense. Otherwise beyond question they make the best tanks for out of doors; the soapstone probably being the better one, if choice exists.

Galvanized iron should *never* be used. Depending upon the newness of the receptacle, large or small quantities of hydrochloric acid, chloride of zinc and other chemicals are always present; an

entirely new vessel will kill all the fishes in a few hours and destroy the plants. The same comment applies to galvanized wire netting and it should not be made use of until it has been well seasoned by exposure to the weather. I have known all the fishes in a tank to be killed in one night by the rain washing through a new galvanized wire screen that had been put over to protect from some cats that were plundering.

Copper is another material that must not be used unless well tinned and again over that a coat of spar varnish. There is, however, always a doubt and it is better to avoid it altogether.

A tank even more than an aquarium should have a good surface of water exposed to the atmosphere, not only for aeration but also to enable light to reach the plants. Of necessity shallow boxes will have ample surface area, but the generally accepted design for deep tanks makes them too narrow; whereas the width should be at least one-third greater than the depth and better yet if twice as much. In other respects the form of a tank is entirely a matter of convenience.

A zinc tank is merely a box made of sheet zinc soldered together, with a protecting crate of wood, and it ought not to have a surface area greater than six square feet nor a depth of more than fourteen inches. The crate should fit tightly, having a nearly solid bottom with side strips at the top and bottom connected at the corners. The zinc box having been settled on the bottom of the crate, the free upper edge of the zinc is turned over on the edge of the top wooden strips and tacked fast. As there is very little strain on the crate it can be made of light wood.

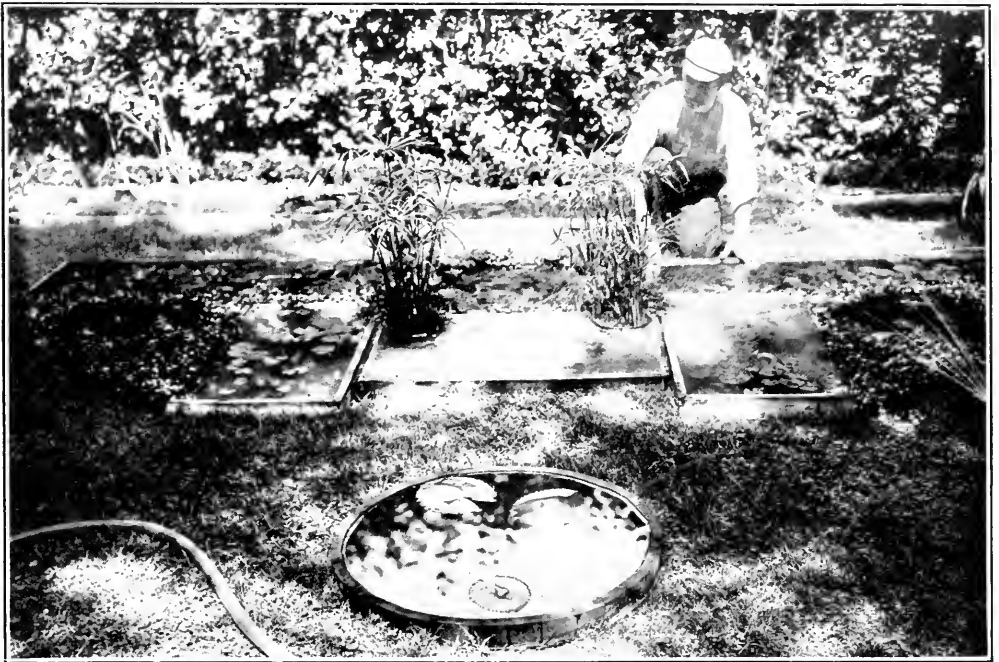
Stone tanks are of slabs of a thickness proportionate to the strength of the material. They are put together with screw bolts, the thread of the bolt engaging with a burr that is leaded fast in the opposing slab. White lead or other cementing material is used at the joints.

Cast and rolled iron tanks, like the last, will not likely be attempted by the amateur and no further notice of them need be made.

