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THE humanistic view and the scientific view of the universe supplement each other; science corrects and guides sense, humanism enlarges and colors and vitalizes science.

* * * * *

Science reveals things as they are in and of themselves; literature, as they stand related to our mental and emotional condition and edification. One is not true and the other false; both are true in their own sphere, true as fact, and true as emotion and idea. Science explains the rainbow, but literature sees it as a symbol and a promise. So with the sunset or the sunrise. Science knows all about the diamond, but knows not why it is so prized by us. It explains the pearl, but not the pearl necklace.—John Burroughs in his recent book, "Under the Apple-trees."

Volume I **JUNE 1916** Number 1

PUBLISHED BY

THE AGASSIZ ASSOCIATION

ARCADIA: SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

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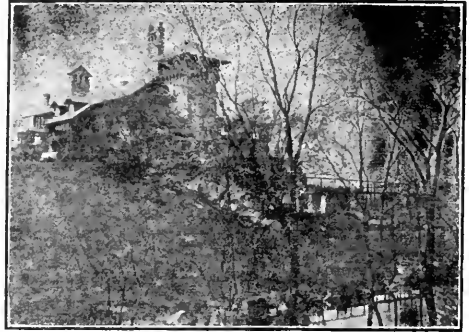
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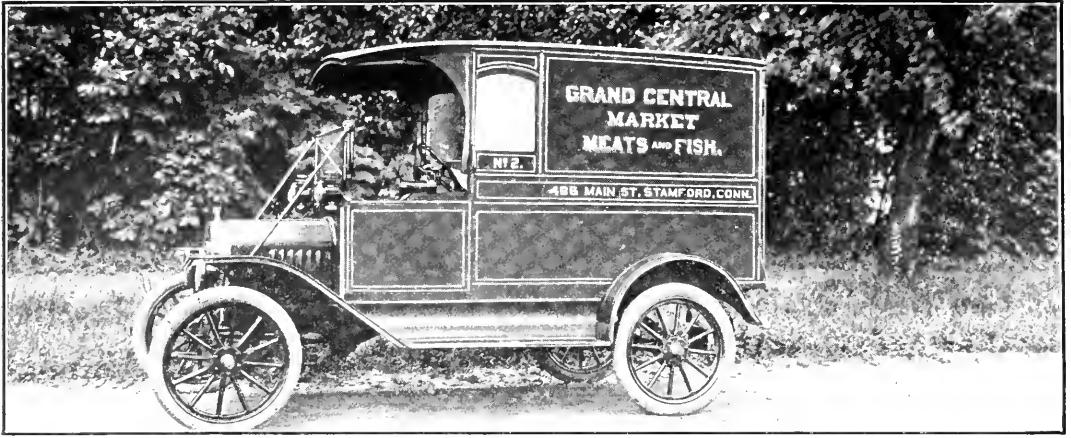
A Clover Conceit.

The clovers are a gypsy band
 Just running riot o'er the land,
 And gay, as courtiers were of old,
 All clad in crimson, white and gold.

On highways and on byways too, ,
 They hold high carnival, 'tis true,
 And nod in courtesy in the breeze!
 Dame Nature's truant children these.

They brighten all the country-side,
 And fling their fragrance far and wide;
 How much they add to man's abode,,
 These dear familiars of the road!

—Emma Peirce.



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This is one of the prettiest, daintiest little frocks that could be shown. In the picture it is made of rose colored taffeta and it is just as smart a little party frock as could be offered. If the model is needed for simpler occasions simple materials could be used and there are numberless pretty ones. To give the pretty dressy effect of the frill and the shirrings at the waist line, the upper edge of the skirt is finished and cord is inserted in tucks to be drawn up to the needed size. If a perfectly plain dress is wanted, the skirt can be cut off and joined to the bodice by means of a belt.

For the 6 year size will be needed, 3½ yards of material 27 inches wide, 2½ yards 36 or 2¼ yards 44, for the plain dress 1 yard 36 inches wide for the ruffles.

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Most of our flies which thrive under conditions created by man are introductions from Europe. The drone fly, for example, entered the United States about 1870 and in ten years became abundant over the whole country. It reached South America about twenty years ago and is now becoming abundant there. A related species entered New York in 1906 and has now reached Ohio. Only last year a new manure-breeding fly, already established in Brazil, appeared in Louisiana.

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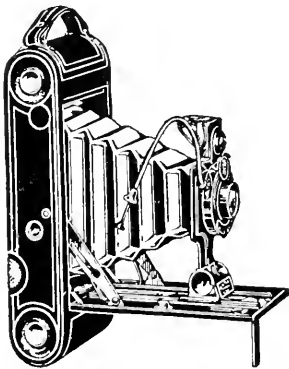
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Reasonable Prices.

During a severe earthquake, the safest spot is, no doubt, the middle of a ten-acre field. But if one must be indoors, the safest place in the house is the inside corner of a room. If the whole building goes, one is at least as well off as anywhere else. But very frequently it happens that one outer wall is thrown down, while the rest of the structure holds together. Since then there is no telling which outer wall it will be, the safest place is away from any in an inside corner.

In the forests of the United States, it has been calculated, as much wood as is used is destroyed by fire, and as much more is wasted by faulty lumbering. So we really get only a third of the product that belongs to us. How far we are from managing our timber supply efficiently appears from the fact that the Government reservations yield, on the average, twelve cubic feet of wood a year on each acre. But the national forests of Saxony average ninety-three!

Some Local Observations

Commodore Benedict and the Birds.

Every bird lover will be delighted to learn that Commodore E. C. Benedict of Greenwich has dedicated his three hundred acre estate at Indian Harbor as a sanctuary for birds and will have it thoroughly equipped under the auspices of The Greenwich Bird Protective Society, aided by such enthusiastic naturalists as Neil Morrow Ladd, Ernest Thompson Seton and others. The Commodore is an exemplification of the benefits of outdoor interest and love of all things natural. He has proved his love of the ocean by traveling many thousands of miles in the spirit of real love for the mighty deep, and he has extensively developed his estate along nature lines. He is an expert on all sorts of plants and has personally made botanical collections in many lands. He knows and loves the birds that frequent his ideal domains; our marine as well as our land birds know of the new development. Indian Harbor even more than ever before will be a Mecca for all birds, and for the Commodore's friends who with him appreciate the feathered songsters. His ideal fittings for the nesting and propagation will attract more birds than ever to this part of Connecticut. It is encouraging to note this good example. May many others follow it.

The Commodore is second in the line of owners of large estates in Greenwich that have thus devoted their territory to the birds. As has been previously announced, Mr. E. C. Converse at Conyers Manor began a few months ago to install a similar equipment, with the cooperation of The Greenwich Bird Protective Society. These efforts in behalf of our birds, not only on an extensive scale but among hundreds of people who have smaller places, are having their pleasing effect. It seems as if our spring birds were never before so interesting and enjoyable and plentiful.

Were Nature many miles away,
Express you'd take without delay;
But since she's waiting at your door,
You simply pass her by, ignore.

—Emma Peirce.

Extensive Photo-Developing Facilities.

Mr. W. A. McClelland, 345 Atlantic Street, Stamford, Connecticut, the well-known, popular dealer in optical apparatus with cameras as a specialty, has recently acquired a complete equipment for developing amateur work on a larger scale than ever before. Such work in this vicinity seems to be increasing, especially in the summer when it taxes everyone's ordinary facilities. The news that we have at our disposal greater facilities for producing high grade work promptly will be received with delight by our amateur photographers.

Put a Dandelion with the Carnation.

[A LETTER IN THE STAMFORD ADVOCATE,
MAY 13, BY EDWARD F. BIGELOW].

It is indeed beautiful to celebrate Mother's Day in May, the month when all nature is mother of beauty and usefulness. It is fitting that this celebration should be on a Sunday when more than on other days all the family is gathered at home. But it is preeminently fitting that the emblematic flower should be a carnation that breathes forth the lasting fragrance of purity and the love of home, for the modern carnation of spring is an indoors product.

But let us along with this lovely indoors flower put the common dandelion of the roadsides that goes forth everywhere to give not only beauty but utility. The dandelion gladdens the eye, beautifies the outdoors and feeds the stomach. It sometimes has hard usage and discouraging obstacles but it never gives up. It is preeminently a fighter in the battles of life, yet kind and considerate and available for giving happiness to even the little children.

So put a dandelion with the white carnation. It is a pretty contrast of colors and of fragrance and the two are an ideal emblem of humanity's life partnerships. And it won't hurt Dad to be taken into consideration a little at the same time that Mother is.

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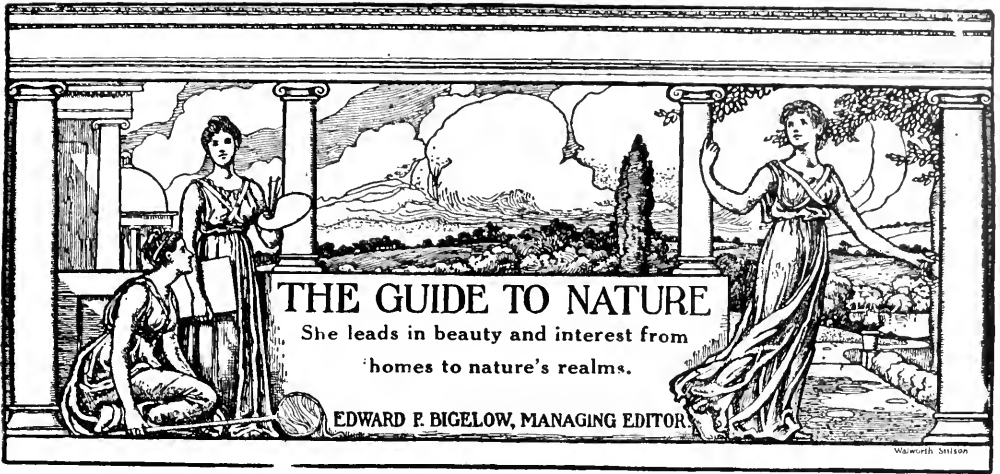
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Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
 Subscription, \$1.00 a year
 Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

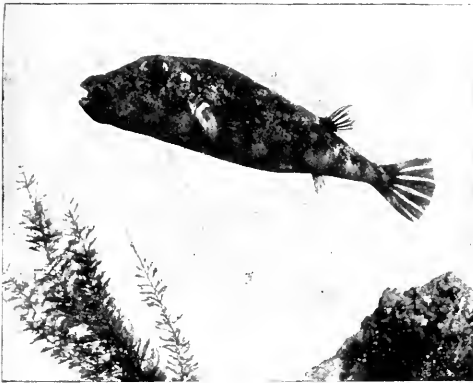
JUNE, 1916

Number 1

The Inflation of the Puffer.

BY C. H. TOWNSEND, NEW YORK AQUARIUM,
 NEW YORK CITY.

Puffer fishes inhabit all tropical and warm seas. There are many species; some of them reaching a length of about



PUFFER IN NORMAL CONDITION.

two feet. They have attracted attention from the earliest times on account of their habit of inflating themselves with air or water until they become almost spherical in shape.

When puffers are dragged ashore in a net they will quickly take in air until the skin is stretched to its fullest extent, and remain inflated until thrown into the water. Even when thrown back they may float for a time upside down, with the

abdomen, or in some species, with cesophagus still tightly distended. If left on the beach they can be knocked about without a particle of air escaping and may die in that condition.

The habit of inflation is protective, and the fishes will distend themselves with water as tightly as with air, if they are attacked under water.

A few good-sized scup or porgy were placed in an aquarium tank containing a dozen young puffers about two inches in length. The hungry scup attacked them at once. In an instant all the puffers were fully inflated with water and became almost globular in form, so that the scup were unable to do more than knock them about like toy balloons, too



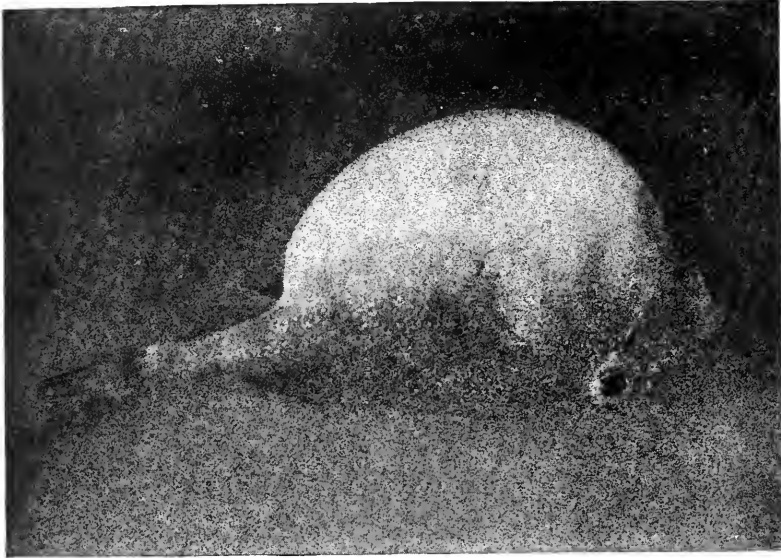
PUFFER INFLATED.

big to be swallowed, and on which they could get no hold whatever.

When young puffers are fully inflated with air, they are almost incapable of movement, and appear like small globes

porcupine. The spines are modified scales and in some species are quite long and sharp.

Puffers which have been frightened near the surface and are inflated with



PUFFER DISTENDED WITH WATER.

with the temporarily useless fins protruding at different angles.

The air or water tightly filling the abdomen or the esophageal sac is kept there by a valve in the throat and can be discharged instantly.

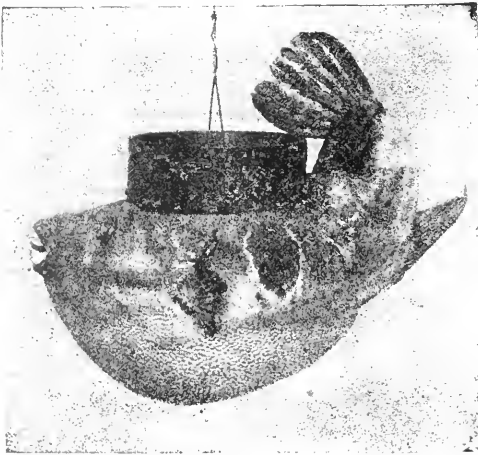
Some of the puffers, such as the spiny species so common along our coast, are thickly covered with stout spines which become rigidly erected when the fish is inflated. This species is often called sea

air are easily driven by the wind and often drift ashore to be thrown on the beach by the waves and even rolled along the sands by the wind.

When taken from the water, puffers begin to inflate at once, making distinct sucking sounds until the utmost distention is attained. Inflated puffers placed in preserving fluid sometimes die fully inflated. They often die inflated on the sea shore and are dried by the sun and wind. It is a common practice with the Japanese to make lanterns of inflated and dried puffers by cutting out the back as shown in the accompanying photograph of a puffer "lantern" in the New York Aquarium. A candle suspended by a wire serves as a light which shows as brightly through the stretched skin of the fish as through a piece of oiled paper.

In the tanks of the Aquarium the puffers are rather sluggish fishes, moving chiefly by their fins rather than by any forceful action of their chunky bodies.

Not the least interesting thing about puffers is the fact that some species live only in large rivers.—Reprinted by permission, with courtesy of use of the illustrations, from the "Zoological Society Bulletin."



LANTERN MADE FROM A LARGE PUFFER.

The Barden Memorial.

BY DR. FRANK CRANE.

Into the home of H. E. Barden, at Kenosha, Wisconsin, stalked that visitor who "descends with equal footstep to the hall and hut."

His attendants, Horror and Heart-break, were with him.

He laid his hand on the youngest son of the home, and the little fellow followed him off, into the land of mystery and nevermore, as all of us must go when the order comes.

Out of the ashes of the father's grief arose a beautiful thought that unfolded into a beautiful deed.

He would build a memorial to the child he had loved "and lost awhile."

Others have erected memorials. Man is the tomb-building animal. There is the Taj Mahal, jewel of extravagant love. There are the pyramids where kings reposed. There are the churches, libraries, colleges and all manner of buildings, and endowed causes.

A thought of pure love is in each of them, but not always a thought of wisdom nor of beauty.

Mr. Barden's thought was beautiful and wise as well as loving.

On Arbor Day he gave to every child in town a small catalpa tree. Through the public schools he distributed three thousand trees, together with instructions about their planting and care.

You see, the little dead boy did not live on as a cold and silent mass of stone, the vain advertisement of vain grief, but he grew, his memory grew, as a green thing in the hearts of many children: his gone life was reincarnated in the most beautiful thing God ever made—a tree.

The next year as many soft maples were given, and the following year elms.

Mary D. Bradford, superintendent of schools, tells us that a careful canvass and report of the tree planting was made the second year, and 934 of the catalpas and 854 of the maples were found thriving, though this number was doubtless too small, as many of the children had moved away or passed on to the high school.

"In 1915," says Mrs. Bradford, "every child carried home a fine, healthy little apple tree. This was regarded as the greatest gift of all. A careful demonstration of the right way to plant the tree was made at each

school by the principal or janitor. It was an interesting sight to see the children pouring out of the schools on Arbor Day, each with a tree, the roots carefully wrapped in paper."

Blessed is little Emil Barden, whose memory lives on in green leaves and running sap, and blessed his father's thought, and blessed too the army of children whose hands have been guided by a consecrated inspiration to do about the cleanest, most unqualifiedly useful thing a mortal can do—to plant a tree.—By permission of The Associated Newspapers.

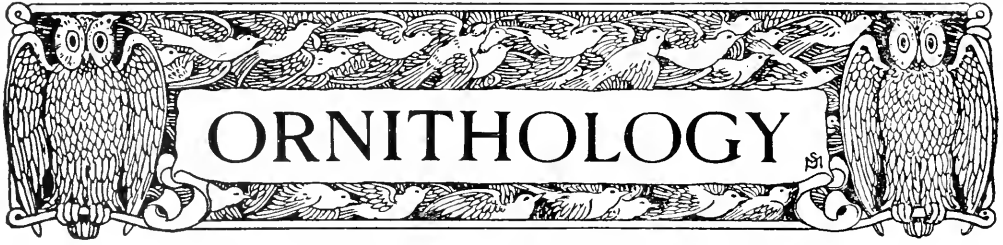
One Day's Outing.

BY W. C. BANKS, STAMFORD, CONNECTICUT.

For a long time one of my friends, whose enthusiasm for minerals is perennial, has been urging me to accompany him on an excursion to the limestone quarries at Canaan, Connecticut. On a recent October day we started, weighted with a plentiful supply of hammers, chisels, enthusiasm and lunch. It was a beautiful day. The cloudless sky, the brilliant coloring of the hills, set off by the somber green of pine and hemlock, made a picture that will long remain with me. Every new vista from the car window was a revelation of beauty. The river winding among the brilliantly tinted hills was alone well worth the journey to see. But, being practical mortals, we wished for more material rewards, and we got them in the shape of some good specimens of diopside, and bladed and fibrous white tremolite. I was so fortunate as to secure a radiated specimen of tremolite and one large crystal, nearly three inches long, of diopside nicely exposed in bluish gray dolomite. These are good indeed, and will long serve to remind me that one corner of Paradise is situated in Litchfield County, Connecticut.

A Correction.

In the article, "Some Local Geology," by Mr. W. C. Banks in our April number appears the statement, "It may since have been more than once submerged, but the absence of stratified drift makes this doubtful." Mr. Banks calls our attention to the fact that this is in error, either through a slip of the pen or an oversight on the part of the proof reader, for the stratified drift certainly does occur abundantly. The sentence should read, absence of stratified *rock*."



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor

A Nighthawk Family.

BY G. H. SELLECK, EXETER, NEW HAMPSHIRE.

Eight pairs of bright eyes, abundance of time to wander in the fields and woods, and an insatiable desire to see everything that old Mother Nature has to show. This is the description of a family of children who lived across the street from me in 1902. They discovered sixty or eighty birds' nests during the first half of the season and the varieties ranged from the woodcock in early April to goldfinch and waxwing in midsummer.



THE NIGHTHAWK ON HER EGGS.

Many of these bird homes were described or shown to me, and among the number was the nighthawk's which Elsie had found on the eighth of June. A day or two later she conducted me

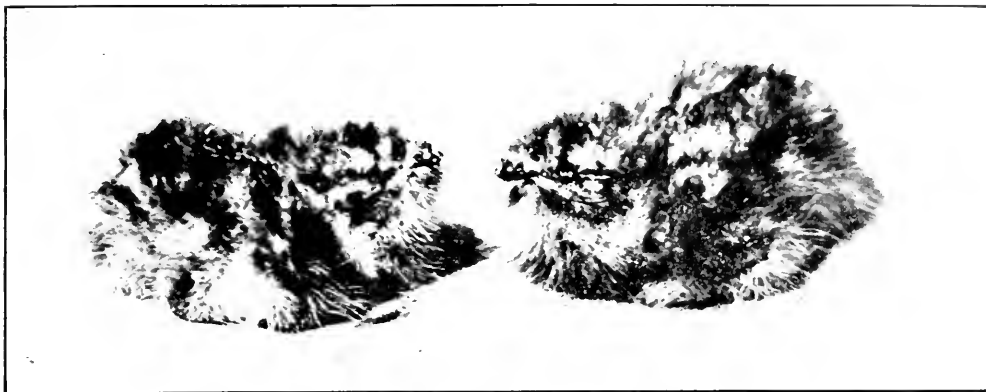


"ALMOST TOUCHED IT WITH MY HAND."

to the spot, and during the next month I visited the home and family—for there soon was a family—several times a week.

The home site was a triangle of dead pine branches about fourteen inches on a side, and the ground was littered with short bits of broken limbs as is likely to be the case a few years after a wood lot has been cut over. The bird seemed to be asleep and left only when we were almost upon it.

Next in order came the inevitable process of obtaining pictures of bird and eggs. Two amateur photographers went with me as guide and master of ceremonies. We began first at a distance of about twelve feet and



"THEY SLEPT FOR THEIR PORTRAIT."

gradually worked up to about three or four feet. The bird appeared to be asleep at first, but during the last part of our operations it was very much awake and watched us intently with one big eye, for up to this time the only motion it had made was to open its eyes. Even when a brier was cut away within a few inches there was no motion except a rapid quivering of the throat which perhaps indicated anxiety.

The bird did not stir until I almost touched it with my hand. Then it lifted its wings to their widest extent, ruffled its feathers, spread its tail and danced just over the edge of the triangle where it immediately settled itself as quiet as ever within eighteen inches of the eggs. This action was accompanied with a slight hissing noise which came from the wide open mouth of the bird.

We had taken five time exposures, and it would seem as if the bird had been bothered enough for one day but we wished to get a picture of the open wings, so I went around on the other side and drove the bird back into the home lot, where we left it actually on the eggs after this trying experience of a full hour with three large men, by whom it was at times quite surrounded, to say nothing of the camera and its evil eye.

Elsie was the first to discover that the little birds were hatched, and that they showed symptoms of Wanderlust almost before their down was dry. Thinking they would be at home at daybreak, I was on the spot early the next morning and found them. In my pocket they were treated to a bicy-

cle ride to the photographer's studio, where they slept for their portrait. Another ride home and their faithful father was waiting for them. I say father, for the white throat patch plainly indicated the male bird.

About two weeks later the young birds, now well feathered, went to the photographer's again and one was photographed in my hand to show its strong foot. At this time they ran swiftly with that peculiar directness which is characteristic of young sand-pipers.

Nighthawks are not so entirely nocturnal in their habits as whippoorwills, which are rarely seen moving in the daytime. In June nighthawks may be seen or heard at almost any time except from dawn till noon, and the explanation is, I believe, quite simple. The females fly afternoons and the males all night. Such was the case in



TWO WEEKS OLD.

my nighthawk family at any rate, for the father slept at home all day, incidentally incubating the eggs and brooding the little ones. At night he was up in the air, while the patient mother sat at home, anxious perhaps like human mothers when their men folks are out late. Of course I do not know that she was on the nest all night, but I saw her there at seven at night and at four in the morning, while the males were flying so near that I could distinctly see their white throat patches.

Nighthawks live mostly in the open country, breeding among rocks and broken branches where the eggs, and more especially the young with their mixture of black and white, are almost invisible. Whippoorwills, on the other hand, live more in the woods, and their little ones are almost the exact color of the dead leaves among which their parents choose to lead them for whippoorwill and night-hawk twins alike leave the nest very soon after hatching, as is the custom of many ground dwelling birds which make little or no nest.

A State's Attack on Hawks.

JOSEPH W. LIPPINCOTT—BETHAYRES, PA.

The Hawk Bounty Law in Ohio has according to Assistant Inspector Major Charles Becht's estimate, led to the killing of 10,000 birds in that State since last June. The killing is still going on, the bounty paid being one dollar per hawk—a high reward to put upon the heads of birds which other states find the average gunner only too prone to shoot without such incentive and even the sanction of the law.

Many of us know the great good certain hawks do in killing off numbers of destructive little rodents whose ranks if unrestrained can increase five to six fold in a year or even less time. That thousands of valuable hawks must perish and be thus lost to communities as mousers and insect destroyers in order that a few rascals in their ranks may pay the just penalty of misdeeds seems to me a great pity.

We may all unite in condemning four kinds of hawks, for they are proved to be enemies of other birds and therefore also of men—they are the sharpshin, the goshawk, the cooper and the peregrin falcon, commonly called the duck hawk because of its predisposition to kill wild

ducks. To such a black list one might also add that big night marauder, the great horned owl. It is an easy matter to find in any library pictures of these destroyers in order to distinguish them.

As a farmer as well as a bird lover I am always indignant when I hear of more or less slaughter of this kind. What will our fields and woods look like if gracefully soaring hawks are forever eliminated from the view and if the land and its crops are throughout the day given over to rodent pests?

In comments upon the same State's game laws appears the statement that it is against the law to kill or injure foxes in Ohio. Verily, here is a puzzle. Is there any wild fox that does not destroy more birds, more four footed game animals and more chickens than a hawk? Does the rather small value of his pelt repay the depredation of years?

These things may become live issues in other states and it is well to carefully consider them from all sides before it is too late.

Just Up the Road.

Just up the road are wondrous things,
The kind of things the summer brings,
That seem to come and go on wings.

Green fields refreshing to the sight,
Soft shining in the morning light,
Deep glowing at approach of night.

High knolls where you may win a view,
Stonewalls where chipmunks peep at you,
Tall ferns that wave the summer through:

And trees that give delightful shade,
A brooklet where the children wade,
In joyous hours that never fade.

Gay flowers are nodding all the way,
But changing hues from day to day,
So evanescent is their stay.

Round hills and evergreens galore,
And lovely wood-paths to explore,
For beauties that they have in store:

'Tis true that these last through the year,
But later on you'll call them drear,
Enjoy them while the summer's here.

The mossy carpets for your feet,
The air with piny odors sweet,
Ripe berries tempting you to eat.

The birds and bees and insects too,
Don't let them be sealed books to you,
But read them ere the season's through.

As on and on the roadway winds,
One ever some new beauty finds:
'Tis many things to many minds.

—Emma Peirce.

Some Cardinal and Owl Notes.

BY DR. R. W. SHUFFELDT, WASHINGTON, D. C.
(Photographs by the Author.)

During the early 60's, most of my bird and egg collecting was done in the country about Stamford, Connecticut, and when I was about thirteen years of age, I had made a collection of the birds of Fairfield County numbering nearly three hundred all told. My boy cabinet also contained a very fair representative series of the eggs of the birds of the same region. Stamford, in those days, was a charming country town of but a few thousand inhabitants; and, although the Great Auk had been extinct then for several years, the extermination of birds of any kind never entered any one's head. During the migrations, thousands of shore birds swarmed on Shippan Point and Greenwich Beach, while in the winter ducks, of half a dozen or more species, could be reckoned on the Sound by the acre.

My collection contained many birds of bright plumage; but even so, I well remember how I yearned to see a cardinal



Fig. 1. Nest of Cardinal Grosbeak (*Cardinalis Cardinalis*) photographed *in situ*.



FIG. 2. SAME NEST AS SHOWN IN FIG. 1, VIEWED FROM ABOVE.

grosbeak, as I had so often pictured him in my mind in his native woods. I never tired of looking at the beautiful plate of a pair of those birds in my treasured copy of Audubon, nor at a mounted specimen of a magnificent male in the collection of my old instructor in taxidermy, Mr. James Jenkins of Stamford; perhaps some of the old folks there can still remember him—he has been dead many years now.

My seeing an old male cardinal grosbeak in the woods, however, came to pass sooner than I had anticipated; for I was but a few months past my fourteenth birthday when I found myself aboard a man-of-war as an officer, during the third year of the Civil War. One day, when I was ashore alone on Key West Island, Florida, I availed myself of the opportunity to get into the swampy woods east of the town; it was there that I saw my first cardinal grosbeak. It was a magnificent male bird in full plumage, and I can remember his coral red bill set in black; his scarlet coat and his elegant crest of the same color—just as though it were an incident of yesterday.

Twenty years after, I saw hundreds of cardinals in Louisiana, Mississippi, Alabama, and several other southern states. In these days, my home is in Washington, D. C., and I probably see several hundred cardinals every year, running across perhaps four or five of their nests each spring.

A couple of seasons ago, I was in Maryland with a friend after birds' nests with a camera. Among some excellent results I obtained upon that occasion, a nest of the cardinal grosbeak was one of the most successful ones. The pair had built in a very unusual, and in what they doubtless thought a very safe place, for they had chosen the slender limbs and twigs of the brush, and a small sapling that grew out from the sides of a high bank of one of the branches of the Potomac River. The nest was more than a yard from the solid bank, and upwards of eight or ten feet above the stream which ran rapidly below. I was over an hour placing my old-fashioned camera in position to get that cardinal's nest; but I succeeded at last, and the result is here shown in Fig. 1.

The eggs are creamy white, streaked with amber and various shades of brown, and they are here given, natural size, in Fig. 2. This last illustration gives such

an excellent idea of the structure of the nest of this grosbeak that no further description is necessary. It now forms a part of the exhibition series of nests of



FIG. 3. YOUNG OF THE BARRED OWL (*STRIX L. VARIA*) AS HE APPEARS AT THE ENTRANCE TO HIS NEST.

About one-half natural size.

the birds of the District of Columbia in the U. S. National Museum.

Some time ago I had in my possession as a pet a fine nestling of the Barred Owl. He was a gentle and interesting bird, and while I had him I succeeded in making a number of valuable negatives of him. He was a most accommodating poser, and one of my best pictures of him is here shown in Fig. 3. He is now full grown and in superb adult plumage, and occupies a comfortable and commodious cage at the National Zoological Gardens, where I presented him last summer. My hope is that the specimen will be responsible for letting a good many visitors and others know what an American Barred Owl looks like; its presence there would certainly tend to that end, were the cage to which he was assigned to bear a proper label, giving the necessary data for the information of the public.

A Flower Marvel.

BY NEAL WYATT CHAPLINE, SARASOTA, FLA.

Did you ever stop long enough to watch a flower bloom? You say that is an impossibility? Well I beg to differ—I saw the marvel for myself a few days ago.

Three of my children and I were walking down the street late one afternoon and, feeling tired, I suggested that we sit down on the grassy sward just off the sidewalk.

We had walked almost to the city limits out Main Street, and felt that we could lay aside conventions and rest by the way if we chose.

Glancing up at the vine clambering over the fence and up a huge pine, I spied a beautiful white flower. When the children brought it to me I found it to be a moonflower, pure white, green veined and deliciously fragrant. When I looked again there was another flower where before there had been none. Calling the children to me I said, "Let's watch and perhaps we can see them open."

We sat entranced at the sight. Tightly folded buds gradually unfolded and with a breath taking quickness, this flower-o'-the-night poured out its soulful fragrance from a huge white chalice.

I fancied this miracle was being wrought for our appreciation alone, until looking up, I saw the queen to whom this sublime obeisance was being made. Calmly she reclined on her silver-edged couch of blue and her subjects vied with each other to do her homage. Just as the sunflower is presumed to worship the sun, turning a radiant face always toward him whom she adores, so the moonflower only gives up her frail and delicious incense and beauty on the appearance of her queen, the moon.

We sat watching this great marvel of nature until, where there was, at first, a fence filled with green leaves and tightly rolled green buds, we turned homeward leaving hundreds of exquisite, light-green-veined white blossoms, pouring out soulful incense to their queen and any poor mortals who would stop long enough to wait and watch for their wonderful transformation.

"Moonflower Corner" is now one of

our favorite resting places when we take our daily walks.

Protest Against Starlings.

Nirvana, Stamford, Conn.

To the Editor:

I notice in *THE GUIDE TO NATURE* for May a protest regarding the indifference so widely shown all over the country concerning some of the pests that menace our national welfare. Your correspondent refers to insects, English sparrows and English starlings and asks for opinions about the latter.

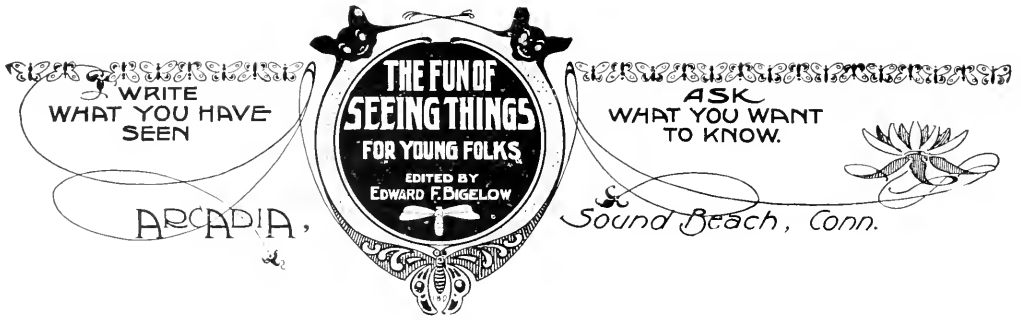
In "Bird-Lore" of July-August, 1907, there was published a letter from me in which I ventured to prophesy, (*as long ago as that*) not only that these birds would drive away our own more desirable birds, but would increase in numbers almost unbelievable. My prophesy has been fulfilled. Every year we hear of some new state being invaded by this pest. In 1905 I could count my starling visitors on my fingers; now, particularly after nesting time, the meadows are frequently black with them. They are very hardy; they remain the entire year round; and since they established themselves permanently I haven't a bluebird on the place where formerly I had five or six pairs that came every year to the same holes or bird boxes.

Every spring I used to rejoice in "showing off" my bluebirds and goldfinches feeding on the lawns together. Every year for the past six or more, the starlings have fought for a natural hole in an elm tree close to my bedroom window. This hole has been the home of a pair of flickers for nine consecutive years. Owing to my watchfulness the flickers have had the best of it until last spring; then, after much pestering on the part of starlings, sparrows and gray squirrels, something happened to the female, and although the male brooded and hatched out the young (for I could hear them) the raising of six proved too much for one parent, and his persistent calling brought no aid, so the nest was finally deserted.

I earnestly wish, with your correspondent, that something could be done to rid the country of these two foreigners. What little good they do (if they do any) would be done by our native birds, and probably much more thoroughly.

Very sincerely yours,

NATHALIE ALEXANDRE.



The Wantonit Club.

PROFESSOR HENRY W. BROWN, COLBY COLLEGE, WATERVILLE, MAINE.

"Is tripe a fish?" This query, in all seriousness, was recently asked the writer by a fourteen-year-old boy. "A fool question," one says, and so it is; but no more absurd than hundreds of others—all

but now! Then, we had none of the short-cut paths to nature knowledge that we have today. Through those interminable keys that formed the bulky appendices of Wood's and Gray's botanies, we patiently and laboriously sought for the Latin names of perfectly familiar flowers; always beginning, I recall with the ob-



PROFESSOR BROWN SHOWING THE FUN OF SEEING THINGS.

showing lamentable ignorance concerning the commonest things of life. To Tom, Dick, and Harry, as well as Maud, the wide-open book of nature is simply one vast, incomprehensible mystery—hardly less undecipherable than some Gilgamesh epic engraved in cuneiform hieroglyphics upon the sun-baked cylinders and tablets of ancient Babylon.

There may have been a grain of excuse for such ignorance, when I was a lad—

vious yet fundamental distinction between phænogamia and cryptogamia. If the specimen in hand was found to belong to the former group,—with what persistent analysis we next tried to "tree it" among the orders of either the exogens or the endogens. At last, we arrived at the highly illuminating fact that our dear, modest, sweet-scented, pinklipped arbutus is really—*Epigaea repens*. To-day with the help of such a manual as "The



WHERE CAMP BECKETT BOYS HAVE THE FUN OF HUNTING FOR THINGS WORTH
ESPECIAL SEEING.

Fieldbook of American Wild Flowers," by Mathews, one can become acquainted with more interesting plants in a single afternoon than we were able to determine in a full week. In those days, fur-

thermore, we spoke of all the ferns, collectively, as "brakes." It was next to impossible to distinguish even the commonest species. But, last summer, my Wantonoit boys, at Camp Beckett, easily

learned to recognize fifteen varieties in one day. Much the same might be said of other lines of out-door interest and study.

THE GUIDE TO NATURE and similar excellent publications are constantly furnishing for us the "open sesame" that admits to wealths of carefully gleaned information. Museums, gardens, herbariums, helps of every conceivable form and variety multiply and abound. How disappointing, then, that only here and there does one meet a person really filled with enthusiasm for first-hand observation of flowers, trees, birds, rocks, or stars. The masses seem not yet to have been aroused. Even high school and college students, as a rule, take little or no interest in "bugs and things;" and the natural sciences, in many quarters, are still being taught with pathetic disregard for the real objects under consideration.

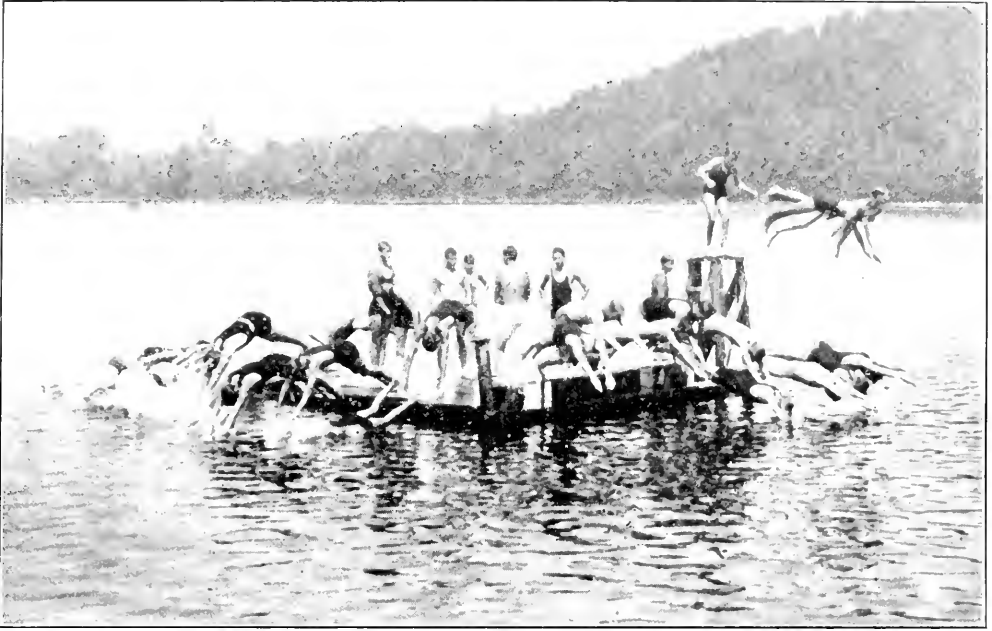
The fact is becoming patent that interest in the things which we are here discussing can not be forced, that it can thrive only where the charms of sensible things are frankly and freely displayed. Nature never deigns to practice absent treatment methods in order to win the love of her devotees she expects but little adoration from those whose ideas of her rest chiefly upon such limited acquaintance as comes from formal study of colorless dried plants, or cadaverous toads, frogs, and salamanders religiously preserved in hermetically sealed jars. The great Heart of Things pulsates only through the abounding life of the world; hence, it is in the open field, in the fragrant woods, along the breezy shore that Nature has her smile and her voice of beauty for us. But, in such places, her varied and subtle charms are utterly irresistible to the normal, clean, genuinely responsive soul. The Wantonit Club, for this reason, is emphatically an out-of-door organization. It finds its special mission in camps—summer groups of alert, right-minded persons—Y. M. C. A. boys and others—whose hearts are open to the words and works of God. "Back to Nature" is its effective rallying cry.

One strong and persistent tendency the Wantonit activities set themselves earnestly to counteract,—a tendency that does violence to every refined instinct,—it is the brutal, primitive desire to take blood. Hunting and fishing from time immemorial have been regarded by our race as the chief, if not the only source

of pleasure for one who would spend a period of relaxation and rest out in the open. "Arise, Peter, kill and eat" is the only Bible mandate which some men appear willing to follow. Yet there are thousands of campers, I am glad to believe, to whom no real pleasure comes in the taking of life,—even that of the humblest sort. But even to these persons the joys of the summer season often are so closely associated with the conventional hunting habit that, although naturally kind-hearted and refined, they come to believe that they have really enjoyed the cruel "sport." For a long time yet, I suppose, he will regard himself as a mighty hunter who, with all the unfair advantage of a modern hunting equipment, can put his human intelligence into successful competition with the simple instinct of some humble, trustful wood creature and bring home its bloody body as indisputable evidence of his valor and skill. What, after all, is more saddening to one than the sight of the dead thing after the telling shot has been fired and the game brought low? What, in the same connection, is more disgusting to any right-minded person than the pride of the greedy fish-hog, who boasts of the magnitude of his catch and who measures his delight by the number of gasping victims he can call his own?

In contrast to the foregoing, we have the clearer, more exhilarating pleasure that comes from hunting birds with the eye, through the medium of a good field glass; from welcoming back the newly opening wild flowers; from discovering some rare species of insect; or from the recognition and naming of stalwart trees, nodding shrubs, cushiony mosses, embossed lichens, gaudy fungi; and, at night, the silent, friendly stars.

The Wantonit Club, which I am glad to have originated, is but one of the many agencies endeavoring to infuse a saner, more healthful spirit into the pursuits and pleasures of the summer season. It has spread its influence widely—into the far West and South, and even across the Atlantic. As its name suggests, it is a body of those who *want to know things*—an organization of alert sense-users. Its spirit is not that of the school room. There is no effort to do thorough scientific work,—the boy has left all this behind with his books. There is simply an attempt upon the part of the conductor of the club's activities informally to in-



SOME OF PROFESSOR BROWN'S BOYS COOLING OFF AFTER A HIKE.

roduce the camper to the common things about him in such a natural and friendly way as shall make him love them at sight. From two to five hundred objects are readily listed and learned, under the system, in a single season. Of course such an accomplishment is of vast importance as an accessory to school and college studies; but the boy does not have this value in mind. He is required to do nothing; for that reason he wants to do everything. He takes pride in his increasing attainments and soon becomes an enthusiastic teacher of others. The instruction is wholly personal. There are no books, no recitations, no collections to make, no examinations to pass. The certificate of membership is awarded only on manifest merit and the proved ability to recognize and name at least two-hundred objects of every-day observation. Seals are attached to the diploma to indicate advanced work. Fifty simple experiments in out-door chemistry constitute one of the features of such work, as it is carried on from year to year.

The club is as simple in its plan and establishment as it is in its working. Each chapter is organized by the National Counselor (the writer), registered by him, and furnished with information concerning its formation and work. The Counselor supplies the certificates and signs them. There are no fees, no charges, no salaries. Each camp pro-

cures its own Director for its work. A small gratuity, the amount being determined by the camp itself, is welcomed by the founder to cover the expenses of a large correspondence, printing, etc. Apart from this contribution, the work of the writer is entirely a labor of love.

The love of nature is a great source of happiness for children, happiness of the best kind in taking possession of a world that seems to be in many ways designed especially for them. It brings their minds to a place where many ways meet; to the confines of science, for they want to know the reasons of things; to the confines of art, for what they can understand they will strive to interpret and express; to the confines of worship, for a child's soul, hushed in wonder, is very near to God. —Janet Erskine Stuart in "The Education of Catholic Girls."

Verandahs and porches are all very fine,
But they "can't hold a candle," I say,
To a nook in the heart of the sweet pine
woods,

Which temper the heat of the day.

—Emma Peirce.

The edible crab of the Pacific coast lays each fall from three-quarters of a million to a million and a half eggs. These she carries attached to her abdominal legs four months, until they hatch.

New and Better Kinds of Fairies.

Oftentimes children, and sometimes even the grown-ups say that they are sorry that the age of fairies seems to be over, and yet there are more wonderful fairies of fact than the old romancers ever dreamed of. Creatures tinier than any they could imagine are working day and night building things for man,

and others, again, tearing them down. The birds themselves can be thought of as fairies with wings, working every moment for man's good, searching out the insects from the crevices in the trees and adding beauty in color and sound to man's life. The scientist has found more real fairies than all of those which have added to the lore of elf and



Drawing by Walter Stone King, courtesy of "American Forestry."

FAIRIES OF FACT—CAN YOU FIND THEM?

Besides the four fairies of romance there are eight tiny living creatures—fairies of fact—of the ground, the trees and the air in this picture. Can you find them all?

goblin, gnome and sprite; and the scientists' fairies are more wonderful because they are tinier than was ever thought to be possible. Then, too, they have such changing and marvelous shapes. The old-time fairies were always thought of in terms that the folk-lore gatherers could understand—that is, they were in the general form of man, only much smaller. But the scientist finds that the new fairies do not have to be limited to any such forms.

So do not be downcast when any one tells you that there are no more fairies, but rather be glad that there are new and different ones—ones that you can study and find out about for yourself, and ones that you know are really alive to-day.

Ah, little lad, that seeks for fairy lore,

Think not that all is gone—that cold dry facts

Must do away with elves and sprites of yore

With all their witching ways and kindly acts.

Here in this time, if we will only learn

The ways of wood-folk in their work or play

We may be sure of fairyland's return

In living wonders of the present day.

—“American Forestry.”

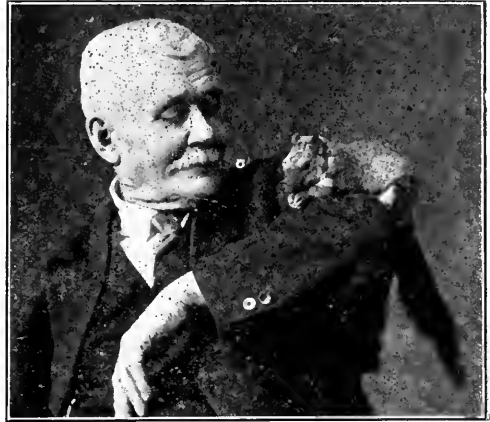
Two Little Girls at a Country Home.

As I walked down the hill through the chestnut woods, I fell to picturing the future of these little rustic maidens. One day they would awake to the fact that there was a great, bustling world only a few miles away from their cabin in the woods. The lure of the city that draws people away from just such charming nooks as this in the country would develop in them a repugnance for their humble surroundings. They may teach in the country or village schools, they may become “sales ladies” in the city stores, stenographers in the offices, or real nurses in real hospitals; but, ten to one, they will forsake the country for town or city. Three score summers hence a grandson may buy up the old home site, build a bungalow on the crumbling cellar walls, and there spend the summers with enjoyment, the lure pendulum swung back again.—Milo Leon Norton in “*Saturday Chronicle*.”

A Nurseryman Lover of Squirrels.

Mr. Charles F. Gardner of Osage, Iowa, is not only a nurseryman having extensive business connections with special interest in strawberries, but he is also a whole-hearted lover of pets. We have received from our member, Mr. Eugene Secor of Forest City, Iowa, an eulogistic letter regarding Mr. Gardner's interest in nature.

Mr. Gardner sent to Mr. Secor the



MR. GARDNER HAS FUN SEEING HIS SQUIRREL EAT NUTS.

accompanying photographs because he felt sure that Mr. Secor would share his interest in his pets, especially since Mr. Secor is so charitably disposed that he feeds the birds and other creatures during the cold weather. An interesting feature of the letter is that it appears to be written by the squirrel, telling the story from the squirrel's point of view. The writer believes that originally human beings were a race of savage and ferocious creatures, but that the world has so progressed that nobody with ordinary common sense would nowadays willfully shoot even a squirrel.

Buttercups.

Buttercups, Buttercups, brimming with gold,

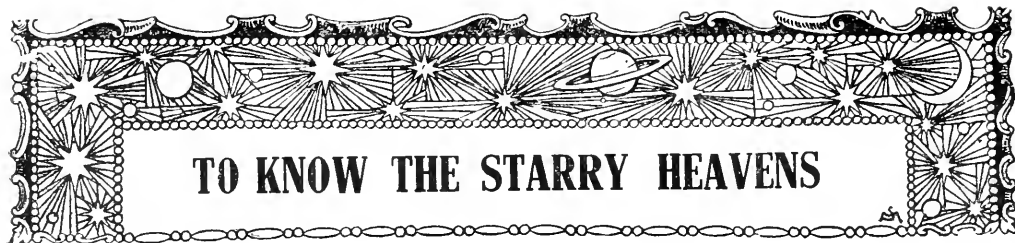
Why are you hoarding it so?

The scythe of the reaper is sharpened for you,

You will go the way all misers go.

—Emma Peirce.

About one-quarter of the living volcanoes of the world are within the boundaries of the greater United States—virtually all of them in Alaska, Hawaii and the Philippine Islands.



TO KNOW THE STARRY HEAVENS

A Check List for the Sound Beach Observatory

The Sun, Our Star, Radiates Light and Heat in Every Direction.

The Diameter of the sun is 866,400 miles; that is, 109.4 times that of the earth.

The Surface is 12,000 times that of the earth.

The Mass is 333,000 times that of the earth.

The Density is about $\frac{1}{4}$ that of the earth or 1.4 times that of water.

The Rotation from the east to the west averages 25.35 days. The rotation is faster at the equator than on either side, showing that it is not a solid mass.

The Diameters of the Spots range from about 500 to 60,000 miles. This may be estimated by comparing the spot with the diameter of the sun.

The Planets, Our Family, All Receive Light and Heat in Varying Degrees from the Sun.

PLANET	Average Distance from Sun in Millions of Miles	DIAMETER	DAY	YEAR	MOONS
Mercury	36	3,030	88 days	88 days	0
Venus	67	7,700	Probably 23 h., 50 m.	225 days	0
Earth	93	7,918	23 h., 56 m.	365 $\frac{1}{4}$ days	1
Mars	142	4,230	24 h., 37 m.	687 days	2
Jupiter	483	86,500	9 h., 55 m.	11.86 yrs.	9
Saturn	886	73,000	10 h., 14 m.	29 $\frac{1}{2}$ yrs.	10
Uranus	1,782	32,000	Probably 23 h., 4 m.	84 yrs.	4
Neptune	2,792	35,000	Unknown	165 yrs.	1

Jupiter's Older Moons—Four in order from Jupiter: I, Io; II, Europa; III, Ganymede; IV, Callisto. (Five others are known but they are not seen except in largest telescopes).

Saturn's Moons: Iapetus, Titan, Rhea, Dione, Tethys, Enceladus. This is in order from most remote. Rings: A, exterior diam. 173,000 miles, 12,000 miles wide. The division between it and B is 1,800 miles in width. B, 17,000 miles wide. C, "gauze" or "crape," 11,000

miles. The thickness of the rings about 100 miles. Composed of "a swarm of separate particles, each an independent moon." Four other moons, not visible except in largest telescopes, are Themis, Phoebe, Hyperion and Mimas.

Uranus's Moons: Seen only in largest telescopes. Ariel, Umbriel, Titania and Oberon.

Neptune's Moon: Seen only in moderately large telescopes. One, not named.

Densities of the Planets. The only planet which is lighter than water is Saturn, though Jupiter, Uranus, and Neptune are each but little heavier than water. The four inner (earth like) planets are of course much heavier. The larger ones have not yet had time to cool off: it is their high temperature that keeps them so expanded.

The Stars are Distant Suns.

Stars visible to naked eye (estimated)

1st magnitude	12	4th magnitude	313
2nd magnitude	48	5th magnitude	854
3rd magnitude	152	6th magnitude	2,010

Total—3,389

In whole celestial sphere on moonless nights seen by naked eye only from 6,000 to 7,000. An opera glass shows 100,000. In big telescope, 100,000,000.

There are only twelve stars so bright as to be unquestionably called "first mag-

nitude" but some estimates include a few more. Of these twelve only the following eight are visible in this latitude.

* * * * *

First Magnitude Stars.

Sirius	Altair
Vega	Betelgeuze
Capella	Procyon
Arcturus	Rigel

* * * * *

A Few of the Other Bright Stars You Should Know.

Aldebaran	Pollux
Antares	Spica
Deneb	Fomalhaut
Polaris	Regulus
Denebola	

* * * * *

Famous Variables.

Algol (Beta of Perseus)—a short period (little less than three days).

Mira (Omicron of Cetus)—a long period (about eleven months).

* * * * *

Delightful Companionable.

Rigel (dainty blue with tiny companion).

Ni of Ursa Major (Mizar, a double, with Alcor).

* * * * *

A Few Best Double Stars.

Gamma Andromedae (Almaack).
Gamma Arietis (Mesartim).
Gamma Leonis
Albireo
Castor
Eta Cassiopeiæ
70 Ophiuchi
Omicron Eridani
Quadruple:
Epsilon Lyrae.

* * * * *

Star Clusters.

Naked Eye: Pleiades, Hyades.

Opera Glass: Praesepe, Coma Berenices.

Telescope: Double in Perseus, 13 M in Hercules, 35 Gemini.

Nebula:

Andromeda, Orion.

* * * * *

How Far Away Are They?

The distances of the planets from the sun (and also from each other) as shown in their table of specifications are measured in millions of miles. Even the nearest stars are too far away for such a

measuring scale. Light travels about 186,330 miles per second. The distance that light travels in a year is used as a measuring unit in stating the distances of the stars. The nearest well-known and very bright star is Sirius which is 8.6 light years distant. (A faint star, Lalande, is 6.9 light years). 61 Cygni is 8 light years.

Many of the brightest and well-known stars are so far away as to be beyond measurement. The well-known Pleiades are supposed to be so far away as to take the light (travelling at 186,330 miles a second) 250 years to reach us. Of course such distances are not only unmeasurable but inconceivable!

A Trio of Good Ones.

G is the first letter in good, and the G of the Greek alphabet is Gamma. When I was showing some of my favorite double stars to visitors in the Astronomical Observatory, it occurred to me that I had a trio of good ones and that they all are Gammas, and therefore not only really good, but alliteratively good. They are Gamma Andromedae, Gamma Arietis, and Gamma Leonis. I believe that the second one was, according to some authorities, the first discovered. The first in the list is surely what our feminine gazers would call the sweetest companionship of all; a well-known astronomer says that the third is the brightest and most spectacular. As the small boy might say, "They are all beautiful;" but an astronomer might well exclaim, "They are Gamma, good!"

Inconceivable Distances of Stars.

It is probable that the stars in the Milky Way are from seven hundred to a thousand "light years" away, and as the power of stellar photography has increased, more remote stars are continually revealed. Just think of it! Many of these stars we see not as they existed in our own time or even in that of our forefathers, but as they were before man lived on earth! Perhaps there are some that the people of this world will never see.—Henry Handy McHenry, in "Popular Astronomy."

The Moon.

Pale wraith in the sky in morning light
It illumines and glorifies the night.

—Emma Peirce.

The Heavens in June.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

The last few months have been noteworthy ones because of the remarkably large number of bright planets which shone in the evening sky. Indeed, at one time, every one of the five naked-eye planets might have been seen in the early evening, and doubtless there are many readers of these monthly papers who derived much pleasure from studying these

but little effort this most brilliant silvery world could be detected and examined in the telescope. The spectacle presented in the evening heavens at this time far surpassed that of the morning sky, where Jupiter reigned alone, pouring out its steady, golden radiance until the coming of the dawn.

But these conditions will very quickly be completely reversed. Already Mercury is again lost in the sun's rays, and even the very brilliant Venus will become quite invisible to us during the present

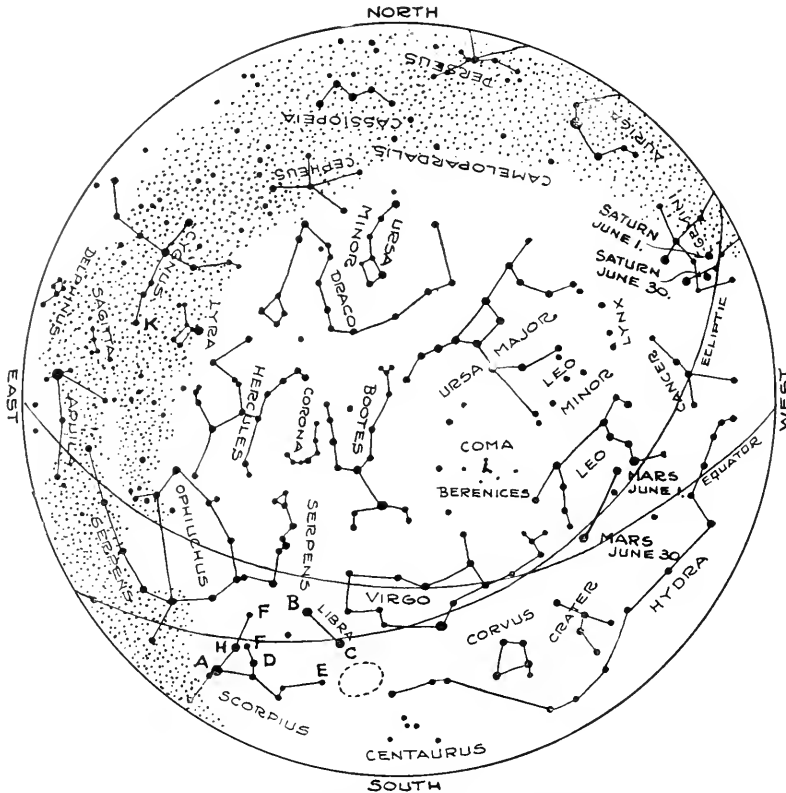


Figure 1. The constellations at 9 P. M., June 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

most interesting worlds in the telescope and from watching their continual and various motions among the winter constellations.

The first deserter from this company of beautiful worlds was the planet Jupiter, which withdrew from the evening sky on April 1; but at this time Venus was nightly becoming so very brilliant in the west, where also Mars and Saturn shone brightly, that the absence of the Giant Planet was hardly noticed. On May 12, also, Mercury ran so unusually far upward in the evening sky that with

month, though it will not enter the morning sky until July 3. Saturn will follow on July 12, and from this date on, of all the five brilliant worlds, the single planet Mars will alone be left with us. This little planet, however, runs so very rapidly eastward that it will not be overtaken by the sun and so become a morning star until February 28, 1917.

* * * * *

The June Stars.

It is in this, the first of our summer months, that the fainter constellations are seen for the first time in the year to pre-

dominate on the face of our evening heavens. It is true that the bright winter groups of Gemini and Leo still linger with us, but these are far in the west, and the former, indeed, has more than half disappeared below the horizon. The whole south and east are filled with the great, faint groups of Ophiuchus, Serpens and Hercules, while the wonderful and complex summer branch of the Milky Way encircles the whole eastern area of the heavens from the south to the north.

The most interesting of the new arrivals is without doubt the beautiful Scorpio, which, with its deep reddish star at A (Figure 1) and its striking band of bright stars at D forms the most beautiful of all our summer constellations. In early times the stars at B and C formed the Claws of the Scorpio and were therefore a part of the constellation, but these were afterward removed to form the single group Libra, thus greatly mutilating the original nearly perfect figure.

To the beautiful, glowing Antares, lying so near the path of the sun and shining so conspicuously in the summer heavens, there are naturally innumerable references among all earlier peoples. Many of the Greek temples were oriented to it; in Egypt it was the symbol of Isis, while in China, as the "Fire Star," it was for centuries invoked for protection against fire.

Antares is a beautiful double star in a moderately large telescope. Its companion is of a green color, which during the last century has shown no trace of any motion around the principal star. There is no doubt, however, that the two suns form a system, just as the earth and moon do, for Antares is very slowly drifting over the face of the heavens and carrying the companion with it; the time required for the companion to revolve once about the larger star is, however, doubtless tens of thousands of years, and possibly much longer.

There are many such majestically slow moving systems now known, but the science of exact astronomy is still so young that we know but little of their true natures. The astronomers of today can only secure very exact measures of their present positions, from which—perhaps ten or twenty centuries hence—the true sizes of these stupendous orbits may be

found. The slow drift of Antares, above referred to, will change its position in the heavens by an amount equal to the apparent distance across the face of the full moon in the course of 45,000 years.

The stars of Scorpio at F are both beautiful triple stars; that at H is a remarkable quadruple system which closely resembles the well-known Epsilon Lyrae, while the star at C may be seen to be a wide double, even in a small telescope.

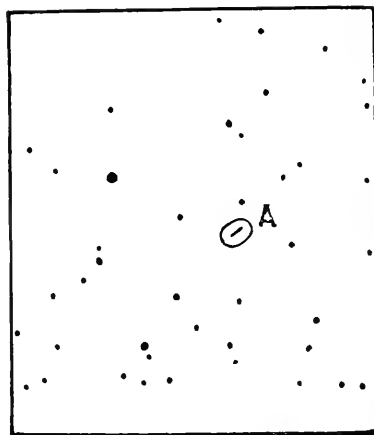


Figure 2. Photographic plate on which a new asteroid is discovered. The dots are faint stars. The moving asteroid has photographed itself as a short trail within the circle at A.

Under good conditions of seeing the observer may clearly detect that the star at B is of a distinctly greenish tint, while that at E is red. The former is a very unusual color among the brighter stars.

To the right of E, a little above and to the left of the extreme tip of the tail of the Water Snake, there is a rather compact little group of faint stars, bordered on the east by a faint row extending in a north and south direction. This very inconspicuous little sky figure has been named the Solitary Thrush.

The observer will find no difficulty in following along the summer branch of the Milky Way and tracing out the bright Eagle, the odd, compact little groups of the Dolphin and the Arrow, and the beautiful Northern Cross, with its striking double star at K. The stars below this last and Sagitta form the little-known constellation of Vulpecula, or the little Fox, from which constellation a stream of faint meteors dart outward in all directions during the last two weeks of the present month.

The Planets in June.

Mercury enters the morning sky on June 5 and reaches its greatest western elongation on June 30. During the last few days of the month it may be seen low in the northeast for a little more than one hour before sunrise.

Venus runs very rapidly into the sun's rays during the month, and, though still a conspicuous object on June 1, it will become completely invisible by three weeks later. During this time it may be seen in the telescope to be very rapidly taking the form of the narrowest imaginable silvery crescent, the apparent diameter of which is at the same time growing rapidly greater as our sister world draws nearer to us. This interesting change of form can be viewed even in a very small telescope. Venus will enter the morning sky on July 3.

Mars will run rapidly eastward through Leo during the month and so will continue to shine conspicuously in the western heavens. Its distance from us is, however, so great that it is a disappointing object in the telescope. It now resembles in shape the moon when about three days past the first quarter.

Jupiter rises about 2 hours and 30 minutes before sunrise on June 1, but this time is increased to four hours by June 30. It will be found almost directly above the east point of the horizon.

Saturn, as shown in Figure 1, is moving slowly eastward in the constellation Gemini. In its eastward motion it will pass very close to the bluish, third magnitude star at L, and its motion from day to day (though this is necessarily very slow, may be clearly observed by a comparison with this star. The two objects will be nearest together on June 20, at which time they will be indistinguishable to the eye, though in the telescope it will be seen that the plane is 2 minutes and 33 seconds above the star. The star itself is an interesting double, having an eighth magnitude companion in very slow motion around it and only seven seconds away. Saturn will pass to the west of the sun and so become a morning star on July 12. During the early days of June, however, it will still form a very interesting object in the telescope, for the rings at the present time are very widely opened.

* * * * *

The Longest Day.

On June 21, at 1 hour 24 minutes P. M.

(Eastern standard time), the sun will attain its highest position in the heavens; at this instant its upward motion among the stars will cease and its downward motion will begin. This instant will therefore mark the beginning of summer, and June 21 will be the longest day of the year.

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The So-called "New Planet."

A cablegram from Germany printed in many of the papers on May 3 announced

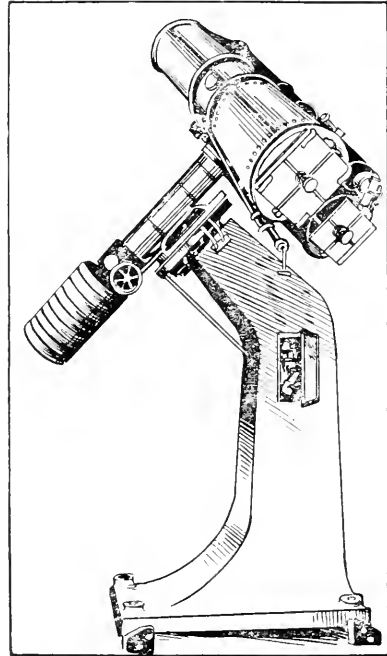


Figure 3. A photographic telescope.

the discovery of a new planet on April 17, though it subsequently appeared that this object had been seen at the Yerkes Observatory some two or three days earlier. This body was not similar to one of the great planets which revolve about the sun, but merely one of the numerous planetoids, or asteroids, which move in a zone between the orbits of Mars and Jupiter. Many of these little bodies are discovered each year, the total number now known being no less than 840. They are searched for by photography. The photographic plate is either kept fixed with reference to the stars, in which case the moving asteroid photographs itself upon the plate as a short trail, or line of light, while the star images are points; or else the plate is moved steadily at about the rate at which the asteroid moves. In the latter case the star images are all

short trails, while the asteroid, if there is one within the region of the photograph will photograph itself as a single point, or dot, of light. Figure 2 shows a photograph obtained by the first process, the faint, new asteroid having photographed itself at A.

The Housewife Who Built a Telescope.

In western Pennsylvania, thirty miles or so south of Pittsburgh, is the little town of Brownsville. Here, shortly after 1840, Phoebe Stewart was born and here she grew up, a simple country girl, hard working, frugal and poor.

Phoebe Stewart married a lad of the village, and as Mrs. John Brashear went



MRS. BRASHEAR AS A GIRL.
From a daguerrotype taken just before her marriage.

with her husband to Pittsburg in search of fortune. Brashear got a job in a rolling mill grinding tools.

The Brashears were too poor to buy a house, and so they built one with their own hands. They added a little machine shop with a tiny steam engine, where John Brashear might play with lathes and tools of his own.

Neither husband nor wife had had much education, but they spent their spare time in study. Their special interest was astronomy. They wanted a telescope and were too poor to buy one; so they made one instead.

In their little shop they turned the brass and ground the lenses. While her husband was at the rolling mill, Phoebe Brashear cleaned and oiled the little engine, set the shop in order and made ready the

tools and materials for the evening's work. After supper, she worked at her husband's side, often until midnight. Whenever she could snatch an hour or two during the day, she started the machinery and worked by herself. Few men were better mechanics.

Lens grinding is slow and difficult. It took the Brashears three years to make their five-inch glass, which they set up in the attic of their cottage. Other housekeepers, as they become more prosperous, aspire to larger houses. Phoebe Brashear wanted a larger telescope, one with a twelve-inch glass. It took only two years to make that, for the Brashears were getting skillful. But just as they finished the glass, it broke.

The husband was completely discouraged. He went back to the mill resolved to try no more. Not so the gallant wife. "Never mind," she said. "We'll make a better one." And the very next night, when the husband came home from work, he found the best of suppers awaiting him, steam up in the engine as usual, and a fresh block of glass in the lathe. He took heart again; and that time the work went through to completion.

That was the turning point of the family career. The Brashears became known, both for their skill in grinding lenses and for the discoveries they made with their telescopes. The Allegheny Observatory began to send them repair work that had hitherto been done in Paris.

With more experience came more skill and more work. Twenty-one years after John Brashear entered the rolling mill, he left it to set up a shop for the manufacture and repair of telescope lenses and other optical instruments. The business grew. "The little shop under the hill" became one of the famous optical factories of the world. Langley, who constructed the first aeroplane that ever actually flew, had his models made at the Brashear works. Here were ground the glasses for the range finders that our navy used in the Spanish War. They were, at the time, the most accurate range finders in the world. The Brashears built for the Allegheny Observatory one of the largest telescopes in the world; its lenses alone cost forty thousand dollars.

Phoebe Brashear lived to see her husband director of a great observatory, a professor in the University of Pittsburgh and for a time its acting head, and trustee of educational funds amounting to

more than twenty million dollars. At her table the most eminent men of science in the world have sat. She believed in her husband's future when he was only a mill hand, and she helped him to become the foremost living maker of astronomical instruments. When she died, in 1910, the world acclaimed her as the greatest influence in her husband's distinguished career.—*The Youth's Companion*.

An Astronomical Observatory for the Community.

CONTRIBUTED EDITORIAL IN "THE GREENWICH PRESS," GREENWICH, CONNECTICUT.

BY EDWARD F. BIGELOW.

For the first time this part of Fairfield County has an astronomical observatory available to the general public. Every reader should be interested in knowing what the value of a community observatory may be. In our utilitarian activity and in our sensational age with its multiplicity of attractions, the first questions are: "What is the use of an observatory? Is it worth while? Why should I take any time to gaze at the stars?" If you would experience the satisfaction of filling your mind with uplifting thoughts, then the observatory has its use, but it is of no use to those who can find pleasure only in life's frivolities.

Neither the Sound Beach astronomical observatory nor any other in the United States, however spectacular the celestial display may be, can compete with the sky rockets and the pinwheels of a Fourth of July pyrotechnic celebration. So much has been said in print and elsewhere about the grandeur of astronomy and of the wonderful spectacle visible in the heavens that I have learned that such statements must be made with discrimination and qualifications. To see a world like Jupiter, thirteen hundred times as large as the earth, with its circling satellites, is spectacular when one tries to realize what it really is, but it is a disappointing display when it is contrasted with a sky rocket. Visitors at the observatory have often said, "Is that all? I thought Jupiter was bigger than the earth, but it is only a little disc of light with four little 'stars' near it."

Visitors gazing upon the volcanoes and the mountains of the moon have voiced their disappointment: "I thought

those things were big volcanoes; but the whole affair looks only like a piece of lace." As the astronomer turned the telescope toward the Orion Nebula, and ventured to say that it is the biggest thing in the universe, and with delight looked at the trapezium, he thought that it would certainly elicit words of appreciation from the visitor, but the result was, "I don't see much of interest in that little cloud."

It is not the eye that sees things astronomical. The mind must mentally grasp the tremendous facts revealed by the telescope. When that point of view is assumed and the position realized, there is nothing more wonderful in nature than the volcanoes, mountain chains and amazing ocean depths on the moon, the mottlings and streaks on Mars, the brilliancy of Venus, the calm serenity of Jupiter and its moons, the sight of a world in formation as it is in the Orion Nebula, the marvelous distance and dainty, delicate beauty of the Pleiades.

These are not spectacular; they eject no sparks of fire, they explode no deafening bombs, they cannot compete with an automobile that surges by at a mile a minute; they offer none of the thrills of an elopement, a burglary or a murder in a novel or a moving picture show. They are quiet, calm, stately, dignified, magnificent.

Of all the anomalies and paradoxes in human nature, nothing is more astonishing than the general indifference of many human beings to their surroundings. We are whirling on celestial pivot at the rate of over a thousand miles an hour, we are rushing through space even more rapidly, amidst marvels of every description, through stupendous distances, and among suns, planets, nebulae, yet few ever seriously give a moment's thought to these things.

The other day an old man died, and I heard a friend say that he is walking the gold-paved streets and gazing at the wonders of heaven. I said: "He lived for nearly eighty years on the earth and he hardly ever gazed at any of its wonders. I do not believe he will suddenly acquire a habit of looking at God's creations in any other place." He and hosts of other people are allowed to stay on the earth for a few decades, but how little time do they devote to the earth and its surround-

ings? To the average person the heavens are irregularly sprinkled with tiny, bright specks called stars. To most people a planet is only a "star," and the moon only a light to light certain nights in the month, or in erroneous popular opinion to regulate the weather.

To give, especially to another generation, a clearer idea of the wonders of the heavens is the reason for the establishing of this observatory. Yet it is not intended primarily for children. Few, if any, children are sufficiently developed mentally to grasp the significance of any celestial view. A special invitation is therefore extended to the business man, in the midst of the life's activities, to stop occasionally and ask where he is travelling in the infinity of space and what his next door neighbors are, where they are, what they are doing and what they signify to him.

And you, gray-haired man or woman, devoutly singing, "The heavens declare the glory of God; and the firmament showeth his handiwork," stop and seriously ask yourself, Do these words mean anything to me? How do the heavens show the handiwork of God, what is He doing with that work, with what material has He fashioned the glory, and what is He intending to do in the future. "Day unto day uttereth speech." What is the utterance? What is the message? What does it mean to you? How do the days speak, and why? "Night unto night showeth knowledge." What knowledge? What value has such knowledge, and in what way can it influence the human race? Do you believe that the heavens are trying to speak to you? Why do you not listen? Do not accept general statements. Do not chant, "O all ye Works of the Lord, bless ye the Lord; praise Him and magnify Him forever," and in the next breath say, "I think we shall have a change of weather, as the moon will change tomorrow."

You read with some interest the discussions about the canals on Mars. You hear about enormous spots on the sun. Do you know what a sunspot looks like? Have you the slightest conception of the appearance of Mars, or in what part of the heavens it is at the present time? Do you know where Jupiter or Venus or Mars or the moon

is at the present time, and which way in the heavens is it travelling? Can you name the brilliant constellations now in the southern skies, and can you anticipate what will be in that position three months from now?

I ask not to puzzle you, but to say that the Sound Beach astronomical observatory is ready to make such things clear to you. The observatory does not hope to compete with modern sensational amusements, yet in itself it is the most sensational thing in the world. It is a joy to gaze on the dim nebulae when one knows what they mean. The observatory will teach you what they mean. There is nothing of greater vital interest than the sun, gazed upon its surface as revealed by the telescope.

Every person in Greenwich enjoys health because the moon lifts the tides that wash out the harbors. Without the tidal influence of the moon the water of Long Island Sound would become stagnant, putrid, evil. That it is not so, we may thank the moon. It is worth while to make the acquaintance of this friend of humanity, it is worth while to know something of its history and to study its friendly face. If there were a volcano in Greenwich, throwing its lava westward as far as New York City and in a radius of thirty or forty miles in every direction, I am thinking that you would look at it. That is what has taken place on the moon. The Sound Beach observatory will show you those gigantic rings of cold and hardened lava.

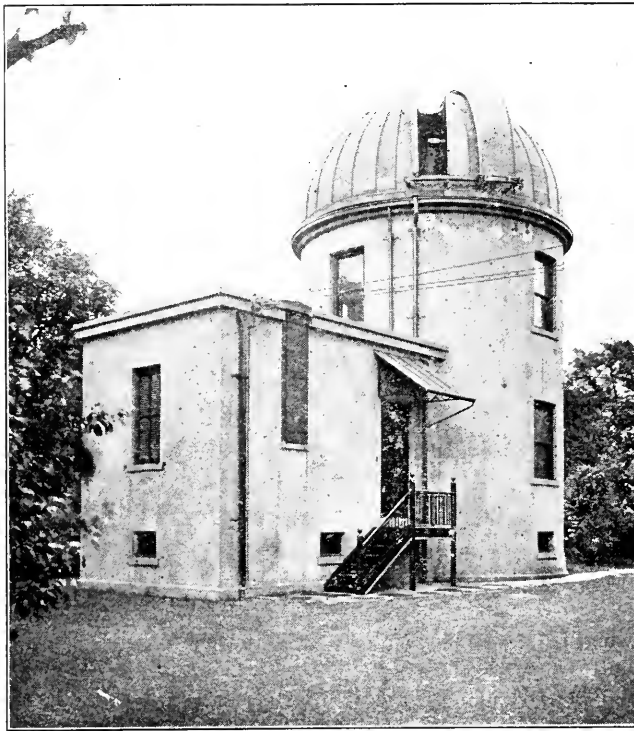
To help the observatory the public has responded generously, although there have been so many calls in other directions for other purposes. The observatory is completed. It is ready for use. Every resident of Greenwich and of Stamford, or of any other place, is invited to share in the gifts of our intelligent friends who believe that intellectual pursuit and enjoyment in the "grandest of sciences" are really worth while.

Truly to him who has sensed the infinite charm of the celestial host belongs untold riches—treasures not to be envied because others fail to appreciate the subtle significance which lends them a rare tone.—Henry Handy McHenry in "Popular Astronomy."

New Observatory in Rochester.

A complete observatory equipped with instruments and accessories that represent the latest stage in astronomical engineering has been erected by the Bausch & Lomb Optical Company in Huntington park, near the residence of George N. Saegmuller, vice-president of the company. Mr. Saegmuller first planned it as a private observatory, but the needs of the company, which has gone into the construction of astro-

While the observatory will be in charge of Mr. Saegmuller and his three sons, all of whom have taken university courses in astronomy, the instruments will be used by other scientists of the Bausch & Lomb Company and by others in the community who take an interest in astronomy. It is intended to set apart an evening for the public, giving it an opportunity to view heavenly bodies that are of interest at particular times.



THE BAUSCH & LOMB OPTICAL COMPANY'S OBSERVATORY.

nomical instruments, particularly telescopes, made an observatory necessary and it was decided that one should be built by the company.

The observatory will be used not only for astronomical work, but for testing the instruments of precision that are made by the company and which, because of the ever-increasing demand for accuracy, demand most thorough tests. Tests can be made in the factory only with difficulty because of the vibrations caused by machinery, but will be made with great accuracy in the observatory, since it will be entirely free from vibration.

Construction of Observatory.

The observatory consists of a tower for large telescopes, thirty-three feet from its main floor to the highest point in the dome, and of an adjoining rectangular wing for time and latitude instruments. The main part of the tower is hollow tile faced with concrete and the dome, twenty-two feet in diameter, consists of an iron frame covered with wood and overlaid with sheet copper. A layer of tar paper and felt is placed between the copper and the wood to protect the interior from sudden changes in temperature.

The wing for time and latitude in-

struments is to be twenty-four by twelve feet, of tile with a facing of concrete.

The interior of the tower is finished in white enamel and all woodwork is red oak with a natural finish. A part of the main floor is used as a library and reception room.

From the main floor a spiral stairway leads to the observation or equatorial room. In this room is an eleven-inch equatorial telescope of the latest type, designed and constructed under the personal direction of Mr. Saegmuller and embodying several new features intended to add to accuracy and to the comfort of the observer. It is sixteen feet long and has a free opening at the outer or object end of ten and one-half inches.

* * * * *

The Telescope.

The telescope is moved by means of clockwork mechanism and revolves with the motion of the earth, so that once it has been set so that a particular star falls within its field the telescope will automatically follow the star's course as long as it is above the horizon. The dome revolves with the telescope by means of similar mechanism, electrically operated. The instrument is mounted on a cast iron pier bolted to a concrete column twenty-eight feet high, eleven feet of which is imbedded in the ground. Before the pier was sunk careful tests were made to determine that it was sunk deep enough to avoid the ground tremors that might result from the motion of street cars and the like.

As the telescope revolves it describes a circle varying in size with the distance of the object from the astronomical pole, so that the eye-piece will be at varying heights from the floor at different times. In observatories of the older type this difficulty was overcome by using an inclined observing chair.

Floor-Raising Mechanism.

In the Bausch & Lomb observatory the difficulty is overcome by raising and lowering the floor of the equatorial room. When the observer desires to change the floor level to accommodate himself to the changed position of the eye-piece he will have only to touch a button and the floor will rise or sink to the desired level. The floor, when at its highest level, is at a distance of about twenty feet from the main floor,

and when at its lowest level, at a distance of about ten feet from the main floor. Only a few of the larger or more recently built observatories have floor-raising mechanism.

The wing that houses the time and latitude instruments contains a small office and computing room. It is finished in a manner similar to the inside of the tower. The office is fitted with bookcases, tables and chairs for the use of the observer while he is waiting for stars to come into the field of view of the transit or when he is computing results of his observations.

The transit room contains a three-inch transit, mean and sidereal clocks and a chronograph on which the time is recorded. There is a vertical collimator below the floor to measure the deviation of the transit from the meridian. Wireless time signals are received from the Naval Observatory at Washington. An opening cut in the two walls and the ceiling of the transit room permit the transit to sweep in the plane of the meridian and permit the stars to be observed at culmination.

* * * * *

Regulation of Temperature.

Double doors shut off the transit room from the office, since the delicate instruments require that the room have the same temperature as prevails outside.

It is planned eventually to erect a wing on the opposite side of the tower in which will be installed a meridian circle and seismograph, the latter to be placed in the basement and used for measuring the amplitude and intensity of earthquakes.

The dome and the wood work were built under the direction of Oscar Kaltenbach, mechanical engineer in the drafting room at the Bausch & Lomb plant; the mason work done by Stallman & Sons, and the instruments were all designed and constructed under the personal supervision of Mr. Saegmuller in the Bausch & Lomb factories.

The first original work carried on at the observatory was a series of observations of Jupiter in September of last year. This work was done by Latimer J. Wilson, Director of the Planetary and Lunar Astronomy of the Society for Practical Astronomy. The results of this work, together with sixty-four of the drawings made by the observer have been published by Bausch &

Lomb in their first observatory bulletin.

Mr. Sinclair of the U. S. C. & G. S. has been engaged for several weeks past in establishing the exact latitude and longitude of the observatory. For this work the wireless receiving apparatus is used to receive the time from Washington. When the exact location has been established the Bausch & Lomb observatory will be regularly listed in the world directory of observatories.

Different Life and Conditions.

The impossibility of life existing as we know it on the planets, has been generally established—even for Mars. But one must not forget that in all probability millions of the stars are, like the sun, the centers of an invisible retinue of planets and satellites, perhaps even more vast and complex than our own solar system. Surely it is not likely that our planet is the only one in the whole cosmic universe capable of supporting human life. There may be planets where races of human beings live whose civilization surpasses ours by an even greater margin than we have advanced beyond the ignorance of primitive man, to say nothing of the possibility of life existing of a totally different nature. Bergson has declared that the chemical affinity of the carbon, oxygen and hydrogen atoms is the genesis of all biological species. May there not be worlds where other elements unite to create species of an entirely different type?—Henry Handy McHenry in "Popular Astronomy."

* * * * *

Eye hath not seen, nor ear heard, neither have entered into the heart of man, the things which God hath prepared for them that love Him.—I Cor. II, 9.

It has been roughly estimated that the extinct stars or suns outnumber the lucent ones, one hundred to one. Verily, the universe is one vast cemetery of dead suns and systems of worlds. The process of creation or of evolution of matter is, however, continuously going on, suns and star systems are ever being evolved, and as Flammarion puts it, "in space there are both cradles and tombs."—"The Call of the Stars," (Kippax).



Claim of Primary Importance of Nature by the Episcopal Church.

Everybody seems to admit abstractly and more or less concretely, perhaps, that God may be discovered somewhere in nature; but I am saying that He is primarily revealed in nature. We believe this is contrary to a widely held public opinion where the Bible takes first place and nature second, if indeed it takes any place at all.

But since the article, "Nature as well as Revelation Reveals God," in the March number was written, my attention has been called to an authoritative statement by the Right Reverend Chauncey B. Brewster, D. D., Bishop of the Episcopal Diocese of Connecticut. In his valuable and interesting book, "Aspects of Revelation," he shows his appreciation of nature as of first importance by entitling the first chapter, "A Revelation in Nature," and more than this he distinctly states in the summing up of that chapter, "Nature is the primary revelation."

I quote the first and the last paragraph of that interesting chapter:

"Before any written books was the book of nature. It has always lain open for men as a primer, wherein they were to learn to read their first lessons, deciphering its characters, spelling out the syllables, and guessing at the meaning. The material world has teaching for those who can read aright.

* * * * *

"The manifestation in nature, as regards what is revealed and what is concealed, is such as to warrant expectation of a further manifestation through something yet higher, that shall more worthily express One who is not only in all, but also above all. Nature is the primary revelation. In order, however, to read it aright, we must have illumination. We need not be surprised to find that the illumination wherein truly to read nature, and to see its divine significance, is a light that shines within.

"The light that never was on sea or land."

Every Church Should Have a Nature Sabbath School.

Carefully Selected Instructors Should Take the Children Out Into the Open and Teach Them the Wonders of Botany, Astronomy and Insect Life.

[From the New York *Evening Journal*. Republished by permission].

BY ELLA WHEELER WILCOX.

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What is your opinion on the subject of a "Nature Sabbath School?" The idea has come to me as a sort of inspiration.

We teach children to think of their natural activities, their play, as something to be put aside, till their religious devotion is over—and so religion becomes not something to love but merely a duty which they hope will be short—the shorter the Sunday School the better the child likes it—as a writer says "we mask the joy of religion by our long unsmiling faces, our mechanical devotion, our whispers and tragic manner," then—is it any wonder that children find religion wearisome?

As Coe writes—"As long as such notions prevail we should expect children to exclude God from their play; to think of religion as unnatural and either grow up indifferent to religion or reserve their reverence for Sunday in the church."

My idea would be to take little ones out under the skies to show them the wonderful beauties of Nature, teach them the nearness of the Infinite and, as my little boy has been taught, to "talk to the fairies" (the spirits of light and love) aside from the spiritual teachings—physically the little ones would be benefited and the little flock could be given such an enjoyable outing that they would learn to love "Nature's Sabbath School" (is the name appropriate?). If you think such an idea of use, I shall be glad to outline a plan which is in my mind, though doubtless it could be improved. M. H. C. C.

The idea contained in the letter quoted above is crude but beautiful. Worked out and properly developed it would become of great value to the world. A Nature Sabbath School should be a part of every Christian church. Teachers should be carefully selected and thoroughly trained to carry out the instruction, which should include the rudiments of botany, astronomy, and the wonders of nature, of insect and star life, should be dwelt upon with reverence and awe.

All these studies should be made as entertaining as fairy stories or fiction in any form.

The children should feel that they are on a picnic and that they are being amused, while in fact they are being instructed, mentally, and their souls are unconsciously being awakened to reverence for and love of God.

A child who attends Nature's Sabbath School under such instruction could never grow into a pessimist or an atheist. Many children have become both who were reared in the depressing environment of the old-fashioned Sunday School. A good man said not long ago that twenty years of his life were marred by his Sunday School experiences.

Sunday to him was a day of horror and gloom, and the unwholesome teachings he heard expounded by a cruel God who sent unbelievers to hell caused him to fly to the extreme of unbelief in any religion as soon as he passed out of the home environment.

After twenty years, however, he came into the light of true knowledge of God through a study of plant life, and the marvels which he found in seed and bulb and bud and blossom caused him to realize the majesty and might of the All Creative Power, and to love his Maker.

Let us have the Nature Study School by all means.

Pass on God's Gifts.

We are at our best when we try to be not for ourselves alone but for our brethren; and we take God's gifts most completely, when we realize that He sends them to us for the benefit of other men, who stand beyond us, needing them.—Phillips Brooks.

I wonder why Bishop Brooks used the word "men." Probably in the sense of mankind. Certainly, girls, boys and women, as well as men, can disseminate "God's gifts" for the benefit of others. That is the essence of our Association. Good term, that—"God's gifts"—life, liberty and the pursuit of happiness—the world of nature, books, friends, the wonders and beauties of the heavens above, the earth beneath and the waters under the earth. Life is not long enough to utilize or to be sufficiently grateful for all these gifts. Probably that is one reason for eternity.



THE AGASSIZ ASSOCIATION

Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

An AA Chapter with Audubon's
Granddaughter.

Louisville, Ky.

To the AA:

A few members of the L. G. H. S. Chapter of the AA recently had an interesting time at the home of Miss

they like their name pronounced in the French fashion.

Miss Audubon talked of the old home in Henderson, Ky., and of the life of Audubon both there and in Louisville where he was in business for so many years, a business, by the way,



AN AA CHAPTER WITH AUDUBON'S GRANDDAUGHTER.

Harriet Audubon, the granddaughter of the famous ornithologist. Miss Audubon is an honorary member of our Chapter. She talked about her grandfather in a way to make him live for us, for although she was young when he died she recalls him vividly. Some French lessons he once gave her she will never forget, she said. The family are proud of their French origin and

for which he had little taste. One good part of it, however, lay in trips to the East which led through the wilds of Kentucky, Ohio, and Pennsylvania. On these trips he pursued his real vocation which was to study birds in their haunts and make records of bird life. Often he endured the hardships of little to eat, no rest at night, and the real dangers of pioneer days. But he

had a happy temperament, great industry, and such a love for nature that he made no complaints.

Audubon was an artist as well as an ornithologist. He spent a number of years in Paris, studying with David, and afterwards exercised his talent a great deal. He has told the history of birds as accurately on canvass as in words. Some of the large original drawings prepared for his great work *The Birds of North America* are in the Museum of the Louisville Public Library. They are highly prized and are worthy of the admiration they command. They speak eloquently of the infinite patience and love of the artist as well as of his skill in faithful portrayal of bird life.

Miss Audubon dwelt upon the courage of her grandfather in the face of three misfortunes that at different times befell his beloved drawings. On one occasion on a steamboat trip to Mississippi, gunpowder defaced several hundred of them. At another time rats got into the box where others were placed for safe keeping and utterly destroyed the labor of years. And again great damage was done by a fire which broke out in a store room where Audubon had left the larger part of his drawings while absent on a trip abroad. Each time the great man set about repairing the loss as best he could and remained unsatisfied until he had duplicated as far as possible the drawings destroyed.

Audubon was much appreciated in Europe. On one occasion he had the pleasure of visiting Sir Walter Scott, whom he much admired. At all times Audubon kept a most careful journal and he tells in it with how much enthusiasm Scott received him and how much attention he gave to his drawings.

For a large part of his life Audubon had the help of a noble wife who understood him and worked with him through every misfortune that came to them. And Audubon acknowledges her comradeship in many loving tributes in letters and journal. But for it perhaps he could not have been to such a degree the brave and dauntless soul who studied nature for the love of her and not for profit nor for the world's approval.

Miss Audubon has promised to go with us on some of our excursions this spring. Her own love for nature as

well as her very considerable knowledge of birds will make her a most welcome and valuable companion.

Sincerely yours,

MARY ROSE SHELLEY, *Pres.*

ELIZABETH PECK, *Treas.*

DOROTHY SHELLEY, *Cor. Sec'y.*

VIRGINIA WHEELER, *Librarian.*

Methods of Seed Distribution.

BY THE REVEREND MANLEY B. TOWNSEND,
SECRETARY AUDUBON SOCIETY OF NEW
HAMPSHIRE, NASHUA, NEW HAMPSHIRE

The interesting letter by Mr. H. Stuart Dove in the February number of *THE GUIDE TO NATURE*, in which he describes the occurrence of two small trees growing on the island of Tasmania, two hundred miles from their native habitat in Australia, brings up the subject of the wonderful methods by which seeds are transported to a distance. Undoubtedly Mr. Dove is right in attributing the planting of these special seeds to the agency of birds, this method being probably more common and important than is generally supposed. Seeds are widely scattered by birds that have transported them in their feathers or on their feet or legs, especially if the seed be covered with a sticky substance or be provided with hooks for "catching on." In one of his investigations, Charles Darwin raised eighty-two plants from seeds found in a clot of earth adhering to the leg of a partridge—a truly astonishing thing.

One of the most interesting meetings of our Nashua Chapter of The Agassiz Association was spent in studying typical seeds and their methods of distribution. Let me commend the subject to our Chapters.

It will be found that some seeds are tramps. Like all hoboes they steal rides. Typical examples are the burdock, Beggar-ticks, agrimony and bedstraw. Others are balloons, like those of the dandelion, thistle, milkweed, aster, willow and goldenrod. Still others are airships, as for instance, the winged seeds of maple, pine, elm, ash, birch and hornbeam. These are either monoplanes or biplanes—winged argosies of the sky.

There are seeds that are shot violently from the seed vessels by explosive force. The witch-hazel hurls its seeds to a considerable distance. The snapdragon is a catapult, as are the

violet, rattlebox, jewelweed, wild geranium and others. The "squirting cucumber" of Europe ejects a thin stream of water with sufficient force to carry the seed to a considerable distance.

Other seeds, like the cocoanut, are boats, and float for long distances to become the originators of new colonies. Some seeds are expert swimmers, being provided with numerous cilia, with which they make good progress through the water. To be sure the action is mechanical, but the result is the same.

The seeds of the chestnut, hickory, beech, walnut, hazel, oak and butternut are all planted by squirrels and other animals, while innumerable small seeds stored by mice are disseminated.

The rose of Jericho, the Russian thistle, the tumbleweed and the tumble mustard are travelers, shaking loose their seeds as they roll along the ground before the wind. The castor-oil bean, which in appearance resembles a beetle, gets snapped up by birds but, being indigestible, is cast out at some distant place.

Still other seeds take long rides in sleeping cars. This is chiefly true of those that are surrounded by a juicy pulp, like the raspberry, strawberry, partridge berry, Indian cucumber, checkerberry, mulberry and barberry. The stomach of a bird makes a comfortable sleeping car. After the juicy pulp has been digested, the seed is voided in new territory.

The linden produces a wonderful parachute, a broad bract, hanging from the middle of which is the fruit. Caught by the wind, these fruits go sailing afar, whirling dizzily, perchance to fall to earth on favorable soil.

Then there is the type of seed mentioned by Mr. Dove in his article—the clingers, covered with a sticky substance. The mistletoe is an example.

An evening spent in the study of fruits and seeds thus becomes a pursuit of absorbing interest. Some of the problems to be considered at such a meeting may be: "Why are some fruits brightly colored?" "Why are some sweet and juicy?" "Why do seeds of juicy fruits have hard, indigestible coats?" "Why do seeds travel?" "Why do many plants produce so many seeds?" "Why are the edible berries usually found on low trees and shrubs instead of tall trees?" "Why are wing-

ed seeds found on tall trees?" "Why are hooked seeds found on low plants?" The wonderful cooperation between plants and insects, and among birds, quadrupeds and plants should also be noted and discussed.

The marvelous methods of seed distribution afford food for thought and material for several evenings of fascinating study.

Four Square Feet of Jungle Debris.

The New York Zoological Society has published, a rather remarkable book by C. William Beebe, in which he tells of his observations on the birds of Pará, Brazil. But what should especially attract the attention of AA workers is a chapter on his studies in four square feet of jungle debris. What he discovered in that limited area is perfectly astonishing. He has shown us what may be obtained from little material.

I believe his studies in the jungle of Brazil might be repeated, *pari passu*, in any forest or grove in the United States. In commendable contrast with the craze for studying big animals, Mr. Beebe has shown what interesting objects may be found in a little space on the face of good old Mother Earth. It has been said that "it is a wise naturalist that knows his own parish." Mr. Beebe has proved that there is a world of wonders in a little debris. The spirit of his work is shown by the following quotations:

"Armed with forceps, lens and vials, I began my search. For days I had gazed upward; now my scrutiny was directed downward. With binoculars I had scanned without ceasing the myriad leaves of a great tree. Now with lens or naked eye I sought for signs of life on an infinitely smaller scale; the metropolis of a fallen leaf, the inhabitants of a dead twig. When I studied the treetop life in the lofty jungle I was in a land Brobdingnag; now I was verily a Gulliver in Lilliput. The cosmos in my war bag teemed with mystery as deep and as inviting as any in the jungle itself.

* * * * *

"Some of the half decayed leaves were very beautiful. Vistas of pale, bleached fungus lace trailed over the

rich mahogany colored tissues, studied here and there with bits of glistening, transparent quartz. Here I had many hints of a world of life beyond the power of the unaided eye. And here too the grosser fauna scrambled, hopped or wriggled. Everywhere were tiny chrysalids and cocoons, many empty. Now and then a plaque of eggs, almost microscopic, showed veriest pin-pricks where still more minute parasites had made their escape. Contracting the field of vision to this world where leaves were fields and fungi loomed as forests, competition, the tragedies, the mystery lessen not at all. Minute seeds mimicked small beetles in shape and in exquisite tracery of patterns; small beetles curled up and to the eye became minute seeds of beautiful design. Bits of bark simulated insects, a patch of fungus seemed a worm, and in their turn insects and worms became transmuted optically into immobile vegetation. Scores of little creatures were wholly invisible until they moved. Here and there I discovered a lifeless boulder of emerald or turquoise—the metallic cuirass of some long dead beetle.

“Some of the scenes which appeared as I picked over the mold, unfolded suddenly after an upheaval of debris, were startling. When we had worked with the lens for many minutes, all relative comparisons with the surrounding world were lost. Instead of looking down from on high, a being apart, with titanic brush of bristles ready to capture the fiercest of these jungle creatures, I, like Alice in Wonderland, felt myself growing smaller, becoming an onlooker, perhaps hiding behind a tiny leaf or twig. This feeling became more and more real as we labored day after day, and it added greatly to the interest and excitement.”

The ordinary killifish, *Fundulus majalis*, of our brackish waters is thought by Dr. S. O. Nash of Johns Hopkins University to have a “direction sense” more or less like that of certain migratory birds. He notes that when a school is cut off in a tidal pool by the falling water, the fish flop across the sand bar to the sea. But they rarely make a mistake and take a wrong direction.

Death of J. Walter Davis.

J. Walter Davis, for several years a resident of Stamford and for a few years a member of The Agassiz Association, died suddenly of heart trouble at his home in Westport, Connecticut, on Sunday, April 16th. Mr. Davis left Stamford last November, after living there for sixteen years. He took active interest in Y. M. C. A. and other religious work, and was an intense lover of nature, but his occupation as a traveling salesman, and his devotion to the Y. M. C. A. and to the Baptist Church, prevented him from devoting much time to the pursuits of a naturalist. His chief manifestation of interest was by means of the camera of which he was a skilled user. Mr. Davis belonged to that grand class of business men who find their recreation in some form of outdoor avocation, although his time for such was limited.

In conversation he always manifested a cordial and evidently heartfelt interest in the religious tendencies of the A.A., regarding the Association as one of the prominent factors in religious and uplift work in this community.

The Agassiz Association extends to members of the family, and to his friends, its heartfelt sympathy, and to the public in general the expression of its high appreciation of him as a thoroughly hale and hearty man in every sense of the words, a believer in the omnipresent God, and a lover of His works.

Death of Miss Fielde.

Students of insect life will regret the death, on February 22, of Miss Alele M. Fielde.