For wooden tanks some general rules can be given. The best width for bottom boards is eight inches. This spaces just right for five nails or screws and is a width kept in stock by lumber merchants; it is a trifle less than eight inches when planed. The bottom boards should be put on crosswise so as to have the shortest possible length exposed to warping. If the bottom is over thirty inches wide it is advisable to run a two-inch batten down the centre. In putting on the bottom boards do not force them together too tightly; all that is required is to get out the surplus cement and have the edges

very large tanks. For boxes of little depth angles cut out of tin-plate answer very well when painted.

All tanks that remain out in winter should have sloping sides to resist the action of ice, and the sides of all tanks with a greater depth than twelve inches are better sloped for the facility it affords for inspection; a slope of one and one-half inches to the foot is about right. Invariably in all nailing bore holes in the upper board for the nails, taking care when working on sloping sides to make the holes at the proper angle. These holes not only prevent splits but also help correct



DR. BURGIN AT THE TANK AND TUB AQUARIA IN THE BACK YARD.

parallel. When the water gets in it will swell up tight enough. The end pieces should never be fastened on the *ends* of the sides, but always be set *between* the sides. If the reverse plan is followed the swelling of the bottom will force the ends loose and leaks will invariably occur at the lower corners. Flat angle irons should always be adjusted on the upper corners. If sufficiently heavy and securely fastened these will obviate the use of rods and similar stays, excepting on

driving of the nails and assist materially to align when putting together. It is well to make all the requisite holes in each piece before starting to put it in place.

For fastening, nails, if used in sizes proportionate to the lumber, will be found secure enough, and whenever reference is made to nails they are always understood to be ordinary wire nails unless otherwise specified. For inch stuff eight penny "box" wire nails are long and heavy enough excepting

at the ends where it is well to use ten penny. For five quarters' stuff ten penny nails are used, excepting at the ends which require twelve penny.

When large tanks are made of heavy lumber spikes are required and generally rods bolted across the ends are necessary. In such tanks, too, the bottom planks are often run lengthwise and held in place by bolt rods running across and through them; but the tank should not be too long or else it will sway in the middle.

All lumber is not only more easily worked when planed but fits better and is more readily kept clean when in use. It can be purchased surfaced and all cut ends quickly succumb to an iron smoothing plane.

Try all work before cementing by lightly tacking together.

Cements, properly speaking, with wooden tanks are caulking materials and not cements, for they do not unite surfaces but fill up the spaces between them. For instance one method of making a tank tight is, before nailing, to bruise with a dull cold chisel a rough groove and in this groove lay a few strands of lamp wicking. When the tank is nailed together and water admitted the bruised wood swells into place again and makes a packing of the lamp wick. However, in this case the additional application of some white lead would probably make assurance doubly sure.

Stiff asphaltum varnish is a good cementing material. Common pitch answers if it can be kept soft while putting the tank together. White lead, red lead and zinc white can all be used in close seams. For the bottom boards a mixture of zinc, white, one part, and common putty, three parts, gives the best result. To repair corner leaks, when they occur, dry the box and pour melted pitch in the angles and work it in well with a hot iron. Generally the less cement used beyond what is necessary to level inequalities the better will be the union.

For an improvised tank an old wooden watering trough makes the best of all tanks. Casks in which olives are imported, cut in half and rehooped, furnish good tanks of about eight gal-

lons' capacity. The ordinary cedar washing tub does very well after proper soaking and seasoning. Wood fibre tubs are also very good. Petroleum barrels cut in half and burned out make fair small tanks, particularly when partly buried in the ground.

Barrels, however, that have contained whisky or other spirits, fatty matters, dyestuffs or anything injurious to life, must not be used unless one is certain that long seasoning has rendered them safe. It is better to avoid them altogether. It is well to remember, too, that until well seasoned all oak casks give off some tannin.