Miss Fielde though she belonged as a whole with the older group of observer naturalists, did a good deal of valuable experimenting on the psychology of various ant species. She was, besides, the inventor of the Fielde portable nest for ant colonies. Her scientific work was rather an avocation than the main business of her life, for she was for more than twenty years a missionary to China and Siam, and wrote several books on China. After her return to this country, she became active in various civic and social movements. Her death occurred at Seattle at the age of seventy-seven.

A Serious Situation Confronts Us

Please Advise and Co-operate

For the year ending March 31st, 1916, our Annual Report shows:

The Expenses of The Guide to Nature	\$4,428.76
The Receipts of The Guide to Nature	3,847.07
	\$ 581.69
Cost more than received	

This deficit has been paid from membership fees and cash contributions, but the problem was still further complicated April 1st by ENORMOUS INCREASES IN PRICE OF PAPER AND CUTS. Our engravers and all others have combined to increase the cost of cuts from fifty per cent. to more than double the former price on some. This, it is said, is a necessity due to the enormous increase in the price of chemicals.

No magazine ever had a more loyal list of subscribers. Undoubtedly some would continue if the subscription were forced to ten dollars a year. With many who really appreciate and need The Guide to Nature, the price of one dollar is all they can afford to pay. The magazine is an important factor in the purpose of our Association—"the general diffusion of knowledge," and we must keep it at one dollar a year if it is possible to do so. We could do this with a margin for general expenses if we had a circulation of ten thousand in place of our present three thousand. The price for the first year was one dollar and fifty cents, but we have struggled for seven years to do the greatest good to the greatest number by keeping it at one dollar. No other general nature magazine has ever been published in efficient form—high grade paper and liberal illustrating, forty-eight pages—at so low a price as one dollar a year. The Guide to Nature is really worth two dollars, and would now cost that if it were not for the time freely devoted to it by several members of the Bigelow family, by our associate editors and by many correspondents.

We are obliged to request every subscriber to devote some time to the Cause.

Secure new subscriptions.

Please do not necessitate the cost of repeated notices of expiration of subscription.

Become a member of The Agassiz Association and aid in its work.

It has been decided to make to our subscribers this statement of the Serious Situation and faithfully try for a few weeks to ascertain what can be done. If at least five hundred new subscriptions are received we can continue at one dollar a year. Your PROMPT RESPONSE, in renewals, new subscriptions, memberships or cash contributions, is earnestly requested.

The Agassiz Association,

Edward F. Bigelow, President.

Arcadia: Sound Beach, Connecticut.

LITERARY NOTICES

DISEASES OF CULTIVATED PLANTS AND TREES.
By George Masee. New York City: The Macmillan Company.

Although this is an English book, it will be found convenient and useful for our American readers. As there is a widespread and intelligent interest in diseases of cultivated plants and a desire to know about their treatment, this book cannot fail to be of general interest to our readers.

THE INSECT NOTEBOOK. By James G. Needham. Ithaca, New York: The Comstock Publishing Company.

It is indeed encouraging to any one eager to see an increase in the interest in nature to observe that The Comstock Publishing Company has been required to issue this, the seventh in The Nature Notebook Series. It is conveniently arranged and will be of interest to classes in entomology as well as to amateurs. The price is only thirty cents.

THE PRINCIPLES OF PLANT CULTURE. A Text for Beginners in Agriculture and Horticulture. By the late E. S. Goff. Revised by J. G. Moore and L. R. Jones of the University of Wisconsin. New York City: The Macmillan Company.

This book was first published in 1897 and since then has gradually grown in size and improved in character. While it was originally the outcome of lectures to students in a short course in agriculture, it is so designed as to benefit the general reader who desires to learn the principles of plant culture. It is a book of especial interest to our students of plant life.

THE APPLE. By Albert E. Wilkinson, Department of Horticulture, Cornell University. Boston. Ginn and Company, Publishers. 8vo. cloth, 492 pages, profusely illustrated, \$2.00

The aim of this book is to bring together and boil down the great mass of literature dealing with the various aspects of the apple business—growing, harvesting, and marketing. In its breadth and scope this volume differs greatly from others in the same field, for whereas they are nearly all useful to only a limited locality, this book is equally well adapted to the East, Mid-West, West, and South. Its author has studied the entire subject in every phase from one end of the country to the other, and has written a treatise which should prove indispensable to the farmer, the orchardist, the home gardener and the students in colleges and secondary schools. The text contains many helpful illustrations, including four full-page color plates.

THE HILLS OF HINGHAM. By Dallas Lore Sharp. Boston, Massachusetts: Houghton Mifflin Company.

The country life that Mr. Sharp celebrates so amusingly in this volume, is that of the business man who seeks a means of escape from the high pressure life of the city, and finds it in a small farm not far away.

"The Hills of Hingham" is one of those books you feel distinctly the better for. By reading it, city dwellers can enjoy rural life without living it, while those who make their homes on the farm can live over again the pleasures, and laugh with the author at the vexations, of life in the country.

OUR EARLY WILD FLOWERS. By Harriet L. Keeler. New York City: Charles Scribner's Sons.

When one goes afield to seek wild flowers in March, April or May, there is no necessity to give much attention to goldenrod and fringed gentian, so here is a really good idea embodied in a book limited to the things of the season. It is well arranged and beautifully illustrated. To look at the volume, as the reviewer is doing, in the last of February when snow is on the ground and cold winds are blowing, it is cheering to be reminded that within a short time, in a still shorter time for our readers after they read this notice, we shall again see the spring beauties, marsh marigolds, anemones, saxifrage and others. Is not life worth living?

MEN OF THE OLD STONE AGE: Their Environment, Life and Art. By Henry Fairfield Osborn. 269 Illustrations and Maps. Price, \$5.00 net. New York City: Charles Scribner's Sons.

"Men of the Old Stone Age" is a first full and authoritative presentation of what has been actually discovered up to the present time in regard to human prehistory. All the known prehuman and human stages of development for the last five hundred thousand years are described as fully and fairly as the material allows. From the time enduring remains of warlike and industrial life appear—one hundred and twenty-five thousand years ago—the author traces every step in man's economic and social evolution; and, finally, all the stages of artistic endeavor.

The volume is, as Professor Osborn says in his Preface, "the outcome of an ever memorable tour through the country of the Old Stone Age"—the Palaeolithic caverns of Italy, France, and Spain. On this tour, which was made in 1912, the author was

guided by the three distinguished archaeologists of France—Emile Cartailhac, Henri Breuil, and Hugo Obermaier.

The book is written in that lucid and easy style characteristic of all Professor Osborn's writings. The ancient races of men

Howard McGregor, of Columbia University, at once an anatomist and an artist, whose models of the Trinal, the Piltdown, the Neanderthal, and the Cro-Magnon men are masterpieces of restoration.



PL. IV. The Piltdown man of Sussex, England. Antiquity variously estimated at 100,000 to 300,000 years. The ape-like structure of the jaw does not prevent the expression of a considerable degree of intelligence in the face. After the restoration modelled by J. H. McGregor.

are made to live again—they cease being fossils and become realities. In this difficult art of restoration the author has enjoyed the co-operation of Charles R. Knight and other artists, as well as of Professor J.

Orchids.

Gay butterflies tangled in meshes of green,
While threading the aisles of the forest un-
seen.

—Emma Peirce.

Microscopes at Special Rates.

Mr. Edward Penneck, 3609 Woodland Avenue, Philadelphia, Pennsylvania, has been engaged for many years in exploiting microscopes, microscopical accessories, medical books, cameras, photographic lenses, etc., and has built up a large business, especially in connection with the University of Pennsylvania, and also has a correspondence business with naturalists everywhere.

Recently he has issued an interesting special bulletin of bargains in secondhand articles of this kind. We suggest that every reader interested in nature study send to him for a copy of this bulletin, kindly mentioning THE GUIDE TO NATURE.

Weeds.

Often beautiful are weeds,
 Would garden beds have graced;
 Opprobrium only covers them
 Because they are misplaced.
 —Emma Peirce.

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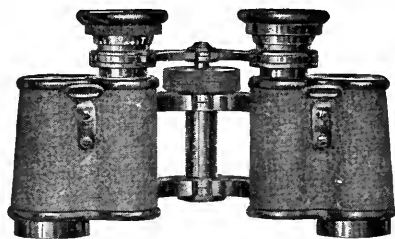
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The Guide To Nature

WHAT IS A "SAFE AND SANE FOURTH?"
REAL PATRIOTISM.

WHAT IS PATRIOTISM?
LOVE OF COUNTRY.

WHAT IS LOVE OF COUNTRY?

I love thy rocks and rills,
Thy woods and templed hills;
My heart with rapture thrills
Like that above.

Let music swell the breeze,
And ring from all the trees
Sweet freedom's song;
Let mortal tongues awake;
Let all that breathe partake;
Let rocks their silence break,
The sound prolong.

Volume IX **JULY 1916** Number 2

PUBLISHED BY

THE AGASSIZ ASSOCIATION

ARCADIA: SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

Subscription, \$1.00 a Year. Single Copy, 10 Cents

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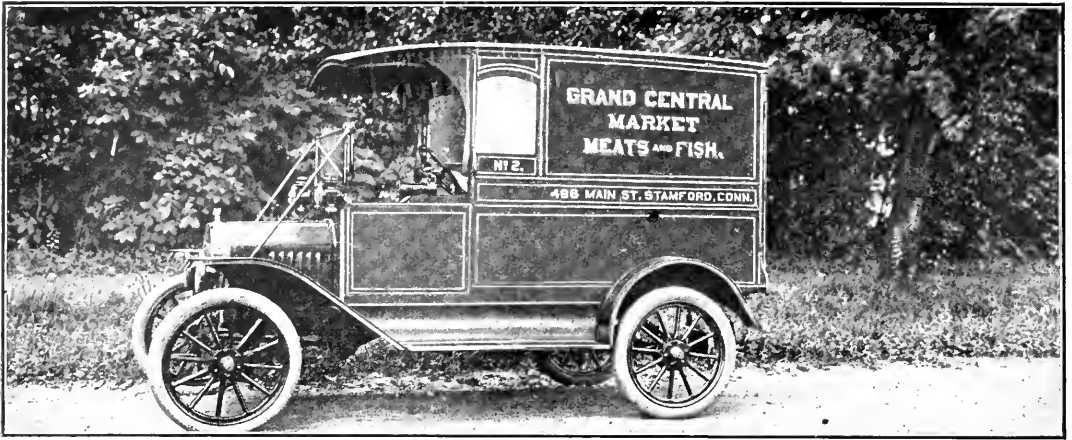
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Clarke has a weakness for tramping in the country and usually dresses for the part. The result was that one day when he took a seat in a homeward bound train the young lady opposite him mistook him for a farm hand.

But bless her, her soul was so nigh to bursting with beautiful thoughts that she must speak or go off pop! So she turned patronizingly to Clarke.

"Don't you feel an utterly passionate sympathy with nature's most incarnate aspirations," she gushed, with a rapt look in her eyes, "when you are walking on the illimitable sky touching moors or riding through the dim aisles of the horizon bound woods, my good man?"

The "rough looking person," as she would have described him, promptly replied:

"Yes, that is so, and I am frequently drawn into an exultation of rapt soulfulness and beatific incandescent infinity of abstract contiguity when my foot catches in the burrowed domicile of the

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lepus, cuniculus—otherwise a rabbit hole."

"Indeed!" gasped the young lady, much surprised. "I had no idea that the lower classes felt like that!"—"N. Y. Globe."

Among the many fruiting trees and shrubs known to attract birds, the authorities of the Arnold Arboretum at Forest Hills, Mass. have found the Japanese crab tree to be the most useful in their experience. This splendid tree is an annual bearer; is most attractive in both fruit and flower, and its heavily-laden crop of small, cherry-like apples remains clinging to the branches throughout the winter, thus affording abundant food for robins, finches cedar-birds, grosbeaks and other visitors.

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For the 6 year size will be needed, 3½ yards of material 27 inches wide, 2½ yards 36 or 2¼ yards 44, for the plain dress 1 yard 36 inches wide for the ruffles.

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A Local Department

Talks on Teeth.

BY DR. D. KATZ, STAMFORD, CONNECTICUT.

The care of the teeth should begin in infancy, almost at the beginning of their eruption. It is often found necessary to begin even earlier by lancing the gums to relieve the pains of eruption.

The baby's mouth should be washed with a mild antiseptic (clean cloth wound around the forefinger and dipped into a solution made with a teaspoonful of boracic acid to a glass of water) after every feeding or nursing. As soon as teeth begin to erupt, the application of a soft toothbrush wet with this solution is advisable.

In children of perfect physique the process of changing teeth is usually well managed by Nature, but abnormal or weak children, as well as children of extraordinary physique, usually require the care of a dentist during the period of changing. It is essential therefore for mothers to know the exact time of eruption of both temporary and permanent teeth. The table given below should be conspicuously pasted in every mother's book.

Eruption of the Teeth. The *temporary teeth* begin to appear through the gum at the 7th month after birth, the lower central incisors appearing first. Their eruption ends with the appearance of the second molars, about the age of two years. The lower teeth slightly antedate the upper. Their formula is as follows:—

$$\left\{ \begin{array}{l} \text{Upper } \overline{1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1} = 10 \\ \text{Lower } \overline{1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1} = 10 \end{array} \right\} = 20$$

24 12 18 9 7 7 9 18 12 24 months

Of the *permanent teeth*, the first molars appear about the end of the 6th year, followed by the incisors about the 7th or 8th year, the bicuspidis from the 9th to the 10th year, the canines about the 11th or 12th year, the second molars from the 12th to the 13th year, and the third molars from the 17th to the 21st year. Those of the lower jaw are slightly in advance of the corresponding upper ones. This formula is as follows:—

$$\left\{ \begin{array}{l} \text{Upper } \overline{\text{Wis. Mo. Mo. Bi. Bi. Ca. In. In. In.}} \\ \dots 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1 \\ \text{Lower } \overline{\dots 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1} \\ \quad \quad \quad 19\ 12\ 6\ 10\ 9\ 11\ 8\ 7\ 7 \end{array} \right\} = 32.$$

$$\left\{ \begin{array}{l} \text{Upper } \overline{\text{In. Ca. Bi. Bi. Mo. Mo. Wis.}} \\ \dots 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1 = 16 \\ \text{Lower } \overline{\dots 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1} = 16 \end{array} \right\} = 32.$$

8 11 9 10 6 12 19 years

The *greatest number of teeth* at one time in the jaws is 48,—including all the temporary and permanent teeth except the third molars, if none have been lost. This occurs between the 5th and 7th years of age.

In my next article I will endeavor to show the evils that come through lack of a little superficial knowledge of dentistry, knowledge which every mother should possess.

Children should be taught not to fear the dentist. Visits to the dentist should be made at frequent intervals so as to avoid long and painful operations in the future. By following these methods I have personally gained the confidence and friendship of hundreds of children who look back in pleasure and not in fear to the times spent in my dental chair.

Roses by the Cellar of an Old Homestead.

I gathered a few of the roses for a boutonniere and stood a few minutes in silent contemplation.

My mind harked back to the early years of the last century, when, in all probability, some young farmer brought to this home a buxom bride. Together they planted these roses by their cottage door. The roses in their young faces faded as the years came and went, but still the roses by the door-stone bloomed fresh as ever. In time the roses of their household, the grown-up girls and boys, were transplanted to other soil, after manner of men; but still the roses bloomed by the door. One day they came back and bore the aged father to his last resting place and strewed some of these very roses upon his grave. Later the form of the widowed mother was laid beside the lover of her youth and the companion of her old age; and the sorrowing children

planted some of these roses upon their lowly graves. Then the house itself turned to ashes, but still the roses bloom every June, missing the gentle hands that tended them so lovingly, but doing their best to beautify the unsightly scar, all that remains of a once happy home. With moist eyes I turned reluctantly and resumed my journey.—Milo Leon Norton in "Saturday Chronicle."

Seek Nature's realm, and you will find
A store of things just to your mind.
—Emma Peirce.

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New York City: D. Appleton and Company.

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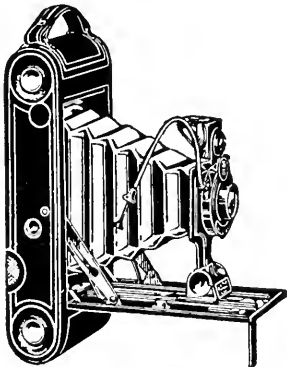
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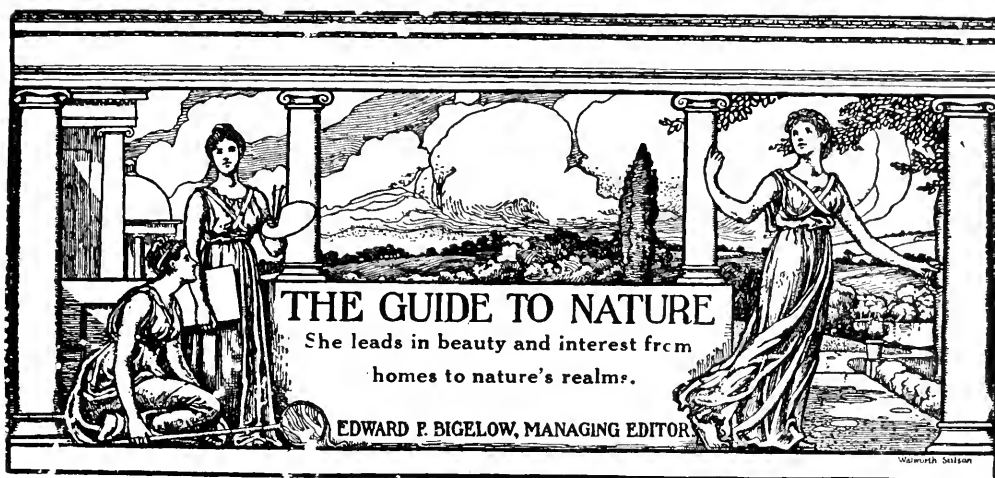
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Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
 Subscription, \$1.00 a year
 Single copy, 10 cents
 Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

JULY, 1916

Number 2

Ornamental Uses of Shells.

BY L. P. GRATACAP, NEW YORK CITY.

Shells, apart from the unique product of the pearl, have often been made serviceable in garden and house and for personal ornament. The old-fashioned garden bed with its fence of clamshells is a very homely instance of the former, and the basket and box, encrusted with variegated shells, in less sophisticated days extorted an unfeigned admiration. The popular employment of the lustrous or iridescent surfaces of shells, often unsuspected beneath their dull repellent epidermis, has attained today a very wide recognition, and the industrial use, also ornamental in its purpose, of the fresh-water clam for the manufacture of buttons assumes economic importance.

Shell ornament when it assumes a personal decorative purpose is certainly very ancient. Prehistoric remains demonstrate this conclusively, as shown in buried necklaces which not infrequently, as in central France, are formed even of fossil shells. The really extraordinary affection for shell ornaments among the aboriginal races, as well as the admiration, exhibited in parlor bric-a-brac, for shell flowers among modern races, illustrates the appeal which these objects make to the eye. In the Board of Trade returns

for the United Kingdom, in 1897 the value of the imported shells (which included tortoise shell) was about three millions of dollars, and while an appreciable amount of this represents industrial uses—as the shell powder mixed

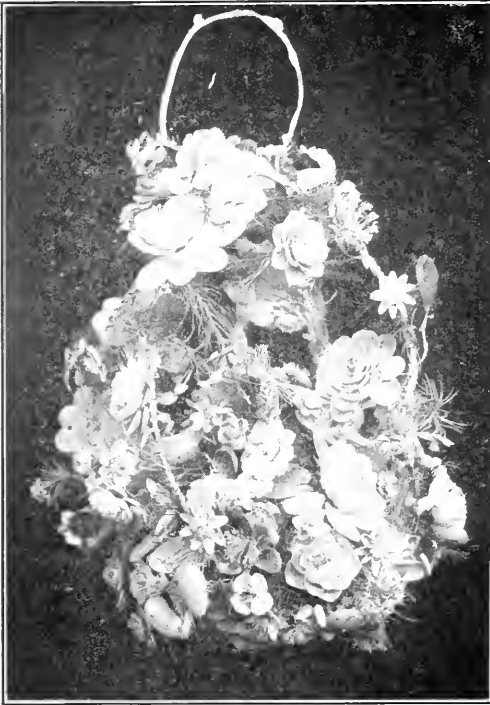


ORNAMENTAL SHELL BASKET MADE BY THE INDIANS OF CENTRAL AMERICA.

in the finer grades of porcelain—yet a large remainder is attributable to the vagaries of taste.

The problem of determining the chronological succession of aesthetic

motives in races can hardly be separated from a studious consideration of the features in nature that evoke the sense of color or suggest the categories of form. The lines in vegetation, and its concrete products in flower, leaf and trunk, stem, tendril and bud, have indisputably been assimilated in art and architecture. The column, the



SHELL BASKET MADE BY INDIANS OF LOWER CALIFORNIA.

acanthus and lotus-leaf capitals are examples. The shapes and attitudes of animals, with expressions derived from their qualities of strength or ferocity, have most conspicuously furnished heraldic design and tropical sculpture with motives and ornament. Shells, less noticeably, must have stimulated artistic feeling, although their involution in art in the way of convention is not conspicuous. Ruskin in his "Stones of Venice" enumerates twelve "proper materials" of ornament derived from the visible universe—which with Ruskin was the most valid and the truest source of decorative ideas. The sixth of these, in a progression upward, was shells, of which he wrote:

"I place these lowest in the scale (after inorganic forms) as being moulds or coats of organisms; not them-

selves organic. The sense of this, and their being mere emptiness and deserted houses, must always prevent them, however beautiful in lines, from being largely used in ornamentation. It is better to take the line and leave the shell. One form, indeed that of the cockle, has been in all ages used as the decoration of half-domes, which were named 'conchas' from their shell form: and I believe the wrinkled lip of the cockle, so used, to have been the origin, in some parts of Europe at least, of the exuberant foliage of the round arch. The scallop also is a pretty radiant form, and mingles well with other symbols when it is needed."

Ruskin is always naively interesting, often stimulating, not invariably rational. The palette of nature has been more lavishly requisitioned in other areas of animal life, but it would be a crabbed and carping judgment to deny the charm of color in shells, its abundant variation or the delicacy of its employment: while the shells themselves are as organic as is a skeleton, or the ribbed and netted framework of a leaf. Very recently Mr. Y. Hirase of the Kyoto Conchological Museum, published a very suggestive analysis, for decorative uses, of shell outlines which, half conventionalized and more or less intricately interwoven, form patterns possibly of wide adaptability to domestic and public ornament, in wall papers, curtains, embroidery and textiles.

Perhaps the most original, and in a sense presumptuous use of shells for ornament is the recent successful attempt to coat them with a dull silver film which, being electrolytically applied, reproduces with fidelity every feature and detail of the shell's surface. Examples of such shells are on exhibition in the Museum. These silverized shells support variously designed implements, or themselves form finished vessels, handles and ornaments. The effects are ingeniously diversified by combining with the shells other objects, such as sea urchins, and by combining contrasted types of shells into an artistic composition.—The American Museum Journal."

The Planets.

With star-strewn heavens as their foils,
The planets are our nightly spoils.

—Emma Peirce.

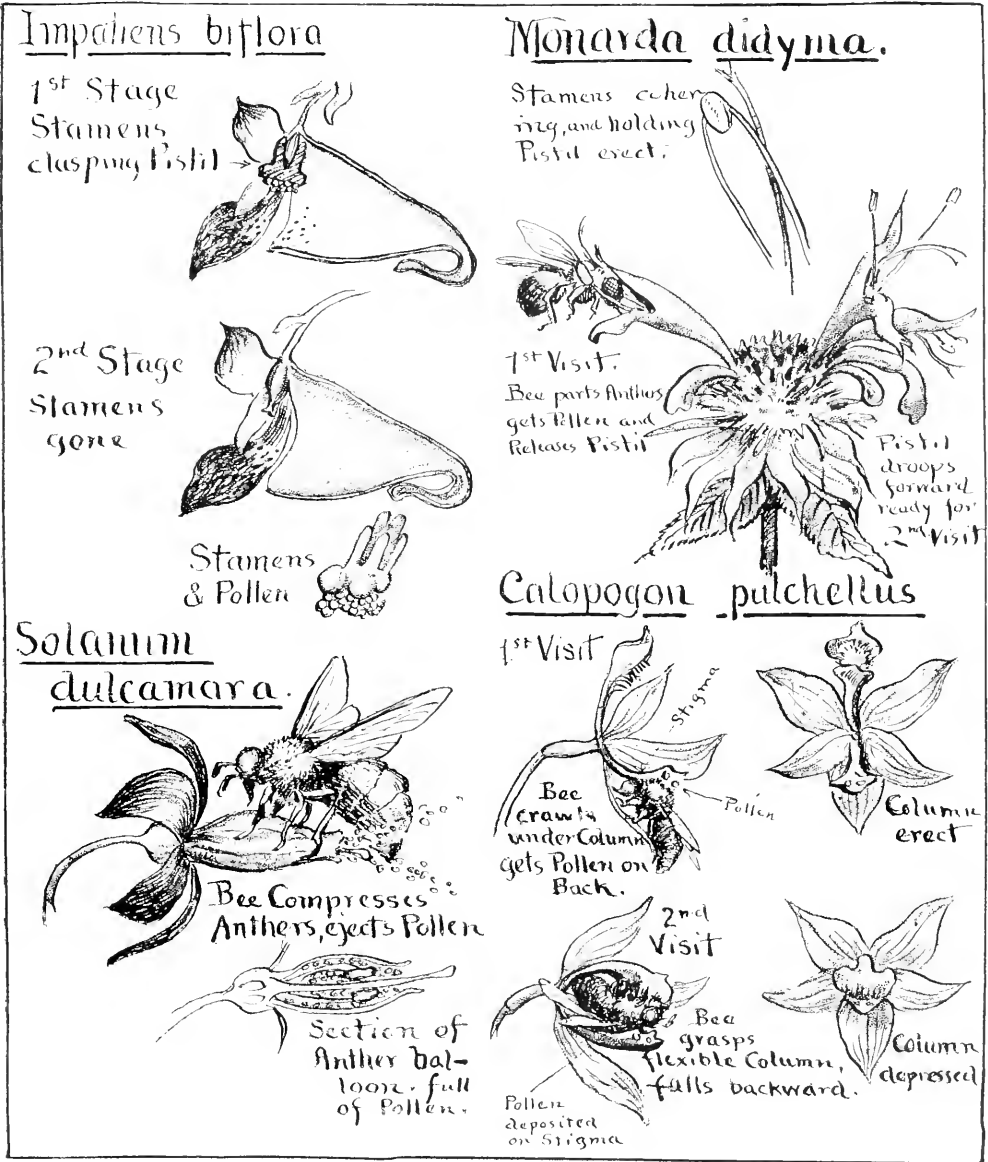
Four Ingenious Floral Mechanisms.

BY HERBERT W. FAULKNER, WASHINGTON, CONNECTICUT.

Nature, in her efforts to procure the cross-fertilization of flowers, offers in July many examples to that end. We may disregard flowers with stamens and pistils in separate blossoms on the

or surprising methods and are therefore more interesting.

The spotted touch-me-not (*Impatiens billora*) bears its stamens in a compact mass, with five prongs that cover and clasp the pistil but are easily detached by the touch of an insect. The stigma is not exposed until the pollen has been



same plant (monoecious) and with the two kinds of flowers on separate plants (dioecious). We may likewise disregard those whose cross-fertilization depends upon the maturing of stamens and pistils at different times, and investigate a few of those that have unusual

removed. Self-fertilization is thus prevented.

In Oswego tea (*Monarda didyma*) the two stamens grow with their anthers pressed together like two hands, palm to palm. Thus they form a lasso which catches the bumblebee as he

visits the flower and entangles his shoulders. As he struggles to free himself, he tears the anthers asunder and from them receives a charge of pollen on his hairy coat. While the anthers are yet united, they hold the long pistil upright and away from the bee, but after the first insect visit, the pistil falls toward the throat of the flower where it is sure to receive any pollen that may be brought.

Apparently the nightshade (*Solanum dulcamara*) seems to wish to keep all its pollen, for it is enclosed in a kind of balloon formed by the anthers united around the protruding pistil. But as the bee alights on this balloon he compresses it and, like a puff-ball, it shoots out the pollen in a cloud that dusts the underside of his body, and is by him carried away and deposited on the protruding pistil of another flower.

Grass pink, (*Calopogon pulchellus*) differs from other orchids as its ovary is not twisted; hence its pollen is below the column and its stigma above. The bee, attracted by its magenta pink color, and its scent of raspberries, alights on the lower sepal and, crawling under the column in search of honey, withdraws with one or two of the pollen masses on his back. How shall these reach the stigma of another flower? The mechanism for accomplishing this is ingeniously simple. The bee aims at the showy blotch of red and yellow velvet on the erect column of the next flower, clasps it and with his weight drags it down. He falls with his pollen laden back against the sensitive stigma, and the flower is fertilized and will bear seeds.

The Mysteries of the Flowers.

The former generation of naturalists, and especially general nature lovers and the young folks, were delighted by William Hamilton Gibson's models showing the mechanism of flowers.

As previously announced, Mr. Herbert W. Faulkner of Washington, Connecticut, is continuing that work in lectures that are delighting audiences everywhere. As an active member of The Agassiz Association, he is assisting us in our general purpose for the diffusion of knowledge, by supplying a series of illustrated articles for this magazine. The second of the series appears in the current number. It

would be difficult to find a more inspiring subject or one more calculated to arouse interest in nature and to stimulate those who already know the delight in such studies.

Nature a Resource in Old Age.

A generation or more ago every student and lover of nature was deeply interested in the writings of E. P. Roe. Our older readers remember this, and especially their delight in his "Nature's Serial Story." These books are also read with delight by the present generation.

We have recently received interesting personal letters from his sister, Miss Mary A. Roe of Watertown, New York, in one of which she writes:

"I am an old woman now, and most of my generation are gone but I am just as interested in life of all kinds as in the past. I also hope when I too pass Beyond it will be the opening of another and wider door into God's great Universe."

She kindly sends us a photograph of herself in her garden.

The frivolous things of life do not afford those resources for later years that the observation of real things stores up for us, those wonderful, beautiful and interesting things that crowd the world around us. It should be encouraging to every young person or to the older worker in nature to note how nature has been a lifelong resource to this accomplished lady.

Personal Observations of the Larger California Insects.

BY MISS MARY A. ROE, WATERTOWN,
NEW YORK.

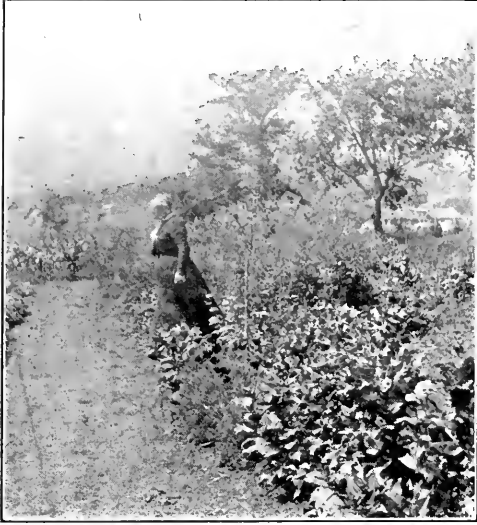
Among the many tourists who have visited Southern California during the past year, few probably have seen living specimens of the large insects in that semi-tropical country.

During a residence there of about three years I had opportunities for observing some rather unusual varieties. Nearly everyone feels a repugnance for spiders, and what I had heard of the big tarantulas (*Mygale*), the most poisonous of the tribe, made me dread to come in contact with them.

One evening about sunset, as I was walking on the carriage drive of a country home, I was startled by the sight of a tarantula leisurely proceeding a short

distance ahead of me. He was as big as a mouse. His thick black body was raised above the ground by eight stout hairy legs. My first impulse was to retreat quickly, but, supposing he was out in search of his evening meal, I resolved to follow him, but at a respectful distance.

Suddenly he sprang forward. Then



MISS MARY A. ROE IN HER GARDEN

he stood still for several minutes. When I reached the spot, I saw a large dead grasshopper that he had pierced by a poison fang between the head and body. The grasshopper had died instantly. After sucking the juices from the body, the tarantula proceeded in the search of other victims.

As the twilight in that region is short, I returned to the house and told my host what I had seen. He said that one day one of his workmen, in digging a trench, handed him from the up-turned earth what looked like a white silk bag. As he grasped it, a tarantula sprang from it to the ground and fled, leaving a score or more of little ones. The tunnel by which the tarantula reached the surface of the earth had been destroyed in the process of digging. My friend consigned the nest and its contents to swift destruction in the kitchen range.

Not long after my first sight of a tarantula, I witnessed a terrific battle between one and what is called a sand wasp, as she too builds her nest in the ground. She was the largest and most beautiful wasp I have ever seen. Her

body, three inches long and, I judged, one thick, was a bright metallic blue. The four large gauze-like wings were shaded scarlet.

For more than an hour, I watched the fierce duel between these insects. Their weapons were about equal in power. The spider was not quite as large as the first that I had seen, but by swift movements he strove to insert his deadly fangs into the wasp and to avoid her venomous stiletto. But the wasp's wings gave her an advantage, and gradually the spider's strength was overcome by repeated stings, and he lay paralyzed or dead, I could not tell which, but as I knew that wasps have the power to leave a glimmer of life in their victims, thus providing food for their young, I watched closely to see the next move.

The wasp flew to a hole in the sand not far away and disappeared for several minutes, then she dragged the spider close to the opening, but it was too small. Then I saw her set to work with head and feet, making the sand fly until she was satisfied that the entrance was large enough. Still she had to push with all her strength to get the spider below the surface and just above the spot where she had evidently deposited her eggs. On returning to the surface, she covered the hole with sand and flew away. Her family cares were ended, for when the little white grubs should emerge from the eggs they would find in the body of that spider all the food required until they also should be ready to rise from the ground in a new and beautiful dress to begin another cycle of life.

My last adventure with a tarantula was an illustration of their wonderful power of endurance. A young man in one of the California canyons captured a large specimen and put it in a quart can, making holes in the lid for air, and brought it to Los Angeles in July leaving it there for me. I was out of the city and did not return till late in September. In that time the spider had received one grasshopper, yet was still alive. I at once poured into the can through the holes in the lid a teaspoonful of chloroform. There was a scurrying inside of the can for a few minutes, then all was still, and I supposed his sufferings were ended.

A week later I put the can on my

desk to remove the specimen. Fortunately the lid was but partly off when the tarantula sprang to the top and put two legs over the edge. I shall never forget the look of anger in those fierce black eyes, and I did not blame him. But I feared his fangs. By means of a book I pushed him back in the can, and secured the lid. I then called for help from two men in the house. With difficulty in preventing his escape they transferred the tarantula to a glass jar half filled with alcohol. It was some hours after he was immersed in this before all movement of his legs ceased, showing that life was extinct.

Once again I had the opportunity for observing at close range the largest and most curious insect I had ever seen. I discovered it one morning on the outside of the window screen. It was more than five inches in length, light green in color and its slender neck and small head rested on its long forelegs that were doubled back at the middle joint in a kneeling posture. A moment later a bluebottle fly settled on the screen. Instantly the long legs of this insect new to me sprang forward to grip the fly, and during a last frantic buzz its head was nipped off by strong mandibles, and the rest of the body leisurely devoured.

I called in a friend to see my visitor and was told that for California it was an unusually large specimen of the mantis. The Mexicans call it "the praying mantis" from its supplicating position when at rest. But from what I had just witnessed I should have spelled that descriptive word with e instead of a. My friend told me that in South America the mantis grows so large and strong that it can catch small birds for food. So closely do they resemble the foliage of the branch on which they rest that birds fearlessly alight close by them. I was assured that they are harmless to human beings, but as this mantis caught sight of us it assumed such a threatening attitude before flying away that I was thankful for the screen and had no desire for a closer acquaintance.

Carnations.

Carnations are the floral standbys,

Always spicy, always sweet;

Not so short-lived as the roses,

They are for all occasions meet.

—Emma Peirce.

The Birth of a Butterfly.

BY L. W. BROWNELL, NEW YORK CITY.

All of us have doubtless seen hundreds of caterpillars. Most of us dislike them, but were it not for these crawling, and often repulsive, creatures, the world



MILKWEED CATERPILLAR.

would be without butterflies,—those fairy-winged sprites of the air that do their share in Nature's work while helping to make the world more gladsome.

The butterfly is but the final stage in the metamorphosis (which is a big word for little people and means a changing from one state of life to another and a more perfect one) of the caterpillar. I am going to describe for you this wonder, for it is a wonder, and is by no means the least of the many that Nature is constantly performing.

There are countless thousands of caterpillars growing to their full size and changing into butterflies everywhere around us during the summer months and yet few people ever see the process. The Milkweed butterfly, also called the Monarch, is the commonest of all our butterflies. It is not only common in this country but is found all over the world, which cannot be said of any other of our but-



CATERPILLAR HANGING FROM LEAF, JUST CHANGING TO PUPA

terflies. It may be seen in large numbers on almost any day of summer or fall hovering about the blossoms of the milkweeds or flitting along country roads. It is particularly numerous in marshy places where milkweeds grow. It is one of the largest of our butterflies, measuring from three to four inches across the wings; its coloring is reddish brown with black borders and veinings on the wings.

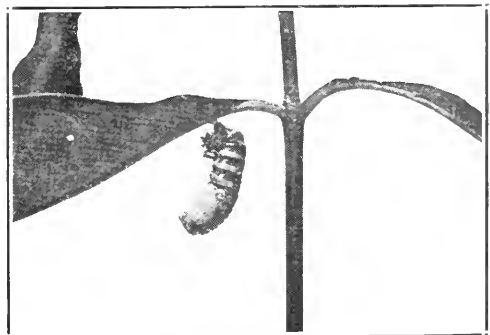
The caterpillar, or larva, if we wish to use the correct scientific name, is, when full grown, about two inches long and a rather pretty fellow. He is banded around his body with stripes of yellow, black, and white. When first hatched from the egg he is very small, scarcely a quarter of an inch in length. He grows very rapidly, however, and his life as a caterpillar is rarely more than twelve to fifteen days long. He spends this entire time on the milkweed plant upon which he was born, for this is his food plant, the leaves of which he eats. If he cannot get these, he will starve to death; he cannot be forced to eat the leaves of any other plant.

He is very greedy and spends nearly all his time, day and night, in eating, but every second day he stops for from four to six hours during which time he changes his clothes or moults. This he does

five times during his life as a caterpillar. You see he eats so much and grows so rapidly that his skin becomes too tight for him, in the same way that a boy's clothes become too tight, so he changes them frequently for new ones. At such times he remains almost motionless for about two hours before and after the change. The actual change itself is quickly made. His skin simply splits down the back and he crawls out of it with a brand new skin. Is not this an easy way of getting a new suit?

If any of you would like to watch what takes place during the various changes that occur between the small caterpillar and the perfect butterfly, find one of these caterpillars (it will take but a short search among the milkweeds) and take him home. Do not handle him any more than you can help, for this is likely to hurt him. The best way is to cut off the plant on which you find him and carry him home on that. Place the plant in a bottle of water and each day put in a fresh stalk, allowing the caterpillar to crawl from the old one to the new. Your little guest will not try to leave you so long as you keep him well supplied with food, but be careful to supply the same kind of leaves as those upon which you found him feeding.

Some day soon you will find him restlessly crawling about the plant, stopping now and then to raise his head and look about, as though not quite sure where he wants to go, or what he wants to do. This does not mean that anything is wrong with him, or that he has grown tired of his home and wants to leave. It simply means that he has reached the end of his existence as a caterpillar, and that he is looking for the spot on the stalk that will be the best and safest place to stay during the next stage of his career



PUPA CASTING OFF SKIN.



PERFECT PUPA.

which is known as the pupal or chrysalid stage.

When he at last finds this spot, which is generally the underside of one of the broad leaves, he hangs himself up by his tail, fastening himself to the underside of the leaf by means of a sticky, silky substance which he spins out. Hanging thus, with his body curved into the form of a hook, he remains without motion for about twenty-four hours. During this time, although we cannot see it, a wonderful change is taking place inside of his body, the results of which we shall soon see.

At the end of twenty-four hours his body straightens out and he begins to twitch and wriggle as if he were in great pain. Possibly he is. Who can tell? At all events his head and upper part of his body (or rather lower part, as he is hanging head down) soon commence to swell and continue to do so until they burst the skin and the pupa or chrysalid begins to come out. By continued wriggling the skin is slowly pushed backward until it is gathered in a little bunch at the tail. Now, while a part of the skin still holds to the chrysalid, the extreme point, ending in a small black hook, is withdrawn, the hook is worked firmly into the silky substance which has held the caterpillar to the leaf, and, with a final jerk, the skin that was so very necessary to the caterpillar is now of no more use, and is entirely thrown off, the chrysalid hanging free from all covering.

During the next two or three hours the shape of the chrysalid slowly changes until at last it hangs a perfect little jewel. It is about an inch in length and of a bright green color ornamented with a circle of golden spots near the top. Perhaps some of you have spied one of these little milkweed jewels in your country rambles, but, common as they are, they are not often seen because they are so well hidden by the broad leaf underneath which they hang.

Now, for from ten to twelve days we can leave our little visitor entirely alone, for, while a wonderful change is still going on inside the green shell, we can see nothing of it. We shall have ample warning when the next change that we can watch is about to take place, for about ten hours before the butterfly is to make its appearance, the color of the chrysalid will slowly change from green to brown and, at the end, we can see within the transparent shell the folded wings of the butterfly.

We must now watch closely or else we shall miss the actual sight of him as he comes out of the chrysalid shell. Suddenly, with no warning, this shell bursts open and the butterfly pulls himself out by the aid of his forelegs and hangs



BUTTERFLY SOON AFTER EMERGING FROM PUPA SHELL.



PERFECT BUTTERFLY.

from the now useless shell a creature all body with small, much-crumpled wings. The process has taken less than one minute, and should our attention wander for that minute we shall have missed it altogether. We think, at first sight, that something must be wrong with him and that he must have been "horn" deformed, for he looks very little like the beautiful insects that we see hovering about the flowers in the garden. We must have patience, however, and watch closely, for this is one of the most interesting parts of the whole performance.

Slowly and steadily the wings unfold, and as steadily the body grows smaller, for the life juices are being pumped from the body into the wings until they reach their full size and beauty. They still hang limp and useless, however, for they are damp and need to dry out and strengthen before they can be used. Presently our little friend leaves his shell and crawls to some higher point on the plant where, for the next four or five hours, he will remain while his wings dry and stiffen. During this time he now and then tests them and learns their use by slowly opening and shutting them until, finally, feeling that he can at last trust

himself to wings, he leaves his perch and flies forth into the world. What a beautiful and graceful creature he now is, and how different from the crawling worm of but two short weeks before! We can hardly believe it possible and yet we have watched the change take place and know that it is true.

All butterflies and moths must pass through the four stages in their metamorphosis to the perfect insect. First, the egg; second, the caterpillar or larva; third, the pupa or chrysalid; and fourth, the perfect insect or imago. Most of them, however, take much longer in the process than does this tiny monarch. Many of them pass the winter in the third, or pupal stage, either wound up in cocoons or buried in the ground or under stones or loose bark, and with these the changes are not easy to watch, but this royal acquaintance of ours passes through all the stages in from three to four weeks, and, for that reason, is the best one for us to study.—"The School-mate." (By permission, with courtesy of the illustrations).

What Makes "Bird's-Eye" Maple?

The explanation of the phenomenon is simple, and a person with a good magnifying glass can work it out for himself. The bird's-eye figure is produced by adventitious buds. These have their origin under the bark of the trunk. The first buds of that kind may develop when the tree is quite small. They are rarely able to force their way through the bark and become branches, but they may live many years just under the bark, growing in length as the trunk increases in size, but seldom appearing on the outside of the bark. If one such bud dies, another will likely rise near it and continue the irritation which produces the fantastic growth known as bird's-eye. It is said that the Japanese produce artificial bird's-eye growth in certain trees by inserting buds beneath the bark. The Field Museum, Chicago, has a sample of what is claimed to be artificially produced bird's-eye wood from Japan.—*American Forestry.*"

The Curtain of the Dawn.

Aflame are all its folds
When we at first behold;
But the coming of the orb of day
Transmutes the flame to gold.

—Emma Peirce.



Geo. A. King '09

A JULY SUNRISE.

Elephant vs. Locomotive.

It is not often that a wild animal deliberately locks horns with an active locomotive on its own rail. Jumbo was killed by a locomotive, but the encounter was not of his seeking. It was an accident.

Once, however, a vicious bull ele-

phant, up, and, worst of all, two persons were killed.

Judging from the complete openness of the country; there was no excuse for an elephant on the track, and therefore the charge of the Siamese "Gunda" was wholly gratuitous.—"N. Y. Zoological Society Bulletin."



BAD FOR ELEPHANT AND LOCOMOTIVE.

phant elected to try conclusions with a whole railway train. In one respect the bad elephant took second money, but the punishment inflicted upon the locomotive and several cars was so great as almost to justify calling the contest a draw.

It was in 1906, on the Korat branch of the Siamese State Railway, that a bull elephant disputed the right of way with a freight train running at full speed. He charged the charging locomotive, and the result to the train is shown in the accompanying reproduction of a photograph kindly furnished by Dr. E. B. McDaniel, for twelve years the head of the mission Hospital at Petchaburi, Siam.

The elephant was killed outright, and buried under the wreckage of the train. The locomotive was derailed and sent down the side of the grade; several cars were derailed and piled

Another Aquarium Society.

There is no other object of nature study more available, in city as well as in country, or more interesting if managed intelligently, than an aquarium. In view of these facts it is surprising that aquarists are so few, but it is encouraging to note that a society that bids fair to be enterprising and active has just been formed in Newark, New Jersey.

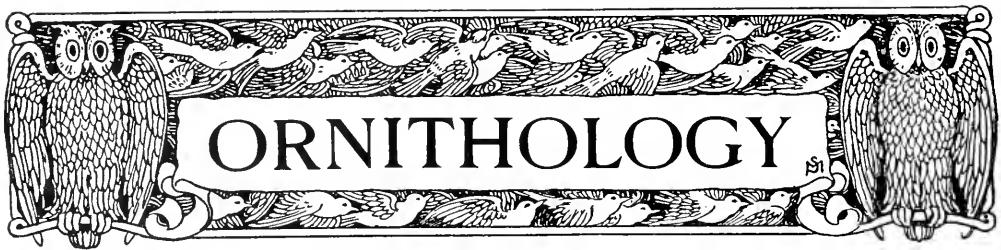
The following officers were elected: Mr. L. Smith of East Orange, President; Doctor Bachmann of Newark, Vice-President; Mr. George Hoernig of Newark, Secretary; Mr. Max Hammerschleg of Newark, Treasurer.

We extend our heartiest congratulations to this new association.

Make the opening course of your morning meal

A cup of the morning air;
It will add a zest to all the rest,
Is easy to prepare.

—Emma Peirce.



ORNITHOLOGY

All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

Bluebird's Nest on the Ground.

A most unusual situation of the nest of a bluebird—and in the writer's experience the only instance he has ever known of one nesting upon the ground—is shown in the accompanying illus-



NEST AND EGGS OF BLUEBIRD ON THE GROUND.

tration. This nest was observed and the photograph taken in company with Rev. M. B. Townsend, Secretary of The Audubon Society of N. H., and was found in Woodlawn Cemetery at Nashua.

A stone jar, 6½ inches high, 4¾ inches in diameter, and with an opening at the mouth of 2½ inches, was found lying upon its side in the grass on one of the cemetery lots, being first noted on the twelfth of May. Both

birds were about on this instance and apparently well contented with their unique home. A considerable quantity of dried grasses formed the nest within the jar and a few hen feathers served for a lining. Four eggs were deposited in the snug enclosure, and it would have been an observation of unusual interest to have watched the growth of this family, had not fate interfered in the shape of a careless passer, who,—little realizing its precious contents,—set the jar upon its base, thus breaking one of the eggs and settling them to the bottom among the grasses, causing the birds to desert their home.

The nest was later found in its disturbed condition by the cemetery foreman, who first discovered it, and the jar has been preserved with its contents,—still showing three of the eggs.

One can only speculate as to what caused these birds to choose such a strange location for their home. There were many trees about the place, and only a short distance away was a maple containing a cavity made by woodpeckers such as one might expect bluebirds to occupy. It may have been that they first selected this site, and being driven away by the woodpeckers, felt compelled to choose the first convenient hollow at their disposal, which proved to be in the jar here shown. Certain it is that it was an unlucky choice for the birds. In such an exposed position it is extremely doubtful if the young would have here been raised to maturity. They would have been an easy prey for the many foraging cats: the sun, beating down upon the unprotected jar, might readily have caused their death, while predatory animals and nest vermin would be far more likely to cause their destruction in such a place, than in the cool seclusion of their usual nesting sites.

The Bird Woman at Home.

It is always interesting to learn a bit of the home life of an author—especially of one whose books we have read and whose characters we have loved.



SHOWING THE SWAMP ANGEL JUST WHY A FLOWER IS RARE

Photograph by G. B. Monroe.

Copyright 1915 by Gene Stratton-Porter.

Mrs. Gene Stratton-Porter is such an author, and through the kindness of Doubleday, Page & Co., who have recently issued her latest novel, "Michael O'Halloran," we are permitted to show our readers some hitherto unpublished photographs of Mrs. Porter at her home, "Limberlost Cabin," in northern Indiana. The accompanying pictures were taken by G. B. Munroe and are copyrighted by Gene Stratton-Porter.

One of the pictures shows Mrs. Porter sitting between two of the splendid oaks on her property near the lake shore. Her present home is about seventy miles north of that alluring spot, "Limberlost Swamp," so accurately described in her books, and about which center the themes for most of her stories. On account of the gradual cutting off of this swamp for commercial purposes, Mrs. Porter felt obliged to change to her new location, at the head of the swamp in Noble County, of which she says, "There are many lakes, miles of broken marsh, and a far greater wealth of plant and animal life than existed during my time in the southern

part. At the north end every bird that frequents the Central States is to be found," and "in one season I have located here almost every flower named in the botanics as native to these regions and several that I can find in no book in my library."

In the third picture Mrs. Porter is shown kneeling among her beloved flowers, at work with bottle gentian. Those who have read "The Harvester" cannot fail to appreciate this picture, which shows just such a scene as she describes around the swampy margins of "The Lake of Lost Loons," and wherein she depicts them with such wonderful vividness that we are compelled to love them as she does herself.

In her story of "Freckles" Mrs. Porter, in telling us about "The Bird Woman," chronicles a bit of her own painstaking work in photographing the nests and eggs and home life of some of the western birds. Her accurate observations and careful recording of data along this line have long since been recognized by scientific authori-



SEARCHING BRITTON AND BROWN TO IDENTIFY THE FLOWER FROM MEDICINE MAT.

Photograph by G. B. Monroe

Copyright 1915 by Gene Stratton-Porter.

ties, as has also been her work among the insects. Her beautiful book "Moths of the Limberlost" depicts in colors many of our native species, and is a recognized authority for the life-histories of those which it describes.

The author is pictured on the rustic seat with her daughter, of whom

A Study in Bird Psychology.

BY ROBERT C. MILLER, 302 EVANS STREET,
UNIONTOWN, PA.

I was one day walking along a country road, when I noticed a young robin making a first and very awkward attempt to use its sparsely feathered wings. Impelled by the inherent desire



GIVING THE BOTTLE GENTIAN ITS CHANCE.

Photograph by G. B. Monroe.

Copyright 1915 by Gene Stratton-Porter.

she says an idealized picture formed her character of "The Swamp Angel" so prettily described in "Freckles," her first nature novel.

Although Mrs. Porter has written a number of novels, she is essentially a nature writer, and a thorough student in her personal observations of the wild creatures. Through her delightful manner of writing she has accomplished great good in popularizing the love of nature through first-hand study. The common fault among many otherwise interesting writers upon nature subjects, of enlarging upon the facts and humanizing the wild things in order to make a good story, is not found in her books. Nothing is more wonderful or interesting than the real facts concerning our wild friends. "The Bird Woman" has brought them to us in a way that we can all understand, and has woven the love of them into the lives of her characters as it ought to be woven into the lives and characters of us all.

to have "a bird in the hand," I picked the little fellow up, upon which he set up such an outcry that all the birds in the neighborhood were summoned to the scene. Half-a-dozen robins responded to the appeal for help, a diminutive song-sparrow came hastening up to join the noisy convocation, and soon all the birds within hearing distance had assembled, raising such an uproar that I felt quite guilty. What I had essayed to do in secret was being proclaimed from the house-, or rather, the tree-tops, and I hastily put the birdling down and went away, like a foot-pad surprised by cries of "Stop thief!"

A few days later I happened upon a young grackle out in the orchard, put it in my coat pocket to see what the results would be. The parent birds raised a great commotion and fluttered wildly from tree to tree above my head. The young bird raised its voice loudly in an appeal for aid, the old grackles chattered and squawked, but none of the other birds came to their help. Robins

were hunting worms on the ground all about, a near-by towhee was singing unconcernedly, and on a neighboring bush a tiny Maryland yellow-throat called in his sprightly way, "Which way, Sir?" The grackles were noisy, disreputable birds, known to be occasional nest-robbers, and in their time of distress, no one would help them. The robins, quiet, respectable birds, might avail themselves of the protection of all the other birds in the orchard, but the grackles must fight their battles alone.

Birds.

If elegance of form, beauty of coloring, or sweetness of voice, were peculiarities which constituted the superiority of one class of beings over another, we should unquestionably assign to birds the highest station in the scale of animal creation. No shadow of fear mixes with those pleasurable sensations with which they are viewed; and those feelings, moreover, are heightened by the ethereal nature of the creatures themselves. In a moment they may spread their wings, launch into boundless air, and be seen no more. We almost view them as beings of a happier world, alighting upon this "dim spot called earth," more as a place of temporary rest, in their voyage through the regions of space, than as their permanent abode. They remind us of those invisible spirits of the unseen world, which, we are taught to believe, traverse the air on the wings of the wind; who alight, but for a moment, among the sons of men, and then depart to breathe a purer atmosphere. Of all unintelligent beings, they alone are gifted with a musical voice, possessing both sweetness and varied expression. Their language, in some measure, is thus intelligible even to man, inspiring him with cheerfulness or melancholy. Hence it is, that from among birds the poets have selected their sweetest themes. They are, both poetically and literally, the butterflies of vertebrated animals: flitting from one plant to another, living less on earth than in the air, and having their wings ornamented with feathers of bright or varied colors. In both we dimly see an indication of that existence which will separate the spirit of man from those cares, anxieties and allurements which chain him down to earth, as if it was his final and only

stage of action. It is highly probable that the "Sweet Psalmist of Israel" had some such thought, when he longed for the wings of a dove, that he might flee from earth and be at rest.—From the opening chapter of Swainson's "Birds," published about 1835.

A Starling Episode.

So much has been said against the English starling in regard to its driving away our native songsters wherever it has taken up its abode, that I was especially interested when we discovered that a pair had made their appearance in the lot across the street from our home—the first of these birds recorded from Hyde Park as far as I have been able to learn—on the 30th of April, and began to carry nesting material into a flicker hole high up in a dead elm tree. Anticipating, though with some apprehension as to the outcome, the watching of these birds daily to note their actions in relation to the other birds, it was with some regret that I recorded their disappearance two weeks later, and believe that they were driven off by the English sparrows, which now occupy the elm stub.

For several mornings following the appearance of the starlings a pair of flickers which had been about the place for some time, and which were doubtless the pair which occupied this cavity during the season of 1915, came frequently to the tree and seemed greatly disturbed by the presence of the foreign birds. When the flickers appeared the starlings merely perched nearby and apparently paid no attention to their outcries or their presence. The agitated flickers meanwhile would flutter around the trunk and peer into the hole, but made no effort while I watched them either to pull out the nesting material or to drive away the usurpers of their home, and after a few such visits we saw them no more.

For a week or more following, the starlings were observed daily about this nest and going into the hole, but were frequently scolded and driven from the tree by some English sparrows which appeared to be occupying a cavity lower down in the same tree.

On the 14th of May I looked in vain for our notorious visitors but have not seen them since. Now the flickers have gone and the sparrows seem to hold

full sway. I cannot say positively that they drove off the starlings, but that was apparently the cause of their leaving. I think, of the two, we would much have preferred the starlings for our neighbors in the old elm.

The Song of the Brown Creeper.

It always brings a thrill to the bird lover to hear a new song or to see a bird which he has never before observed. Such a thrill was mine on the first of April last, when wandering about the edge of a swamp near my home I heard a clear, sweet little warble, and following up its author, found the bird to be a brown creeper. The song, repeated many times at rather long intervals while I watched the bird a few yards away, seemed to consist of four parts: the first note rather high; the second lower, the third again higher, and the last ending in a little descending trill.

After feeling well acquainted with these birds as winter residents for some twenty years, and never having heard any note from them except their usual mouse-like squeak, uttered while running up the trunks of the trees, I was naturally surprised and elated with my new discovery. Their fine note seems always very elusive and the shadow-like movements of the bird itself make it often-times a rather difficult one to locate and observe. In this instance, however, it was soon marked by its song; although the bird did not seem to pause while giving it, but kept on its spiral course up the trunks of the swamp maples,—twisting about one for some fifteen or twenty feet, then dropping down to the base of another nearby to repeat the performance.

H. D. Minot, in his early work on "The Land Birds and Game Birds of New England" speaks of this song as follows: "Their indescribable song is a very pleasant one, being somewhat like the far finer music of the winter wren, and is varied, some of the notes being loud and sweet, while others are much feebler and less full in tone. It is repeated in both spring and summer, but never, I think, before March."

Wm. Brewster, in a biography of the brown creeper, mentions the fact that in its northern summer home among the spruces and firs this bird has an

exquisitely pure, tender song of four notes, aptly describing it as "the first of moderate pitch, the second lower and less emphatic, the third rising again and the last abruptly falling, but dying away in an indescribably plaintive cadence, like the soft sigh of the wind among the pine boughs."

The Passing of a True Friend of the Birds.

Bird lovers generally, and especially those interested in the great study of migration, have lost a valued friend and counsellor in the death of Prof. Wells W. Cooke of the U. S. Biological Survey, who died at Washington on March 30th.

Prof. Cooke was acknowledged pre-eminent authority on all matters pertaining to bird migration, and through years of patient study and correspondence had built up a most valuable system of compiling facts concerning the movements of birds throughout the country, for the use of the Department of Agriculture, with which he has been identified for the past fifteen years. The success of this undertaking has been largely due to his devoted personal work.

Though but fifty-eight years of age at the time of his death, Prof. Cooke has lived long in the service of his fellow-men. In his gathering together of useful information he has accomplished in this time what seems little short of marvellous, and the results of his splendid work cannot help but show increasing value in the coming years.

A Singing Blue Jay.

While visiting the interesting aviary at the Boston "Zoo" a short time ago, the writer was greatly surprised to hear a new and imitative song from the throat of a common blue jay, which, with three others, was in a large cage inside the enclosure. Surprise was turned to delight when this bird repeated its performance, not once, but many times, while I stood watching it a few feet away. The song was varied and given after the manner of that of the brown thrasher. It contained numerous warbles—one a very good imitation of that of a canary.

About six feet away from the blue

jays' cage stood another in which were confined a number of St. Andresberg canaries, and this was doubtless the source of that part of the jay's song. I did not need to look far for the remainder of its "copy," for the room was filled with birds, both native and foreign, and a continuance of songs, calls and squawks of a most varied character was constantly being poured forth. It seemed difficult to reconcile the soft notes and truly sweet strains which this jay was now uttering with the bird which we know only as harsh, boisterous and anything but gentle and refined, in both song and habits. It appeared to be amusing itself by softly imitating the various songs and calls that took its fancy, rather than to be performing for the benefit of its hearers. During its song it remained huddled together on a branch, while its companions in the cage were hopping about and feeding unconcernedly. A deformed bill and the absence of a tail, probably worn and broken by flying about the cage, added to the strange individuality of this bird.

As this was a totally new and unheard-of experience from the writer's point of view, it would be interesting to learn whether any other of our readers have ever heard a blue jay sing.

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Since writing the above notes I find, in the May-June number of *Bird-Lore* a similar experience recorded by R. E. Robbins of Brookline, Mass., though the author does not here state the circumstances under which the bird was heard.—H. G. H.

One almost wonders sometimes, why it is that the sun keeps on year after year and day after day turning the globe around and around, heating it and lighting it and keeping things growing on it, when after all, when all is said and done (crowded with wonder and with things to live with, as it is), it is a comparatively empty globe. No one seems to be using it very much, or paying very much attention to it, or getting very much out of it. There are never more than a very few men on it at a time, who can be said to be really living on it. They are engaged in getting a living and in hoping that they are going to live sometime.—Gerald Stanley Lee.

Studying the Nest.

In the *Farm Journal* for April the following sixteen suggestions were made for nest study. "Be very careful not to touch the nest or eggs. Use this as a study plan: 1, name the bird; 2, when the mating began; 3, actions during courtship; 4, when nest-building started; 5, whether male or female or both did the building; 6, site of the nest; 7, materials used; 8, when the nest was completed; 9, how the birds acted during nest-building; 10, when first egg was laid; 11, number of eggs laid; 12, color of eggs; 13, when last egg was laid; 14, whether male or female or both incubated the eggs; 15, actions during incubation; 16, when first bird was hatched."

The above is an excellent outline for observers to follow, and to it might be added the important study of feeding the young from the time of hatching to their leaving the nest. Long individual observations should be made if possible to secure accurate information. A complete study of a single nest is much more to be desired than the haphazard observations of numerous species.

Wild Strawberries.

Walking around the cellar, my eye caught the glow of red, ripe strawberries in the thin meadow grass. Here was just the dessert I needed after my lunch of sandwiches. There is a well-founded suspicion that no berry equals the wild strawberry in flavor. Reader, if you have never eaten a shortcake of wild strawberries deluged with sweet cream which has hung in the well to ripen, then you have my sincerest sympathy, for you have thus far lived in vain. In the city restaurant where I take my meals, they have little squares of shortcake (so called) upon which, bedded in whipped cream, are a few sour, wilted, cultivated strawberries, labeled, "Strawberry Shortcake—10 cents." I never insulted my palate with one of the detestable frauds. It is an insult to any farmer's son or daughter to offer such a miserable apology to one who has known the real thing.—Milo Leon Norton in "*Saturday Chronicle*."

A Rose.

The acme of florescence
Proud nature's fairest work;
Wherein, to show its limits,
A little thorn doth lurk.

—Emma Peirce.



TO KNOW THE STARRY HEAVENS

The Heavens in July.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

The most striking astronomical event of the present month will be the eclipse of the beautiful full moon, which will take place on the evening of Friday, July 14, while the moon is passing the meridian, high in the heavens. Two

all, with the single exception of Mars, disappeared from the evening sky. The reader who has from time to time been observing the morning sky however, knows that for many weeks the beautiful Jupiter has been shining brightly there, and as the weeks of July go by he will see the planet Venus steadily climb upward in the dawn, where by the close of the month it will be a no less brilliant object

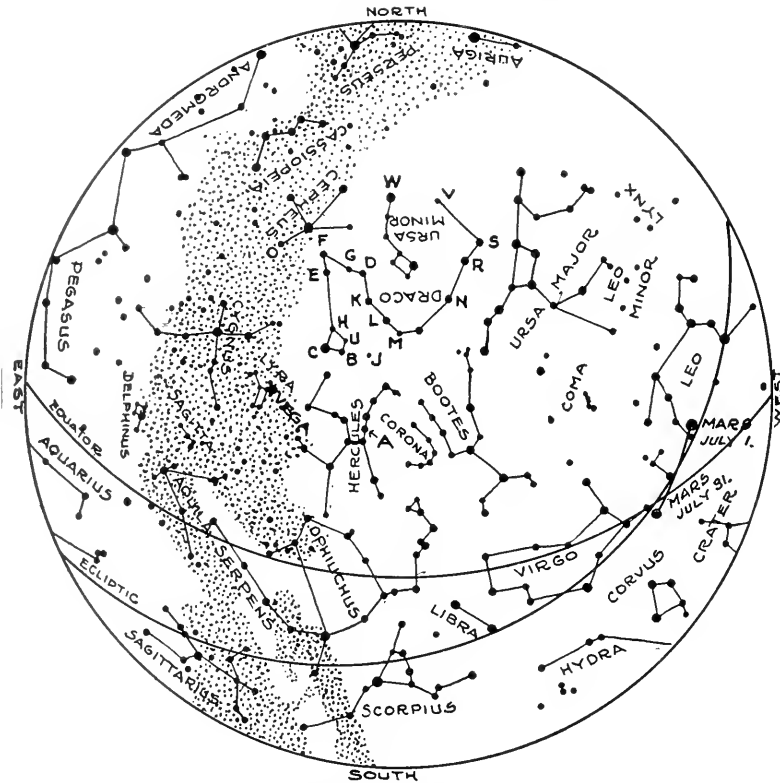


Figure 1. The constellations at 9 P. M., July 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted).

weeks later there will occur the fourth eclipse of the present year—an interesting annular or ring, eclipse of the sun; but this will be wholly invisible from the United States. As to the bright planets which for so many months have made our western heavens beautiful, they have

in the morning than it has been for so many weeks in the evening.

* * * * *

The July Stars.

The slow, seasonal turning of the sphere has now brought the brilliant summer group, Scorpio, exactly to the meridian south, and has carried the very large

group, Hercules, with its wonderful, closely packed cluster of sixty thousand suns, (at A, Figure 1) to its highest position in the heavens. The summer branch of the Milky Way has mounted halfway to the zenith, and the part of this including Delphinus, Aquila, Lyra and Cygnus is unsurpassed in beauty by any other like region of the heavens.

The reader who is already familiar with the brighter constellations and who takes a pleasure in gradually becoming acquainted with the no less interesting but fainter and less well-known groups, cannot do better than to select for his study this month the long and winding Dragon, for this group is now high above the Pole, in its most favorable position of the year. The head of the Dragon is formed by the four stars at H (Figure 1) of which both B and C are interesting binary systems, though they are excessively difficult, even in the largest telescopes. The orange star at C will always be a memorable one to astronomers, for it was from observations upon this that the astronomer, Bradley, two centuries ago, made the epoch-making discovery of the so-called Aberration of Light.

From the region H, the body of the Dragon extends downward to the yellowish star F, and then upward, winding around the Pole through M, meeting the brightest star of the constellation at N., and finally ending in the tip of the tail at V. The star at D is a beautiful pair with an opera glass, the components being separated by an apparent distance equal to that across the full moon, and, in fact, all the stars at J, U, E, F, L, M, R and S are double stars, though many of them are very difficult in the largest telescopes.

To the Arabians, the stars, J, B, C, and H, were sometimes known as the Mother Camels, protecting their foal, at U, from the two Wolf Stars, K and L, who were lying in wait for it. The foal is a little pair of stars, easily seen double in a small telescope. The brightest star of the Dragon, at A, was the Pole Star of forty-seven hundred years ago; the central passage of the great pyramid of Cheops was directed to it, as indeed, were similar passages in many other of these structures. During forty-seven centuries the slow course of the procession has carried

our pole from this star to Polaris (at W) while six thousand years from now the pole star will be the bright object at O, and in twelve thousand years it will be the magnificent Vega.

The reader may now also well trace out the long, winding Serpent of the southern heavens, with Ophiuchus, the Serpent Holder, who is holding the twining Serpent in his hands. The portion of the Milky Way below and to the left of this group is wonderfully rich in clouds

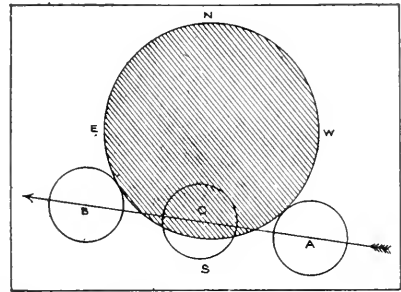


Figure 2. The eclipse of the moon, July 14-15, 1916.

and clusters, and indeed its whole summer branch is so filled with intricate detail and variety that it will well reward many evenings of careful exploration.

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The Planets in July.

Mercury reached its greatest western elongation on June 30 and for the first few days of the month will be seen shining brightly in the dawn for about one hour before sunrise. It should be looked for well to the north of the east point of the horizon. On July 28 it will enter the evening sky but it will not attain its greatest distance east of the sun until September 9.

Venus enters the morning sky on July 3 and toward the end of the month will become a conspicuous object there. It will attain its greatest brilliance on August 9.

Mars, the only planet remaining with us, will pass from Leo well into Virgo during the present month. In a moderately large telescope the polar cap and the larger markings may still be made out, but this world is now far too distant to be observed to advantage. To the naked eye it is now even fainter than a first magnitude star; in the telescope it has the shape of the moon when about three days past full.

Jupiter is becoming a conspicuous and beautiful object in the morning heavens. On July 1, it rises about four hours before sunrise, but by July 31 it rises before midnight. This planet will be the reigning object of our evening heavens during the coming autumn and winter months.

Saturn is in conjunction with the sun on July 12, and so cannot be observed during the present month.

at the point where the moon passes through it. The center of the moon will reach the point A, and the eclipse begin, at 10 hrs. 19 min. 18 secs. P. M. (Eastern Standard Time); it will reach the point C, and the eclipse be the greatest, at 11 hrs. 45 min. 54 secs.; and it will finally reach the position B, and the eclipse terminate, on July 15, at 1 hr. 12 min. 30 secs. A. M. The moon will thus

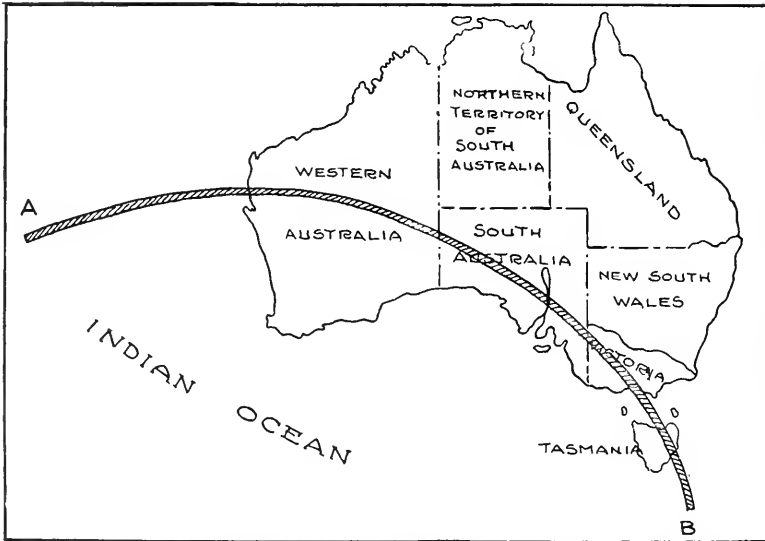


Figure 3. The path across Australia of the Central Eclipse of the sun, July 29, 1916.

On July 3, at 3 A. M., the earth will pass through the point of its orbit which is farthest distant from the sun; on this date we will be more than three million miles farther away from the sun than when the two bodies were closest together, six months ago.

* * * * *

The Eclipse of the Moon.

On the late evening of July 14, our moon in its eastward monthly journey among the stars will pass into the earth's shadow and a large part of its light will be cut off. The great shadow of the earth stretches out into space directly away from the sun, the extreme tip of the shadow being no less than eight hundred and fifty-seven thousand miles away from us. This length is, of course, far too small to reach to the stars or to any of the planets, but as the distance of the moon is but two hundred and forty thousand miles, it follows that sometimes the moon plunges into the shadow and is eclipsed.

In Figure 2, the large, shaded circle represents a section of the earth's shadow

at no time be wholly covered; it is probable that even the portion wholly within the shadow will not become entirely dark. Instead, the observer will probably see areas of illumination on the dark ball of our satellite which may vary from copper color to greenish, or may even in part be of a deep red. These changing colors during the progress of an eclipse afford a most interesting sight. They are due to rays of sunlight which have passed through the rim of air surrounding the earth, and which have thus become so bent within the shadow that they fall upon the darkened moon. To an observer on the moon at this time the "New" earth would be seen as a black ball, surrounded by a brightly colored rim of light. Sometimes during an eclipse the rim of air about the earth has been filled with clouds so that no light could penetrate it and the moon has therefore entirely disappeared, but this is very unusual.

* * * * *

The Annular Eclipse of July 29.

On the evening of July 29, the moon

will pass completely onto the bright disc of the sun, thus hiding all of the latter from view except an intensely bright and narrow ring of its outer edge. This eclipse will be wholly invisible in northern latitudes, however, the path of the annulus first striking the turning earth at A, Figure 3, sweeping across Australia and Tasmania to B, and finally leaving the earth's surface at a point about nine hundred miles south of New Zealand.

Wanted: A Small Telescope.

An experience of more than six months in our popularizing and popular observatory has shown that the nights for really good seeing are few, and that most of our visitors come in large parties. These include chapters of The AA and companies from other organizations, such as churches, schools, Camp Fire Girls, Boy Scouts, Woodcrafters and family groups. We have had the observatory crowded on many of the best nights by from thirty to forty people when it was important to have each moment used to advantage. As every astronomer knows, many of the attractions of the heavens may be seen with a three or four inch instrument practically as well as with a larger one. We desire contributions in money, or the gift of a secondhand telescope on tripod mounting and of moderate aperture, that will supplement to advantage our six-inch Clark on pillar mounting. The Sound Beach Astronomical Observatory has been so eminently successful, and has so stimulated others to establish observatories in other places, that we are sure our friends will come to our aid and will give us at least one small telescope. It is becoming more and more evident that the best form of popularizing observatory is one that has several small instruments. For most celestial objects big telescopes reveal no more of real interest than the small ones. If many persons are to be reached and not kept impatiently waiting their turn, especially on a cold night, when the atmosphere is quiet and seeing is therefore at its best, then the really practical form should be a battery of telescopes. The ideal observatory would be a long room with the roof completely removable above a row of small instruments. Any observatory that attempts to entertain and to instruct visiting parties should have more than

one telescope. Think of it for a moment. Forty people come into an observatory. To give each one only a minute is really hurrying him too much, but that takes about three quarters of an hour, more than that in actual practice, and even then a visitor, after waiting an hour and a half, may have only two brief peeps at the heavens. We feel confident that our philanthropically disposed people will see that we are at once supplied with greater optical facilities.

EDWARD F. BIGELOW.

Astronomy in Education.

In urging a popular education in astronomy one might remark that our children would never be homesick if they learned to recognize the heavenly host that still watches over the familiar home scenes. But seriously speaking, I think that astronomy should be included in every high school curriculum. Not the mathematical side, of course, as that is too technical and uninteresting for most people, but a thorough knowledge of the fundamental facts of physical astronomy. In these practical days education has been largely transformed from mere book learning into a means of preparation for our careers. Nevertheless a very proper reaction has set in, and it is becoming more and more apparent that it is desirable for every student to carry several purely cultural studies.—Henry Handy McHenry in "Popular Astronomy."

One can glory in a great cliff down in the depths of his heart, but if you mention it, it is geology, and an argument. Even the birds sing zoologically, and as for the sky, it has become a mere blue-and-gold science, and all the wonder seems to be confined to one's not knowing the names of the planets. I was brought up wistfully on

Twinkle, twinkle, little star,
How I wonder what you are.
But now it is become:
Twinkle, twinkle, little star,
Teacher's told me what you are.
—Gerald Stanley Lee.

Nature's portals are ajar,
Her latchstring always out,
You do not need to seek her far,
Her paths are all about.
—Emma Peirce.

THE MINERAL COLLECTOR

Marvelous Collection of Stones.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

A few miles from Oregon, Ill., there resides an old soldier by the name of Virgil Reed. As a result of his army experience he is totally deaf, as a consequence of which he is quite lonesome. Some years ago when he found that his affliction prevented him from en-

specimen stones from every state in the United States, and also from every capital in the country. These specimens range in size from a mere pebble to large rocks, some of them weighing several tons. He has gone to much expense and considerable labor in procuring some of these larger rocks, and the manner in which he has handled them, almost alone, forms an interest-



A PRIVATE MINERAL COLLECTION ON A HUGE SCALE!

joying the companionship of his friends, in order to pass away the time, he began to make excursions over the country in his vicinity, picking up here and there curiously shaped rocks and stones that attracted his attention, and began to study them. These were carried back to his home and carefully laid away. Up to that time Mr. Reed never felt any interest in geology, but as his collection grew rapidly, he began to take an interest in this study, though he lays no claim to any great knowledge of this science. He has

ing story. He has literally rods of stone fence around his yard, every stone having its own history which he enthusiastically narrates to his visitors. Only half of his collection can be shown in the picture. Mr. Reed is the old gentleman with the canvas gloves, to the left. He has been collecting these stones for over thirty years, and his place is visited by hundreds of people, some of them scientific men, to examine these boulders. Some of these stones are arranged in flowerbeds, which, in summer, lend an addi-

tional attraction to the home. In this collection are some fine specimens of meteoric stones, ranging from 700 pounds to $7\frac{1}{2}$ ounces. He takes pleasure in showing what, perhaps, is the only specimen of English chap granite in the United States. He amuses his visitors by showing them some specimens of scoriaceous rocks which actually float. In this collection are to be found stones of almost every shape, many of them strikingly resembling animals, ships, faces, etc. When he began his collection, Mr. Lewis had rocks scattered so thickly over his yard that his boys, in coming home at night often fell over them. Because of their complaints he decided to adopt some system in arranging his boulders. Hence the arrangement seen in the picture. Mr. Reed is being urged to bequeath his collection to some nearby educational institution, as, in all probability, after his death, others would likely use them to fill ditches, or make road.

Why Study Minerals?

BY W. C. BANKS, STAMFORD, CONNECTICUT.

This morning a friend gave me a copy of Shepard's "Synopsis of Mineralogy." Beginning with the Introduction I read:

"There is no study that can be made more interesting and useful than mineralogy, and in no branch of science is the use of a text-book, alone, so inadequate as in this one. To study minerals, the student must have the specimens not only before him, but actually in his hands, that he may feel, examine, and test for himself."

Here we have the explanation of the great value of mineralogy as a nature study. Nothing else is so well fitted to train the faculties in the habit of accurate observation. "He that hath eyes to see, let him see;" but few really see, or, for that matter, use any of the senses with the nice accuracy required by accurate knowledge.

Here I have three specimens of yellow metallic minerals. To the unaided sight they are similar to one another. Let us test them with a knife blade. One yields a greenish black powder: another is too hard to be cut, while the third is sectile, like a piece of lead or of gold. Obviously there is considerable difference here, yet, to the unaided sight, the specimens are all much alike. Let us test them on char-

coal, with the blowpipe. Two give off a strong odor of sulphur, and fuse into gray, magnetic globules; the other fuses without change of color. This is another proof that they differ. If we take these three fused assays, after crushing them, and drop them into three test tubes, with a little nitric acid, and apply gently heat, we find that two are dissolved, while the third remains unchanged; that one of the first two colors the solution light green, the other light yellow. We add a little caustic ammonia. One remains unchanged in appearance; each of the others precipitates a brownish iron hydrate, and one of them gives a beautiful blue solution of copper hydrate. The first specimen is native gold; the second pyrite, a compound of sulphur and iron; the third, chalcopyrite, a compound of copper, iron and sulphur. Not only do they differ in these ways, but they are unlike in specific gravity and in crystal form. Although they appear to be similar, to bring out their differences requires numerous tests, and some careful observation. The sense of smell detected the sulphur; the sense of touch, the specific weights, and the sense of sight, the color and the form. I have cited these three merely as examples of the resemblances and differences among minerals, whose study tends to educate and develops the faculty of observation. But aside from the desirable mental discipline obtainable from their study, minerals, perhaps as distinguished from mineralogy, are well worth our attention. Where can we find more beautiful examples of color and form than among the members of the mineral kingdom? Consider the magnificent coloring and form of fluorite, calcite and quartz, not forgetting tourmaline with its many pleasing hues and tints. Of the other so-called precious stones, consider the delicate blue of a fine turquoise; the pure, restful green of the emerald; the luscious red of the ruby, and the limpid purity of a fine diamond. "But," it may be objected, "we all cannot make collections of gems." No, but we can all enjoy their beauty. Aside from æsthetic considerations, mineralogy consists of something more than fine, exhibition groups of fluorite and gem stones. In its study we become acquainted with useful ores, and even the commonest minerals acquire an interest for one that becomes even superficially acquainted with the subject. Minerals from every point of view are well worth studying.



EDITORIAL



Maturity and Old Age Better Than Youth.

When one hears an adult or an old person eulogizing youth, when he sees a child dancing along the sidewalk, or running across the fields, when that adult says, "That is the best time of life," then he has not properly used his years for the accumulation of experiences. Eulogizing youth is like saying that a green apple is better than the ripe apple, a bud better than a flower, a seed better than the perfect plant. One that lives near to nature finds, as Dr. Van Dyke has said, that the last years of life are the best.

I am reminded to make this suggestion to our nature-loving friends by a pleasant letter received this beautiful spring morning from Professor D. L. Earnest of Athens, Georgia. He writes in regard to the Editor's nature work and his own joy in nature;

"The thing I most like about your work is the spirit of it—you meet nature with a smiling face and you enjoy her beauty. You do not divorce utility and joy—life is a time to be glad in, and you know it and show it! Athens was never so beautiful as at this time; no spring was ever so bright and pleasant. As I grow more mature my joy in life increases—the more of life I know, the better it is enjoyed. I have discovered places fragrant and inspiring. I am not wholly spending my time in pleasure seeking; this winter I have appeared in public eyes seventy-four times—I mean since September. Not bad for a beginner!"

In connection with this the words of Thoreau come to mind: "All nature is new in the spring, and fortunate are we if it finds us new." The quotation may not be literally correct, but it represents the spirit of Thoreau's life and of everyone, who, like Professor Earnest, lives near to Old Mother Earth.

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Since the above was written a letter has come from Professor Earnest in which he states as follows:

"The reason the man enjoys life more than does the boy is because he has more with which to see, can understand more, hence appreciate more. We see with what we are and we are what we have seen; the sooner the beginning is made the bigger and better and brighter life will be.

"Who is literary? Who is illiterate? The book of nature is good reading; its alphabet we have barely learned. Is not he illiterate who has not learned to turn and enjoy its pages? Nature study is to see, to understand, to enjoy. If life is misery, life is worthless. Must it be destroyed? No! Catch my meaning; personally life may be painful but may contribute to the joy of another soul; but surely unless one gets or gives joy, his life is vain. Start to-day if nature has told you nothing; she will if you but cultivate her acquaintance; know her and she will instruct you, smile upon her and she will give you joy.

"As you older grow and know her better Nature speaks to you more as a friend and the best of friendships takes years for growth. God's book is best for study and for delight; the thought of man seeks other things than self as he grows more contemplative and less impulsive, and it is not strange that all nature is aglow with God if we seek her face, alive with interest and appreciation."

Has the World Progressed?

The Bulletin of the Brooklyn Institute of Arts and Sciences publishes a rather remarkable article under the title, "Do We Progress?" and while we agree with the Bulletin in not endorsing all the conclusions reached in that article, we must admit that the writer raises some interesting questions. We quote his opening paragraph:

"The late Dr. Alfred Russell Wallace—he who quite independently of Darwin thought out a theory practically identical with the theory of nat-

ural selection—stated shortly before he died that he did not believe in progress. As a matter of fact, it is extremely difficult to point out definitely where progress in humanity may be observed. There is certainly no progress in man's highest expressions of his intelligence. Viscount James Bryce has observed that the poetry of the early Hebrews and of the early Greeks has never been surpassed and hardly ever equalled. Neither has the philosophy of Plato and Aristotle, nor the speeches of Demosthenes and Cicero. No one pretends that there is any progress in art. The masterpieces of architecture, sculpture, and painting date as a rule from long before our time, some of them nearly twenty-five hundred years back. Yet in spite of this, many mortals cherish the belief that there has been an advance beyond our forebears in many things, and especially in education. Why are we so sure that there has been decided progress in education? At the present time we are admittedly far below many preceding generations in art, literature, architecture, arts and crafts, and many developments of taste. Why then should we think that in education, one of the highest of the arts, the moulding of the human mind into beautiful shapes instead of the moulding of more plastic material, we should be far ahead of the past, and, therefore, in a position to find no lessons in it? The fact is that much of the educational work of the past is superior to that of the present. Today in this country the tendency in education is toward an accumulation of superficial information rather than a training of the intellect for hard thinking."

The philosophy is based on the teaching of a book issued 2900 B. C., "The Instruction of Ptah-Hotep," of which a translation has recently been published by E. P. Dutton & Company, New York City. In this schoolbook of Ptah-Hotep, which is said to be the oldest book extant, it is interesting to note the clear, direct and picturesque style as a piece of genuine literature, and that it contains philosophy, advice in education, in the training of character and for practical everyday life. The book is translated from the Egyptian with an introduction and ap-

pendix by Battiscombe G. Gunn. The writer in the Bulletin makes these suggestive statements:

"Ptah Hotep looks up to God as the giver of all good things. He loves His creatures, and above all loves man, and observes man's actions very carefully, and rewards or punishes them according to their deserts. Indeed, the picture of God is as striking a presentation of the fatherliness and the providence of the Almighty and of most of the lovable characteristics of the Deity as there is to be found anywhere in literature until the coming of Jesus Christ. And this book was written as long before Solomon as Solomon is before us!"

He concludes with this suggestion:

"There is no such thing as evolution or progress in literature, and in art and architecture we are far behind the ancients and the people of the Middle Ages. Everything, indeed, depends on ourselves and not on our predecessors, and this in itself constitutes the highest form of incentive to do our best work."

We do not give these quotations our unqualified approval. We reprint them on account of their thought provoking qualities. It is well to pause at times, especially in educational work, to ascertain just how far we really have progressed. There is much liberal thought in this ancient schoolmaster, Ptah-Hotep, that it may be well for us, forty-eight hundred years after his time, to consider. One would naturally suppose that the world would change considerably in that period. Probably it has changed, but is it now all that it should be? That is the question.

We live in a wonderful world, and the wonders of the world without us are matched and more than matched by the wonders of the world within us. This interior world has its natural history also, and to observe and record any of its facts and incidents, or trace any of its natural processes, is well worthy of our best moments.—John Burroughs in "Under the Apple-Trees."

Wood Lilies.

Lifting painted cups to Heaven,

To catch the sun and dew,

Like torches bright they light the way,

The scented woodland through.

—Emma Peirce.

Have You Eaten Custard Pie?

I was about twelve years of age when one day I came home after a snaring and hunting expedition, as hungry as it is possible for a country boy to be, and that is saying a good deal. I had tramped over many miles and had had no dinner. It was about three o'clock in the afternoon. I said, "Grandmother, I cannot wait until supper. I am almost starved. Bring on a lot of things. I want my supper now."

I do not recall all that she brought, but I remember fried cakes and custard pie, of both of which I was very fond. I literally stuffed down two or three of the fried cakes after the manner of ravenous country boys and then turned my attention to the custard pie. Although I was rather surprised to hear grandmother say, "Eat all you want," I decided to accept her advice. The whole pie should go. The first quarter went in about six pieces—one does not have to chew custard pie. The second quarter slowed down to about eight mouthfuls, but I was well through the third quarter when for the first time I really tasted that pie and began to suspect something. I tasted again. That pie had been kept a little too long. That was grandmother's reason for not keeping it any longer. I looked at the old lady. "Isn't this pie sour?" She tasted a bit and thought, as if she had a difficult philosophical problem to solve. She tasted a little more. "Yes," she admitted, "I guess perhaps it has been kept a little too long." I decided with disgust that it had been kept far too long. I had been too hungry to make the discovery but my stomach decided in less than half an hour that it should be kept no longer.

No, I have not wholly lost my liking for custard pie. I like it even to this day; that is, after I have decided that it is eatable, but never since then have I seen a custard pie without an unavoidable feeling of repugnance. My mind as well as my stomach was then and there poisoned, and what might have been all my life a delight has been greatly marred by the feeling of disgust aroused by a sight of this most delicious of all domestic concoctions. My reason can overcome it but con-

siderable force of will is needed to do so. To that extent one pleasure in life has been destroyed.

My friend, have you ever tasted custard pie? I fancy you have; that is, the spirit of it, because when you first see a toad or a snake you shudder at it although your reason tells you that there are no more beautiful creatures in the world. Perhaps some naturalist urges you to hold the snake in your hand and you reluctantly admit that it is a glossy, dainty, graceful creature. Some naturalist assures you that it is all nonsense about a toad giving you warts, but it takes much argument and much hesitation before you receive the toad into your hand and notice the jewels in its head, its beautiful eyes. Perhaps you are persuaded to hold it in your hand until it sings to you its sweet lullaby. Finally you do really enjoy it, if you are strong enough to overcome the impression that you received in childhood when some one exclaimed, "Oh, that horrid, nasty thing!" and your mind was prejudiced. Are you afraid in the dark? Is the pleasure of a stroll in the darkest Africa of the woods and thickets marred or wholly annihilated because in your childhood, or perhaps in one of your ancestor's youth, some one tasted the spirit of that custard pie and your pleasure has been marred for all your life; in that part of the twenty-four hours you cannot enjoy nature?

I remember about midnight in camp when during a severe thunderstorm I sat at the entrance of a tent occupied by some sixteen or seventeen young women in order to keep them from being frightened and that after the storm had abated, and I was on my way back to the Plainville, Connecticut, camp meeting ground, I sat under a tree as the thunder rumbled off toward the west, and the lightning flashes were becoming less vivid. I was alone with the grandeur of nature. The time was about two o'clock in the morning. It is good to be alone with nature and with one's self. But why did I enjoy it? Because in my boyhood I had not eaten a sour custard pie of the midnight of nature, as so many other people have done. To me it was a celebration of those days when I felt at home in the woods at night.

Are you afraid to go into a graveyard and stay there alone at night? Your reason tells you that it is only the sleeping place of your friends, and thus to revere their memory should be a joy, but somehow you or some of your progenitors have absorbed the spirit of that custard pie. You have been frightened by the unknown. You are terrified not only by the surrounding darkness, but by the thought of the untraveled road that each of us must tread. Your reason tells you that it should be a delight to enter into new scenes and unfamiliar places, to enter into those joys that the eye hath not seen nor hath it entered into the heart of man to imagine, yet you shudder at the thought of that unknown region. Yes, but unreasonably so. There is really nothing to fear except one's self. In the darkness where reason tells us there is no enemy nor any lurking danger, yet somehow, because of danger in the past and present of the human race, there is the feeling of dread that requires much force of will to overcome.

As I grow older, my reason and the delicious qualities of good custard pie have taken much of that dread from my mind, but I wonder how much older I must be, and how much longer experience must influence the human race before reason and love will wholly annihilate the dread. Afraid in the woods? Afraid in the cemetery? Oh, for a greater love to drive out the fear of things that we should wholly enjoy. Yes, my friend, you have eaten sour custard pie, and some of the happiness of your life has been destroyed. Struggle with all your powers so that all the world shall have less dread, less ugliness, less enmity, and a better era of peace and serenity, of loveliness and beauty, shall be ushered in.

In Memoriam Hominum!

Though some of our Latin scholars may criticise the syntax of that expression they must admit that it recalls at least a suggestion of something in memory of men, but I want to play upon the word and sing, like Virgil of old, in memory of mankind's once familiar hominy. In all the cornfields, in all the gristmills, in all the kitchens, hominy is only a memory to the older members

of mankind. During a correspondence extending over more than three years in all parts of the country in search of this lost hominy I have yet to find the first particle of the real thing. I have been deluged with letters telling of innumerable places where one might obtain hominy, and into these places I have chased the fleeing will-'o-the-wisp, only to find something entirely different—what every New England boy knew half a century ago as hulled corn, or the monstrosity that any self-respecting New England boy would have been ashamed to know, a pale-faced, blanched, Japanese-like form of corn, known as hominy grits. Now it is neither hulled corn nor this so-called hominy grits the loss of which I am deploring, but real hominy from yellow corn.

Good old Noah Webster, and I have no doubt that Daniel too, knew what hominy was, knew that the original was common yellow, Indian corn broken by the Indians. Of course when they pounded it with a pestle in the hollow of a stone, their breaking was somewhat irregular. The white man improved upon that. He broke the grains by placing the gristmill stones far apart and then sifted out the soft, mealy portion by some process not known to the writer. The thin skin covering the corn was removable. Good old Webster tells us that the word itself is closely associated with the term "roko-hamin" used in Virginia, but the Virginians parched the corn before they pounded it. It seems that there was a variety of processes but the process that produced the real material, dear to the heart of every New Englander, is unfortunately no more or is beyond the researches of my three years' correspondence.

After something like a year's correspondence, an aged miller promised that if he could ever find the spare time he would grind a bushel of the real old stuff. I waited for six months and then wrote inquiring if he were not almost ready to find the time, but a marked copy of a paper mailed to me by one of his relatives told me that he had passed on beyond time.

There was another miller in the eastern part of Connecticut. Oh, yes, he knows all about it and just as soon as he can complete repairs on the gristmill he will supply all I need. For a

time he answered the letters, especially when I enclosed a stamped and self-addressed envelope, but as it is now a year and a half since he made the last report on those repairs, I judge that mill is either in a state of collapse, or else that he has joined my first miller in a conference beyond time.

In the heart of the country at an old homestead I found a man that said, "I know just what you want," and smacking his lips continued, "My, but I can remember those hominy pies even to this day." "That is it. You have got it right," I said. "Pies with luscious raisins and a custard, all made of the real old hominy." "Well," he continued, "I do not know as you can get it in stores nowadays. We have discontinued it in the North but they are not quite up to us in the South and they still have hominy." "You mean," I said, "they are far ahead of us if they still have hominy and we have not." "I will give you a few addresses," he said. I wrote to several including a famous old gristmill in Richmond, Virginia. One man was kind enough to write, "We have the real hominy," and to send me a liberal package. Imagine my disappointment when I found it was nothing but such as is sold at department stores.

John Greenleaf Whittier, why do you not come back and reprimand some of these grocers for using your classic "bowl of samp and milk" as a misuse of the name samp? It is about as near what you had in mind as huckleberries are to peas.

Went to visit a man in New Jersey. He said, "We have here an old-fashioned gristmill. They have just what you want." Gleefully I alighted from the automobile and accosted the man at the desk, "Give me a peck of hominy, will you?" The man at the desk laughed and said, "I know what you want. We have not got it. I have heard my grandfather tell about it." Then I realized that I had grown beyond youthful years when a full-grown man like that had to refer to his grandfather!!

A young friend in the back country of Connecticut known as Columbia, tried to sing not only "Hail Columbia," but "Hail Hominny" as having discovered the desideratum. She told me where to write to get all I needed.

Result, loss of another two-cent stamp and the stenographer's time.

Isn't it strange that the human race will let drop out of use such a delicious food? Where is the wholesale grocer that will make fame and fortune by putting up the real material and placing it on the market? He need not try to palm off on us any white hominy grits or any hulled corn similar to that made from lye over wood ashes. Nor need he try to convince any one that those white particles are the real thing; I fear that the making of hominy is a lost art. That is my reason for singing this gastronomic epic, "In Memoriam Hominum."

"Proofs" that Disprove, or, Arguments That Do not Argue.

I want to prove to you that an oak tree is more beautiful than a lily of the valley. Listen carefully and catch the force of the logic. Let us consider this important question as to the relative beauty of an oak tree and a lily of the valley. I am sure that you will recognize the force of the indisputable argument, because the robin is a beautiful bird and pulls earthworms from the soil among the lilies of the valley under the oak tree.

"Quod erat demonstrandum"—with a flourish of trumpets as if the whole thing were therefore conclusively proved.

"What nonsense!" exclaims the reader. "What has a robin under an oak tree among the lilies of the valley got to do with proving that an oak tree is more beautiful than a lily of the valley?" That is your question, and you must answer it or I must refer you to those who have used that kind of logic.

In the month of March, I sat in a schoolroom in a town of Maine. The room was packed with school-teachers who were listening to a talk about the rural interests of Maine. The speaker was trying to prove that Maine is the most beautiful and most interesting place on earth, or, as it seemed to me, he was trying to console them for the misfortune of having to teach school under the rural conditions in Maine.

The most conclusive proof that that particular place in Maine is the most beautiful and most interesting spot on the earth would have been to tell the teachers to look out of the rear window over one of the most beautiful landscapes that I

have ever seen. The ground was covered with snow; snowflakes were falling thick and fast; the valley, hills, and evergreen trees together formed a vision like a vision of Paradise. I have seldom seen anything more beautiful than that view from the window of the Emerson School in Sanford, Maine. My eyes were devouring the distant hills, while my ears were assailed by the speaker. Here is the substance of what he said:

"Some of you teachers may at times, especially in the winter, feel that Maine is a dreary region, and that your lot has fallen to you in unpleasant places. But Maine is really better than you think. I know a lady who recently left her native Maine and went to Los Angeles. She wrote charming letters about the wonderful flowers, and trees that were so beautiful through the entire winter, but she said, 'I cannot like Los Angeles with all its beauty quite as I like Maine, because my friends are in Maine and they make me feel that Maine is the best place on earth.'"

Oh, what a proof! It throws up the whole question. It is presumable that for those who have known both places from childhood there are friends in both places. On that point odds are even. The question under consideration was whether Maine is the more enjoyable place of residence, or as good as Los Angeles. The questions have as much relevancy to each other as has the robin pulling earthworms to the comparative beauty of the oak tree and the lily of the valley.

Much more might have been said of the wonderful kaleidoscopic beauty of Maine as compared with the somewhat monotonous scenery of Los Angeles! Is there a son or a daughter of New England that would change the beautiful winter snow for a place where one never sees the miracle of the snow? Who would change that for a land in which there is no burst of spring? That reference to the friends cancels the whole question, and makes the logician throw up his hands in despair at the attempt to prove the intrinsic beauty of Maine in comparison with that of Los Angeles.

* * * * *

ANOTHER PUZZLE IN ARGUMENT.

In the April number of "The Ladies' Home Journal" is a full page editorial essay with elaborate mythological illus-

trations, entitled "The Immortality in Our Islands." Many readers undoubtedly have been delighted at first impression by the full page, illustrated treatment of a subject so vital to every human being. The author asks, "What is Immortality?" He then proceeds to sum up the principal qualities in two paragraphs:

"To know that you have received from your father and mother, and from the fathers and mothers of their fathers and mothers before them, a foundation of body and character and personality—good, bad, indifferent, all in one:

"To take the many qualities thus passed down to you, qualities doubly precious because of their very source, and to combine them with the heritage of one who is nobler and finer and dearer to you than anyone else, passing them on, molten and welded into a greater metal, to sons and daughters of your own."