The soapstone washtubs are divided into compartments holding about twenty-five gallons and make fine tanks. The soapstone sinks are good also for shallow hatching boxes. A soap stone, porcelain or porcelain lined bath tub furnishes an excellent tank of very considerable capacity. For hatching and many operative purposes quite large agate ware basins are procurable and especially suitable.

If true ponds are desired instead of tanks we must consider that a pond is practically a tank of some water-tight material either placed or constructed below the level of the earth. Therefore a wooden box of any size, merely nailed together with the sides and bottom battened and all the joints pitched, can be put in the ground and termed a pond. The wood of such box need not be heavy as the surrounding soil takes up all the pressure. With such a general idea as a starting point such a crude method can be improved upon in various ways:

First. The sides can be sloped.

Second. The wood bottom can be left off and replaced with grouting and a cement finish.

Third. No wood need be used at all and all the dimensions be made of grouting and cement.

Fourth. The bottom remaining of grouting and cement, the sides can be built of either stone or brick.

In pond work there are several points to remember:

First. Lime mortar is not suitable as it will not harden. It is true that for brickwork in a greenhouse it can

be used, provided it is protected by a covering of cement; but in all cases outdoors hydraulic cement must be used for a successful result.

Second. The sides must slope considerably if the consequences of ice pressure are to be avoided.

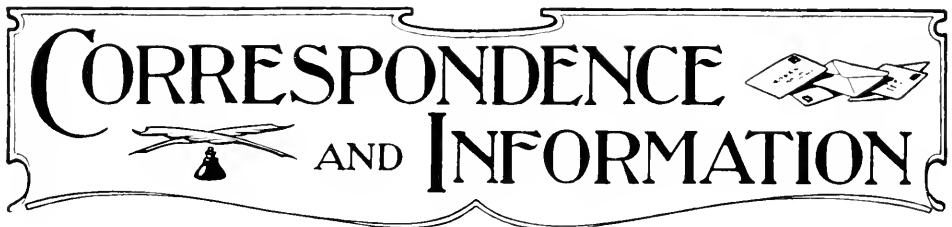
Third. Inasmuch as the bottom receives the weight it should be firmly set on the ground to prevent cracks from uneven settling. It is well to ram the earth before spreading the grouting.

Fourth. The center of pressure is two-thirds of the depth below the surface; therefore the sides up to this point should be as resistant as the bottom, but can be gradually thinned

down towards the top.

Fifth. In building a grouted or concrete tank avoid making it in sections. Try as far as possible to have all continuous and in particular never join old and new work at corners and angles.

Sixth. Great care must be taken that all cement lined ponds are thoroughly soaked with changes of water for weeks before admitting fishes; otherwise the caustic lime held in solution will seriously injure if not destroy them. The exact time of the soaking will depend upon the quality of the cement, the thickness of the wall and the number of changes of water.



CORRESPONDENCE AND INFORMATION

"The Man with the Hoe."

Johnstown, Pennsylvania.

To the Editor:

I have just read with interest the short story, "'The Man with the Hoe' at the Sunrise Party." Professor Nolan says, "His heart was fuller of the sordidness of hell than it was of the splendors of heaven, and that he did not see the sunrise though its glories shone all about him."

No! No! His heart was not full of the sordidness of hell—far from it. It was the novelty of the sunrise that made the college professor and his students rave over its glories. It is by no means fair to compare the intellect of an ordinary mountain farmer with that of a college student. If the farmer had been raised in a city he would doubtless have become as enthusiastic as any of that party. But he was not. During his entire life he has probably seen mountain sunrises or sunsets. Here was a bunch of "city folks" excited over a sunrise. "Umph, hell," was his remark, and he shows his contempt in a characteristic fashion.

Last summer, I left my home with a camping outfit and a twelve-foot rowboat. For two months I voyaged alone down the Ohio and Mississippi Rivers. What were my impressions as to the grandeur of sunrises and sunsets and of all nature? For the first few weeks my heart was full, and I revelled in the great beauties surrounding the mighty, silent river. I can vividly recall how I was thrilled as the sun was setting over the green hills; how I slipped silently over the glassy river, and how from the banks the quail called. It was worth the whole trip to enjoy those few grand moments.