He then outlines other features of the giving to sons and daughters of the best that lies within one's self,—likeness of the parent, of the mind, of experiences in suffering and in joy, of ideals, and of standards that have influenced.

The writer concludes that this is "the one Immortality unselfish enough and noble enough and human enough to have been ordained for the finite comprehension of mortal kind by the infinite wisdom of a loving God."

If all that that editorial writer outlines is Immortality, then there is no Immortality. There is only Heredity. He has used all the arguments of annihilation, and has there put the whole of the main question. He has offered a so-called proof that disproves—an argument that does not argue—and has proved that there is no Immortality.

He should have concluded as a kind of benediction to his reader, with the epitaph that an atheist requested his relatives to carve on his tombstone, "I was, I loved, I am not."

If what that editorial writer has outlined is Immortality, then a rooster is immortal when his head is chopped off and his body used in a potpie. He has given all his characteristics to the succeeding cockerels of the farmyard. If what he has outlined is immortal, then horses, cattle, trees, and plants are immortal, because they have transferred their characteristics to their descendants. Perhaps in a certain sense they are immortal. Perhaps there was a modicum

of truth in Thoreau's exclamation to the pine tree on the summit of a hill. "You tower above me in this life. Perhaps you will still tower above me in some other life."

That, however, is not the meaning of the term, Immortality. If Immortality means anything in the hope of the human race, it means a distinctive continuance of individual life in some form after death. According to the fallacious argument of the "Journal" editorial, the only people living are those on earth, and if our earth should gradually cool in eons to come until there is a last final survival of the human race, then the entire human race, with all its principles and methods, has been annihilated. In a homily upon what Immortality should be, this should be included. It is impious to refer to any other Immortality it is only an acceptance of the annihilation of the individual.

When one tries to prove the comparative merits of two localities, or of two forms of life, and must add a third factor, it is an argument that does not argue except for the other side of the question. Anybody who sees in nature an argument for God and a future life, cannot permit such rank nonsense to pass without comment.

There is no form of attack so insidious as that which lulls one to sleep by some quieting brook, and no pernicious argument so subtle as that which is carried on with mellifluous, melodious, but deceptive words.

There's A Path.

There's a path that leads to pure delight,
And it starts at your very door.
It may take you into a garden sweet,
Or around by the breezy shore.

It may go far into wooded depths,
Where shade and coolness reign,
Or out into the sunshine bright,
Along a flowery lane.

It may follow the shining river down,
As it flows its way to the sea.
Or meander by the singing brook,
As it wanders through the lea.

It may climb the hills and mountain heights,
Or end in the nearer fields,
Whichever way it may chance to take,
It untold pleasure yields.

For it guides you into Nature's haunts,
Her fairyland, her own,
Where wonders, inspirations, joys,
Are lavishly bestowed.

—Emma Peirce.



Limitations of Omnipotence.

A letter from the Rector of an Episcopal Church calls attention to the problem of nature's "care for the type, and its carelessness for the individual; its 'redness in tooth and claw.'" In company with this is another from a religious microscopist, who says that he is more and more puzzled by the problem of pain and evil, and that while looking at nature and at humanity, he is becoming still more puzzled to know where God is, and why He permits certain things to be.

Many similar questions appear in our correspondence and in various public prints. It is my belief that all these things, that so pain enquiring and troubled souls, arise from a fallacy in the accepted notion of omnipotence as applied to God. But, and I say it with reverence, God cannot do everything. He has not unlimited omnipotence. His power is universal only within the bounds of consistency. He must be pained because humanity is expecting so much of Him and is calling on Him to do the impossible, to be inconsistent and to break His own laws. Let us consider the matter. There are almost innumerable things that God cannot do. To ascribe to any being the power to undo the things of yesterday is unthinkable. Thus far I have dictated this article. Omnipotence Himself cannot undo that act of dictation, as thus far done. He cannot change the fundamental principles that He has established. Twice two can never be fifteen. Omnipotence is not applicable to such an attempt. After He has created the law of gravitation that universally attracts, He cannot then prevent two freely movable bodies from colliding, if other and similar bodies should cease to act upon them. He will roll this world together as a scroll when His power of gravitation has worked itself out in the fullness of time, and when his unerring laws bring this planet into collision with something else. The result will be a nebula. On the gigantic scale on which the universe is created, these laws may take millions of years to accomplish such

a result, but that result will come as surely as a ball now falls to the ground when unsupported. He cannot give individuals or nations, which are only a collection of individuals, free will, and at the same time stop them from doing what they want to do. With all His Omnipotence He could not have stopped the Civil War, and at the same time have decided the human question that the war itself decided. Neither the North nor the South was wholly right nor entirely wrong. Both were right, and the clashing rights had to work themselves out in a way that is ultimately shown to be the best for humanity. If He had interposed by divine power at any time during the Civil War, as He could have done, since He had already created gravitation, He could not have *stopped that war and at the same time have settled the question from the human point of view*. Humanity had to settle that question. He cannot create righteous human beings and deprive them of the ability to do evil. That would be to create mere dummies. The thoughtful person must see that in a world in which there is no possibility of evil, there can be no possibility of righteousness. It is equally true that in a world where there is no possibility of a struggle, there can be no development of strength. The stones of the field never struggle with another; the stones of the field never develop an individual strength; they are merely acted on by the universal power of gravitation. A struggle for supremacy must give pain to the under dog in the fight, and likewise more or less to the upper dog. But dogs that never struggle would not be dogs as we know dogs. The tooth and the claw in such conditions would be useless, and would never have been developed.

Health is meaningless without the possibility of sickness. Joy is meaningless without the possibility of sorrow, as cold is only a term for the absence of heat. If everything in the world had the same temperature, the terms heat and cold would be meaningless. The most thoughtless man cannot but perceive the goodness, the righteousness, the marvelous power of a Creator that could produce a world in which there are extremes, the possibilities of health and sickness, of joy and sorrow, of goodness and of sin. Anything that should come short of that possibility would be dead, inert space. One

may well question whether or not the Creator Himself in His Omnipotence could have created a world in which there should be none of these possibilities of extremes. Are we not giving the Almighty unkind treatment, when we ask Him to abrogate His beneficent laws, when we clamor for the undoing of all that He has done for the good of humanity? His beneficent laws are working successfully in the struggle for existence in the daisy field; in the contest between the tiger and the man; between the Allies and the Teutons. In some struggles the cause of the contest may not at the time be known. Time and again such examples are visible in the world of nature and of humanity. When the Diplodocus struggled with Triceratops who that stood by and saw one a victor could understand the matter at stake? At present no one doubts the beneficent effect of those ancient struggles. We human beings are now engaged in a variety of similar contests, the chief of which is the struggle between nations. Even thousands of years may be needed to prepare the right perspective, and to clarify the puddle.

Minister, scientist, agnostic, for a moment put yourself in the place of the Almighty, and imagine how you would feel. Say that you are the benefactor of the race, and have provided a perfect home for a certain family under conditions that you know are the best for that family, and practically the only ones that can by any possibility be for its welfare. You having so decided, what would probably be your thoughts and feelings if that entire family should begin to clamor for a change and to say, "See, here, you do not exist."

You have established affairs so wisely that you are under no necessity for a constant display of your nature in the adjustment of those affairs. Like a competent factory superintendent, you do your work so thoroughly that you seem to make no effort to accomplish your tasks.

I wonder if the Almighty does not sometimes, perhaps all the time, feel the ingratitude of human beings who complain because He has given pain as a guidepost. Who has ordained that struggling shall develop strength. Who has allowed evil surroundings to exist so that righteousness may finally abound, and then is constantly asked to make changes

and do everything over again in another way.

Let us be perfectly frank. Human beings would be called either foolish or vicious if they talked in that way about their human landlord, who had provided a good home for them in best possible conditions. Why do we complain because God has made it necessary for us to work out our human problems for ourselves?

God is omnipotent only within the bounds of consistency, while we poor human beings are constantly asking Him to be omnipotent in inconsistency.

It is true that the Bible in several places makes the statement that "with God all things are possible." But that self-evidently means omnipotence within consistency and wisdom. Is it thinkable or possible that God in His all-power can make Himself inconsistent, or weak, or that in His wisdom it is possible for Him to do foolish things?

The North and the South in our Civil War were both right in praying to God for victory. *The prayers of both were granted.* Both North and South were victorious in settling a human question for the best good of all. To the South belongs the greater gratitude because of its greater suffering and sacrifice, that all may enjoy for all time the settlement of a human question in which both sides were right.

But you argue the South might have behaved herself and stayed in the Union and not brought all the pain, loss and suffering upon herself and the North. Yes, but the question would still be unsettled. Could any referee nation have passed an opinion that would have settled it as securely as now? Could God have continued free will of North and South and settled it without permitting the struggle?

Don't enjoy the benefits of struggles and then blame God or doubt Him for permitting struggle.

God always looks to the happiness of the individual. It is not true and not substantiated that God cares for the type and is careless of the individual. Salvation has never come to a nation but to individuals composing that nation. All natural science tells us that there are many types. Indeed, nature does not recognize any such thing as a type except as a collection of successes.

Put an hundred oak trees and an hundred ash trees into competition and it is

only a struggling of individuals. Buffaloes, carrier pigeons and extinct species of the past just as readily compete in this struggle as do any individuals of those classes, only a type represents a collection and there are always fewer collections than there are individuals composing that collection. It is recognized at once that righteousness cannot exist where there is no evil and even Omnipotence cannot be inconsistent with itself.

Flowers not to be Honored, but to Honor.

Human beings are to consider the lilies of the field and from them to draw lessons and inspiration. Flowers are taken into a church to honor the church, not to be honored by the sacred edifice.

A correspondent in New York State calls attention to the fact that in an Easter day talk to the young children of the Sunday school, a clergyman said that the lily bulb had what he called a lowly position in the earth and struggled hard to grow and be something, and that finally as a reward for its efforts it was awarded the honor of a place in the church for public observation. The correspondent asks if that explanation is not wrong end to. We think it is. A work of man, even if consecrated, cannot honor the humblest flower that comes direct from the hands of God as His masterpiece of handiwork. The works of man are honored by the presence of the Supreme Worker's beautiful production. That clergyman had a glimmering of the true notion, though things with him seem to have been a little twisted. What he evidently meant to tell those children was that some of the grandest works of God have an humble beginning, but that there is always the possibility in drawing life from Him so to influence others by beauty and usefulness as to honor and inspire every one with whom that life comes in contact or association. The lily has apparently an insignificant and lowly beginning but how gorgeous it becomes, how useful and how inspiring to others because it has received its life from God. That lesson may be followed in the development in any human being, however lowly or humble the surroundings in which he may be placed.



THE AGASSIZ ASSOCIATION

Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

Report of the Putnam Chapters

On February 10th the Senior Putnam Chapter held its first regular meeting at the President's house. After the Treasurers' report one of the Members showed us some interesting stones which she had, and we talked about silk and its manufacture.

we watched the large logs slowly burn Dr. Bigelow told us most interesting stories about the founding of The Agassiz Association and the meaning of the colors and names.

Our Chapters had been very enthusiastic about this new interest but we returned from our visits to ARCADIA still more eager to go to work and do something. The beautiful influence of



THE SENIOR PUTNAM CHAPTER OF THE AGASSIZ ASSOCIATION.
GREENWICH, CONNECTICUT.

At one meeting we practiced songs which we later sang at ARCADIA.

On March 17th we held an Agassiz morning in our school, The Greenwich Academy, and in assembly nearly every Member told of some interesting thing about nature which she had either discovered or read.

The two Chapters have been to visit ARCADIA twice, and both times had a splendid visit. On the first trip we all sat around the huge fireplace in the Welcome Reception Room and while

this splendid Association is already bearing fruit for every day this spring some girl has come running into the room eager to tell something which she has discovered in connection with the awakening of spring and the approach of summer. Many of the Members have notebooks in which they are keeping record of the birds, trees or flowers which they have seen.

Gradually the thought that Louis Agassiz wished to leave with us is being planted in our minds and hearts.

A good prescription for a weak heart or constitution is, "Join The Agassiz Association." It's worth while.

BETHIAH WATERMAN,
President Senior Chapter.

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Some Observations by Members of This Chapter.

The Flicker's Nest.

Out in the old dead tree in front of our school there is a flicker's nest. The little round hole in the tree looks as if the father bird had been working very hard. The nest is so high that we can not see into it.

The other day the father bird was tapping on the tree for his mate, but she did not come. We are going to watch the nest and see if we can see the birds.—MARY MILBANK.

* * * * *

A Starling's Nest.

Last year outside of our house a starling's nest was built in our apple tree. Every morning this family of starlings would wake us up at half-past four or five. This starling laid four eggs and it was not long before there were some little starlings. This summer they are back again and in the very same nest.

ELEANOR PIER.

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Our Gardens.

We each have a garden on the grounds of our school. It is measured out in little beds for each child. We planted corn, radishes and beets or turnips. The flowers are candytuft and mignonette. Some radishes are up and there are tulips in blossom.

CLARISSA MACKCEE.

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The Flicker's Nest.

Outside of the building there is a tree. One day some flickers came and they thought that the tree would be a good place for a nest so they began to pick and pick. In a little while the hole was finished. When they were making the hole they tapped and it was a funny little noise that they made. The little red head bobbing up and down looked very odd. The nest is too high for us to look into. It must be a lovely little home down there.

FRANCES HOLMES.

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The Flicker's Nest in Our Chimney.

About a week ago there was a flicker trying to make his nest in our chimney.

In the morning at five o'clock he used to wake us up. He made a lot of noise on the chimney.

We waited a few mornings to see if he would stop making that horrible noise, but he would not. So I told my grandmother about it and she had a man put some bags around the top of the chimney.

A few days later we heard the flicker again, so we looked to see if he had made a hole in the bag and we found out that he had. We were going to have another bag put on the chimney, but the flicker went away and has not come back since.

ELIZABETH ANDERSON.

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The Robin's Nest.

We have a robin's nest in a maple tree right outside of our window at school. We watched the robins build the nest. One robin would stay there while the other would bring the straw and pieces of rag. It is about halfway up the tree. The leaves are now so far out that you can hardly see the nest.

MARGARET HOUSTON.

That Woodchuck Story.

BY WILLIAM R. LODGE, CUYAHOGA FALLS, OHIO.

Woodchuck Day or Groundhog Day or Candlemas Day has been much ridiculed, yet so far as the woodchuck's coming out is concerned, it is a mystery to many people. It is a fact, however, that the groundhog does awaken from his long sleep on the second day of February. This has been proved conclusively at the Silver Lake Park Zoo of Cuyahoga Falls, Ohio. For eight years we kept here a white woodchuck that was caught in Northampton Township and presented to the late R. H. Lodge by Frank Wetmore. Mr. Lodge made careful experiments to ascertain whether or not the animal would come out on the second of February, and learned that it would.

The woodchuck was kept in a small round cage about two and one-half feet in diameter, with an oak bottom and an oak top, with quarter-inch rod irons, placed vertically about two and one-half inches apart, on centers and separating the top from the bottom. This was about two and one-half feet high and gave ample room for him to stand up and be fed through the bars. Early in November the cage was filled with forest leaves.

The woodchuck curled himself up in the center and went to sleep. Without food or drink he remained in this condition until the first or second of February, the cage being placed in an old-fashioned root cellar where there was no artificial heat.

On several occasions during December and January William R. Lodge tried to arouse him by shaking the cage, and did so disturb him that he would raise his head and grate his teeth, a familiar habit among woodchucks and other rodents, but was never able to induce the

At that time the cobs would be disturbed and the woodchuck always came out of the nest and stood on his hind feet, with his hands on the bars and his nose through the spaces. He was asking for food, at which time he was given a parsnip, sometimes cabbage leaves and cake. He would stay out for a day or two, and then go to sleep again, usually for about six weeks, the time depending upon the weather, though the writer does not remember that he stayed out continuously after February 2nd. He usually slept for most of the time, though occasionally he would come out for food. On two



A WHITE WOODCHUCK.

animal to come out of his nest so as to become visible. To prove that the woodchuck did not move during a large portion of the winter previous to February 2nd, Mr. Lodge took pop-corn cobs and laid them over the center of the nest, squarely above the woodchuck, and not more than six inches from his head, placing them rail-fence fashion, so that he could easily determine whether or not they were disturbed. They remained in this position for many days during January and up to the beginning of February. Mr. Lodge's bedroom was immediately over that portion of the cellar and at an early hour in the morning of February 1st, of different years, he was awakened by a shrill whistle such as woodchucks make, but more often not noticed until the 2nd.

or three occasions the cellar doors were opened and the cage placed so that if there was any morning sunshine he would have an opportunity to make use of it. The cage was also sometimes set at the head of the cellar stairs so that it has been proved that the groundhog does come out on February 2nd and not until that time. There being no snow, at present, it has been hard to determine whether or not any of the woodchucks have come to the mouths of their holes in this locality. But it is well-known to hunters and trappers that they do come out about the second of February, for their tracks are found in the snow and even their muddy and sandy footprints on the rail fences where they sometimes climb for a sun bath.

THE AGASSIZ ASSOCIATION

YEARLY CASH REPORT.

(ACCEPTED BY THE BOARD OF TRUSTEES, MAY 27, 1916.)

Summary—Cash Received.

April 1, 1915, to March 31, 1916, inclusive.
 From THE GUIDE TO NATURE.....\$3,847.07
 From Contributions for Observatory 1,239.63
 From Members' Dues, Contributions,
 etc..... 1,498.87

Total.....\$6,585.57

Summary—Cash Paid.

FOR THE GUIDE TO NATURE.....\$4,428.76
 For the Sound Beach Astronomical
 Observatory 1,160.52
 For General Expenses and Improve-
 ments 996.29

Total.....\$6,585.57

NOTE: Payments on Observatory to amount of \$79.11 made after March 31st, 1916.

Auditors' Statements.

ARCADIA: Sound Beach, Connecticut.
 The above is a correct summary of cash received and paid from April 1, 1915, to March 31, 1916, inclusive.

(Signed) EDWARD F. BIGELOW,
 Sound Beach, Connecticut.

Subscribed and sworn to before me this 13th day of April, 1916.

(Signed) HARRY C. FROST,
 Notary Public.

* * * * *

Stamford, Connecticut.

This is to certify that I have examined the details of which the foregoing is a summary and find all to be correct.

(Signed) C. R. FISHER,
 Auditor for the Public,
 Stamford, Connecticut.

Subscribed and sworn to before me this 29th day of April, 1916.

(Signed) CLARENCE E. THOMPSON,
 Notary Public.

* * * * *

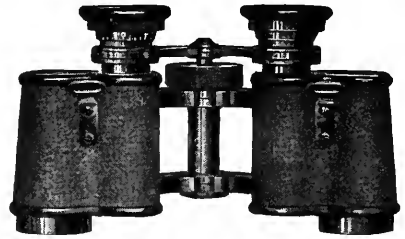
I have examined the record of receipts and expenditures of The Agassiz Association for the year ending March 31, 1916, and have no adverse criticism to offer. The expenditures seem to have been made wisely and for the best interests of the Association.

(Signed) HIRAM E. DEATS,
 Auditor for the Board of Trustees.
 Address, Flemington, New Jersey.

May 27, 1916.

SOME COMMON PLANT FAMILIES. A Botanical Textbook. By Willard N. Clute. Joliet Illinois: Willard N. Clute & Company.

This is a convenient, interesting and elementary description of some of the leading plant families. As might be expected from what we know of the author's literary skill and botanical attainments so simple, plain and lucid an essay as this is only what might be anticipated. It is all of this and instructive.



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A decorative border of repeating floral and leaf motifs surrounds the entire page.

The Guide To Nature

The more things thou learn-
est to know and to enjoy, the
more complete and full will
be for thee the delight of liv-
ing.—Platen.

Volume IX AUGUST, 1916 Number 3

PUBLISHED BY

THE AGASSIZ ASSOCIATION

ARCADIA: SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

Subscription, \$1.00 a Year. Single Copy, 10 Cents

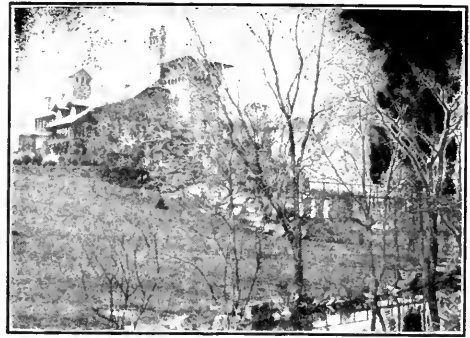
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A Compromise.

"Look here, Hiram," said Si, "when are you going to pay me that eight dollars for pasturin' your heifer? I've had her now for about ten weeks."

"Why, Si, that critter ain't worth more than ten dollars."

"Well, suppose I keep her for what you owe me?"

"Not by a jugful! Tell you what I'll do: you keep her two weeks more and you can have her."—The New England Farm.

A botanist who makes a hobby of cultivating native orchids lays special emphasis on planting them in soil like that of their native habitat. He relies principally on moss, leaf mould, swamp muck, pine needles and powdered charcoal, and in special cases adds pounded granite and coal ashes.

To a Fountain.

Oh jeweled fountain, leaping high,
 And flashing in the sun,
 You frolic as the moments fly,
 You gladden all the passers-by,
 Your day has just begun—
 And yet how much you've done!

—Emma Peirce.

Fresh New Crop Vegetable and Flower SEEDS

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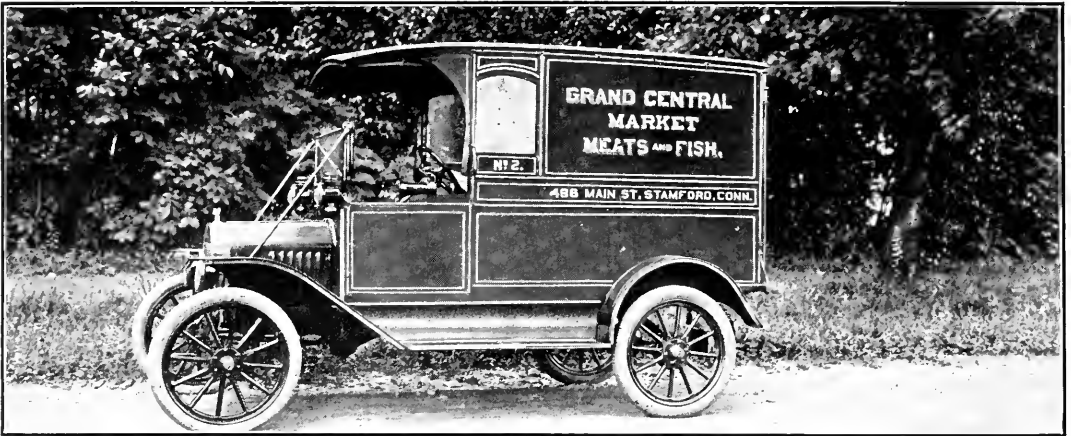
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Sec'y and Treas.

Bees and Bullets.

A novel home for bees, and a queerer method of making that home, is reported in "Gleanings in Bee Culture," by Mr. L. J. Holzworth of Phoenix, Arizona, who discovered the bees in a cactus. With his axe, he removed the fleshy part of the plant and found a nice dry, snug beehive about two feet long and one foot in diameter. As to the method of making the cavity he tells this singular story:

"I then wondered how they could have got in there and what had originally made the hole. Some birds may pierce the thorns and thick flesh that covers the skeleton work within, but they always choose to do it at the more tender top, and therefore there must be some other cause. My investigation, however, soon dispelled all doubts, as imbedded in the wall just opposite the entrance, was a bullet with its nose in the right direction. This told the story. Some one had, perhaps carelessly, shot into the cactus years before, and, contrary to the general rule of wantonness, had actually made a home for a nice swarm of bees."

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The Moss Rose.

Beneath its fairy thatch of moss,
The pink of the rose appears;
No wonder it favors finds to-day,
This darling of other years!

—Emma Peirce.

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Children's happiness is so often induced by simple things and nothing could contribute to it more perfectly than rompers such as these. They are comfortable, they entail no anxiety as to possible soil or wear and tear and they leave the little wearer free to play and to dig and enjoy life generally. In the picture, they are made of a dotted linen with trimming of plain color but all the simple washable materials are appropriate. Gingham, chambray, percale, galetea and the thinner dimity and lawn for really warm days. Many mothers use rompers exclusively for the little boys and in such case they are made of finer materials for afternoon wear. White dimity or white Habutai silk smocked and trimmed with blue would be very charming for such use.

For the 4 year size will be needed, 3 yards of material 27 inches wide, 2 5/8 yards 36 or 1 7/8 yards 44 with 3/8 yard 36 inches wide for the trimming.

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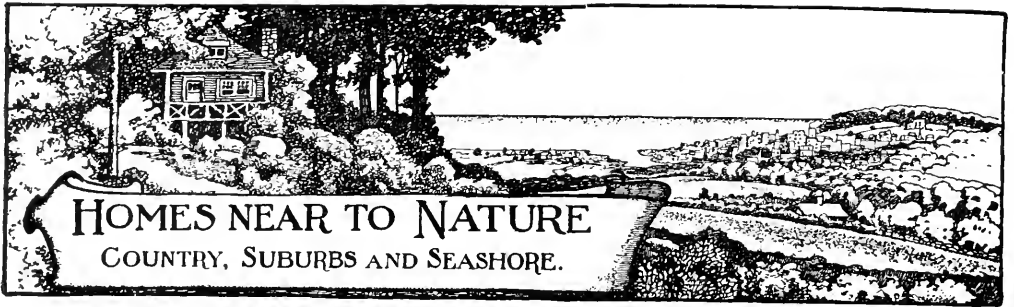
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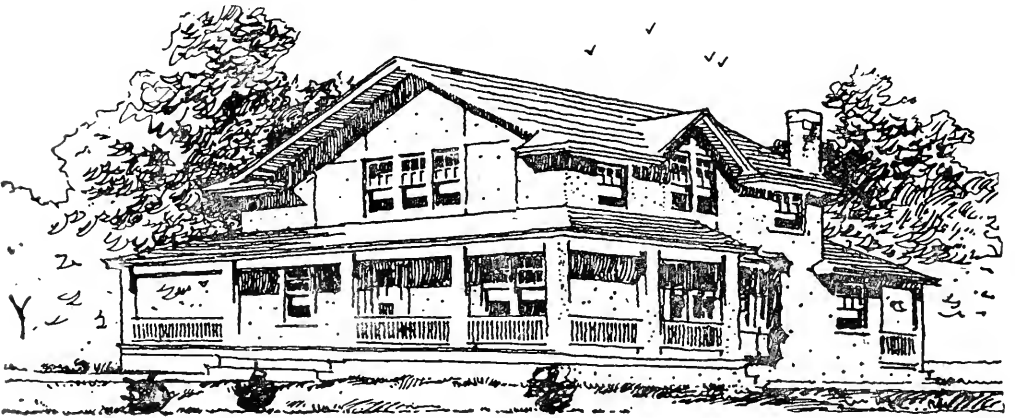


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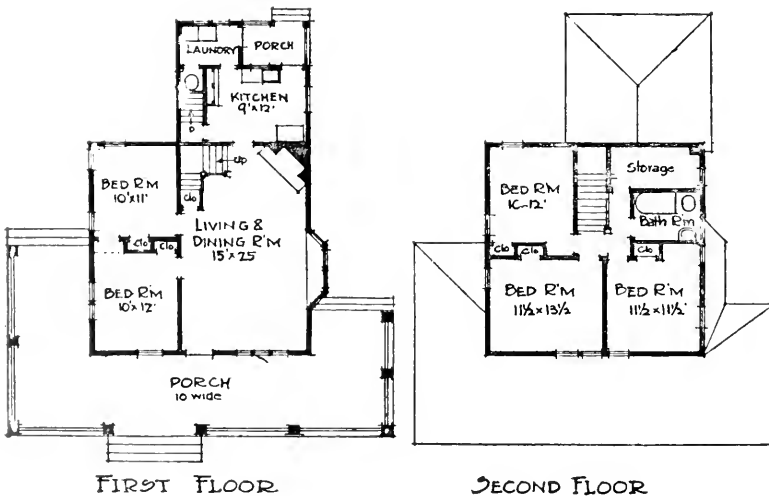
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THE GUIDE TO NATURE.

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Can you imagine a cottage presenting a more homelike appearance than this one? A large porch extends across front and around both sides. Living room and dining room are in one or

can be separated if preferred. Opposite are two bedrooms, and in rear an exceptionally complete kitchen. Laundry and rear porch complete this floor. Living room contains bay window and



large open fireplace. Second floor contains three sleeping rooms, bathroom and storage room. Closet space provided throughout.

Stucco exterior. Shingle roof. Cellar under entire house.

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Lumber	625
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Painting and Glazing	175
Plumbing, etc.	250
Hot air heating	125
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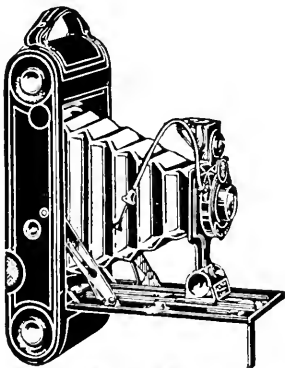
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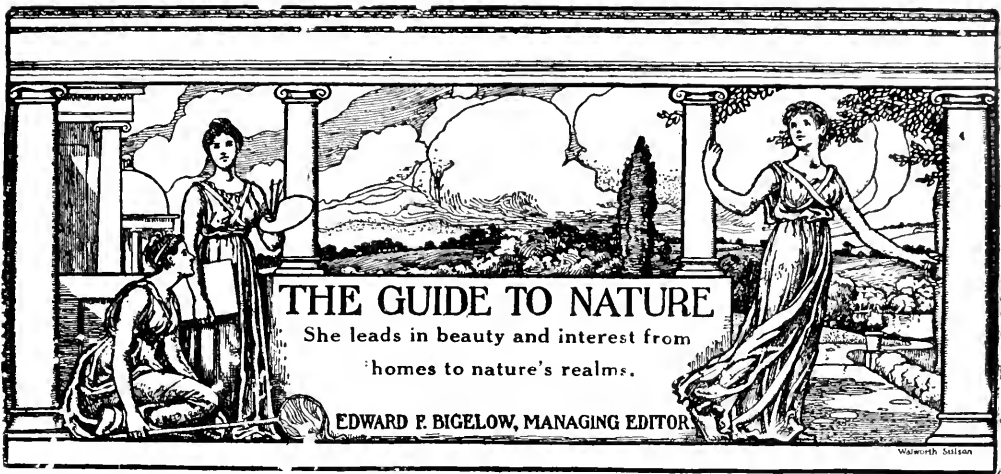
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Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
 Subscription, \$1.00 a year
 Single copy, 10 cents
 Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

AUGUST, 1916

Number 3

A Garden of Beautiful Flowers.

BY CAROLINE CLARK HINTON, BOISE, IDAHO.

Elizabeth Park, Hartford, famed for its rose garden and many beautiful flowers, attracts many visitors from all



THE FAMILIAR LARKSPUR.

over New England. On a Sunday automobiles from various states move slowly about the park, while hundreds of pedestrians study the roses and old-fashioned flowers more closely, learning, as they do so, what flower gardening is like on a large scale.

All of us are more or less familiar with the usual country house garden with its crimson ramblers, its rows of Canterbury bells, its beds of larkspur and phlox. Now that gardening, even for the amateur, has become more than a fad, and flowers more than a recreation, we can appreciate the real work, the care and thought, that has been put into these country gardens.

In Elizabeth Park we have these gardens on an immense scale. The huge beds of phlox of velvety maroons and



"BEDS OF PHLOX OF VELVETY MAROONS."



"THE RAMBLERS.....ARE HIGHER THAN THOSE SEEN ELSEWHERE, AND MORE LUXURIANT IN BLOOM."

larkspur are veritable riots of gay and rich colors.

The ramblers, both crimson and delicate pink, are higher than those seen



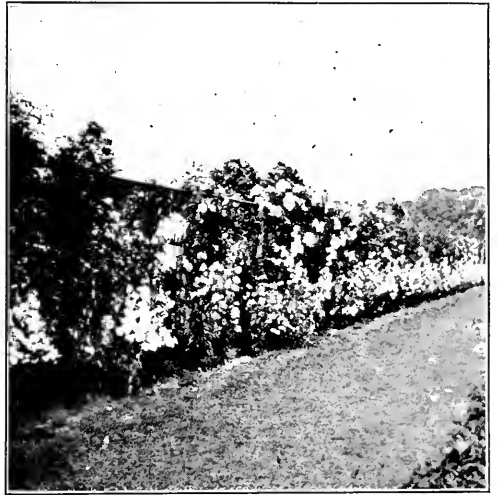
THE HIGH ARCHES, COVERED WITH ROSES,MAKE A PLEASANT WALK TO THE RUSTIC, VINE COVERED SUMMERHOUSE."

elsewhere, and more luxuriant in bloom, as though well aware of the fame they must live up to!

The high arches, covered with roses, are many, and make a pleasant walk to the rustic, vine covered summerhouse, while roses tall and short, and all colors and kinds, from the White Killarney to those of deepest red, bloom in beds that cover a large area of ground and invite serious study and exclamations of wonder.

Long are the rows of Canterbury bells, beautiful and fragrant are the bells of garden pinks, while the peonies deserve a chapter to themselves.

Although the Queen Perfection and Victor Hugo attract the eye at once, the Japanese single peony holds it longest. This white peony with its yellow centre, so like and yet so unlike the pond lily, is lovely indeed. Near by, in charming contrast, the purple iris grows tall and beautiful as an orchid.



"LONG ARE THE ROWS OF CANTERBURY BELLS."

Marvelously cultivated are these flowers, for here is none of the atmosphere of the hothouse, but of nature, gorgeons and supreme. The surroundings are helpful. Trees border the gardens; across the road is a pond with frogs croaking and large



"THE PEONIES DESERVE A CHAPTER TO THEMSELVES."

families of ducks eager for crumbs. Further into the park are vistas of cool green shade and playgrounds for children.

But these pleasures are in many other parks. The gardens are not. Fortunate are those who can visit these gardens in summer, and with camera and notebook, spread the wonders of them to those who have not yet seen them.

A Little Local Geology.

BY W. C. BANKS, STAMFORD, CONNECTICUT.

One day a friend, a gentleman whose education dates back to prehistoric times when the study of geology was regarded as sacrilegious if not immoral, asked me in all seriousness, "Do you take any stock in the theories of geology? Do you credit the theory of an ice age in this region?"

"Go anywhere about here," I said, "and you can find abundant proof." As there may be some, even yet, that regard these things as a "tale that is told," I desire to direct attention to some of these local proofs, as Professor Rice's interesting article on "Boulders" has moved me to do.

In the southern part of the township of Stamford, including territory to the east and west, the surface rock is a light gray or a dark bluish granite—gneiss—the Thomaston and the Danbury granodiorite gneisses of the Connecticut State Geological and Natural History Survey. If the loose surface material were made up of disintegrated local rock, it would be of the same character as the bedrock. But it is not. All over this region we may recognize loose boulders that were certainly derived from the Berkshire schist, to the northward of this region. Also quartzite amphibolite and many other rocks of foreign origin. I found on Shippan Point a small boulder of hard sandstone that showed embedded fossil plants; another, from another locality, showed fossil shells, both impossible as local products. In many cases where the surface soil is removed, we find the underlying rock grooved, or smoothed, results certainly due to the grinding action of an ancient ice sheet.

A splendid example of a pothole is to be seen on Mill River at Stillwater. Such is nearly always an evidence of

the former existence of glacial ice. It marks the foot of a torrent that plunged through a crevice in the ice. This, aided by loose material, formed a great hydraulic drill. The level plain on which the business portion of the city of Stamford is built is formed of off-shore deposits carried down by the torrents from the melting ice and rearranged by the tides and waves of Long Island Sound. These are but a few of the many evidences of the existence of the great ice sheet over this region. To search them out is an interesting pastime.

The Birch Road to Dreamland.

The accompanying illustration was the frontispiece to "Popular Photography" and attracted the writer's attention because it is an extraordinary photograph. From the photographer's point of view it is well balanced and beautiful, but there is in it an emblematic aspect that pointedly appeals to one, especially if to him roads and woods connote human life. How shall one enter nature, and how shall one accept guidance to the chasms of discovery in the unknown distance?

It was Henry David Thoreau who gave us the correct prescription when he, entering a wood, exclaimed, "O woods, I would be as pure as you are pure." One cannot but fancy that Thoreau, walking down this road, would exclaim after gazing at that cluster of white birches, "There is the keynote to the symphony awaiting me in that hazy distance."

The winding road suggests the curve in the distance, like the shaft in the curve of the interrogation point which some one has fancied to be a curved hand held at the ear after a question and signifying that the ear is ready for the answer. Other curves in the road suggest other and greater curves beyond the immediate vision, and that if one would answer the question of nature, he must bear with him over all the road the spirit of appreciation.

In this picture there is a charm about the distant view. It brings up an endless series of memories and of future possibilities. Beyond the uncertainty of that tangled growth there may be scenes known years ago, or discoveries not made after decades of wandering. It brings back the old road to the red schoolhouse; it tells of the tin pail filled with salt for



"BEYOND THE UNCERTAINTY OF THAT TANGLED GROWTH."

the cattle in a rented pasture visited once a week on a Sunday afternoon; it tells of the searching for birds' nests in June, and of the remembered soliloquies made in silence as we wandered down just such a road in later life.

One may find in this road all that one may find in any pathway, and all that one knows may be read into it. A road, yes, any road, is not only nor wholly a road in itself; the greater part exists only within one's heart and breast.

The photograph was taken by Miss Gladys A. Mattson, Bantam, Connecticut.

The Joyous Out-of-Doors.

Make Haste and get acquainted
 With the joyous out-of-doors,
 'Tis appealing to your senses,
 And besieging all your pores.

The freshness of the morning,
 The glory of the night,
 The radiance of the hours between,
 Filled with sunshine bright:

They're better than a tonic,
 They beat the M. D. quite,
 They'll give you happiness and health,
 The mantle of their might.

—Emma Peirce.

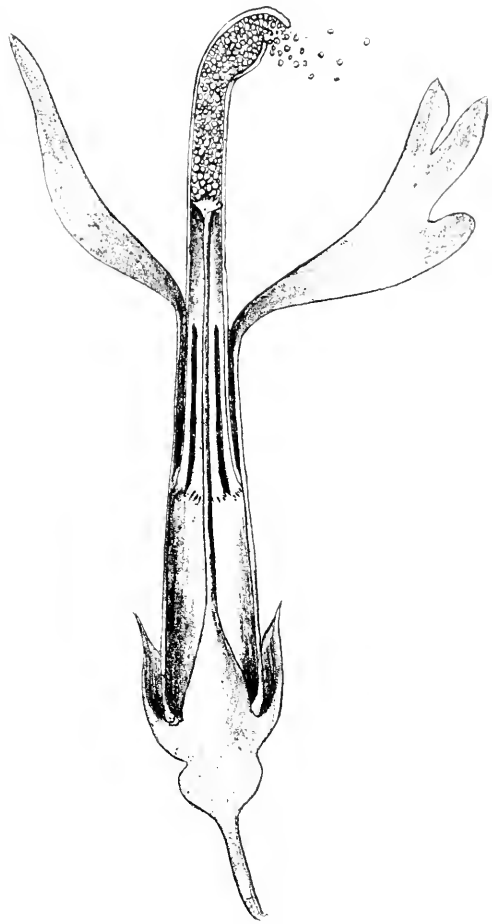
Flowers Pumping and Exploding.

BY HERBERT W. FAULKNER, WASHINGTON, CONNECTICUT.

Each August for many a year I have watched for the coming of the cardinal flower (*Lobelia cardinalis*) and, knowing the family to which it belongs, and where it dwells by the river's brink, I believed that I knew the flower itself, until one day last summer when I decided to examine its mechanism. I was surprised at the "mystery" that it revealed, and that I can best describe by comparing the structure to a pump, whose cylinder is formed by the anthers united into a tube and whose piston is the stigma pushed forward by the growing style as the piston rod. The pollen is shed in the cylinder, is compressed there and is eager to escape.

When an insect drinks from the flower and backs out, he scrapes against a valve at the outer end of the tube, opens it and receives a charge of pollen on his back. We, too, can open the valve and see the pollen ooze out, and when we have set it all free, we see the stigma with its odd terminal rosette emerge and make ready for the touch of the pollen that must come from another flower. Other lobelias which I have examined prove to possess a similar apparatus to insure their cross-fertilization.

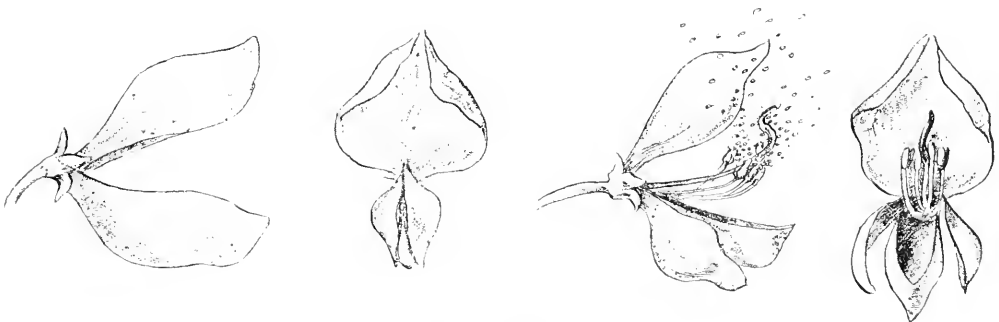
Many of the pulse family push their pollen at their insect guests, but none are more active in this way than the tick trefoil (*Desmodium nudiflorum*). The small, pink flowers grow in a loose spike and resemble a sweet pea blossom in form with hood, wings and keel. The pistil, stamens and pollen are all securely enclosed in the keel until an insect alights on it, when out they jump with a veritable explosion, the pollen flying in a cloud and dusting the astonished guest. The *Desmodium*, how-



CARDINAL FLOWER.

ever, is not a magazine gun. One shot bursts it open and thereafter its pistil is exposed to receive the pollen from another plant. The sketches show a flower before and after the explosion.

The fringed orchids, (*Habenaria*) treat their insect visitors as beasts of burden, clapping a package of pollen on their



TICK TREFOIL.

backs and gluing it there "for keeps." These pollen packages tied up in the form of clubs with adhesive handles lie exposed and waiting in little grooves or pockets close to the opening of the honey

well, and the flower is fertilized.

The third sketch shows the front view of the flower of the orchis with pollen clubs lying in their pockets above the honey well.



PURPLE FRINGED ORCHIS.

wells where they will surely fasten themselves to the head or the eye of a thirsty insect.

In the first sketch, representing a section of a flower of the purple fringed orchis, is seen a pollen club being withdrawn from its pocket by the head of a departing butterfly.

The second sketch shows a similar section of another flower where we see that the stigmatic surface is so low and so far back that the pollen club, erect upon the butterfly's head, could never strike the mark. But nature so plans that as soon as the pollen club is withdrawn from the first flower its slender stalk withers, its head droops forward and, carried to the second flower, it unfaillingly strikes the stigmatic surface in the roof of the honey

Recipe For Troubles.

Would you like a recipe for the little vexations and annoyances of life that keep the mind uneasy and disturbed? Let us give you one. Go out in the silence of some starry night and look up at the stars for a minute or two. Get within their influence for a moment. Take in the spirit of their tranquility and peace. Think what they are and where they are, and you will soon lose yourself in the infinity of their being. You will begin to feel God has made this world big enough for you and that the little cares that vex you are only intruders that you should despise and scorn. Just try it, and if it does not cure you you are not the man you think you are.—"Ohio State Journal."

Notes on the Two-Toed Congo Snake.

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

Many years ago, while living in New Orleans, I had in confinement several specimens of the three-toed Congo snake (*Muraenopsis tridactylus*); they were obtained for me by my creole and negro collectors, the animal being quite common in the bayous near where I lived and did

phiaumidae, the famous, two-toed Congo snake (*Amphiuma means*). For the courteous loan of three or four of these I am indebted to Mr. Edward S. Schmid, of Washington, D. C., who imported them from Florida in addition to his stock of unusual animals kept in connection with his supply of pet animals from many parts of the world.



FIGURE 1. THE TWO-TOED CONGO SNAKE.

my collecting in that region. These specimens are probably now in the collection of the Smithsonian Institution, as all my material of that kind was forwarded to Professor Baird, who kept me supplied with the means for exploration in southern Louisiana. While there I prepared quite a full account of the anatomy and biology of the three-toed siren just referred to, publishing the same in *Science* (Mar. 24, 1883, p. 319, 8 figures). It is a most interesting batrachian and perfectly harmless, though the negroes, in their usual superstition, stand in great horror of its bite.

Only recently I have had in my possession living specimens of the near relative of this three-toed member of the *Am-*

This two-toed batrachian ranges throughout the Southern States north to North Carolina; but I did not meet with it in Louisiana, where, as I say, the three-toed one was more or less abundant. Those loaned me for study by Mr. Schmid were in excellent condition and very vigorous. As they all had the branchiæ or "gills" on the sides of the head, I took them to be subadult. After they had been in my possession a day or so, I undertook to photograph one with a 5x8 vertical camera, the animal being confined in a white porcelain dish. After an hour's trial, I at last succeeded in doing this; though at one time I did think that that unobliging Congo "snake" would never come to a

state of complete rest,—that is, for a sufficient length of time for me to make a successful exposure. The result I obtained is here shown in Figure 1, where the branchiæ or gills, and the feeble forelimb with its two toes, show very well indeed. The eyes, situated forwards, are

ing Chief of Exhibits in that museum. Mr. Benedict generously presented me with this specimen for the present purpose, and I photographed it from life. Beyond the photograph here reproduced in Figure 1, I do not remember ever having seen *Amphiuma means* figured be-



FIGURE 2. EASTERN RING-NECKED SNAKE.

very small, circular, and without lids; while the body is nearly cylindrical, and the caudal portion is flattened transversely, the creature being a rapid and splendid swimmer. At this age the entire body, including the head, is of a rich snuff brown, rather lighter on the under parts. Its bite is perfectly harmless; and so far as my observation goes, it had none of the interesting habits that I fully described in *Science* for its three-toed cotsin. At no time did any of them make an attempt to escape from the different receptacles in which they were temporarily confined.

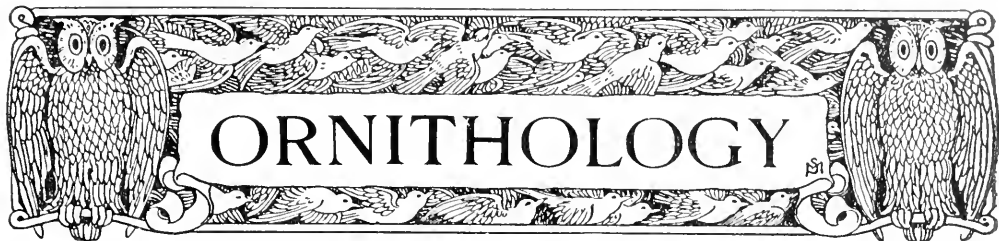
That *Amphiuma means* is not a snake will at once be appreciated by comparing it with the pretty little Eastern Ring-necked Snake (*Diadophis punctatus*), here shown in Figure 2. This beautiful and very gentle little reptile was taken in Maryland by Mr. James E. Benedict, Jr., who is the son of the veteran naturalist of that name connected with the Smithsonian Institution, and at this writ-

fore from a photograph of the living specimen; I do not envy anyone the task of duplicating it.

These specimens were not over a foot long, whereas adults sometimes attain a length of more than a yard. They possess lungs as well as gills, and they can therefore breathe both in and out of the water. Some of their structural characters are known, but a good account of their entire anatomy still remains to be written. Among the *Batrachia* they are nearest related to the Salamanders.

Omitted Credit for a Photograph.

To the courtesy of Dr. R. W. Shufeldt of Washington, D. C., we owe the use of the photograph of the white woodchuck in the July number of *THE GUIDE TO NATURE*. It had previously been used by us with full credit to Dr. Shufeldt, but our repeated thanks and acknowledgement were accidentally omitted from the July issue.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor

The Brown Thrasher.

BY L. W. BROWNELL, PATERSON, N. J.

The brown thrasher is a not uncommon resident of the entire eastern portion of the United States, but owing to the fact that he is of a somewhat shy and retiring disposition he is by no means one of the best known of our birds to the casual observer. He is a close relative of the much better known catbird and closely resembles him in shape but not in coloration and is a considerably larger bird. He is also a relative of the famous mockingbird of the South and is himself a mocker of no mean pretensions. He is, in fact, one of the most accomplished songsters of all our feathered choir but he is an extremely diffident performer and will not sing a note if he thinks he has a human audience. Owing to this there are many people, I have learned, that, while knowing the bird, are totally ignorant of his reputation as a songster and even regard him as being limited in his vocal power to the harsh and most unmusical note to which he gives utterance when angry or alarmed.

His song, in its easy flow and melody, somewhat resembles that of the catbird. It is a distinctly finer performance, however, and has the added charm of originality for the thrasher depends but little upon his mocking abilities while the catbird, as does the mocker, steals the theme of his song boldly from the notes of other birds.