But by the time I reached the mighty, terrible Mississippi, the glamour and the novelty had worn away. I still loved the sunrise and was thrilled by it but not in the same way. Nature was even more full of interest, more full of life and joy, but it was a deeper joy. It was not the kind to make me tell everybody I met how grand are nature and sunrises.

I became sick on the Mississippi and camped for a week with two tramps,

two men who were, externally, the toughest of the degraded. They were true friends. They knew what it was to be alone, friendless and sick, and they treated me like a brother. I learned to know them—their better selves. Don't you imagine they loved their river, the sunrises, the forests? Yes, sir! They loved them and with a sense as refined as ours who call ourselves cultured gentlemen.

If that "sunrise party" had slapped the old man on the back, given him a smoke and talked with him, not trying to point out to him the things he knew better than they did, they would have found a man better versed in the ways of nature than they were, and with a spirit as loving and appreciative as theirs.

Sincerely yours,
PHILIP W. WOLLE.

I am glad this good word has been said for "the man with the hoe;" it is well to weigh carefully both sides of a question. I, too, have known intimately—not only for a few days but for years—those who are "externally the toughest of the degraded," and yet who loved rivers and sunrises and forests "with a sense as refined as ours who call ourselves cultured gentlemen." There are thousands who live near to nature, as claimed by Mr. Wolle, who possess in a high degree refined feelings, strong sturdy love and lofty inspirations. But I believe that Mr. Wolle strengthens Professor Nolan's point. It is not in the individual but in the particular class typified by "the man with the hoe" that lies the trouble. It is not the occupation, not the country, but what the man represents. The members of the "sunrise party" had no opportunity to apply the jovial slapping nor to give the convivial smoke before the hell manifested itself. The trouble was not with the occupation, as Mr. Wolle proceeds to prove by the two men whom he knew, and who were "externally the toughest of the degraded."

Yes, I like Mr. Wolle's kindness of heart that prompts him to speak a good word for the representative man with the hoe, but the more the matter is considered from his point of view, the

stronger Professor Nolan's point seems to be.—E. F. B.

A Snake-Eating Frog.

Brooklyn, New York.

To the Editor:

The student of nature, meeting as he does, many strange and curious things in his daily tramps, becomes accustomed to anomalies. I must confess, however, that when my small boy told me that a wood frog in his vivarium, was devouring a snake, I was rather incredulous. I hastened



THE SNAKE-EATING FROG.

to the scene of action to see for myself this startling phenomenon. The beautiful little wood frog, *Rana sylvatica*, had been in the vivarium for some time. The evening before the boy had put a lively little garter snake in with the batrachians. The wood frog seemed to forget entirely his atavic dread of the reptile kind and promptly attempted to make a meal of the little snake. The accompanying photograph shows the frog struggling with a morsel far beyond his capacity. He worked for an entire day with a zeal worthy of a better cause but never succeeded in swallowing the last three inches of the snake. At the end of twenty-four hours he was obliged to give up the attempt altogether and to restore the snake to his native element.

JOHN. J. SCHOONHOVEN.

My First Sight of a Northern Shrike.
234 Willoughby Ave., Brooklyn, N. Y.
To the Editor:

Late in January, the twenty-seventh

to be exact, I had watched a full hour in Prospect Park for birds, and had seen absolutely nothing but one English sparrow. About to start home, disappointed, I caught a glimpse of a bird new to me, which I decided was at least as large as a catbird. He was somewhat hidden by the shrubbery but I felt pretty sure of black wings, black and white tail, a black spot near the eye, with most of the body very light grey, and bill stout. He was eating something most eagerly. Feathers kept falling to the ground, and by the bright red color he seemed to be feasting on raw meat. After finishing his repast he flew from tree to tree and disappeared.

Now was the time for thorough investigation which showed the remains of a small bird; we will hope it was an English sparrow, hanging on a strong twig about an inch long, the size of a stout thorn, growing from the main trunk of the shrub. The head and nearly all the flesh were gone as well as the tail feathers and long wing feathers. Just the skeleton and the legs were left with some of the rump feathers.