Nuttall says of this song:

"Stationed in the top of some tall orchard or forest tree, the male, gay and animated, salutes the morn of his arrival with his loud and charming song. His voice somewhat resembles that of the thrush of Europe but far

more varied and powerful rises pre-eminent among all the vocal choir of the forest. His music has the full charm of innate originality; he takes no delight in mimicry, and has, therefore, no title to the name of mocking-bird. (He is called in the southern states the French mocker.) On his first appearance he falters in his song, like the nightingale, but when his mate commences her cares and labors, his notes attain all their vigor and variety. The young birds, even of the first season, in a state of solitary domestication, without the aid of the parent's voice, already whisper forth in harmonious revery the pathetic and sweet warble, instinctive of the species. In the month of May, while the blooming orchards perfume and decorate the landscape, the enchanting voice of the thrasher, in his affectionate lay, seems to give grateful utterance for the bounty and teeming profusion of nature, and falls in pleasing unison with the harmony and beauty of the season."

Nuttall found something beautiful in the notes of nearly every one of our birds, and went into rhapsodies over many of them, often allowing his enthusiasm to carry him to extremes. In this case, however, his praise was not misdirected or too profuse. The thrasher gives his performance almost invariably from the topmost branches of the taller trees, and usually at or near the edge of the woods. In such a position he will sit for hours, pouring forth his delightful song, not actually as a continuous performance, but with occasional intermissions for rest, until the too close approach of some stranger causes his diffidence to assert itself. Then he will suddenly cease his melody and dive from his elevated perch and seek shelter in the dense underbrush beneath or in some near-by thicket or brush pile. His song is well worth listening to but we will never hear it by waiting in our front door-yards for the singer to come to us. We

must go to his haunts if we would learn of his powers as a vocalist and, moreover, we must enter then with due regard for his innate modesty, else will we be likely to come away disappointed.

The thrasher, like many another unfortunate bird, is greatly disliked by the farmer, who accuses him, and not without reason, of being a rather constant thief of his cherries and other small fruit. It is undoubtedly true that these birds, like the catbirds, do help themselves occasionally to a dessert of cherries or strawberries. They have, however, an even greater right to them than has the catbird for the damage that they do in this direction is so much more than offset by their helpfulness in destroying untold hordes of insects that it is less than insignificant. This fact the farmer never stops to consider or, perhaps, it would be more charitable to say, he is entirely ignorant of it. In point of fact the thrashers, while being songsters par excellence are also to be placed among our most useful birds.

In the defence of their nest and young these birds are even fiercer and more determined than are the catbirds, if that is possible. Often I have had them dart into my very face with open beak, raised crest and glaring eyes, frequently even striking me with their

wings, the very epitome of righteous anger and indignation. At such a time they give repeated utterance to a note that is halfway between the hiss of a snake and the hoarse mew of a cat, and which can be likened to no other sound with which I am acquainted. Their defense of their home is more often successful than otherwise, except when it is attacked by man, and Audubon relates a story of a pair whose nest was attacked by a snake while the female was sitting upon it. She unfortunately was caught in the coils of the body of the enemy, but at her first cry her mate, together with another male of the same species, flew to the rescue, and were so successful in their onslaught that they not only drove away and killed the snake but rescued the female uninjured. This is a good story and, while I cannot doubt the truth of Audubon's statement, I am nevertheless inclined to the belief that the snake must have been a very small one for there are few of the smaller birds that can cope successfully with a snake. They are, however, one of the strongest of the smaller birds and can usually come off victor in an encounter with any other. They are also antagonistic to each other, especially during the mating and breeding season, and at this time severe and prolonged encounters between two males is no unusual sight, yet they will quickly join forces in an attack upon a common enemy.

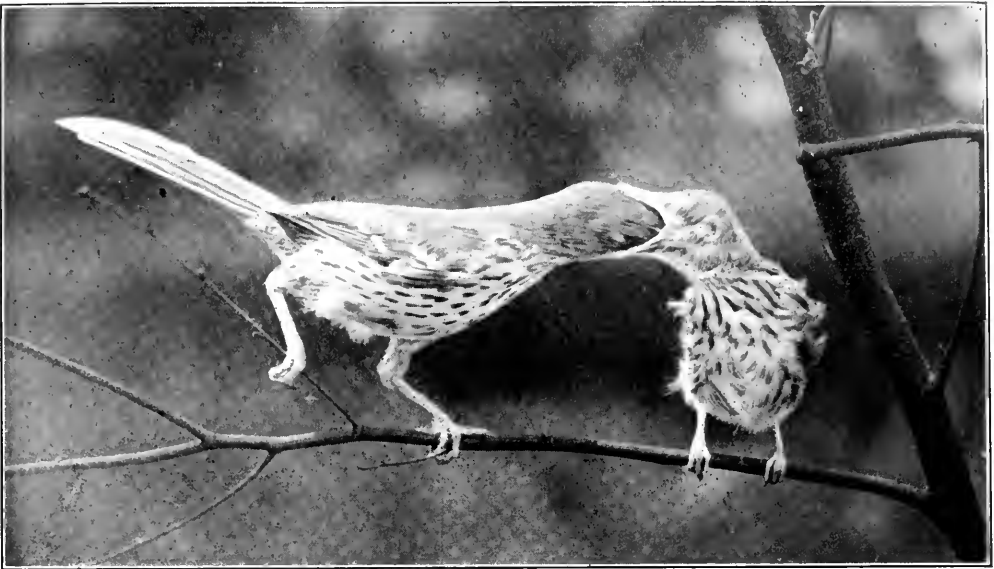
They are easily raised in confinement if taken when young and their ability as a songster makes them a delightful pet. Why anyone, however, should ever wish to cage a creature who is so evidently created for space and freedom, passes my understanding, and whenever I see one so caged I have an almost irresistible desire to open the door and let him go free.

Many stories are told illustrative of the sagacity of birds and I am inclined to repeat, for what it is worth, the following anecdote of a tame thrasher from Wilson's Ornithology, as told him by William Bartram:

"I remember to have reared one of these birds from the nest, which, when full grown, became very tame and docile. I frequently let him out of his cage to give him a taste of liberty.



THE NEST OF THE BROWN THRASHER.



BROWN THRASHER FEEDING HER YOUNG.

After fluttering and dusting himself in dry sand and earth, and bathing, washing and dressing himself, he would proceed to hunt insects, such as beetles, crickets, and other shelly tribes; but being very fond of wasps after catching them and knocking them about to break their wings, he would lay them down, then examine if they had a sting, and, with his bill, squeeze the abdomen to clear it of the reservoir of poison before he would swallow his prey. When in his cage, being very fond of dry crusts of bread, if, upon trial, the corners of the crumbs were too hard and sharp for his throat, he would throw them up, carry and put them in his water dish to soften, then take them out and swallow them. We see that the bird could associate these ideas, arrange and apply them in a rational manner according to circumstances. For instance if he knew that it was the hard, sharp corners of the bread that hurt his gullet and prevented him from swallowing it, and that water would soften it and render it easy to be swallowed, this knowledge must be acquired by observation and experience, or some other bird taught him. Here the bird perceived by the effect the cause and then took the quickest, the most effectual and agreeable method to remove the cause. What would the wisest man have done better? Call it reason or instinct, it is the same that

a sensible man would have done in this case. After this same manner this bird reasoned with respect to the wasps. He found by experience and observation that the first he attempted to swallow hurt his throat and gave him extreme pain, and, upon examination observed that the extremity of the abdomen was armed with a poisonous sting; and after this discovery, never attempted to swallow a wasp until he first pinched his abdomen to the extremity forcing out the sting with its receptacle of poison."

This is crediting the bird with a greater amount of reasoning ability than I am entirely prepared to admit that he possesses. The account was given by a gentleman who had a reputation as a truthful and careful observer and, therefore, while his observations were undoubtedly correct, his deductions, I am inclined to believe, were somewhat erroneous.

A student of insects at the New Jersey Agricultural Experiment Station has proved that what attracts the female house fly to manure heaps and other refuse where it lays its eggs is largely the odor of ammonia which they give off. Since in cities probably nine-tenths of the flies are hatched in horse dung, it may well be that a simple treatment of such refuse with acid to neutralize the ammonia will suffice to "swat" completely our summer plague.

Birds Drowned in Oil.

"The Standard Oil Bulletin" has a startling item in regard to waterfowl that through an error of judgment settled into a pool of oil, mistaking it for water. Sometimes these oil lakes cover acres of ground, and in the night or during the beautiful desert twilight and in the windless dawn, these tar colored pools resemble bodies of water.

"Instinct does not always save the birds. Men employed around the great Lakeview sump tell how the migratory waterfowl, flock after flock, dropped out of the turquoise sky and plunged into that lake of oil. Majestic pelicans, deliberate of flight; snow geese, hawks, fast-flying canvassbacks and ducks of all varieties that take the annual trip from Alaska to the flats of the lower Colorado river, alighted by the thousands in that oil sump, never to rise again. When these struck, their feathers became saturated with oil and their flying days were over. Many would remain on the surface, to be soon overcome by the heat and fumes of rising gas. Others would dive when excited or closely pressed. One old watchman long in the fields maintained that they committed suicide. The sight of birds struggling in the oil and countless blackened bodies floating on the surface had not the effect of deterring others from making the fatal plunge."

This seems to be an example of the birds' inability to reason or to learn from observation.

An Efficient Lecturer on Birds.

Mr. Frederic S. Webster of the Ames Studio, Colonia Building, 379 Fifth Avenue, New York City, is giving illustrated lectures of deep interest on the wonder-world of bird life. Mr. Webster has had long and varied experiences not only with wild birds but with birds in captivity. He has been preparator-in-chief of zoological specimens in the Carnegie Museum and other large establishments. His experience covers a period of more than forty years of continual association with birds and the assiduous study of their habits. His lectures show a real acquaintance with birds, their personalities, characteristics, their haunts, habits and methods of life.

Yes, the Blue Jay Can Sing.

Miss Edith A. Wright of Chatfield, Minnesota, reports an interesting experience. She has heard a blue jay singing at four o'clock in the morning. She gives a vivid description of the "rapturous song" that suggested a vision of pure water sparkling and tinkling over a rocky bed.

She is right in asserting that the song was appealing. To me the sound suggests the tinkling of broken glass.

The United States, although the greatest grain-producing country of the world, has almost the lowest yield per acre.

The United States Bureau of Ethnology estimates that at coming of the White Man to this continent there were within the present limits of the United States about eight hundred and sixty thousand Indians. The number is now about one-third of this.

Nature's Invitations.

Kind Nature's invitations,

You will find them everywhere,
They are nestling in the blossoms,
They are floating on the air.

They are in the lofty treetops,
And in the lowly weeds,
Spread broadcast in their blooming,
Far-wafted in their seeds.

They are in the waves of ocean,
And on the glistening sand,
They are in the waving grain-fields
That we see on either hand.

They are on the mountain ramparts,
And on the dimpled hills,
They are thundering in the mighty falls,
And whispering in the rills.

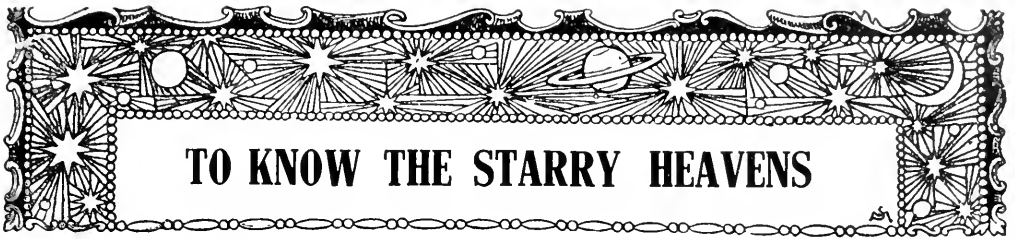
They are in the sunrise glory,
And in the sunset glow,
They come pattering in the raindrops,
And feathery white in snow.

They are in the mists of morning,
And in the starlit night,
Abroad in velvet darkness,
And glancing in the light.

They are in the birds' sweet singing,
And in the insects' hum,
And in the woodland murmurs,
Which softly bid us "come."

They are ever in our pathway,
They are always right at hand,
Then let us not be churlish,
But show we understand.

—Emma Peirce.



TO KNOW THE STARRY HEAVENS

The Heavens in August

BY PROFESSOR ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

The most interesting astronomical event of the present month will be the passage of the crescent moon over the bright planet Saturn. This, the only planetary occultation of the entire year

shine with more than 100 times the brightness of a first magnitude star. This beautiful world is nightly drawing closer to the bright Saturn, though it will not approach most closely to the Ringed Planet and pass to the east of it until September 5.

But to study and observe these

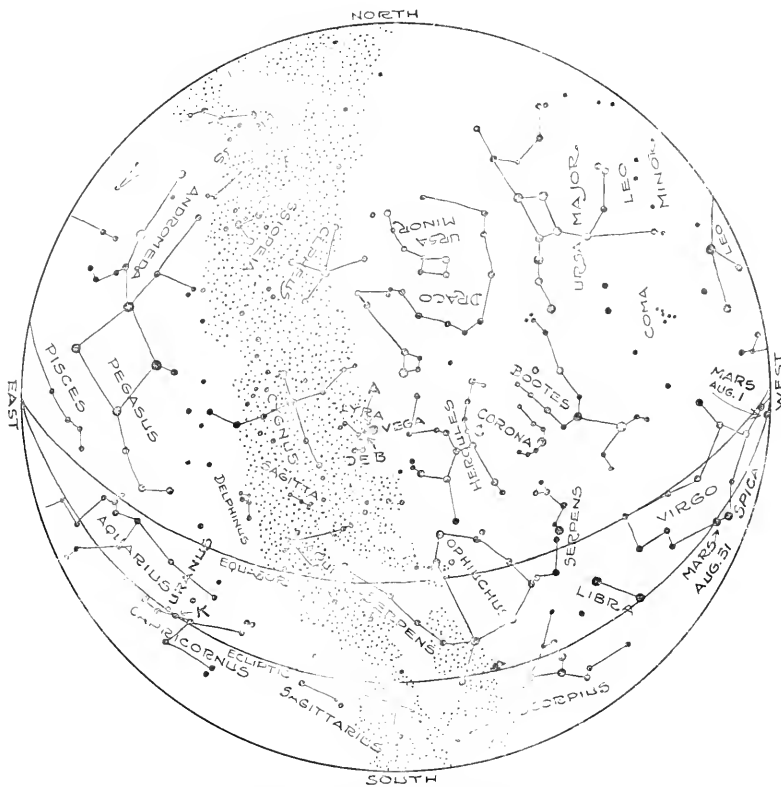


Figure 1. The Constellations at 9 P. M., August 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

which is visible from our country, will be a most beautiful sight when viewed in a small telescope. The planet Venus, which is still seen as a very narrow crescent in the telescope, is, however, rapidly widening and also increasing in brightness. On August 9 it will attain its greatest brilliancy when it will

beautiful objects it will be necessary for the reader to go out very late in the night, only an hour or two before dawn. It is in the morning sky that the three brightest planets are now to be found; in the evening heavens the bright Mars alone remains with us and this is so far away and so very low

in the west that it is in very unfavorable position for observation. By September 1 it will have passed beyond the borders of our evening map, but on this date the great Jupiter will be just entering the map in the east, and this beautiful world, with its retinue of bright moons, will shine in our evening skies throughout the entire winter. On August 10, the faint Uranus, which is

the heavens, the delicate fainter groups, such as the Maiden's Hair, the Crown, the Arrow, the striking little figure known as the Dolphin or Job's Coffin, and many others can be gradually added, until the whole summer heavens has become familiar to him.

It is in Andromeda, at N, Figure 1, that there is found the wonderful Great Nebula, while at the point C of the

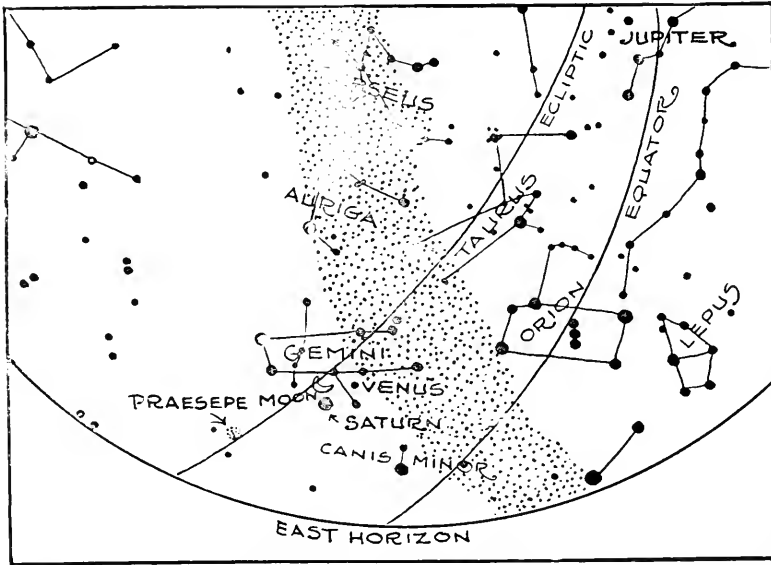


Figure 2. The eastern heavens at 3 A.M., August 25, showing Venus, Jupiter and Saturn, the last about to be occulted by the crescent moon.

just visible to the naked eye, will come into opposition with the sun, and so be nearest the earth. This will be the most favorable time of the year for observing this very large but very distant world.

The August Stars.

The slow progression of the seasons has brought the Great Square of Pegasus and the bright Andromeda into our evening sky, while the summer branch of the Milky Way with its train of bright groups, extending from Sagittarius in the south to Perseus in the north, has now become raised almost to the zenith. With this beautiful pathway to guide him, the merest beginner in astronomy can readily trace out many of the larger summer groups, of which the most easily found are Scorpio, the Archer, the Eagle, the Northern Cross, and Cassiopeia. Having thus made a beginning and, as it were, found his bearings on the face of

constellation Hercules there is the wonderful cluster of 60,000 stars. Both of these objects are just visible to the naked eye on a clear night, and they can hence be well studied with even a small telescope, though it requires a large glass to reveal much of their wonderful beauty. The intricate detail of the former, showing how it consists of a great winding spiral apparently condensing into a solar system, can in fact only be detected through a long exposure of the photographic plate.

Almost exactly in the zenith there shines out the brilliant, blue Vega, a wonderful sun immensely larger and immensely hotter than our own sun, which is so far away that the light with which we view it has been 21 years and 8 months on its journey to us. Vega is receding from us with a speed of nine miles a second; it is also drifting slowly in a transverse direction and so changing its position

among the stars, but this motion is so slow that it will require 7000 years for its place to become changed by an amount equal to the apparent distance across the full moon. Of the two faint stars, A and B, Figure 1, which with Vega form an equal-sided triangle, the former is seen to be an interesting double in an opera or field glass, while a larger telescope reveals it as a remarkable quadruple system of suns. The latter is an unequal pair of a greenish color. Almost on a line with E and D, but nearer to the latter, is the remarkable Ring Nebula, which in a small telescope appears as a dim, misty, oval patch of light of about the size of the planet Jupiter. This is one of the gaseous nebulas, of whose nature and development we know very little. They may be matter in a very primitive condition from which denser clouds, and finally systems, may develop in the course of ages, or they may, as some think, be a disintegration product, formed possibly at the time of the tearing apart or breaking up of a star. This nebula is the best example of its type in the heavens; the Great Nebula of Andromeda, at N, is the finest example of the second large class of nebulas, which are of a whitish color and of a spiral structure.

* * * * *

The Occultation of Saturn.

The beautiful phenomenon will occur on the early morning of August 25, when the crescent, waning moon is but two days from new. As seen from Washington, the bright, advancing, east edge of the crescent will begin to cover the disc of Saturn at about 3 A. M. (Eastern Standard Time). The planet will remain hidden for 1 hour 1 minute, after which it will begin to emerge from behind the dark, west edge of the ball. At this time the whole ball of the moon will probably be dimly visible to the naked eye, being faintly illuminated by the light from the nearly full earth.

The exact instants of the beginning and ending of the occultation cannot be given for all different observers because these are much influenced by the observer's position upon the earth. To be certain of witnessing the phenomenon the reader should therefore go out

and turn toward the eastern heavens at shortly before 3 A. M. (Eastern Standard Time), noting the positions of the moon and Saturn with reference to each other. By considering that our satellite moves eastward among the stars an amount equal to its own diameter in the course of an hour, he can estimate quite closely when the occultation will occur. It is very unfortunate that in the extreme south central parts of our country and also in the Far West the occultation cannot be witnessed because the moon and Saturn will not have risen; in the Mississippi Valley the end only can be observed, but in the Eastern States the entire phenomenon will be visible.

In the telescope one will see the steadily advancing, bright edge of the moon successively cover the satellites of the planet, the western part of the ring, the ball, and finally the eastern edge of the rings, all of which objects will afterward re-appear in the inverse order from behind the dark, or western, limb. Altogether, an occultation of Saturn is of more interest than that of any other of the planets.

* * * * *

The Planets in August.

Mercury is in the evening sky, but is invisible throughout the month since it does not come to its greatest eastern elongation before September 9.

Venus is very conspicuous in the east for a few hours before dawn. In the course of the month it moves eastward across the constellation Gemini; during this time it will be seen in the telescope to be rapidly losing its crescent shape though it will not become exactly half full until September 12.

Mars will be seen low in the southwest for a few hours after sunset. During August it will move eastward through Virgo, passing two degrees north of the bright star Spica on August 28. At this time the two objects will form an interesting stellar figure in the southwestern heavens, for the reddish color of Mars will contrast strongly with the blue color of the star.

Jupiter rises almost due east at about 11 P. M. on August 1, and at about 9 P. M. on August 31. It is in excellent position for observation during the early morning hours.

Saturn is moving slowly eastward in Gemini, and is hence also conspicuous in the morning sky. It will be passed by Venus on September 5.

Uranus is in opposition with the sun on August 10. The observer may find this faint world at this time as follows: Let him point his telescope on the star at K, Figure 1, bringing this object carefully to the middle of the field. Be-

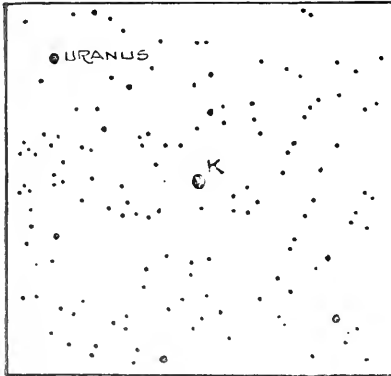


Figure 3. Showing all stars so bright as the tenth magnitude within a region three degrees square about the star K of Figure 1. For use in finding the planet Uranus with a small telescope.

scope, let him then wait 4 minutes and 7 seconds, and then elevate the telescope in declination exactly one degree, or an amount equal to twice the apparent diameter of the moon. Uranus will then be found in the center of the field. It will appear as a greenish star of exactly the sixth magnitude, but by its dull luster may be readily distinguished from a true star, especially if the seeing on this particular night is reasonably good.

* * * * *

The August Shooting Stars.

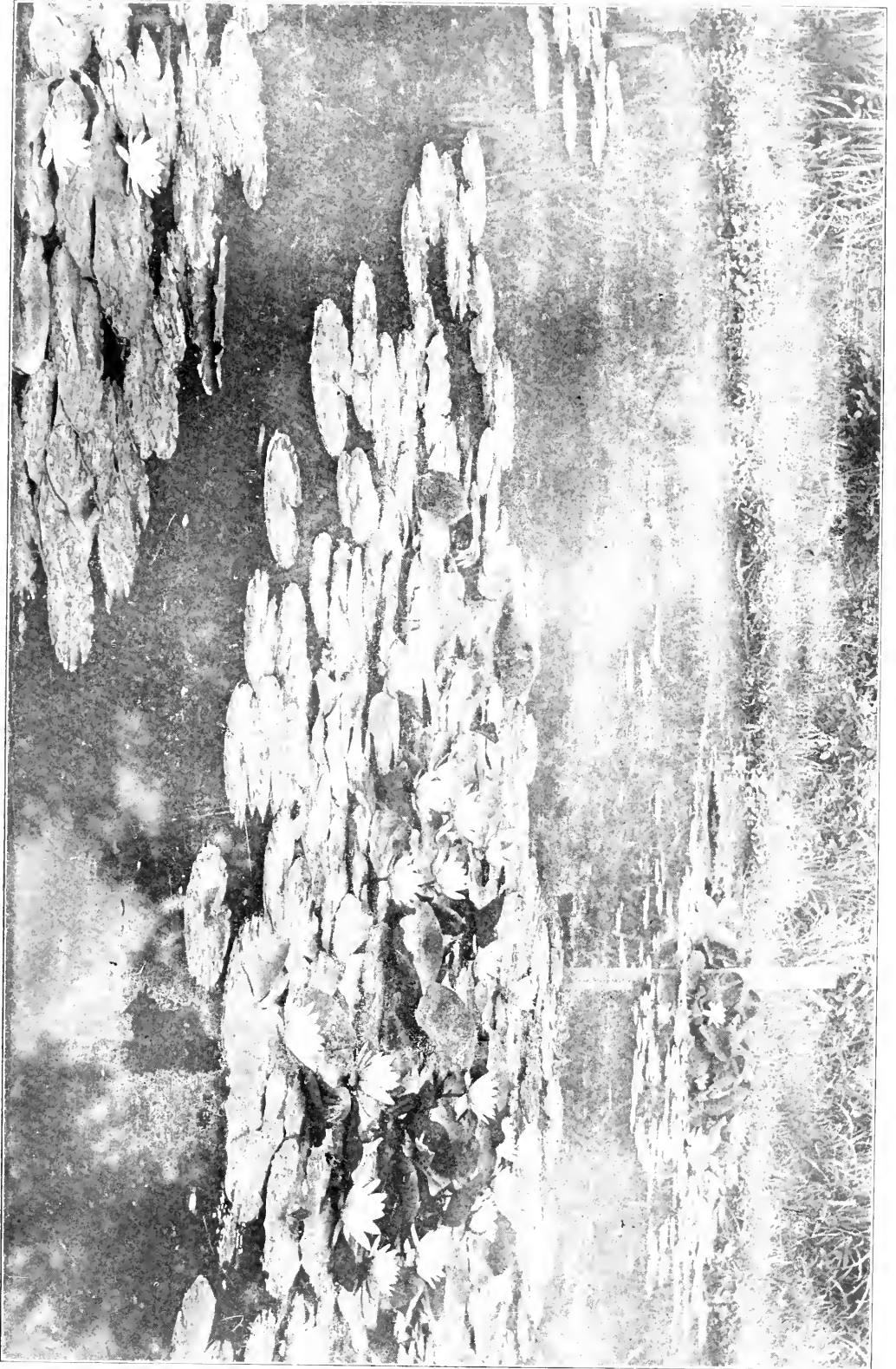
These shooting stars, known also as Perseids, are most numerous for a few nights before and after the 10th of the present month. They will be seen to dart outward in all directions from the Radiant, at R, Figure 1, and move slowly over the sky, sometimes leaving a short trail behind them. By steadily watching this region of the heavens the observer will probably see a shooting star at an average interval of some three or four minutes. A careful record of the apparent paths of these objects among the stars, the time being also noted, constitutes a kind of observing of real value, and one especially suitable for the amateur astronomer.

ing careful not to disturb the tele-



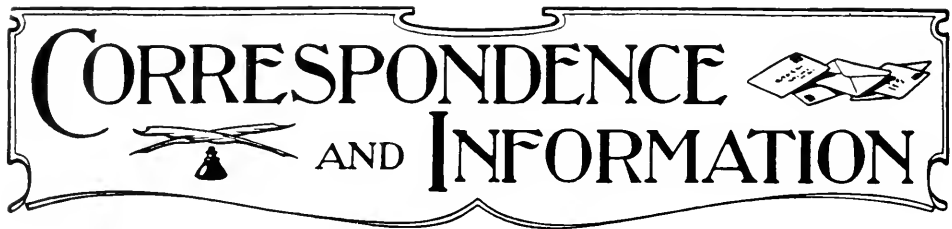
The Joy of the Fields.

Let the young folks bid good-bye to the cities in August and spend as much time as possible in the woods and fields



THE WHITE POND LILIES HAVE BEEN ENTIRELY DEPLETED THIS SEASON.
This photograph was taken by Mr. George W. Kellogg, Rochester, New York.

CORRESPONDENCE AND INFORMATION



Private Ownership of Public Roads.

A question frequently asked is, Who owns the trees, the shrubs and plants that grow along the public roads? Not only private individuals but officials are confused by the question. Recently a resident of New York state ordered certain travelers to stop picking apples from a tree that grows in front of his property. They laughed at him and said that he had no more right to them than they had as the fruit was growing in the public road. To maintain his position he submitted the question to "The Rural New-Yorker." The reply was that the owner is right and the travelers wrong. The question was submitted to Cummings & Lockwood of Stamford, Connecticut, as to the situation in this state. They report in an interesting letter that covers the whole ground and is here printed. It appears that tree wardens are somewhat limited in their power. They do not own the trees along the public road as their actions not rarely suggest. The trees belong to the owner of the adjoining property. It appears from this opinion of Cummings & Lockwood that the owner of the adjoining property owns not only the fruit but the flowers, raspberries, huckleberries, strawberries and the grass that grows along the public road. Children especially sometimes think that they must ask permission to pick the daisies from the field, but that they are at liberty to gather them up from the sidewalk and the roadside. The owner of the adjoining property controls the flowers in the roads as completely as he controls those in his fields. It seems to be a general belief that pedestrians may break down shrubs and flowers and pick berries in the public road without saying even, "If you please." The public has no such right. They have only the right to travel over the road. We are sure that the letter from this well-known

law firm will be read with interest. It would be a pleasing consummation if the conditions as there described should be respected not only by private individuals but by some public officials. A tree warden, acting in behalf of the public, should keep clearly in mind when he is trimming the trees that he is dealing with private property. The right of pasturage along public roads belongs only to the owners of the adjoining property. No one has any right to pasture his cattle along a public road in front of private property than he has to feed the horse or the cow in the middle of the owner's farm without saying even so much as, "If you please."

Stamford, Conn.

To the Editor:

We have received your request for an opinion regarding the law of Connecticut as to ownership of land traversed by highways, and rights in trees and herbage growing thereon. We are glad to comply with your request, but it is proper in doing so to add a warning to your readers that a legal opinion rendered upon any subject without references to a particular state of facts, should not be relied on as controlling those facts. This opinion is intended merely to give a very general and nontechnical view of the law of Connecticut, as a matter of abstract interest to your readers.

It is safe generally to assume that each proprietor whose land abuts on a highway owns the fee of the land to the center of the highway. The reason for this rule of law is that the Town or the State by which the highway is opened, does not acquire any actual ownership (viz: the fee) of the land, but only a right to travel over it, which right is held in trust for the public at large. When the highway is opened, therefore, the fee of the land remains in the original proprietors; and because most highways are so ancient that it would not be possible or convenient

to ascertain who actually owned the fee of the land taken for highway purposes, the law supplies a strong presumption that the proprietors on either side own to the center of the highway. That is the normal situation, and strong proof is necessary to controvert the claim of any proprietor to his fee to the center of the highway. Of course if a single proprietor originally owned all the land through and over which the highway passes, he remains the owner of the fee of the entire highway after it is opened. Now suppose he conveys by deed his land abutting on the east side of the highway to another. At the time of this conveyance he owned the land both east and west of the highway, and also the highway itself, subject only to the public use. If, in his deed of the land east of the highway he describes the land as "bounded on the west by a highway," then the grantee of the deed will take the fee not only to the edge of the highway, but to the center of it; for it is also the law that a deed bounding land on or along a highway shall be construed as intending and making a conveyance to the center line thereof, unless it be expressly stated in the deed that it is otherwise intended. Thus every deed of land adjoining a highway tends to reestablish the normal situation if it has ever been upset; for few deeds will be found in the records where the grantor has expressly limited his grant to the edge of the highway.

The normal situation may be changed in still another way. It has been seen that the Town or State, when opening a highway, under ordinary process of law, takes only an easement, or right of way over the land, and not the complete ownership. Yet it occasionally happens that a proprietor of land voluntarily gives a deed to a Town for highway purposes, which conveys the entire fee to the Town, and not only the usual right of way. It has been held that the Town has authority to accept such a deed and accordingly it may own the fee of the land. In this case the grantor has no rights left in the land of the highway, at least so long as the highway remains as such.

In case a highway is abandoned by the public authority, the ownership, or fee of the land is unaffected in the normal case, because the fee has never left the abutting proprietors. While the highway remained, their enjoyment of the fee was simply curtailed by the public use or ease-

ment, and now that the easement has terminated the proprietors are restored to the full use and enjoyment of the fee, without that curtailment. Of course the case is different where the Town (for example) has received from the owner a deed of the highway land. There the Town owns the fee of the land, and the grantor of the deed owns nothing, at least so long as the highway remains. Why, then, cannot a Town, after obtaining grants of land for highway purposes, proceed to close the highways and sell the land to anyone who will buy it? It cannot do so because the Town is a corporation whose character empowers it to act only for governmental or civic purposes; and dealing in real estate is not such a purpose. The Town cannot hold land at all for such a purpose or for any other purpose not directly connected with government or civic welfare. Thus, if a highway of which the Town owns the fee be abandoned the fee immediately reverts (returns) to the grantor who conveyed to the Town, or if he be dead to his heirs. The grantor has never lost quite all of his interest in the land by conveying to the Town. He retained a contingent interest because the Town could take only upon a condition implied in law that it would use the land for proper public uses. The abandonment of the highway is breach of such condition, and reverts title in the grantor or his heirs.

Your readers will perhaps be most interested in the rights which the abutting proprietors and the public, respectively, have in the trees and herbage growing on land within the limits of a highway. The above discussion is necessary to a proper understanding of these rights, which we now take up. We assume, in what follows, that the normal situation prevails, viz: an open, travelled highway over which the public has a mere easement or right of way, and of which each abutting proprietor owns the fee of the land to its center line.

In law, everything that grows upon land, or is so attached or annexed to it as to be practically inseparable from it, is part of the real estate itself. Thus, title to a tree, a shrub, or to a house, follows title to the land, for each of these is in law a part of the land. Since the abutting proprietor owns the land to the center of the highway it follows that he also owns the trees, shrubs and other natural products found thereon, and such is the law

of Connecticut. It may be laid down broadly, that the abutting proprietor, as between himself and any other private person, owns the trees and other growths on his portion of the highway, absolutely. Any other person, not clothed with public authority or not in the act of removing an obstacle to his proper use of the highway for travel, has no color of right to injure any such growth or to take its fruit. A violation of the proprietor's rights as above outlined is a trespass just as much as it would be to commit a similar depredation on the owner's premises a hundred feet back from the highway, and the unauthorized taking of any of the owner's property in either case is a theft.

It does not follow, however, that the proprietor of the highway land can enjoy the untrammelled use of these trees and other growths. He is curtailed in his enjoyment of them just as his control over his half of the highway itself is limited, by the reasonable requirements of the public use. Thus a tree or any other object which obstructs travel, may be trimmed or removed, as public convenience demands; for the public easement, within its limited scope is paramount.

In Connecticut, by statute, the public has acquired additional rights in wayside growths, wholly apart from the primary common law rights as to highway travel. These public rights are exercised chiefly by Town Tree Wardens. Their jurisdiction extends over all public trees within their Towns. Since all the territory in Connecticut is within the borders of some Town, all public trees in the State fall under the jurisdiction of the respective Tree Wardens. Public trees are defined by the statute as "all transplanted trees, and all other trees not less than six inches in circumference measured two feet from the ground, within the limits of any public way." Tree Wardens may, with the consent of the Selectmen of the Town, trim or remove any such tree when they deem public welfare or safety demand it; and any person may make application, as representing the public, for such trimming, cutting or removal to the Tree Warden, and in that case the Warden will hold a public hearing, after giving due notice thereof, on such application, and anyone aggrieved by the Tree Warden's decision may appeal to the County Commissioners of the County in which the Town is situated, and the decision of the Commis-

sioners on the appeal will be final.

All of the provisions limiting the rights of the abutting proprietors in these trees are designed solely with a view to the public welfare and enjoyment, and do not affect the proprietor's rights as against private parties not acting as representing the public. The public good is superior to the private right, and even the proprietor himself cannot injure these so-called public trees which he owns; but on the other hand, when other private parties, merely as such, desire to act in any way affecting such trees, (as, for example, a telephone company in stringing its wires), they must first obtain the consent of the proprietor, since they are engaged in a private enterprise primarily, and they must in addition obtain the consent of the Tree Warden, to insure against an interference with the public enjoyment of the trees affected by the enterprise. In other words, where the agency which threatens a public tree is wholly disinterested and public spirited, the consent of the public authority alone is required, although the proprietor is in some cases given an opportunity to be heard; and where the agency is wholly or partially attributable to a private or special interest, the consent of the proprietor is requisite, with a veto power in the public authority as a safeguard to the incidental public rights involved.

We trust that these general remarks will prove of interest to your readers, and remain, with best wishes for your continued success.

Yours very truly,

CUMMINGS & LOCKWOOD,
Stamford, Connecticut,
June 22, 1916.

The flow of the famous intermittent spring of Bombay is found to have no relation to the seasonal rainfall. The flow may continue from two weeks to two months, and be followed by one to three years of dryness. Moreover, the flow may start up five months after the last drop of rain in the region.

In the flower-embroidered meadows,
And the majesty of trees,
In the blue of distant mountains,
And the lure of tropic seas;
In the ecstasy of bird song,
The murmur of the breeze,
Are witcheries of nature
Would e'en the worldly please.
—Emma Peirce.

Curious Growth of Vine.

Bristol, Conn.

To the Editor:

A friend in Wisconsin sends me the enclosed photograph of a bitter-sweet vine which, after creeping several feet under the house, emerges from a small crevice



THIS VINE GREW THROUGH THE SIDE OF THE HOUSE.

near the window, and has grown about ten feet across the window and under the veranda. It is the climbing bitter-sweet, *Celastrus scandens*, which extends westward to the Dakotas.

MILTON L. NORTON.

Darwin and Franklin.

Three letters of Erasmus Darwin to Benjamin Franklin which "Science" prints in its issue for June 2 reveal interesting characteristics of these two great men of science. Darwin though about forty years old had not then become famous, and he seems to be not a little flattered by the attentions of the great American, who was some twenty-five years his senior. He writes of his own observations and experiments with electricity, and other matters of natural history, and he sends his papers to Franklin to be presented before the Royal Society. Incidentally, in 1787, he thanks Franklin for favors shown his son Robert during his visit to

France—where, of course, Franklin was a very great person indeed. Robert Darwin, it will be remembered, was the father of Charles.

Among other items, Darwin tells of his labors in printing the first translation into English of four volumes of the works of Linnaeus, some ten years after the latter's death. Franklin, it is well known, had a large circle of scientific correspondents who kept him informed of the scientific news of two continents. Darwin, apparently, was by no means the least valuable of this group.

The Opening of the Evening Primrose.

BY W. I. BEECROFT, GREAT BARRINGTON,
MASSACHUSETTS.

In a recent number of THE GUIDE TO NATURE was an article on the opening of a cultivated flower in which the petals can be seen to unfold. It is not generally known that the same phenomenon may be observed in a native plant, the common evening primrose (*Oenothera biennis*). One watching these plants at sundown will be rewarded with the sight of the flowers unfolding as he gazes upon them, the movement of sepals and petals being plainly visible. Stems bearing buds about to open may be carried a considerable distance and the flowers will open as they are held in the hands.

Nature fits our every mood,
Her influence is aye for good.

—Emma Peirce.

The trouble with our attempt to conserve the supply of fish food, says the Commissioner of Fisheries for Victoria, B. C., is that we spend too much money on doing things and too little on the scientific study of what ought to be done.

That men and women are becoming more unlike, is one of the by-products of a study of ancient Anglo-Saxon bones made by an English anatomist. The investigator finds that the modern Englishman is quite as tall as his ancestor of the middle ages, but somewhat lighter in build. But the modern woman is almost precisely two inches shorter than her forebear ten centuries ago. All this is quite in line with over evidence that woman is the evolving sex, while men are remaining physically as they always were.

THE AGASSIZ ASSOCIATION

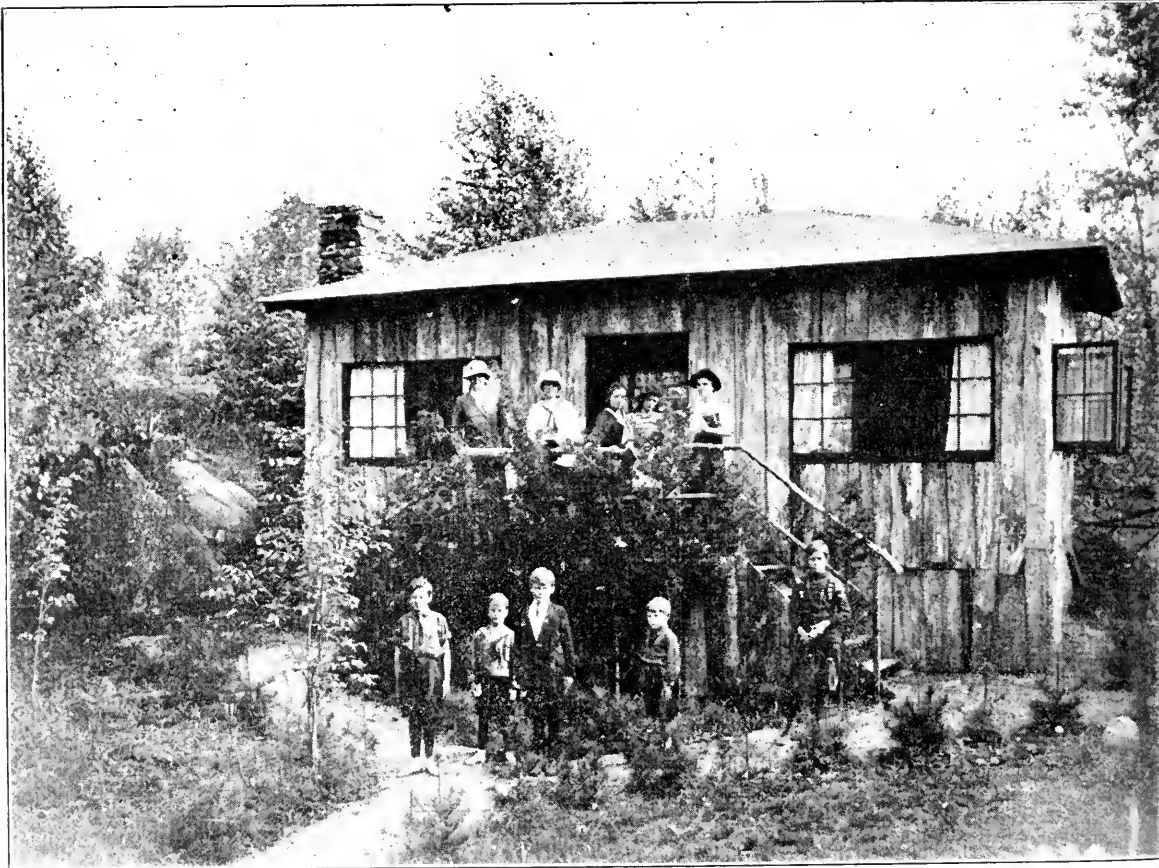
Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

A Little School with a Big Idea.

Right here in our town of Greenwich is a movement in Woodcraft education, and in real study of Mother Nature, that those interested are watching with high hopes of a development of more than local interest.

For several decades educators have been groping for the ideal nature study. The value of the study of nature is generally admitted but it is also admitted

that in many cases it is a failure or verges upon failure. The trouble is that most attempts at nature study teaching have been half-hearted, trivial or perfunctory. Comparatively few teachers seem to grasp the scope. Nature is a mighty big thing. It is the whole kite and not the tip of the tail of the kite. When educators learn that the study of nature is the main part of an education and not a little fad or



OUR ERNEST THOMPSON SETON CHAPTER (WABANAKI SCHOOL) WILL HAVE THIS BUILDING EQUIPPED AND DEVOTED WHOLLY TO AGASSIZ WORK.



NOT READING ABOUT BEES BUT USING THEM AS PLAYMATES.
Our Chapter in the Wabanaki School.

frill on a time honored system, then the problem will be solved. The limited grasp of the importance of nature in some classrooms is pitiable.

But here in the Wabanaki School of Greenwich the entire school goes right to nature and lives in the wild woods. Nature is made the central theme and around this are the fundamentals of an education. The young folks love nature because they live with her and they know nature because they see her every day in all her fullness and beauty. Here the problem is grasped in a whole-hearted way. It is evident that in this school not only the "meat" of a nature education is put forth but there is also a fair amount of poetry and sentiment. The location is ideal and there is every indication that the plans will be worked out effectively.

The Agassiz Association Chapter has its own building perfectly equipped for nearness to nature. The cooperation

of a large number of naturalists, including Mr. Ernest Thompson Seton and the editor of this magazine, has been secured to assist the young folks in their original researches. Nature study is not merely taught but really loved and enjoyed. The management of the school has made an ideal combination of the costumes, Indian lore, poetry and knowledge of the Woodcrafters with the biological knowledge and original research of The Agassiz Association.

Contributed Specimens.

The Misses Worrell, Sound Beach, Connecticut: two interesting specimens of black-eyed Susan. One of these shows an interesting coloration of the center and the other, much larger, a remarkable transformation of the flower, which is partly doubled and partly heart-shaped, together with a malformation of the stem, the whole probably caused by fasciation.

Larchmont Manor School Chapter.

This Chapter, recently reorganized with the addition of fifteen new members, is devoting especial attention to the study of insects and plants. The members have visited ARCADIA. A letter from the Corresponding Secretary reports that the visit was greatly enjoyed and the interest in nature greatly stimulated. The new officers are as follows: President, Lillian McGeachin; Vice-President, Cornelia Dean; Recording Secretary, Eugenia Boross; Corresponding Secretary, Mlys Boross; Treasurer, Nancy Walden.

Correspondence and Specimens.

Dr. Robert Unzicker, R. 1310, 220 South State Street, Chicago, Illinois, desires to correspond and exchange specimens with other Members interested in Lepidoptera, Coleoptera, minerals, Indian relics and reptiles.

Man or Insect?

A plainly seasonable hint is The Agassiz Association's suggestion that a camera is a better present for the boy than a gun. In these days of bacteria battle campaigns there is two-fold seasonableness in the suggestion that collecting the infinitely varied and fascinating butterflies, moths, mosquito hawks and beetles is both better and more interesting than robbing the nests of wild birds.

Among the many things to which the war is attracting a new kind of world-wide attention is the food supply battle between man and insects, a problem which worries the specialists in ultra far-sightedness as much as the old worry about the ultimate over-population of the planet. They are seriously debating the question who will ultimately win in this world, man or insect. In Europe attempts are now being made to utilize the devastating swarms as pork fatteners and government scientists at Washington have tried a new dish made of grubs, which they recommend as delicious. With sober men they are trying to start a discussion of the edibility of locusts and the like in connection with the world's meat supply problem.

What may be taken seriously by all thoughtful people is the general question of the human struggle against all detrimental insects as a class. Not only the war's emphasis on the need of augment-

ing and safeguarding agricultural productivity, but the new attention to better utilization of the planet's most productive areas makes this now more timely than ever. Insects are the chief obstacles to economic conquest of the prolific tropics. Energetic organization of nature study clubs would be far more than promotion of a pleasurable fad. Such a movement might, indeed, rank in dignity with the quite obviously commendable movement for establishing rifle ranges and training camps.—Editorial in "The Baltimore Star."

From a Sustaining Member.

BY L. SCHWIFERS, LOWER LAKE,
LAKE COUNTY, CALIFORNIA.

Under the stimulating influence of my membership in The Agassiz Association we, that is, my pupils, my family and I, have made some progress in becoming more deeply rooted in the realm of Nature.

A great help in our astronomical self-instruction is the cloudless California sky and our distance from disturbing sources of light. It is a delight to walk into the fields just before going to bed and stroll through the different constellations, and watch Venus, Saturn and Mars from evening to evening. Thus the sparkling, dome of the heavens becomes a sublime picture book.

A novel charity has just been established by the will of a Miss Everest of Kent, England. The grounds of her estate become a perpetual sanctuary for bird life, while the house is to be a resting place for the ill and over-worked. An endowment of four thousand dollars provides the maintenance. Miss Everest, by the way, is the daughter of the former Surveyor-General of India whose somewhat inappropriate monument is the loftiest mountain of the globe.

Sidney, Australia, has lately secured, for a zoological park, a beautiful tract of sixty acres on a point extending into the harbor.

Rose and gold in the morning,
Gold and rose at night,
Make them the shades symbolic
Of the vestibule of light.

—Emma Peirce.

An Inquisitive Squirrel.

BY FRED HIGH, CHICAGO, ILLINOIS.

The picture of the squirrel facing the kodak tells a story in itself, but it would take a movie outfit to transfer the scene to the picture world. There were about five squirrels which had actually learned to read character sufficiently well to pick out those who are their friends

in a Thrift Campaign among the banks. Its purpose is to induce the children to appreciate the lessons that our feathered friends may teach us, both by what they do and what they fail to do, and how each may mean to them either life or death. Any one interested can obtain a free copy of "Lessons Learned from the Birds," a thirty-two page book-



EFFICIENT NATURALISTS STUDYING A SQUIRREL.

from those who are indifferent to them. At least a dozen others kept darting about but never venturing near enough to get the prize that we offered.

A few peanuts enticed these little park dwellers into the open path, in spite of the fact that the thermometer was creeping toward zero. One of the squirrels jumped on my back, climbed over my shoulder, crawled cautiously down my arm, leaned over my hand and inspected the camera. He even looked into it as though he understood its workings. It was this inspection of the camera that attracted the attention of the squirrel that was caught by Mr. Flude who had been trying to photograph one as it faced the lens.

This photograph was taken for the purpose of getting a squirrel picture with which to illustrate a little commercial booklet that we were then preparing entitled, "Lessons Learned from the Birds," which in conjunction with Miss Sara V. Preuser's splendid book, "Our Dooryard Friends," is being used

let, by addressing "The Platform," 64 East Van Buren Street, Chicago, Illinois.

This is a serious attempt to demonstrate the pecuniary value of our birds in their efforts to protect us from the depredations of noxious insects and their allies. We try to show the commercial world that the study of animal life pays dividends in cash.

The first meteorite ever reported from the state of Florida has just been acquired by the National Museum. The specimen is a fragment, a little over two pounds in weight. The finder was a fisherman who brought up the stone in his net from the bottom of Lake Okechobee.

Trees.

Stately and tall, with their leafy crowns
 Ashimmer in every breeze,
 With their grateful shade, and their blossoming time
 What more enchanting than trees?

—Emma Peirce.

A Bulldog with Kittens.

A French bulldog owned by Dr. H. F. Dailey of the veterinary staff of the Angell Hospital lost her puppies soon after their birth. About that time a

hours of sunlight will be devoted to examination and admiration of nature's beauties on this earth.

"The hours of darkness, given up to sleep no longer, will be devoted to the



HAPPINESS IN SPITE OF INCONGRUITY.

litter of motherless kittens was brought to the hospital. Jane at once adopted them of her own volition, and for several weeks bestowed upon them all the care and attention of a loving and devoted mother.

We are indebted to the courtesy of "Our Dumb Animals" for the use of this remarkable photograph.

A Dream of Real Living.

"The New York Journal" for June 12, 1916, in a thoughtful editorial article suggests that in time human beings will do without sleep, and cites in this connection some interesting characteristics of the lower forms of animal life. The writer concludes that after a while we may really begin to live. As an example of what living means to him, he says:

"As old age needs less sleep than babyhood, so in our maturity as a human race we shall probably demand less sleep than now in our racial babyhood. Perhaps none at all will be needed.

"If that happens our lives will be doubled in value, they will be complete. The

study of space, to investigation among other worlds.

"That kind of life will be worth while. Bear in mind that we shall only really begin to live on this earth when we shall have settled all the little social and material questions here and shall have begun in earnest the study of the universe in which we are a speck.

"The days of the future will be given up to artistic enjoyment of the beautiful. The nights will be devoted to intellectual development and research.

"Man will LIVE."

It will be ideal living when time is no longer given to pernicious and artificial pleasures but to the enjoyment of the beautiful. Let us iterate and reiterate these words: "The hours of sunlight will be devoted to examination and admiration of nature's beauties on this earth." May it come true! It seems too good to be possible. We shall really begin to live when beyond social and material questions we shall find mental pleasure in the study of the universe. An ideal use of our leisure! Compare that real enjoyment with the foolish pastimes of the present.

Unusual Aurora.

BY C. D. ROMIG, AUDENREID, PENNSYLVANIA.

At 10:00 P. M. on April 28th of this year my attention was called to a bright light in the sky, that I presumed to come from a powerful searchlight, but was in reality an unusual aurora borealis. An arch of light apparently three feet wide started on the western horizon and reached to the eastern, passing a little south of the zenith, and lasted for about an hour. Occasionally I noticed short bars of light that cut through it at nearly right angles. At times the arch became slightly ragged, showing parallel separations running east and west. A few bright spots or crossbars moved rapidly from east to west for some distance, showing strong air currents. I observed a similar aurora in May, 1907. A strong column of light extended from the eastern horizon, increasing westward but reaching only about two-thirds of the distance across, and curving slightly like the letter S. In an hour or so the light faded, except at a point south of the zenith, where it lasted for some time longer.

I have been told that this kind of aurora occurs in April or May when conditions are right, and that on the following morning we may look for frost. This followed the display of this year.

I recall one other in 1895, when the whole sky was a mass of waves showing rainbow colors and resembling the mirage of a lake or an ocean. A wonderful effect was produced by bending the head back to look straight up. One then seemed to be looking into a great dome of commingling kaleidoscopic colors.

In another of the usual type there appeared on the western edge a blotch as red as fire, bigger than a barn, and so intensely red that its light was reflected on the eastern horizon. In noting these displays I had the advantage of high ground and remoteness from city lights, buildings and trees.

Among the great and memorable events described in a book entitled, "Our First Century," is an account of the aurora on the night of November 14th, 1837, which is said to have been the most magnificent that had occurred in several centuries, and a reference also to grand displays in August and September, 1850.

The Lecturer Is a Challenger.

The value of a lecture lies largely in its challenge to fixed customs and established modes of thought. The lecturer does not waste the time of his audience in labored argument to prove that the desert of Sahara has sand in it, or that the Pacific Ocean is wet. He is a pathfinder, and seeks to blaze a trail through regions not yet fully explored. He is the aggressor, and calls all men to give valid reasons for the convictions they hold, or abandon them for better.—*Chautauqua Program*.

Nature is so close and near,
Why not make her just as dear?
—Emma Peirce.



"THE MAN WITH A HOE" MAY BE EXCUSED FOR LOOKING SOUR THIS YEAR. The Arcadia garden has been covered with water much of the time.

Uncle Sam Exploring for New Plants.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

The Bureau of Plant Industry, under the Department of Agriculture, at Washington, sends out explorers to various parts of the world in search of new plants which might be introduced into this country and prove of value.

Individuality of Tides.

The United States Coast and Geodetic Survey has been developing a new theory of tides. According to this theory, the familiar pictures of the geographies, with two knobs of water standing out on opposite sides of the earth, is entirely wrong. There is not, in fact, any general tide any-



IN SEARCH OF "NEW" PLANTS.

The picture shows an outfit used by one of its explorers near Ure-dalik, Chinese Turkestan. The large cart, with its three mules in front and one horse behind, and over 1,000 pounds of baggage in it, trekked through a piece of sandy and alkaline desert. The man in the foreground is a Russo-Turki interpreter; the others are the driver and the general helper.

According to a late report on Irish fisheries, the rings on the deeper valve of the oyster are not, as is commonly thought, a reliable test of age. Oysters of known age that had been under observation at the experiment station for four years showed from three to eight "annual" rings.

California Poppies.

Bright sunbeams in the garden,
Caught and held there fast;
But like the really sunbeams,
Night couches them at last.

—Emma Peirce

where; but each separate ocean has its own tide quite independently of the rest of the water on the globe. Thus the waters of the Pacific swish back and forth with no more relation to the swishing in the Atlantic than as if the two oceans were two separate bathtubs in which two children were being washed.

From this, it follows that every great lake, every small lake and every little pond, even down to every tiny pool, has a tide of its own precisely like the tides of the larger oceans except that the rise and fall may be only the fraction of an inch.

As we contemplate the infinite spaces above us, with no beginning and no ending, we become "stilled" as it were by the immensity of it all. Our finite minds stand appalled, but the sense of a Great Power creeps gradually over us and the unseen almost becomes real, while Life takes on a new meaning.—
Editha S. Campbell, Erie, Pennsylvania.

A Touch of the Unknown.

I recently went to Colchester to visit the scenes of my boyhood in a wild territory far out in the heart of the country. No one in that part of the country knew of my intention to make the visit. I called at the farmhouse where I had not been for about twenty years. The lady of the house did not recognize me until a correct surmise by her daughter revealed my identity. She then sent a younger daughter to a distant cornfield to call her father. The daughter was not to give my name but simply to say that some one had dropped in on business. We wished to see whether he would recognize his boyhood friend.

On receipt of the message the farmer said, "You can't fool me. It is not any one on business. It is Ed. Bigelow. I thought perhaps he would call, because I saw him on the street in the village last evening. I was surprised to learn that he was in this vicinity, but at once surmised that he would not go away without visiting his boyhood home."

The interesting fact is that I did not arrive in Colchester until that morning and went directly from the station to his farm by automobile!

Would you take Nature for your friend,
She'd give you pleasure without end.
—Emma Peirce.

Schrapnel bullets, fired at aircraft and dropping back to earth from great heights, are not especially dangerous. The resistance of the air prevents them from ever falling faster than about five hundred feet a second.

A Lapful of Pony.

About the last kind of a pet to hold in one's lap is a pony, but here is an illustration showing that a woman was able thus to treat a pony.

We are indebted to "The National



A NOVEL LAP PET.

Humane Review" for the cut and to Mr. Charles S. Jenkins of Lansdale, Pennsylvania, who has one hundred and twenty-five ponies, all pure Shetlands. He says there is satisfaction in producing an animal that will not be killed for food, but will be kept to give pleasure and health to its owner and make better the men and women and children that use it well.



PARASOL ANTS (EACH CARRYING A LEAF) ON THE MARCH.

Cut by courtesy of The New York Zoological Society.



The Symbolism of Snails.

BY LEAH B. ALLEN, WELLESLEY, MASSACHUSETTS.

Is any one interested in snails, ugly little things famous for slowness? They were interesting to the great artist in metal, Peter Vischer of Nuremberg. One of the treasures of that city is the beautiful bronze shrine of St. Sebald. A miniature Gothic chapel is raised above fifty or more statuettes of apostles, prophets and personifications of abstract qualities, all supported on twelve snails, with a dolphin at each corner. It was designed and executed in the early part of the sixteenth century by Peter Vischer, who, aided by his five sons, worked for twelve years on this masterpiece "to promote the Glory of God Almighty and St. Sebald." Dolphins, strong, swift swimmers, were anciently believed to carry souls across the ocean to the Isles of the Blest, and are frequently found carved on early tombs.

The meaning of the snails is not plain, but Lady Higgins, a renowned English astrophysicist, eager to understand all that she saw, determined to ascertain their symbolism. She noted details in works of art with the same alert, appreciative sight with which she saw delicate lines in a star's spectrum. Not finding an explanation in the books, she for several years studied the habits of living snails. She found that they can be kept apparently dead for at least two years and then be resuscitated. This characteristic seems to be sufficiently symbolical of the resurrection of a soul to justify the artist in using them as foundations for a shrine.

Lady Higgin's note in regard to her experiments does not state the variety of snails observed. Perhaps some reader of *THE GUIDE TO NATURE* may be able to tell us if American snails have this power of waking from life so long dormant.

[The symbolism of animals in Christian art is frequently a matter of arbitrary interpretation. To my mind it is a question whether Peter Vischer had any definite idea in mind, besides originality and artistic conception and execution. The use of animals in art during the fifteenth and sixteenth centuries had little of the symbolic. The artists strove for pleasing designs and harmonious results and used the animals best suited to their talents.

The dolphins in art have several symbolic interpretations, sometimes representing Christ Himself, again representing the individual Christian soul seeking the knowledge of Christ, and in still other particular cases the idea is that of love and tenderness. Your correspondent's symbolic interpretation of snails is new to me, and I think it is very good.—N. P. C.]

What Your Face Tells.

Somewhere I have read a little story of St. Francis of Assissi who invited a brother religious to go to the city with him to preach to the people.

After they had traveled through the streets for a long time, turning this way and that, the brother remonstrated with his companion: "Why," he said, "I thought we were going to preach." "We have been preaching," replied St. Francis. "Our very walk through the streets has been a sermon to every person we met. Our manner, our demeanor, our dress, everything about us incidentally turned the thoughts of those people toward God."

How true it is that "the gods we worship write their names on our faces." We gradually come to resemble our ideals, the things which most occupy our minds. Hope or fear, joy or sorrow, success or failure eventually reproduces itself in our expression of countenance, in our manner, in our atmosphere, in our personality. The thoughts we habitually harbor, whether optimistic or pessimistic, hopeful or despairing, sad or merry, will write their record in our faces, exactly in accordance with their nature. We are all preachers of sermons. Our faces as we go about the world are preaching the gospel of good cheer, of hope, of joy and gladness, of success or that of pessimism, despair, of disappointment, of misery, of failure.—*Orison Swett Marden in May Nautilus.*

Dr. Bigelow Elected Scout Naturalist.

The Managers of the Boy Scouts of America have elected Dr. Edward F. Bigelow, of Sound Beach, Conn., "Scout Naturalist." He will guide the great and growing organization of boys in their nature studies, answer questions and conduct a department entitled "On Nature's Trail" in "Boys' Life," the official monthly publication of the Boy Scouts. Their magazine has already attained a circulation of more than 100,000.

This work is not entirely new but rather a development of one of the lines of interest and helpfulness that has been carried on for a long time by Dr. Bigelow through The Agassiz Association and its ARCADIA. A large number of organizations have found help at ARCADIA in their nature interests. Dr. Bigelow has for many years taken an interest in Boy Scouts. He has answered many letters, addressed them in various places and troops have been frequent visitors at ARCADIA. He has also written departments of the Scout Handbook. This new development has been undertaken on an extensive scale at a remuneration hardly covering the cost of correspondence, with not much of any allowance for traveling and other expenses that will necessarily be incurred. Dr. Bigelow is accepting so large an undertaking in the belief that it will be sustained by naturalists and philanthropists, and especially by those who recognize the tremendous importance of the educational possibilities of the great Boy Scout Movement.

The Managers of the Boy Scouts of America make the following announcement:

IMPORTANT NEWS FOR READERS OF
"BOYS' LIFE."

We have just completed arrangements for a big new department to begin in the September number. This department will be called "On Nature's Trail." It will contain just the kind of "nature stuff" that boys—and Scouts especially—like to read.

Dr. Edward F. Bigelow, who has just been appointed "Scout Naturalist," will show our readers the mysteries and delights of "Nature's Trail."

If we had known of anybody better

qualified to conduct such a department than Dr. Bigelow, we would have "landed him" for "Boys' Life." But we don't believe any such person exists.

Thousands of you boys know who Dr. Bigelow is, for you have read his stories and have heard him talk. We don't need to say anything to those of you who have had this privilege for you know from experience that Dr. Bigelow "has the goods" when it comes to nature stories. And you other fellows will find this out when you "hit the trail" with the famous naturalist next month.

Dr. Bigelow has been a nature expert for years and years. He was an authority on nature subjects before most of you fellows were born. And his interest and enthusiasm grow faster than his years. When he tells you anything about birds or animals or plants just take it all right in and if you ever get into an argument about any fine points of nature study you can settle it in a jiffy if you can say, "Dr. Bigelow says that's so." There's no need of going any further for authority. He knows!

Every boy has heard about The Agassiz Association and the work this organization has done to increase an interest in nature subjects. Dr. Bigelow has been president of this organization for nine years.

When you see a copy of the latest edition of the "Handbook for Boys" you will find in it a corking article on "How to Tell North, South and Other Directions." This article was written by Dr. Bigelow, who also wrote "Good Hunting among the Fungi."

Many of you have read the interesting magazine, "The Guide to Nature." Dr. Bigelow is the editor.

Most of you have read, at one time or another, the "Nature and Science" department of St. Nicholas Magazine. Dr. Bigelow was editor of that department for fourteen years.

For a great many years Dr. Bigelow has been lecturing throughout the country, conducting nature outings for boys' schools, and boosting nature study noon and night.

Recently he has taken a particular interest in Scouts, answering letters

from them and giving them special lectures on his tours. So he understands Scouts as well as other natural things.

But this tells you only what he has done. It doesn't let you know that he is big and jolly, and bald-headed, and always ready to laugh; that he has keen eyes and keen wits, that he is chuck-full of fun, that he is full of good stories—and, what is more important, that he can *tell* them too. In fact he's a regular fellow and that "Dr." on his name isn't half as formidable as it sounds.

His department, "On Nature's Trail," is going to be nature and nothing else. In it he will give you a lot of tips from his own experience and plenty of information that will make scouting mean more to you than it does now.

And besides—and this is one of the best things about his department—he'll *answer all your questions*.

Get ready for a bully old hike with Dr. Bigelow "On Nature's Trail," beginning with September "Boys' Life."

Personal.

At no other time have so many hopes been centered on the Boy Scouts. I refer to this not so much on account of the possibility of their becoming soldiers at some future time to fight foreign enemies, as on account of the present need that they shall become men to meet the many problems that are rapidly arising, some of them acute and surprising. What this world needs is men that will think intently and possess the qualities of true manliness. No other organizations have succeeded along such lines as well as the Boy Scouts, but it is admitted by managers and friends who have watched the development of this great Movement that the association needs greater development in the department of nature education. There is need for the training of the inner qualities of the Scout as well as of his physical being. He needs to see and hear as well as to march. We believe that every friend of the Boy Scout will give their heartiest approval to the new efforts in this direction. We desire to receive suggestions from writers, naturalists, sportsmen, from everybody who not

only breathes and lives out of doors but who finds a mental joy in such existence and in such pursuits.

Let me say personally that I have seldom undertaken any work that so impressed me with its responsibilities. Think of the army of boys to be helped and to help others in this educational work. We need more earnest, manly men. A boy is the only thing in all this world that can develop into a man. We are relying on the support of those who believe in men.

EDWARD F. BIGELOW.

Aquatic Interests.

Our interests in water life are manifold. They are in part economic interests, for the water furnishes us food. They are in part æsthetic interests, for aquatic creatures are wonderful to see, and graceful and often very beautiful. They are in part educational interests, for in the water live the more primitive forms of life, the ones that best reveal the course of organic evolution. They are in part sanitary interests; interests in pure water to drink, and in control of water-borne diseases, and of the aquatic organisms that disseminate diseases. They are in part social interests, for clean shores are the chosen places for water sports and for public and private recreation. They are in part civic interests, for the cultivation of water products for human food tends to increase our sustenance, and to diversify our industries. Surely these things justify an earnest effort to make some knowledge of water life available to any one who may desire it.—"The Life of Inland Waters."

The sign language of the American Indians has been shown to be at least as old as the year 1535.

California Poppies.

Chalices of sunshine
 In the morning light,
 Closing fast their bonny cups,
 At approach of night.

Giving gold so freely
 Through the summer day,
 Thrifty grown, at twilight hour
 Hoarding it away.

Radiating gladness,
 Glowing in the light,
 Breathing e'er a sweet behest
 "Make *your* world as bright,"

—Emma Peirce.

Kind Words for Lectures

University of Tennessee Capstone of
Public School System, Knoxville,
Tennessee.

PROFESSOR HARRY CLARK, DIRECTOR OF
THE SUMMER SCHOOL.

To Whom it May Concern:

We had Dr. Bigelow with us for one week's lectures during the 1916 summer school, and he made an unusual impression on our students and on the people who came in from the city. He won the club women of the city, and he had many invitations for social courtesies. His crowds grew with each lecture, because as one woman said, "He is so sane and so different from the usual lecturer." Another enthusiast came up to me after one of his lectures, and said, "Where did you get him?"

Many lecturers try to state bizarre hyperboles in order to catch attention, but Dr. Bigelow won his crowd by his interesting ways of stating fairly both sides of mooted questions.

He has an inexhaustible energy, for he attended classes all day long and then after night would go down to the market house and interview the hucksters who drove in from the country. At 8 P. M. he would be on hand for the night lectures. Just for a side line he would go out in the city and make a talk for the negro institute to accommodate our country superintendent or conduct a round table on some topic for the students and club women. I envy him his vigor that has come from his out-of-doors life.

A Most Unusual Speaker.

Dr. Bigelow is a most unusual speaker. He is sort of "different" and some would say "queer" but he is very entertaining and in listening to him one is impressed with his breadth of view and sympathies.

One characteristic of the man that has manifested itself to those who have heard his two lectures is that he does not like to commit himself or to state his position on anything but he rather prefers to let his hearers decide for themselves any issues that may come up in the course of his address.

Dr. Bigelow made quite an impression on those who heard him during his stay in this city. He is a most unique personality and is a man of wide study and thought. He has a way of his own of looking at life and it is a good way. Dr. Bigelow is an optimist and a lover of nature, in fact, his love of all living things, both plants and animals, is the most characteristic thing about him. He can see the beauty and the lesson in the smallest plant that grows and if all could look at nature through his eyes the world would indeed be a fascinating place.

The Summer School management is to be complimented upon securing such a man as Dr. Bigelow for an entire week. His lectures have proven an inspiration to hundreds here and his object, which as he said was to make people think, has certainly been accomplished for one cannot sit for five days and listen to this speaker without thinking.—"The Journal and Tribune," Knoxville, Tennessee.

The Teachers of the Summer School of the University of Chattanooga.

BY DAVID R. LEE, DIRECTOR.

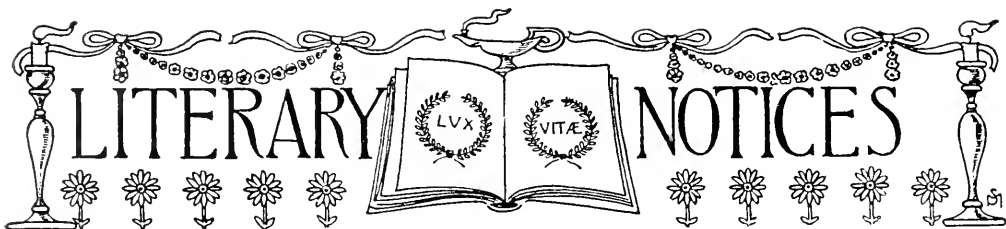
(BY UNANIMOUS VOTE OF THE ENTIRE
SCHOOL.)

An Appreciation.

To the man who is able to dignify the common wayside weed with a name; who can paint the lily and gild refined gold without it being called "ridiculous excess;" "who in big hearted sympathy finds songs in running brooks and sermons in stones and good in everything"—

To such a man, represented in the person of our distinguished guest, Doctor Edward F. Bigelow, who has for five days taken us through the fertile fields of thought and opened our eyes, long closed, to see the beautiful in God's out-of-doors, we offer this word of grateful appreciation for his splendid services in our behalf.

May he live long and prosper! May his shadow never grow less!



LITERARY NOTICES

LAND BIRDS OF NORTHERN NEW YORK. By Edmund J. Sawyer. Published under the Auspices of the Watertown Bird Club, Watertown, New York.

The author justly tells us that "after all has been said for the observant love of nature the best is that it can keep its votary young at heart in a world like this." Mr. Sawyer has practised what he preaches and he has helped others in their practice. He is an effective writer and skillful as a student in all departments of nature but especially is he at home among the birds. We cordially recommend this little handbook with its dainty illustrations and appropriate text.

UNDER THE APPLE-TREES. By John Burroughs. Boston, Massachusetts, and New York City: Houghton Mifflin Company.

John Burroughs not only grows better in many respects as he grows older but he enters a wider field. He says that he can write only on natural history like any farm crop when it is ready to be harvested, "but philosophy we have always with us. It is a crop which we can grow and reap at all times and in all places, and it has its own value and brings its own satisfaction." In Mr. Burroughs's younger days nearly all his writing was devoted to the description of his observations. In recent years it tells us of the thoughts suggested by the various phenomena of nature. That is human life. Active young folks see things and the older folks sit down and think about them. Activity is as characteristic of youth as philosophy is of age.

The book is named from the title of the first chapter but other instructive sections cover a wide range of this famous naturalist's speculations. Many readers will not agree with Mr. Burroughs in some of his conclusions, but one that wishes to read both sides of a question will be interested not only in his conclusions but in the course along which his mind travels to arrive at a retrospective resting place. Mr. Burroughs's earlier books made us study and question nature. In this he makes his readers study and question him. But that is in harmony with his theory that man is only a part of nature.

He teaches that there is no admixture of the human element in astronomy and geology. Some of us believe that geology shows as much provision for the human race as for any other form of life. Nothing in any geological formation is an active enemy to mankind but that cannot be said

of certain forms of animal life from mosquitoes up to tigers. The mines of oil, coal, iron, copper, suggest an infinite mind filled with kindly desire to provide for the human race. That these came by chance or were developed without reference to an adaptation in future eons, is unthinkable.

THE LIFE OF INLAND WATERS. An Elementary Text Book of Fresh-water Biology for American Students. By James G. Needham and J. T. Lloyd. Ithaca, New York: The Comstock Publishing Company.

Here is a real book and one that is needed, one that touches the field in a satisfactory way. There are a few English books that American students have become forced to use for lack of anything better, but this new work excels not only in its adaptability but in its scope all those English and similar books. It includes much on various forms of larger as well as microscopical life. It is devoted chiefly to ichthyology. It is a big book, well printed on coated paper, containing 438 pages magnificently illustrated with 244 illustrations. The only criticism that can be made, and that is not really unfavorable, is that it covers too wide a field when its use outside of a college classroom is considered. For the amateur however it presents a good bird's-eye survey of the whole realm of small forms of aquatic life up to and including the larger aquatic insects. We recognize that from even so large a book many phases of the subject have been necessarily omitted. For these we must turn to special books. There is however a great amount of text and many illustrations that are new and not duplicated in any other publication. It is an excellent work for the amateur to consult if he intends to give attention to aquatic investigations. Through it he may survey the whole field and decide what he likes best.

An extensive bibliography offers many suggestions for specializing. The authors give special acknowledgement to Agassiz as an inspiring teacher, to Dr. Joseph Leidy as an excellent zoologist, and to Dr. Alfred C. Stokes whose "Aquatic Microscopy" is a useful book for beginners, but they located this famous microscopist in Connecticut, where his book was published, and not in Trenton, New Jersey, where his home is. The wide sympathetic interest of the book is well shown by the following sentence:

"The school boy lies on the brink of a

pool, watching the caddisworms haul their lumbering cases about on the bottom, and the planctologist plies his nets, recording each season the wax and wane of generations of aquatic organisms, and both are satisfied observers."

Flowers.

Flowers along the roadside.

Flowers in garden bed,

Flowers with joyful wedding bells.

Flowers where tears are shed:

Flowers to deck our tables,

Flowers to soothe our pain,

Sweet is their companionship,

Over and over again.

—Emma Peirce.

Studies at the British Mint show that the wasting of metal coins is not, as is commonly supposed, principally the result of mechanical abrasion. On the contrary, the chief loss comes from the chemical action of the acids of the perspiration. These act especially on copper; and while they do not directly affect either gold or silver, yet by dissolving out the copper in the alloys, they leave a spongy surface, which wears more rapidly than the fresh coin.



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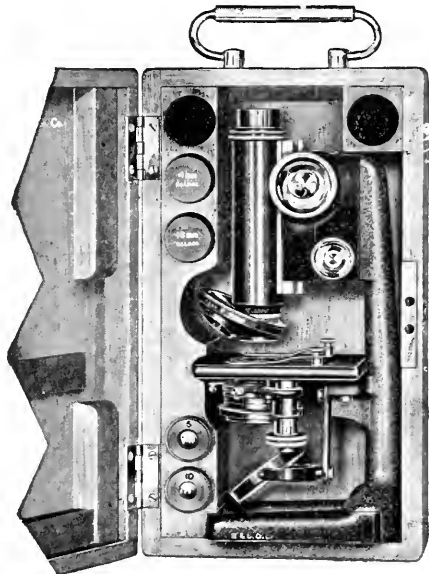
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HOW TO KNOW THE MOSSES. A Popular Guide to the Mosses of the Northeastern United States. By Elizabeth Marie Dunham. Boston and New York. Houghton Mifflin Company.

The subject of this book is treated in a simple, non-technical way so that with some species considerable may be learned without the use of the lens. But with the generality of the mosses not much serious study can be done without the pretty constant use of a pocket lens or, better still, the compound microscope. Yet this book simplifies the subject so that the lover of nature may acquire at least a passing acquaintance with these beautiful plants. The author calls attention to their wide distribution. They are found in all sorts of places except in salt water.

"They grow on moist and on dry ground; on bare rocks and ledges and on those that are covered with soil; on trees; on decaying wood, such as old logs and stumps; on old roofs; and even in streams and ponds and in places that are sometimes submerged. They are especially abundant in cool, moist woods and luxuriant swamps where old logs are rotting, but many may be found in drier and more open places, such as old fields and meadows, and even along the roadside."

Dogs for the South Pole.

In his recent lecture in Exeter on Captain Scott's expedition Mr. C. H. Meares mentioned that in his forthcoming expedition Sir Ernest Shackleton would take a number of dogs which had been used for hauling in Canada. The animals, numbering ninety-nine, arrived in London on Tuesday week and will leave again on the *Endurance* next Wednesday. They are all half-breeds, their ancestry being represented by wolves, and have been used for sleighing and hauling fish. Fish has been their chief food, but in view of the special work for which they are destined they have been trained to feed on biscuits—quite a new form of sustenance to them until they left Montreal for London, but so acceptable that they consumed 18wt. of Spratt's meat fibrine dog cakes by the time they arrived, and are now confirmed biscuit eaters. That they should have taken so readily to their new food is fortunate, for more depends on this than may be imagined. Captain Scott admitted that his failure to reach the Pole on his 1901 expedition was due to the fact that he substituted stockfish for biscuits as food for the dogs which accompanied him on his final dash. Sir Ernest Shackleton will rely on Spratt's Dog Cakes for his teams' food, and a sufficient supply is being taken on

board the *Endurance* to last throughout the expedition. The dogs, who are now at Spratt's quarantine kennel at Beddington, answer promptly to their names—Blackey, Collar, Noble, Nero, Captain, Colonel, Chimo, etc. The ages range from one to six years; eighty of them are unusually large, the remainder being younger and somewhat smaller. In many of them the features of the St. Bernard, Newfoundland and German wolfhound are very pronounced. "Fox" is perhaps the prettiest of the pack, remarkably clever and well trained and one of the team leaders, although but a year old. Light, an all gray dog of the prairie wolf type, is another of the team leaders, being the champion of them all, the best worker and the fiercest fighter.

Chrysanthemums.

Chrysanthemums, glorified daisies,
Who fitly can render your praises?

You come at a season when blossoms are few,

When Garden-flower homage is given to you.

In all of your wonderful phases.

—Emma Peirce.

The eighteenth volume of
Bird-Lore
begins February 1, 1916.

Volume I contained 206 pages and no colored plates; Volume XVII contained 560 pages and eleven colored plates.

The magazine has grown, but the price remains the same.

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The Guide ON Nature

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est to know and to enjoy, the
more complete and full will
be for thee the delight of liv-
ing.—Platen.

Volume IX **SEPTEMBER, 1916** Number

PUBLISHED BY

THE AGASSIZ ASSOCIATION

ARCADIA: SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

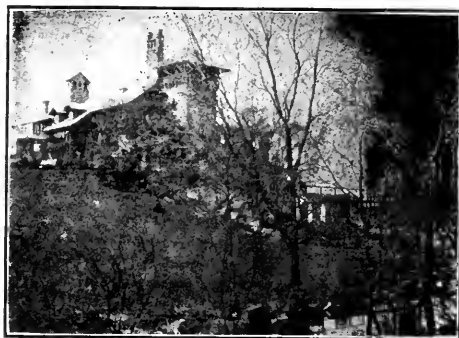
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American Business Women.

MAY MANTON.

[FROM THE ELECTRALOGUE, NEW YORK.]



R E A T I N G dresses for dolls is doubtless a delightful occupation for tiny chubby - faced and curly-haired girls. Indeed, they seem to be able to get a greater measure of enjoyment out of

it than any other childish occupation. But, when these little girls begin to grow, somehow the zest of this particular pastime is lost and soon the making of dolls' clothes is abandoned entirely.

But to one girl in particular, a vivacious Scotch lassie, the pleasure of this occupation was never lost. Indeed her joy in designing and making frocks for her dolls survived long after she had passed the recognized "doll age" and became a rather large girl. But conventions or no conventions, she still found pleasure in designing diminutive wardrobes, and when she had outfitted her dolls to a degree where further additions would be sheer extravagance (and not to be countenanced by her Scotch parents) she looked about her for the dolls of other and much smaller girls which needed attention.

And strange as it may seem, this propensity for designing clothes for dolls clung to her so long that finally she determined to put it to a very practical use. Instead of dolls she chose human beings, little girls and boys and grown women, and forthwith she proceeded to design clothes for them, until now she is designing clothes for the women folk of almost the entire nation, for there is little doubt that May Manton's pattern-making is today a national institution of unbelievable size.

It is true that Miss Manton's genius for making patterns developed from her youthful desires to make her dolls look pretty—or perhaps that is a misstatement. Perhaps her genius for

making patterns and designing dresses was given expression as early as the day when her chief desire was to make dolls' clothes; but whichever is the case, the result of thirty years of practical pattern-designing, as evidenced today in Miss Manton's tremendous business, attests to both her skill and, what is more important, her ability as a business woman.

Miss Manton is one of a number of women of national renown who have been extremely successful in business. Her wits and her foresight have resulted in the establishment of an institution capable of keeping the wheels of a huge factory humming day and night. She has her representatives in nearly every city of the United States and in many cities of foreign countries, and she has gained through her business a countrywide friendship and respect.

Just where Miss Manton's designing of clothes passed from pleasure into business is hard to say. Of course, through it all the pleasure of the occupation has not been missing, because, even today, after thirty years of this form of work, Miss Manton visits her designing-rooms in Sixth Avenue, New York, every day, and all the work done by the staff of a score or more artists is accomplished under her immediate supervision, or at least at her direction.

The task of making dolls' clothes when she was a little girl was, of course, purely one of pleasure. But as she grew older and really began to forsake her own dolls she found many others to occupy her attention, the doll families of her little friends. Later she married, and then she had another family of dolls of her own to design for, only these dolls were of a much more active type than the pink and white Dresden ones she had dressed in her early day. At the age of nineteen, married, and the mother of a family, she came to this country.

But still, with all the duties of a wife and a mother, she found time to design frocks, gowns, dresses, skirts, waists, and a host of other things, for herself, her children and her friends. Indeed, her skill in this line was so marked

that there appeared to be no outlet for her energies but that of commercializing this pastime of hers, and commercialize it she did, with the aid of her husband, Mr. George H. Bladworth. That was the inception of Miss Manton's pattern business.

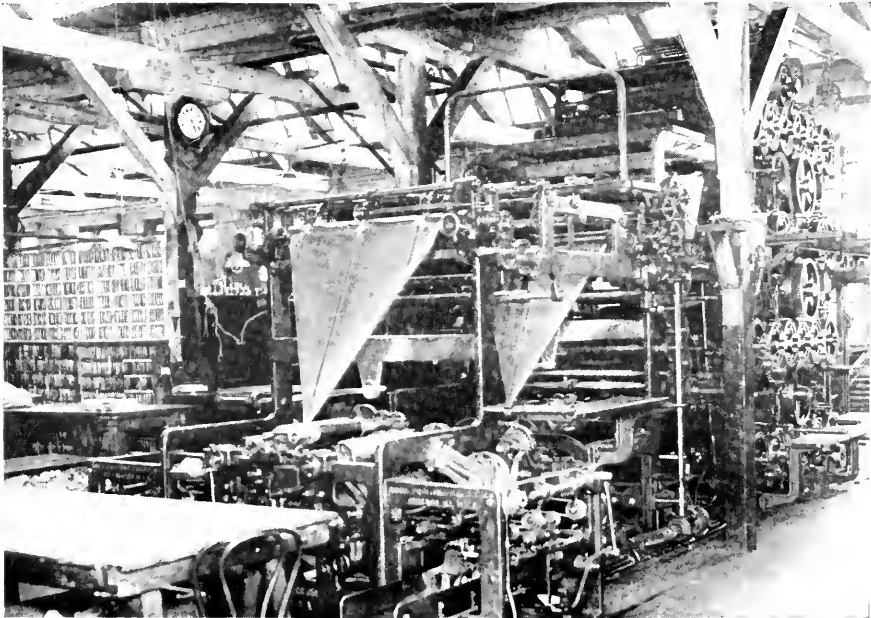
In spite of her cleverness, however, Miss Manton found that the establishment of a pattern business on a successful footing was no easy task, and she was forced to work early and late, many hours a day, to carry out her plans for a national business institution. Year after year she strove, building and ever building. Millions of patterns were designed, created and marketed broadcast, until finally a huge factory in Newark, New Jersey, was established to manufacture the flimsy paper designs that were so much in demand among the women of this country. Millions of these have been turned out during the last three decades and in styles they have run the gamut from quaint looking costumes of the eighties to the present creations, for Miss Manton has always adhered to style.

But a great many things beside hard work contributed to the up-building of

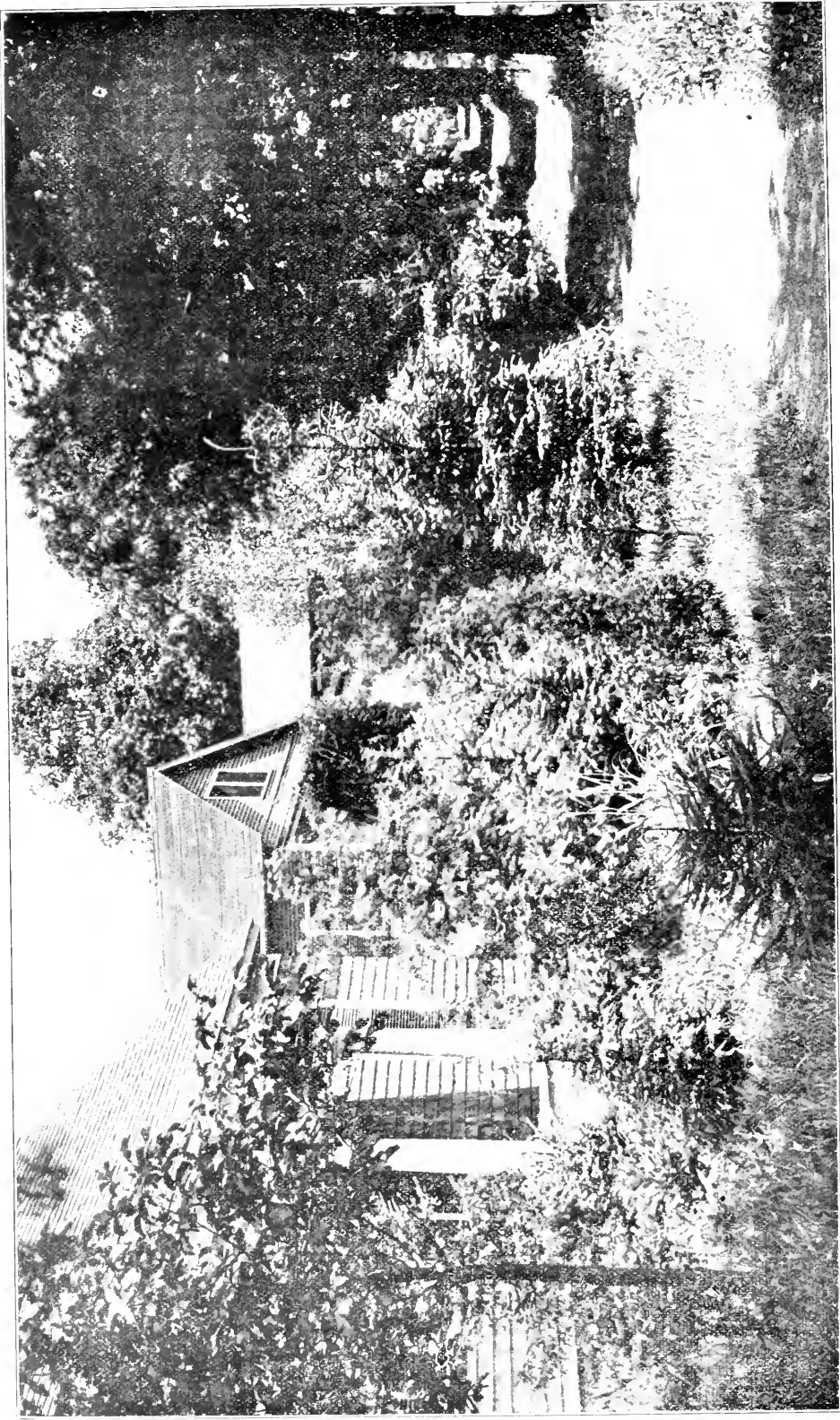
this huge business, not the least of which being Miss Manton's keenness in judging the ability of others. Through this she was able to gather about her an able staff of assistants and a staff upon which she could rely in any emergency. It was with this competent force ever at her command that she forged forward. Her ideas were the foundation of the establishment and the vital force which made it accumulate volume. But the execution of these ideas fell to the men and women she relied upon. Under her direction one corps of assistants designed and built the products of the firm while another group developed the business policies and conducted the sales campaigns along lines that she herself had thought out and suggested.

Miss Manton has maintained her place at the helm since the business was inaugurated and today she still directs the big institution in spite of the fact that she has already done more than her share of the work. Daily she devotes several hours to the problems that present themselves for solution. And always before she leaves the place she pays a visit to the designing room.

(Continued on Page IX.)



THIS IS NOT A NEWSPAPER SHOP, BUT A CORNER OF MAY MANTON'S PATTERN FACTORY.



Air-Abn-A THE EASTERN SECTION OF THE FRONTAGE.
The Total is 420 Feet on Air-Abn-A Road.

available to a student in California or in Japan as it is to one in Sound Beach. It is a clearing house for the interchange of the observations of all naturalists. The youngest child can have its flower or cocoon identified and through it the most learned scientists of the land can have the benefit of personal communication with experts in any branch of scientific study. The technical student, the occasional sight-seer or the fanatical hobbyist may obtain a response or a sympathetic interest at ARCADIA. The youngest boy or girl is encouraged to see and to tell what he sees. A student recently arrived at ARCADIA is eighty-two years of age. There are others of equal age or equal youth who have never seen ARCADIA and who probably never will see it, but that are benefited by the institution.

The buildings are:

The Welcome Reception Room where companies gather for social and general educational and scientific purposes. It is what the word, "Welcome," implies. The building is never rented, an admission fee is never required. That is the spirit of ARCADIA. The recipient knows that there are expenses and he may aid to any extent or not at all. The one who gives nothing in money receives as careful attention as the one who has given thousands. On the same principle the one who knows but little of nature is treated with the same courtesy and with the same manifestation of our desire to aid as is the famous specialist. Our visitors and correspondents include all these classes.

Then there are the office, the laboratory where problems are worked out and methods for the disseminating of information are devised.

The observatory is equipped with a six-inch Clark telescope and is now making every effort to secure an additional four-inch in order to provide for the large parties that frequently visit it. In this observatory we do not attempt original scientific work. The purpose is to teach others what is already known, and to interest and uplift them along these lines. The aim is not new facts, but a new life.

The apiarian laboratory is better equipped than any other in the country. It gives information freely, as is proved by the demonstrations of the fact that

honeybees may be safely handled in the spirit of love. It is one of the most attractive features of the institution.

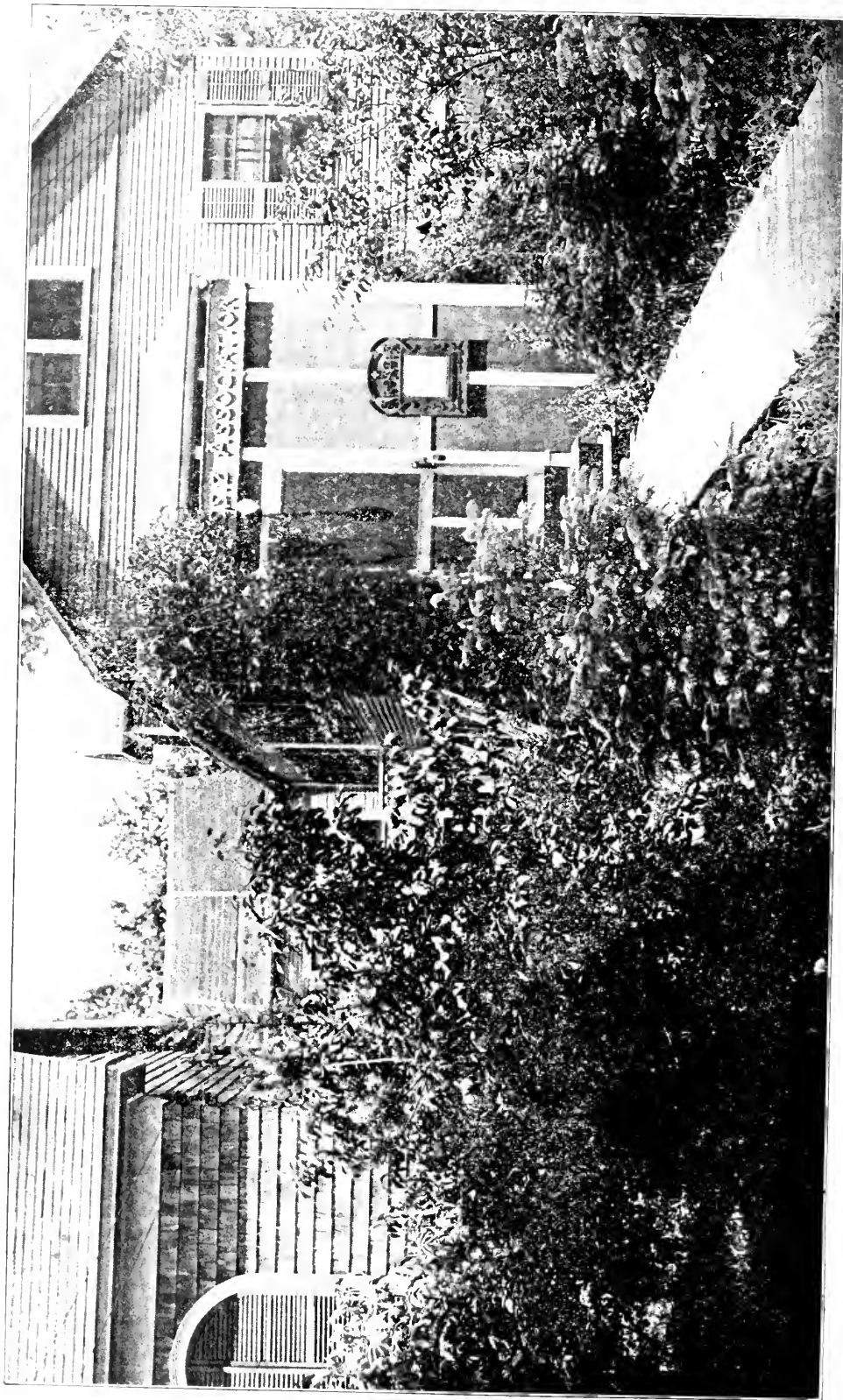
The storage building contains an enormous number of negatives and illustrations of every phase of nature study. From this house these are pretty constantly sent to naturalist's publications in all parts of the country.

Botany Bungalow is the home of an experienced botanist who gives her time freely in answering questions by correspondence or assisting in the instruction of visitors.

Birchen Bower, the residence of the Bigelow family, while a part of ARCADIA, is not owned by The Agassiz Association, yet it adds to the comfort and satisfaction of the visitor and the facilities for carrying on the work of The Agassiz Association.

The Agassiz Grove is a picturesque place and is well adapted for visitors, for picnics or for ornithological students. In this grove there will be a development known as Little Japan, consisting of pavilion, cook room, rest cottage, etc. In connection with ARCADIA is the Forest of Arden of 100 acres, a region of uncultivated nature within about six minutes walk of ARCADIA and well adapted to all sorts of biological investigations, including microscopical life of remarkable richness and variety.

The growth of the institution in recent years has been rapid. The Agassiz Association has the hearty cooperation of the New York, New Haven and Hartford Railroad, which leases to it, for a nominal sum, an extent of territory for the study of wild nature. In this part numerous trees and shrubs have been planted, and walks have been built by the generous and liberal aid of the railroad company. The institution depends for its support upon membership fees, gifts, and the income from subscriptions and advertisements in its magazine, *THE GUIDE TO NATURE*. The President of the Association receives only a nominal sum for certain mechanical work in connection with the magazine. He has no salary for editing *THE GUIDE TO NATURE* nor as president of The Agassiz Association. In this missionary work he is liberally aided by the members of his family and by a number of associated naturalists. Some of the latter edit depart-



ARCADIA—ENTRANCE TO THE OFFICE AND LABORATORY, the center building in the distance. The eastern end of the Welcome Reception Room is shown at the left.

ments and supply text and illustrative material in an extensive range of natural subjects. The spirit of The Agassiz Association is free from commercialism. It is thoroughly permeated by a spirit of helpfulness to others. It emphasizes not only the joy of seeing for oneself, but, more than that, the joy of relating that observation to others, which Ruskin says

and nature, but such improvement may be considered from various points of view. In nature, the agricultural college is primarily considering humanity's stomach. Most modern forestry has humanity's homes in view, and modern mining has as its end humanity's transportation or machinery for some utilitarian purpose, or some utilitarian object for the benefit



THE ROSES AND "OLD-FASHIONED" HARDY PLANTS BY "BIRCHEN BOWER."
(The Residence.)

is the greatest thing in all the world.

We often hear the expressions, "art for art's sake," "music for music's sake," "nature for nature's sake." Only a moment's consideration is needed to realize that all these are delusive. There can be no music for music's sake, and no nature for nature's sake. A human being must necessarily make the whole world benefit himself or his kind. Music is for the improvement of one's fellows, as are art

of humanity. The useful must necessarily be uppermost in the human mind. All life is built on a physical basis. But homes, food, clothes, travel, working conveniences and modern inventions of transportation are a means to an end. They provide material things for real life. In the struggle for improvements in material things of life, there is danger that the highest plans of life may be forgotten.