Then flashed across me the name, shrike, and little by little I recalled his other name of butcher bird and many things I had read of his habit of impaling beetles, mice and small birds on thorns or on barb wire fences. I remembered, too, that last fall, a few rods from this spot, I had seen a dead English sparrow wedged in the fork of a small tree, just above my reach. I tried my best to get it down, thinking I might find out what caused its death. Now I am quite ready to believe the northern shrike did the deed. I find he is also called the nine-killer and the nine-murder, from a curious belief that he kills just nine birds a day.

If one shrike kills nine English sparrows every day, how long would it

take all the shrikes to kill all the English sparrows in the country? Who will solve this problem?

CAROLINE M. HARTWELL.

A Brilliant and Long Continued Rainbow.

Belfast, Maine.

To the Editor:

One of the most brilliant and long continued rainbows ever seen in this section marked the close of the storm of September fourth and fifth. A southeast gale, with rain, had changed, by way of the south, to northwest squalls and showers. At about ten minutes past five on Sunday afternoon rainbow colors began to appear, and in six minutes the bow was complete. The northerly end showed between my position and a clump of bushes not thirty rods away, and the other end became entangled in a group still nearer. The colors were very solid and brilliant, and the gradations from one into another were most beautiful. After nine minutes of the complete bow a break was caused by a small patch of blue sky appearing in its track, but the bright coloring continued fifteen minutes in all. The last coloring faded at thirty-seven minutes after five, thus making the total time twenty-seven minutes.

JOHN S. FERNALD.

THE FAIRY WAND.

By Mrs. Emma Peirce, New York City.

When we entered our favorite wood
A magician had plainly been there,
For a change had come over it all,
There was mystery e'en in the air.

The conifers flashed in the sun
With a radiance new and serene;
Etherealized was each shrub,
In hiding each vestige of green.

An exquisite fabric like lace
Had been thrown over mossy mounds low;
Apotheosis wrought in a night
By the fairy-like wand of the snow.





The Heavens in April.

BY PROF. ALFRED MITCHELL, OF COLUMBIA UNIVERSITY.

The month of April will be the most important in the history of Halley's comet, and those who are interested in astronomy will now watch the skies with redoubled interest. The comet was discovered on September eleventh last while still three hundred millions of miles from the earth and sun, and seven months of time before it should swing past the sun at its closest approach. When the comet was picked up in the photograph of Max Wolf, it was so faint that only the largest telescopes in the world could find it, and it showed not the slightest trace of tail. During the past half year, the comet has brightened far too slowly to suit the average reader who has a fresh wonder served up daily with his morning paper. However, during March it has brightened enough to permit it to be seen with a three inch glass, but it did not have much of a tail, and was rather disappointing. As far as we know it has not become bright enough to be visible with the naked eye, though undoubtedly many thought they saw it. During April all this will be changed and the comet will undoubtedly blaze forth in the skies.

The diagrams show in a manner readily understood by all the characteristics of the comet's orbit. On April 20th the comet will be at perihelion, when it comes within fifty-four and one half million miles of the center of the sun. Then it turns in its course and starts on its long flight for thirty-eight years off into the depths of space to a distance of three thousand millions of miles. The closer and closer the comet comes to the sun, the more does the heat of the sun act on the material forming the head, and generate forces to throw off matter which eventually

forms the tail. We are not absolutely certain of the nature of the solid core of the comet, though the consensus of opinion seems to favor the idea that it is made up of solid bodies some large, some small, the whole being like a great number of meteorites moving along together. This lump which in some comets is six thousand or eight thousand miles in diameter, and in smaller comets not more than one hundred miles, is loosely packed together with large interspaces. Science is forced to this theory mainly on account of the action of Biela's comet.

This comet discovered in 1826 was a most interesting one. It had a short period of six and two third years, and calculations showed that its path came within twenty thousand miles of the earth's. That was sufficient to start a great comet scare—one of the many we have had—that the comet was going to collide with the earth, and as a result the earth was to be blown to pieces. This of course, proved that a "little knowledge is a very dangerous thing," for the calculations of the astronomer showed that the earth would arrive at the crucial point a month before the comet. As we now know, no harm came to the earth.

HOW TO FIND THE COMET

1910	Comet rises earlier than the sun	1910	Comet sets later than the sun
April 4	0 50	May 20	1 0
16	1 30	22	2 45
24	1 55	24	3 20
May 6	2 10	26	3 50
10	2 20	28	4 5
14	2 00	30	3 50
16	1 30		

Meanwhile, the comet is rapidly increasing in brightness. On February 3, Professor Barnard measured the length of tail to be five million miles,

and by February 27 this had increased to fourteen million. The tail will thus be long enough to reach past the earth on May 18, when the comet is fourteen million miles from the earth. We will cut through the tail, but the story of what we may see then will have to wait till later.

THE PLANETS.

Mercury is at superior conjunction on April 5, and will be invisible during the first of the month.

the planet.

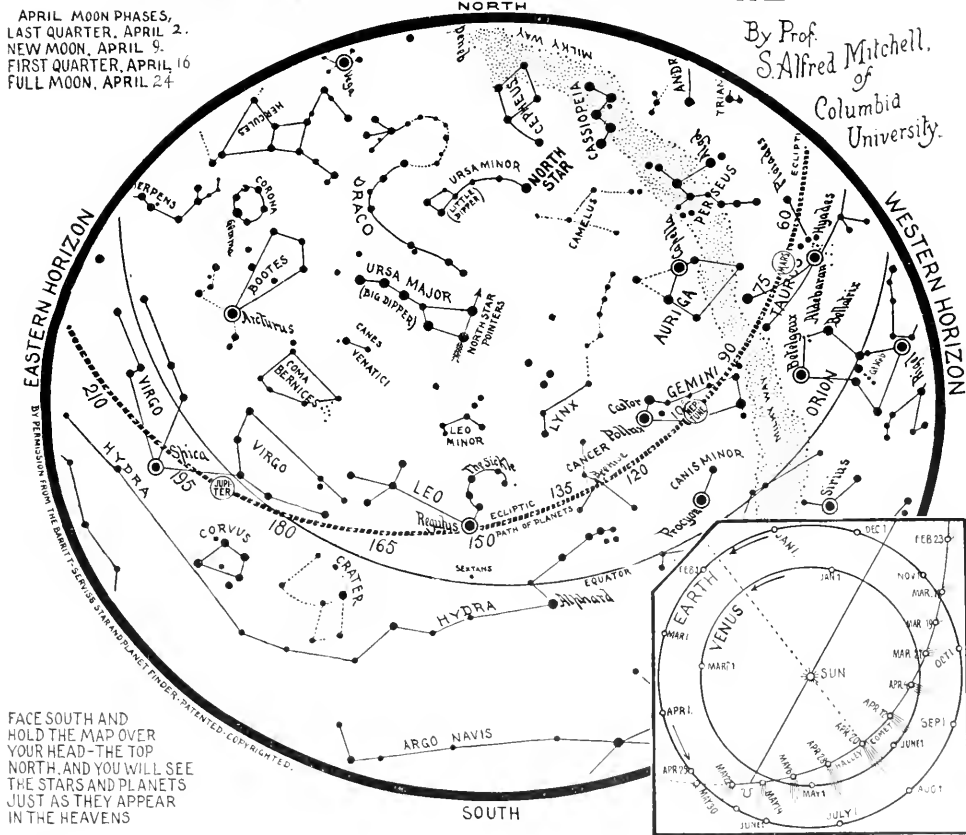
Jupiter has just passed opposition and is closest to the earth and brightest. At the first of the month it is on the meridian at midnight. The four brightest satellites are readily visible in a good pair of field glasses, and the belts of Jupiter, which are always interesting to an amateur, are seen with but a small telescope. On April 21, it will be in conjunction with the moon about midnight.

Saturn will be in conjunction with

EVENING SKY MAP FOR APRIL

APRIL MOON PHASES,
 LAST QUARTER, APRIL 2.
 NEW MOON, APRIL 9.
 FIRST QUARTER, APRIL 16
 FULL MOON, APRIL 24

By Prof. S. Alfred Mitchell,
 of
 Columbia
 University.



FACE SOUTH AND HOLD THE MAP OVER YOUR HEAD—THE TOP NORTH, AND YOU WILL SEE THE STARS AND PLANETS JUST AS THEY APPEAR IN THE HEAVENS

Venus is a morning star and for a couple of days before sunrise, is a brilliant object. On April 23 she is at her greatest elongation west from the sun, and the following day shows half her disk illuminated. When closest to Halley's comet, it will be 11° south of it.

Mars is slowly getting towards the west, now setting almost midnight. The diameter has decreased to 5 inches, so little of the detail may be seen on

the sun on April 16, and will not be visible this month.

Uranus will be at quadrature 90° west from the sun on April 15, and Neptune is 90° east from the sun in Gemma on April 6. It needs, however, a strong glass.

As usual the map represents the sky as it appears at 9 P. M. on the first of the month, at 8 P. M. on the 15th and 7 P. M. at the end.

THE CAMERA



Studies in Snow and Ice.

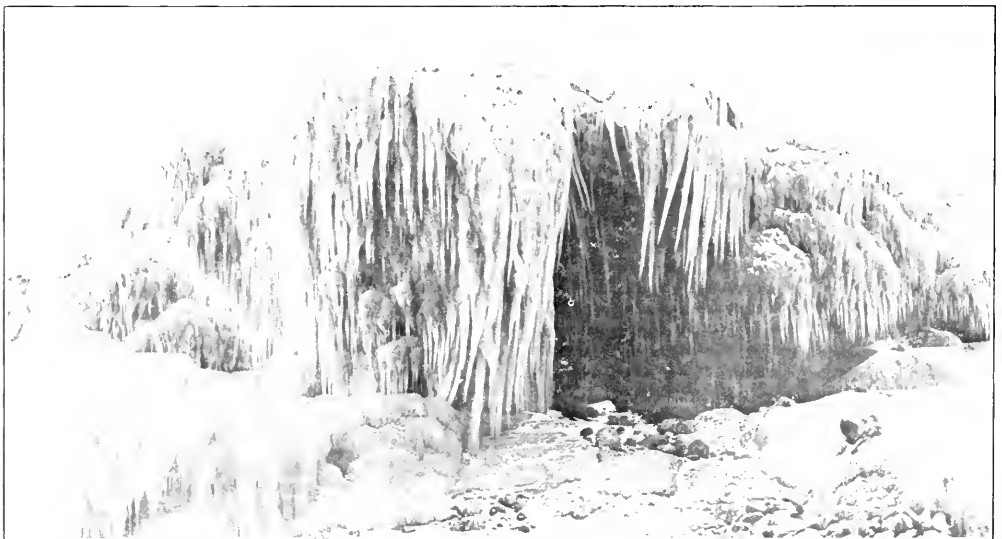
BY NELLIE B. PENDERGAST, DULUTH
MINN.

The photographer who would se-

cure good winter pictures must firmly believe in the motto "what's worth having is worth going after," and purchase the beautiful things at the cost



"THE BIG SPRUCE AND SNOW-LADEN BUSHES."



"EVERY PARTICLE OF WIND-DRIVEN MIST FREEZES ON WHATEVER IT TOUCHES."



A REMARKABLE STUDY OF SNOW-LADEN BRANCHES.

of wading through deep snow or facing icy winds—frequently both.

The big spruce and snow-laden

bushes is one of the rare instances where the Mountain came to Mahomet,

—being a bit of my own yard and



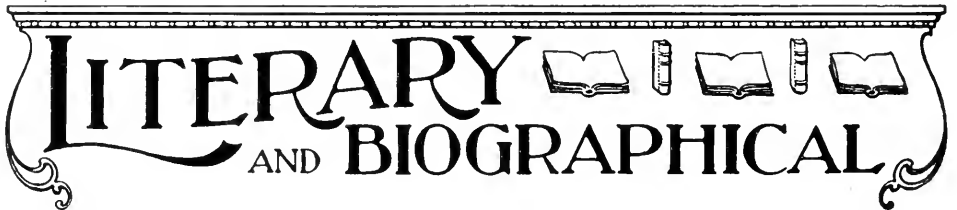
IN THE UNTRACKED PARK.

blossomed into beauty over night, and could be photographed comfortably through the open door of the shed: but usually there is no such luck.

The ice-bound branches and icicle-hung rock are souvenirs of the terrible temper of Gitchie Gumee,—being one of the late storms so dreaded by vesselmen, coming in the winter before the lake freezes, but when the weather is so cold that every drop of wave-flung spray and every particle of wind-driven mist freezes on whatever it touches. The branches are the top of a tree some 4 feet back from the edge of a 10 or 12 foot bank. They were able to bend with their load and es-

aped alive, but a larger tree some 5 or 6 inches through was snapped off like a pipe stem. The rock was secured by scrambling down steep, icy ledges and venturing out on broken cake-ice near shore—with due caution as to which cake one chose, and lively work to avoid frozen fingers.

The bit of snow-laden park cost nothing more strenuous than wading through about 2 feet of new snow—but then, who cares for such things after it is over and you have the pictures. The enthusiast is like the small boy who will go swimming, and philosophically accepts the inevitable "lickin'" on the ground that it was "wuth" it.



LITERARY AND BIOGRAPHICAL

Poultry Secrets. Gathered, Tested and Now Disclosed. By Michael K. Boyer. Philadelphia: Wilmer Atkinson Company.

The articles are short but the practical knowledge condensed into them is extensive. It gives the gist of much experience.

The Iris Manual. A Manual on the Phlox. A Manual on the Propagation and Cultivation of the Peony. By C. S. Harrison, York, Nebraska. To be obtained from the author at 25c each.

These are convenient and interesting manuals of the three flowers, per titles, and show that the author is not only a practical florist but has in addition the real love of the beautiful.

Are Bees Reflex Machines? Experimental Contributions to the Natural History of the Honey-bee. By H. V. Buttel-Reepen, Ph. D. Translated by Mary H. Geisler. Medina, Ohio: The A. I. Root Company.

These observations on the psychical faculties of honey-bees may be used as a general biology of the honey-bee. The author truly says: "It seems to me that the biological knowledge concerning *Apis mellifica* which has been gained by practical bee-keeping has scarcely entered scientific literature, and, strangely enough, the results are little regarded: it has not passed over into the flesh and blood of science."

A Year's Work In An Out-Apiary. An average of 114 and ½ pounds of honey per colony in a poor season, and how it was done. By G. M. Doolittle. Medina, Ohio: The A. I. Root Company.

While the book is intended for the specialist, it is none the less desirable for the plain, everyday keeper with his home apiary, or for the amateur with his five to ten colonies.

The House in the Water. A book of Animal Stories. By Charles G. D. Roberts. Boston, Massachusetts: L. C. Page & Company.

The name of this book is also that of the first chapter. There are other interesting stories of animals in the author's characteristic style.

The Marvelous Year. Introduction by Edwin Markham. Drawings by Gertrude Huebsch. New York City: B. W. Huebsch.

The book contains brief biographical sketches of the following persons born in 1809:

Edgar Allan Poe, Frederick Francois Chopin, Abraham Lincoln, Oliver Wendell Holmes, John Calvin, Samuel Johnson, Charles Darwin, Alfred, Lord Tennyson, Frances Anne Kemble, Franz Joseph Haydn, Nikolai Vasilievitch Gogol, William Ewart Gladstone, Felix Mendelssohn-Bartholdy and Edward Fitzgerald.

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