In the multiplicity of articles, maga-



WHERE VISITORS GO FROM THE WELCOME RECEPTION ROOM TO THE AGASSIZ GROVE.

zines and institutions, for example, that tell one how he may go to nature and live there comfortably, have a picturesque modern home, a flower garden and a vegetable garden, and how he may make these profitable, there is danger that the real essentials may be overlooked. Theological seminaries and churches as social organizations do not produce the inner religious life which is the most important of all. Neither do elaborate magazines that tell how to plan and furnish a home in the country, tell us how really to live on a farm, but rather how to care for a garden or to have the best cow or pig in the community. Biological laboratories, however well equipped for research work in life forms, do not necessarily tell humanity how to live. Nor do huge observatories and gigantic telescopes tell one how to obtain the real influences and the real joy from the heavens. All these so-called practical concomitants of life are useful and have their place, but they are useful only as a means to an end. One may study any aspect of nature all his life and never make it really his own. It is in spirit an

actual entering into the realms of nature for personal uplift and joy that The Agassiz Association was established at Lenox, Massachusetts, forty-one years ago this summer. It has had a varied experience not only in itself but in noting the multiplicity of organizations that owe their origin to The Agassiz Association and under its influence have branched out into a wide range, all of them considering nature. There are organizations that forbid one to whip a horse or to pull a cat's tail. There are others that forbid the wearing of birds on the hat and the shooting of them for pies. There are others that promulgate athletic activities and outdoor life and the building of bonfires in the woods, with long ceremonies that seem to share the customs of the untamed savage in his propitiatory worship of nature. There are others that believe in pulling fish from the ponds and streams for pleasure, and in various forms of killing wild life known as hunting. Some societies take their members afield to name and classify the plants, to gather mushrooms for food; still others walk abroad and feel satisfied when they re-

turn with a check list of the birds they have seen or the flowers they have named. Still others depend for results upon the number of miles they have "hiked" and others, liberally supported, have as their gospel fresh air and pure food in contrast even for a few weeks or a few days with the stifling influences of the great and crowded city.

All these are highly commendable in their own special field. When one considers any one of them, he wishes to devote his life to that particular form of nearness to nature. One man longs to go to the country and raise bullfrogs or skunks, while another would like to specialize in taking young people from the crowded city to camps for a few summer weeks, while another would like to tell every young man in the country how to apply the proper fertilizer to a field to obtain the best crops; while another gives careful consideration to the best form of fishhook or the proper kind of fly to use and when to angle successfully for large and spirited fish. But these are only parts of a wondrous and inspiring whole, parts of the life of old Mother Nature. It is too big an undertaking to specialize in all forms of nearness to na-

ture, but nearness to nature is too important to have any part of it neglected. It has often been said that if one were to go through a big university and take all the courses about one hundred and fifty years would be required. What can one do in such a dilemma? Shall he be contented with a smattering and know nothing thoroughly, or shall he know thoroughly some one thing and nothing of anything else? The Agassiz Association has always believed that one should survey the whole field and become a specialist in one or a few things and then have a wide range of sympathy and helpfulness for others interested in other departments. One who shuts himself within a shell, whether it be a mental pursuit or a physical cell, limits himself to a restricted range of enjoyment.

Dr. Bigelow and ArcADIA.

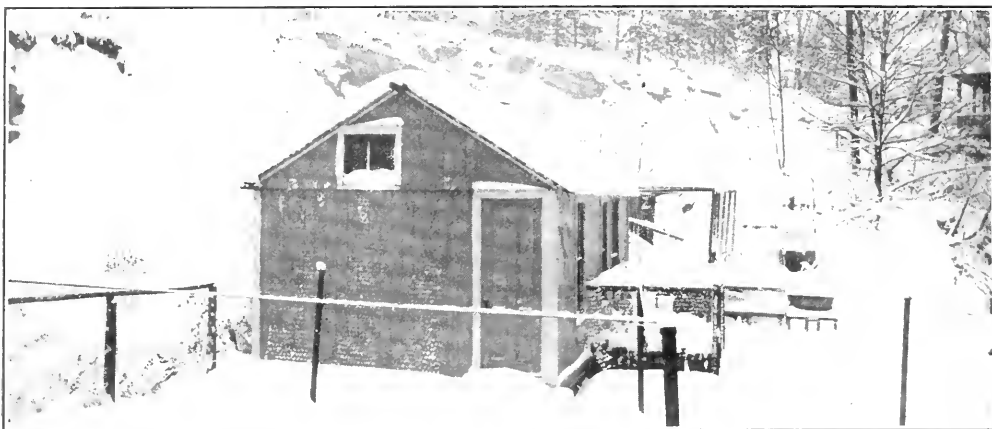
(AN EDITORIAL IN THE "SATURDAY CHRONICLE," NEW HAVEN, SATURDAY, AUGUST 5, 1916.)

Those of our readers who know the lure in nearness to nature will find much satisfaction in the interesting story of ARCADIA on another page of this issue,



THE ENTRANCE TO BOTANY BUNGALOW, THE HOME OF THE BOTANIST.

The building is almost completely covered with roses and honeysuckle, and is surrounded by a picturesque botanical garden.



THE PRESENT ARCADIA GREW FROM THIS ONE BUILDING IN A BACK YARD IN STAMFORD ONLY EIGHT YEARS AGO.

Note the one snow capped hive, the total apiary at that time.

by Doctor Edward F. Bigelow, its creator and director. Situated in one of the most charming regions of Connecticut, with an immediate environment of its own as full of enchantment as its name, this ideal institution, although unknown to many lovers of nature in our own state, is a Mecca for pilgrims from far and near. The gradually widening knowledge of its existence, of its purposes and aims—its soul-feeding mission, will bring to it an

ever increasing list of votaries to share in the feast of nature secrets its methods are ever unfolding.

To those with an innate fondness for the things of the natural world about them and a longing for intimate knowledge of its mysteries and myriad offerings ArcAdiA brings a light which clears the powers of perception and an open sesame rich with revealings. The particular advantage in an alliance with this



THE APIARY FOR DEMONSTRATION, INSPECTION AND EXPERIMENT.



A DELEGATION OF YOUNG NATURALISTS FROM THE CHILDREN'S MUSEUM, BROOKLYN, CAMPING IN THE AGASSIZ GROVE.

institution for purposes of nature study and the realization of the exaltation springing from intimate association with nature, lies in the thoroughness of method which rules its ways. It leaves the obvious and superficial to those who are satisfied with these for knowledge, and with its keys of science goes to the heart

of things and unlocks the secrets that give new vision and passports to the better side of life.

Doctor Bigelow issues an attractive little magazine which brings regular messages of the doings at ArcAdiA and is as full of the call to nature as the song of the wood thrush or the riot of beauty in an autumnal landscape.



DR. BIGELOW PRESENTING A CHARTER TO A NEW CHAPTER.

Trees and Flowers.

BY W. C. BANKS, STAMFORD, CONNECTICUT.

Some years ago, my interest was directed to flowers and trees and I became painfully aware that I knew less than nothing about them. I determined to remedy this. But at the start I encountered the obstacle that I believe prevents thousands from becoming students of nature: a lack of information concerning text-books and methods of study. I did not know where to get the books I needed, nor where to apply for the information. ARCADIA? Well, yes, now; but at that time Sound Beach was more noted for strawberries and clams than as the seat of a popular nature college.

I had an old Gray's Manual but I do not recommend it to a beginner. At that stage of my knowledge and desires, it repelled me. Finally, I found the books I needed. I procured a copy of "Our Trees and their Leaves" (Matthews) and "Field Book of American Wild Flowers" by the same author. I also bought a copy of Gray's "Field and Class Book of Botany." This is Gray's original work, not revised, and although it is perhaps somewhat obsolete, I value it highly. With this book I studied botany all one winter. It is necessary to have a little knowledge of the technical side of the subject in order to appreciate and enjoy the study of flowers and trees. In my rambles about the country, I collected the leaves and, as far as possible, the fruits of every available species of tree. By comparing these with the descriptions and illustrations in my text-books I soon became well acquainted with most of the trees of this region. The number of beautiful species that we have is really surprising. It is fascinating to study them, they differ so widely in form and character. Compare, for instance, the white oak, gray birch, beech, tupelo, bilsted and chestnut, not forgetting the white elm and the tulip tree. What a difference in the habit of growth and in the form and color of their leaves. I have a large box full of dried leaves that I collected while studying trees. I have several times thought to destroy them, but

they are so associated with memories of pleasant rambles in the woods, that, thus far, they have escaped cremation. They are not so much dried leaves of ancient vintage as documents proving that I had a right good time the day I collected those from the tulip tree, and saw the beautiful greenish blossoms touched with red. Also, the day I collected this spray of the hop hornbeam near Gorham's Pond and got caught in a shower, which I weathered nicely, thank you, under the wide branches of a hemlock. Also this big, tinted, sugar maple leaf, which came home with me from the Shepaug Valley, together with a bagful of garnets and spathic iron ore, with memories of masses of scarlet and gold on the rocky hillsides under a blue October haze. And so on through the box. I intend to be sentimental and keep those leaves.

In studying the wild flowers I selected a piece of country about one-half mile long and one-quarter mile wide, on both sides of the Noroton River. Once a week I explored this region. In this way I came to know the flowers in their season. The number of species that a limited area, such as this, will yield, is surprising. This has now been partly cleared and built on and many of the wild flowers are gone, still I find some of my favorites, but in sadly reduced numbers. Wild flowers and civilization do not successfully mingle. I remember, as quite an event, the time when I found the Indian cucumbers growing on the edge of a swamp. Also the masses of pinxter flowers, and the water lilies, and the half acre of Pentstemon in blossom, and the day that I looked into a tangled growth and discovered the colony of closed gentian. But the "find" that pleased me most was a single stem of the Turk's-cap lily with twenty-one blossoms, looking like a Christmas tree with its candles lighted. And so on down the entire list of finds. There was, and is, a thrill in every one. Try it and see. I began this article intending to tell how I studied flowers and trees. But telling of the pleasure that I have had in their company has taken all my time. To be in their company is the best way to study them; find pleasure in their society and that will

furnish an incentive for many a woodland ramble.

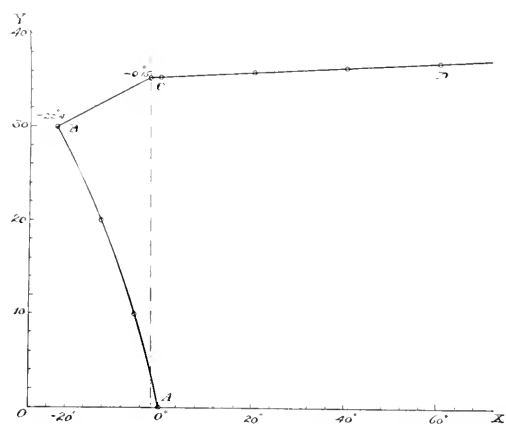
Finally, I procured a copy of Gray's Manual (Seventh Edition). Then, for the first time, I realized how little I knew about botany. But it wasn't so much botany that I was after as flowers and trees, and I already knew those fairly well. So I survived my perusal of that valuable work.

The Physics of Freezing Mixtures.

BY FREDERICK H. GETMAN, PH.D., STAMFORD, CONNECTICUT.

[Written by Request of the Editor of this Magazine.]

It is well known that the process of solution is accompanied by a thermal



DIAGRAM—SEE LAST PARAGRAPH OF NEXT COLUMN.

change. In general, when a salt dissolves in water the temperature of the system falls. For example, a marked lowering of temperature occurs when potassium iodide is dissolved in water, while if ammonium thiocyanate is dissolved in water (20 grams of salt in 25 cubic centimeters of water) sufficient heat will be absorbed in the process to freeze the containing vessel to the surface of a block of wood which had previously been wet with water.

There is abundant evidence to show that when a substance dissolves its condition is analogous to that of a gas. The essential difference between a substance in the solid, liquid and gaseous states is its energy content. In other words, when a solid is converted into a liquid, or when a liquid is converted into a gas, energy in the form of heat is required. Consequently when a salt goes into solution heat is taken up from

the solvent and a fall of temperature results.

When sodium chloride (NaCl) or common salt and finely crushed ice are intimately mixed, as in the familiar freezing mixture used in making ice-cream, a small amount of the salt dissolves in the liquid water present and the thermal equilibrium of the system is disturbed. Assuming the system to be well insulated from the warmer environment of the room, further solution of the salt can only take place by the melting of more ice with a consequent lowering of temperature. The liquid water resulting from the melting of the ice, dissolves more salt, and more ice is thus forced to melt with a further reduction in temperature. This process will continue until ultimately one of three things will occur, viz., (1) all of the salt will dissolve, or (2) all of the ice will melt, or (3) a mixture of salt and ice having the same composition as the solution will be formed. This mixture is termed a *cryohydrate* and the temperature of the system corresponding to this particular mixture of ice and salt is called the *cryohydric temperature*. The lowest temperature which can be obtained with any definite freezing mixture is the cryohydric temperature.

A clear insight into the mechanism of freezing mixtures can be obtained from the accompanying diagram representing the solubility data for sodium chloride. The solubility of sodium chloride expressed in grams per 100 grams of water is plotted on the vertical axis OY, and the corresponding temperatures are plotted on the horizontal axis OX. Starting at the point A, representing the melting point of ice (0°C .), and adding increasing amounts of salt, the temperature falls along AB until the concentration of salt corresponding to B is reached. At this point both salt and ice separate together and the cryohydric temperature, -22.4°C ., is reached. This is the lowest temperature attainable with salt and ice. Again, starting at the point D (60°C .) and lowering the temperature, the solubility of salt in water diminishes as indicated by the line DC. At C (-0.15°C .) the salt which separates from the solution holds in chemical

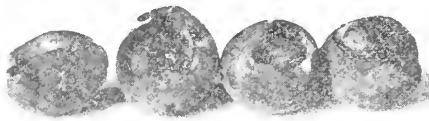
combination two molecules of water and has the composition represented by the formula $\text{NaCl} \cdot 2\text{H}_2\text{O}$. On further cooling of the solution the solubility of the hydrated salt, $\text{NaCl} \cdot 2\text{H}_2\text{O}$, changes along the line CB and finally terminates at the cryohydric point B, corresponding to a concentration of 30 grams of sodium chloride per 100 grams of water. This diagram makes it clear that the most economic proportion in which to mix ice and salt for the production of low temperatures is that corresponding to the composition of the cryohydrate.

It is obvious from the foregoing discussion of the mechanism of the production of low temperatures by means of ice and salt, that the function of salt in removing ice from a side-walk in winter is to form a salt solution having a lower freezing point, the changes involved represented by the line AB.

The Snail.

BY ROBERT S. WALKER, CHATTANOOGA,
TENNESSEE.

Almost everyone knows a snail when he sees one, but how much do we know about the queer, interesting little crea-



PEACHES EATEN BY SNAILS.

ture? To begin with, did you suppose there were more than fifty different kinds of snails in the United States? There are, although by far the most common is the *Helix Pennsylvanica*.

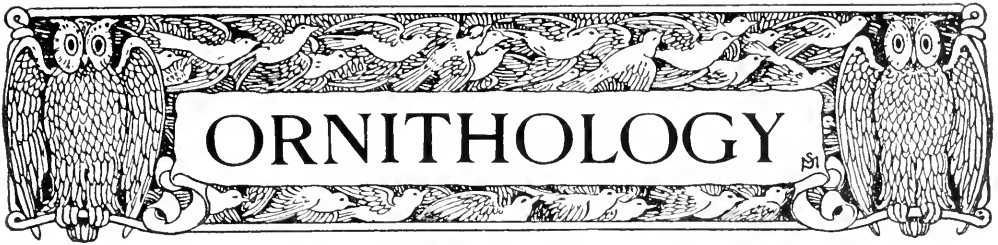
A good many people believe that snails are blind; they are not, although their sight is not at all keen. If you watch a snail moving about, you will see it push out its two tentacles, which remind us of the antennae of a butterfly. The eyes are placed at the tips of these tentacles.

How and when does the snail get his

shell? That is another question often asked by country folk. The answer is: he is born with it. The eggs are laid in early spring, and within four weeks they hatch. The eggs are enclosed in a capsule, and an amazing number of little snails, usually about fifty, each in its delicate shell, are to be found in each capsule. The shell hardens rapidly as it is exposed to the air, and the snail soon is ready for business.

Never look for a snail in a sunny, dry spot. Go to the cool, shady, grassy side of the house or garden, and if there are snails about you will find them. Violet beds are their favorite places of abode. They eat almost any kind of green thing. If you wish to give the snail a particular treat, scatter a few peaches in the grass plot or on the border of the violet bed. You may have a hundred snails in such a bed and never know it until you have tried the peach test. By the second morning you may find that the snails have visited every peach and eaten most of them. Snails break the skin of a peach and eat directly to the seed, and then continue to eat until nothing remains but a clean seed and a thin, fuzzy peach skin. Sometimes you will find as many as four snails wrestling with a single peach. Snails do not have teeth. The mouth is only a slender rasp-like "lingual ribbon."

A shower of rain is balm to a snail. That tender body of his must secrete plenty of mucus or oil, so there will be no friction and no sore feet when the day's journey is over. So dry weather is hard on the snail. A parched atmosphere absorbs much of the precious moisture that he cannot afford to lose. But when the misty days occur he is out immediately, tossing out his tentacles as if testing the humidity of the atmosphere, and using them as a nearsighted person uses a cane. The snail can walk only about twelve feet an hour, but he can walk up a pane of glass as fast as he can along a level garden path. That is because his creeping foot secretes a constant supply of mucus, and the contact of the foot is always with the surface of mucus and not with the glass or the ground. Whatever the surface or the slope of his track, the friction against which the snail must contend is always exactly the same—
The Youth's Companion.



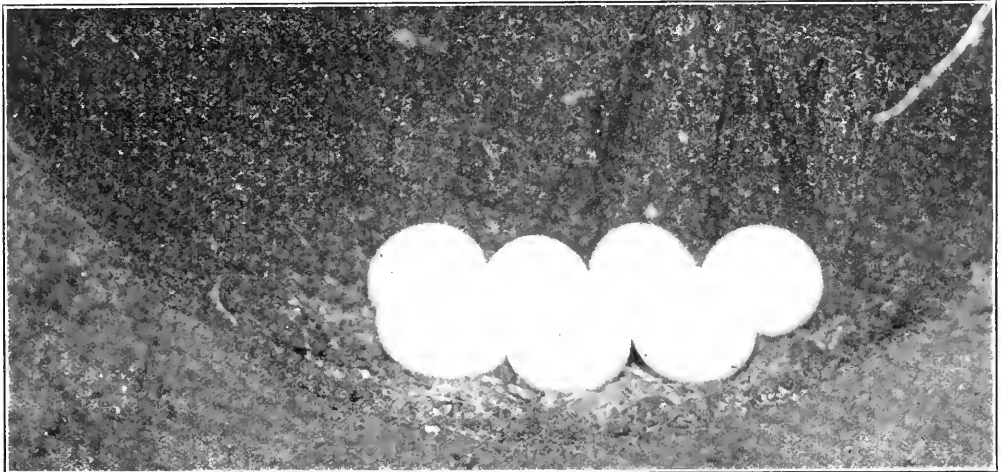
All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor

The Belted Kingfisher.

BY L. W. BROWNELL, PATERSON, NEW JERSEY.

Any of my readers who have ever spent even a short time in the country

table food, and he sometimes even seems to do so from preference. That he thus quite frequently changes his diet, often voluntarily when there is no real reason for so doing, has been conclusively proven upon several different occasions and the theory that he lives exclusively upon a fish diet seems to have been thoroughly exploded. Captain Charles Bendire tells of baiting a trap for an owl with a mouse and upon visiting it the next morning he found a kingfisher caught by the



THE NEST OF THE KINGFISHERS.

near a lake, pond, river or stream of any size that contains fish, must surely be familiar with the sharp, rattling, roll-call-like cry of the belted kingfisher; for, although the bird himself is large and his plumage rather striking, his call is so very much more conspicuous than is he himself that it is often by it alone that we are made aware of his presence, and should it be sounded within half a mile of us we cannot help but hear it.

He is, as his name implies, largely but by no means exclusively a fish eater, taking his prey alive, in fairly deep water, by accurate, well planned dives, in which he seldom fails of his object. When he cannot obtain fish he will resort to a diet of insects, small mammals and even vege-

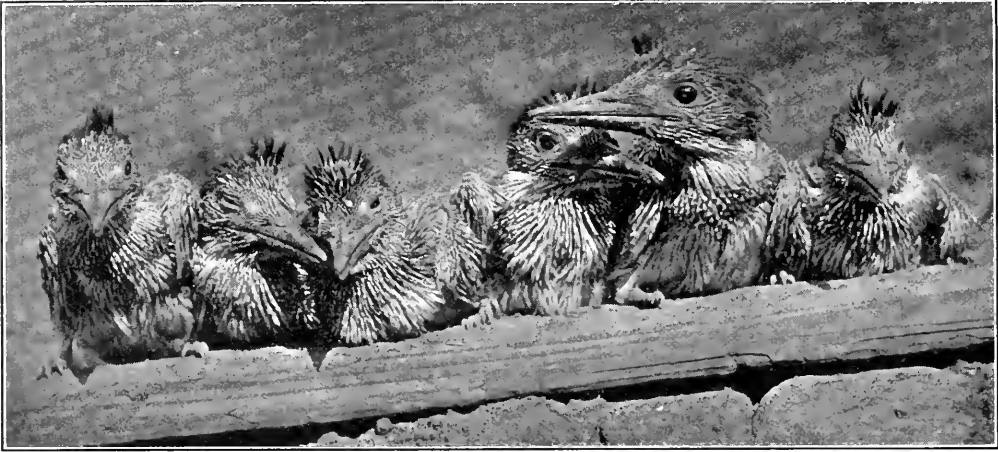
neck. The bird had evidently plunged downward for the bait in the same manner that he would have dived for a fish and sprung the trap with his beak. Dr. Elliot Coues relates the following concerning a bird of this species that was closely observed for some weeks in Florida:

"When the water is so rough that it is difficult for him to obtain fish, instead of seeking some sequestered pool, he remains at his usual post, occasionally making an ineffectual effort to obtain his customary prey, until, nearly starved, he resorts to a sour-gum tree in the vicinity, and greedily devours the berries." This argues him to be rather deficient in intelligence, which is undoubtedly true.

The kingfisher has been, for many years, unfairly branded as a fish thief and, as such, he is shot, upon every occasion that offers by members of the angling fraternity. They never stop to consider that the bird, who catches the fish for food only, has really a much greater right to them than he who catches them merely for the pleasure which the sport affords him. In consequence of this he

distinguish, much less describe, but of which we are nevertheless aware, and which must carry its meaning to the listening ears of others of his species.

His favorite perch is a dead branch overhanging, or a pole or stump protruding from, the water. Upon such a perch he will sit by the hour patiently waiting and watching for some unwary fish to swim sufficiently near to give him his



YOUNG KINGFISHERS.

has been persecuted to such an extent by man that he has learned, by bitter experience, to distrust and fear him and has finally become so wary that it is no longer easy for a human being to approach even within gunshot of one.

His peculiar sharp cry is the only note to which he, seemingly, can give utterance. He uses it upon every occasion that offers and as a voluble expression to every feeling of which he is capable. Moreover this cry is usually uttered while the bird is on the wing, generally either immediately after leaving a perch or just before reaching one; while winging his way from fishing ground to nesting site, or upon leaving the water after having made a catch. It is his signal to his brooding mate when approaching the nest with food; his cry of alarm to warn her of some threatening danger; his love song when wooing her; and his challenging war cry to an intruder upon what he is pleased to consider as his especial domain. While, to all intents and purposes, this cry is, in every case, absolutely identical, still for each different occasion it has a different intonation that alters it in an intangible way that one can hardly

chance to make a catch. Each bird or pair of birds seems to have three or four favorite perching spots within the limits of their exclusive territory and they divide their time pretty equally between them, rarely returning immediately to the same perch after having caught a fish. While occupied in waiting for his opportunity the bird remains almost absolutely immovable and, on account of this, despite the fact that his plumage is rather brilliant in coloring, it is extremely difficult to detect him against his background of dark green foliage. Unfortunate indeed is the fish that passes close enough beneath him to afford him the opportunity for which he has been waiting, for it is almost certain that this particular member of the finny tribe will shortly leave his native element never to return to it. There is an instantaneous flash of wings on the part of the waiting bird, an almost simultaneous splash, and he has disappeared completely beneath the surface of the water. The next instant, however, he is again on the wing and, giving voice to his rattling cry, he is darting along the bank to his nest or to one of his favorite perches where he

can devour his prey in peace and quietness. That he has the fish for which he dove is almost a foregone conclusion, for he rarely misses when once he has seized the opportunity and made his dive. His name is, undoubtedly, well deserved for he assuredly is a king fisher.

The kingfishers are anything but social in their relations with each other and it is most unusual that two pairs should be found nesting within anything like a close distance of each other, or even using the same fishing grounds. Clear streams, small rivers, ponds and small lakes that abound with fish and whose shores are, at least in spots, more or less perpendicular and well wooded, are their favorite resorts. Generally a pair will preempt a certain territory, such as a stretch of half a mile or so of a river bank or an entire pond if it is small, and will refuse to allow others to fish within this territory, much less make their nest there. There are, of course, notable exceptions to this rule, and there are cases on record in which the birds have formed quite a colony in some particular bank, but these cases are very rare.

Where a bank extends for a considerable distance it is very likely to be occupied by several pairs who place their nests at more or less regular intervals sufficiently far apart to avoid interference. I know of one such bank extending for something more than two miles that annually shelters ten or a dozen pairs of birds.

The kingfisher is of no very great benefit to man although he does devour some insects and a few rodents. On the other hand neither is he particularly harmful. The small amount of fish which he annually catches is of very little importance for he is not numerous enough anywhere to noticeably reduce the inhabitants of any one body of water. We can therefore, it would seem to me, well afford to allow him to live his life in peace.

He is the halcyon of the ancients who attributed to his spirit after death the power of directing the course of the winds. The week preceding and the week succeeding the winter solstice comprise the fourteen days that were known as the Halcyon Days. It was during this time that the sea was supposed to always remain calm in order that the kingfishers

might more easily build their strange nests.

To their bodies was attributed the power of giving peace and plenty as well as strength and beauty and all the other necessities of a happy existence. They were supposed to be able to turn aside the thunderbolts and therefore any house in which one was kept was perfectly safe from lightning, at least in the minds of its simple inmates. In some parts of France even to this day they are often called "moth birds" on account of the power with which their bodies are accredited to drive away and keep away moths from woolen clothing.

These are but a few of the myths and superstitions by which this bird, or rather this family of birds, has been surrounded. It is needless to say that they have no foundation in fact but had their origin in the strange habits of the different members of this interesting family.

The flight of the kingfisher is strong and rapid and he is capable of sustaining it for long distances without rest. When making extended flights he rises to a considerable height. His mode of progression consists of a series of five or six quick beats of his wings followed by a long glide.

He is nocturnal as well as diurnal in his habits and is abroad fully as much in the night as in the day.

A genuine love of nature in its broadest, deepest, highest development—a love which reaches with wide and eager vision and extended hands toward the stars above, and out upon the uttermost bounds of land and sea, wakening, vivifying, sharpening every sense, and enkindling in the heart a warmth of interest so genial and pervasive as to make one under its influence as a soul aroused to its real self from a vague, dull dream of being—a love of nature like this must inevitably start from some first point of individual contact. And the realm of birds is quite sufficient to meet the requirement.—Augustus Wright Bomberger.

A love of birds leads to a love of all nature, and a love of all nature to the brightest, best and happiest life under heaven."—Augustus Wright Bomberger.

A Tree Swallow's Unique Home.

Curious nesting sites are constantly being discovered which bring to our minds the strong individuality occasionally shown by some of our native birds. We have previously noted in this department several such instances, but the accompanying illustration probably shows a situation which is unique for a swallow's home.

In Canton, Massachusetts, on the line of the Blue Hill Street Railway, are



THE CURIOUS NESTING SITE OF THE SWALLOWS.

signal telephone boxes at the various turnouts, as is the general custom along suburban electric lines, and in Box 24 of this line a pair of white-bellied, or tree, swallows has nested during the past season, paying apparently not the slightest attention to the close proximity of passers-by.

These birds gained entrance to the signal box through a knot-hole in the door; this being shown in the picture just below and to the right of the key-hole. This entrance hole was one and one-half inches in diameter and but

fifty-one inches from the ground, the box itself being about three feet in height and eighteen inches square. In the rear left-hand corner at the bottom of the box was placed the nest, which was composed of dried grasses and lined with feathers. Notwithstanding the fact that this box was opened and the telephone used at half-hourly periods throughout the day, these birds continued to remain until their brood was reared, five eggs being laid and four being hatched, and brought forth by the faithful and undaunted little mother.

Strange it is that such a location should be chosen by birds which nearly always build their nests in the vicinity of water, selecting for this purpose a discarded woodpecker hole or natural cavity high up in the dead stub of an old willow, or in other convenient trees bordering the ponds and marshes or overhanging the river banks, where they skim the surface of the water and the lowlands, finding abundance of food among the hordes of insects which there abound.

A Sound from the Marsh.

BY W. I. BEECROFT, GREAT BARRINGTON,
MASSACHUSETTS.

Our most unusual experiences come unexpectedly. It was in this manner that I made my most interesting observation among the birds, an observation that has been accorded to but few. It was just at sunset. I was taking an after supper stroll along the railroad that runs through the marshes at the bottom of the Hoosac Valley in the Berkshire Hills of Massachusetts, when I heard, off in the marsh, a peculiar sound that I recognized at once, from descriptions that I had read, as the notes of the American bittern, sometimes called stake driver, marsh hen or meadow hen or mud hen. All the naturalistic temperament in me was aroused. I was filled with the desire to see and hear the bird at close range. Stalking a bittern in the tall grass and weeds of a marsh interspersed with clumps of alders and abounding in mud holes and water holes is no pastime for any except the enthusiastic naturalist. I will leave the details of that stalk to the reader's imagination. But after getting as near as possible without ex-

posing myself, I could see the bird with the exception of its legs which the grass concealed.

The opening notes resembled the sound made by striking a flat board or paddle against the water. How this was done I could not tell as the bird held its head low in the grass. I suspected that it might be done by snapping the bill together. Then followed the principal theme—ker-glug, ker-glug, ker-glug—with the head thrown up in the ker and bobbed down on the glug, accompanied by various contortions of the neck. After repeating the performance several times the bird flew away. The entertainment though short was highly interesting and I felt well repaid for my preliminary efforts.

The notes of the bittern are among the most remarkable sounds in all animate nature in this part of the world. It is eminently fitted to the muddy, oozy surroundings in which the bird dwells. In quality it has a peculiar bungholey sound, suggestive of the exit of a thick liquid out of a hole of a jug, with a muffled glug as the air rushes in. I think that no bird with the exception of the loon makes a sound quite equal to it. The long drawn out calls of the loons, their low dismal moans and their demonical laughter, all mingled together as I have heard them in the evening on the lakes of northern Maine, are the weirdest and most unearthly of any sound that I ever heard. The notes of the American bittern have been variously described. Like the songs of many other birds, they may not be always the same. The eventide serenade of this particular bittern was certainly unique in its way, grotesque in its performance and singularly appropriate to the place. I afterward often heard them at the same time of day but whether it is their usual hour for singing I cannot say.

It is one of the most enjoyable features of bird study, as in truth it is of life in general, that so many of its pleasantest experiences have not to be sought after, but befall us by the way; like rare and beautiful flowers, which are never more welcome than when they smile upon us unexpectedly from the roadside.—Bradford Torrey, in "A Rambler's Lease."

The Scarlet-Breasted Robin of Australia.

BY H. STUART DOVE, WEST DEVONPORT, TASMANIA.

A male scarlet-breasted robin, with nest and young, is here shown, being photographed at East Gippsland, Vic-



SCARLET-BREASTED ROBIN AT NEST.

toria, Australia, by Mr. T. H. Mac. This is one of our most familiar species, both in Victoria and Tasmania, and a little gem, with his bright breast, black throat and head and large white frontal patch. The female has a patch of red on the breast, a smaller frontal patch, and general brown plumage. This bird remains in pairs throughout the winter, while its congener, the flame-breast, flocks at that season.

The nest is of fine bark, protectively ornamented on the outside with mosses, lichens or coarse flakes of bark, and is lined with dry grasses or feathers. Three or four eggs are laid, and these are either greenish or creamy white, spotted with blue grey and brown.

A writer has observed that the first time the redbreast was seen in Australia by a naturalist it must have been on a boulder in a field in the wintertime—hence the name, *Petraeca* or "rock-dweller."

If you make a friend of Nature,
You will ever bless the day,
When you put your trust in something
That will gladden all your way.
—Emma Peirce.

Give Nature kindly welcome,
She does so much for you:
In all vicissitudes of life,
Her friendship would ring true.
—Emma Peirce.

Three Bird Homes.

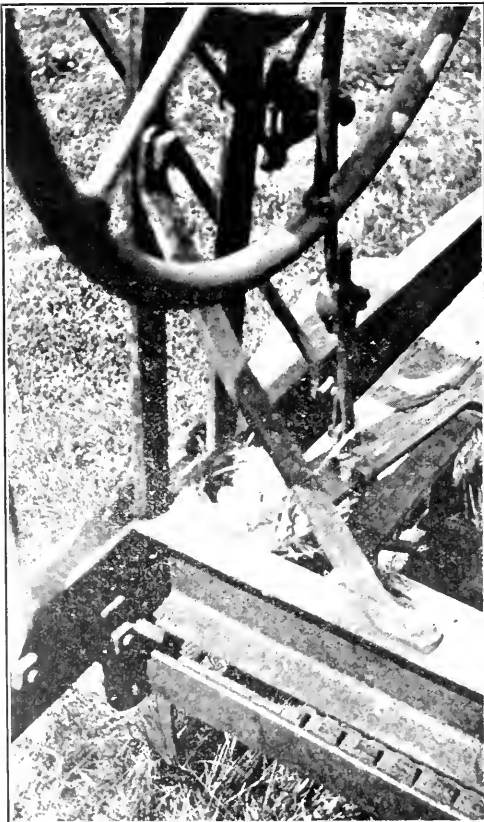
BY WARREN KIMSEY, LATHROP, MISSOURI.

I recently discovered a pair of Arkansas kingbirds building their nest on the fan of a windmill, near Delhart, Texas. This was not strange on account of the scarcity of trees—in the Panhandle one may look for miles and not see a single tree. There is no doubt but that these birds would have preferred a tree for their nest, but trees were more scarce than windmills. Around this particular ranch house, near which the windmill stood, there were several scrubby apple trees, though they were too low for kingbirds to use.

In another instance in Missouri, I found a robin's nest on an old road grader that stood by the side of the road. The picture shows the nest quite clearly—two of the four eggs being visible. In one sense the location of this nest was unusual as there were many desirable trees at hand; though it seems not so unusual when one considers that the robin is a freakish bird about its



NEST OF WHITE-BREASTED NUTHATCH IN HOLLOW TREE.



ROBIN'S NEST ON ROAD GRADER.

nest building, having the reputation for making its home in strange places.

There is a white-breasted nuthatch's nest in the hollow tree shown in the other picture—the location of the nest in this instance being characteristic of the bird. As I put my hand in at the bottom of the opening, I found eight crawly young birds in a furry nest. These industrious little birds seem to prefer to have their nest near the ground. Imagine—eight youngsters to be fed. I stationed myself near-by with a field glass and watched the process. The parent birds were wise. Most of the food was carried from a clump of willow trees, some two hundred yards from the nest. I think they were getting small worms from the tender leaves of the willows—the ragged appearance of the leaves indicated this. The birds worked so rapidly that they frequently met at the opening of the tree, or on wing between their home and the clump of willows. And no

wonder. Think of it! Eight hungry babies calling constantly for food.

The Federal Migratory Bird Law.

It has been thoroughly demonstrated that the Federal Migratory Bird Law has accomplished great good throughout many states in not only conserving some of our fast disappearing game birds by protecting them in their breeding grounds and through the mating season, but it has also resulted in a very substantial increase in many localities of certain species of our song and insectivorous birds.

This bill was put through only after exceedingly hard work by the friends and lovers of bird life, and as it doubtless caused some inconvenience to pot-hunters and to wealthy "sportsmen" who wish to shoot at all seasons, there has been a continued effort to get the bill, or parts of the same, nullified, though it has been generally acknowledged to be of the utmost benefit to the population as a whole, and has been declared to be entirely constitutional in its present form.

"Original regulations in Massachusetts, Connecticut and Rhode Island stopped shooting on January 1. They terminated shooting in Illinois, Iowa and Nebraska on December 16 and in Kansas and Missouri on January 16, which is late enough. The latest proposed regulations of the Biological Survey at Washington plan extending the shooting season to January 15 in southern New England and to establish an open season on wild fowl for the gunners of Illinois, Iowa, Nebraska, Kansas and Missouri between the dates of February 9 and March 11, in addition to the fall open season.

"This is spring shooting in mating time which is a crime against nature, against sport and against the spirit of conservation. If carried on it must end in the wiping out of the birds. These States are a valuable breeding ground of our depleted flocks of wild ducks and other waterfowl, which are increasing in number under the beneficent Federal law.

"All sections of the country are interested in this, for more wild fowl in Missouri means more wild fowl eventually in Maine, in Massachusetts and

all other States. Moreover, spring shooting in the Middle West will soon mean spring shooting in the other sections. Spring shooting soon means no shooting for it leaves no birds to shoot. The real sportsmen understand this as well as do the conservationists."

Let us take no backward steps in bird protection.

Swallows Gather Feathers for Nests.

BY F. H. VAN HISE, SUMMERLAND, B. C. CANADA.

On June 22nd, while in the yard by the lake, I noticed a northern violet green swallow trying to pick something up from the surface of the water, and upon going closer saw that it was a white chicken feather, which the bird finally secured.

I then went into the house and brought out a handful of feathers, dropping them on the water, from our wharf, one by one. I had been there only a few minutes when the swallows began to take them, coming sometimes within a foot or two of me. When I dropped them from a point as high as I could reach some of the swallows would catch a feather before it would strike the water. Once a Wright fly-catcher came and snapped at a feather as it fell, but did not get it.

There were about a dozen swallows here at the same time gathering feathers, and I frequently saw one bird take three (picking up one at a time) at one trip. Then they would fly away, though sometimes the males would remain, circling around over the feathers floating on the lake. Soon they would all come back again for more. Sometimes when one got a feather the others tried to make her drop it, and then catch it as it fell.

I do not think that the males took any, but am not certain, as they were taken so fast that it almost made me dizzy to count them. These birds took one hundred and twelve feathers in forty-six minutes.

Come out into the air,
There's ozone enough to spare;
'Twill fill your lungs and clear your
head,
You'll better earn your daily bread,
If so your day you share.

—Emma Peirce.

The September Stars.

The whole sky is full of wonderful objects of interest; the Milky Way in particular will well repay many evenings of exploration, and the observer might also carefully examine the colored stars, clusters and nebulas of Andromeda, Lyra and Hercules if he has not already done so. It is probable

The constellation Aquarius is of very great antiquity. The very earliest human records (which are those of Babylonia) show the familiar Water Bearer and his Urn; this region of the sky was known as the Sea, possibly because the sun passed through it during the rainy season. Some students ascribe to this group the enormous antiquity of 15,000



Figure 2. The Constellation Aquarius.

that it is such faint groups as Sagittarius, Capricornus and Aquarius which are less well known to many readers. In the last constellation the curious "Y" formed by the stars at A, Figure 1, is most apt to be familiar to the amateur observer, though the whole constellation contains objects of interest, many of which are visible in a telescope of but two or three inches' aperture.

The Y-shaped group of stars marks the Urn held by the Water Bearer, from which there ceaselessly flows a great stream of water, outlined by the stars A, B, C, D and E. The Southern Fish, whose head is marked by Fomalhaut, is represented, unnaturally enough, as perpetually swallowing all the water of this stream.

years. In the false science of Astrology, Aquarius was given great importance, its stars influencing the air and seasons "in a wonderful, strange and secret manner." For example, when it was on the horizon with the sun the weather was sure to be rainy.

The possessor of a small telescope will find that the stars G, H and K, and also all of those marked L (Fig. 2) are most interesting double stars. The two suns at G are of a greenish color and revolve about one another in the course of about 700 years. At H there are three stars, the closest together being yellow and blue, respectively, and thus forming a fine contrast, as indeed do many of the other pairs. It was in front of one of the stars at H that the

planet Mars was seen to pass in the year 1672, an observation which later proved of very great use in determining the motion of this planet and also the mass of our sun and the distance from the sun to the earth. In 1643, when the planet Jupiter was a little to the left of the star at N, it was seen surrounded by five little points of light and the dis-

or less after sunset. This planet will pass to the west of the sun, and so leave the evening sky on October 5.

Venus is a brilliant object in the morning sky, where it will be seen rising in the northeast three hours before sunrise. It reaches its greatest distance west of the sun on September 12; at this time it has in the telescope the shape of the moon when half full. Venus will pass to the east of Saturn on the morning of September 9; the two planets will then form a most attractive figure in the morning sky.

Mars during the month will move from the eastern borders of Virgo almost to the bright southern star of the Balance. It is now too near the sun to come within the borders of our evening map, and, though it may be seen in the southwest for about two hours after sunset, it is in very unfavorable position.

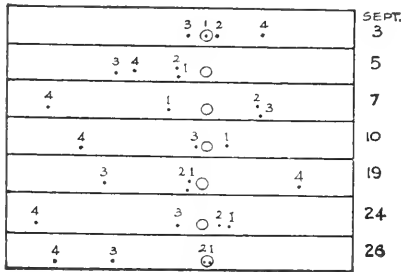


Figure 3. Showing the relative position of the planet Jupiter and its four brightest satellites as seen in a small inverting telescope in the early mornings of the dates indicated. (At 20 minutes before 1 A. M., E. S. T.)

covery was accordingly announced of no less than five new Jovian moons. The slowly moving planet, however, in time left its new companions behind, and these distant little stars may be seen still grouped together at any time.

At the point M (Figure 2) there is a beautiful round nebula; at R of Figure 1 there is the "Saturn Nebula," while a bright nebula from which a stream of stars branch out will be found in Figure 2 at S. In this region also there are many variable stars. At U there is a sun which varies in brightness from the sixth to the eleventh magnitude in the course of thirteen months, while the star at V constantly varies from the eighth to the twelfth magnitude in a period a little longer than nine months. What causes are in operation to make these and many other distant suns suddenly and regularly blaze out with hundreds of times their usual brightness we do not know. But if our own sun should vary in this manner all life upon our earth would be quickly destroyed

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The Planets in September.

Mercury will attain its farthest distance east of the sun on September 9, and for a few evenings before and after this date may be seen shining brightly in the southwest, low in the twilight glow. It should be looked for an hour

The beautiful and interesting Jupiter is now seen well above the ground in the east in the position indicated in Figure 1. The planet is now moving slowly westward (or retrograding) in the constellation Aries. It is in excellent position for observation, but it can be studied to best advantage when, toward midnight, it has mounted higher in the sky.

Saturn is shining near Venus in the early morning. Its rings are now widely opened and it is in favorable position for observation.

On September 22, at 4 hours 14 minutes P. M. (Eastern Standard Time), the center of our sun will cross the celestial equator and at this instant autumn will begin. Were it not for the refraction of our atmosphere, which causes all heavenly objects to appear slightly higher above the ground than they otherwise would be and thus slightly lengthens the apparent day (from apparent sunrise to sunset), the night of September 22 and the following day would be of exactly the same length.

* * * * *

The Observation of Jupiter's Satellites.

The possessor of a small telescope will find it most interesting to study the rapid motion of this planet's four bright moons. If he will look at the system at any time, carefully noting or sketching the positions of the satellites,

and then, after the interval of an hour or more, point his telescope upon the system again, he will readily see that not only have the satellites changed their positions, but that the ball of the planet is also rapidly turning around.

At frequent intervals one or more of the moons will be seen to pass in front of or behind the planet. Jupiter is also attended by a great conical shadow, which stretches out into space in a direction exactly opposite to the sun, and occasionally a moon may be seen to pass within this shadow and be eclipsed.

For example, if Jupiter is examined on the morning of September 3, when near the meridian, at 12 hours 10 minutes A. M. (Eastern Standard Time), the appearance will be that indicated in Figure 3, the moons all crowded close to the planet and one of them projected on the disc. On this same evening the moon will enter the planet's edge at 1 minute 25 seconds A. M. and emerge from it at 2 hours 8 minutes 31 seconds A. M. Meanwhile another moon will

be seen to emerge from behind the planet at 13 minutes 36 seconds A. M.

Similarly, on September 9, there may be seen:

Third moon begins transit, 9 hours 45 minutes P. M.

Second moon disappears in eclipse, 10 hours 2 minutes 30 seconds P. M.

Third moon ends transit, 10 hours 41 minutes 56 seconds P. M.

First moon begins transit, September 10, 1 hour 48 minutes 40 seconds A. M.

Second moon reappears from behind planet, 2 hours 34 minutes 45 seconds A. M.

First moon ends transit, 3 hours 55 minutes 51 seconds A. M.

It will be noticed that during much of this night there will be but two moons which can be seen separated from the planet.

Similar especially interesting eclipses, transits and occultations will occur on September 10, 16, 18, 23, 24, 25, 26 and 27, but space is here wanting for a detailed description of them.

The Awakening of Greenwich.

BY VIRGINIA PERESFORD, AGED 13, WABANAKI SCHOOL STUDENT.

It is now three o'clock in the morning, the sky is beginning to turn grey, and the stars to vanish, one by one. I am still sitting at my desk at the window by the light of one sickly candle. Oh! how dreary it is, there is a cold chill in the air, but I am not sad because I know that in a few hours this side of the world will be transformed.

I lean my head on my hand, my brain is not fit for work at this hour, it is only fit for musing. My God! It must have been terrible, (but terrible has no meaning now-a-days) when people at one time lived in such a world as it is at this minute, dreary and cold, with never a change for months together! And how wonderful it was when perhaps a child ran out of a cave and cried, "Oh mother, what is that thing in the sky?" And the mother falling on her knees cried out, "It's the sun! It's the sun! Oh joy!" And all the people worshipped the pale glimmer in the sky, and little by little it grew stronger and stronger till it was at its glory! What a time that must have been! As I look through my window all these things pass

through my weary mind.

Look! There is a red glow, faint as my poor candle. It grows and deepens in color, then another ray, and another! They seem to light up the whole sky, which is turning blue. Now a tip of the real sun and now the whole of it! Oh! How wonderful it all is!

Now the leaves are stirring and the birds singing. Next door a window opens, and an old man in his nightcap looks out and laughs for mere joy at the sight of jolly Mr. Sun.

Now the sun is well up in the heavens. I turn my gaze southward and see the first automobile whiz up to the station and another, till there are twenty. Then comes the train and stops a minute for the hurried passengers, who crowd on, then it speeds out of sight, leaving no trace.

Then I see the sparkling water, blue as the sky in May. In another direction I see the smoke of the Council fire of Wabanaki. Now men go in and out of the stores, up and down the streets. The early school boys pass by with a merry laugh. All this is too much for me,—I blow out my candle, shut up my book, and walk out to be a part of this happy town—Greenwich.—Our Town.



EDITORIAL



The Obstacles to the Dissemination of Good Things.

Only in a limited sense are all men created free and equal. No one is free to act for himself nor are all people equal. Everybody must regard the rights of others, and so long as there are differences of capacity and ability, so long will there be those who have much and those who have little. This is true of mental as well as of worldly wealth. Everyone possessed of knowledge or of goodness, or of a desire to disseminate that goodness among others, knows that the weak-minded, pernicious and miserly are few. I have had opportunity to know men and women of great wealth but I have known very few who were not desirous to disseminate that wealth among others, and they do do it as far as they can, but they would accomplish vastly more if there were no obstacles that work against such dissemination of good things.

The rich man desires to do good with his wealth and would do so more frequently, if his efforts were not so discouraged. And yet people who try to bridge the apparent chasm between the so-called classes and masses are especially found of thinking that the rich man disregards the masses and they quote, or misquote, the alleged saying of an old-time wealthy man who is reported to have said, "The public be damned." I seriously doubt whether any rich man ever said that or felt like saying it. If he were wealthy, he did not acquire his wealth without a fair degree of common sense, and that common sense would tell him that his wealth came from the public. The wealthier a man is, the more regard he has for the public, and this regard manifests itself in efforts to benefit the public. One needs to be only ordinarily observing to see that many examples which come to the rich man thoroughly dishearten and discourage him in his philanthropical efforts.

In Sound Beach only a few years ago, a wealthy man tried to share the delights of his extensive acres with his fellow citizens. He said, "Come and use my well mown acres as a free golf ground." The offer was gladly accepted by the mass of his fellow citizens. But everywhere there are always selfish, ignorant citizens, although in Sound Beach there are few such. Some of these came from New York and other places temporarily for the summer. They became members of that golf club and took the privileges as if they were inherited rights not only for use but for abuse. A prominent woman of Sound Beach only a few days ago told me that she saw people coming from those golf grounds laden with shrubs and flowers ruthlessly broken and ungratefully gathered from this man's premises. One day, the owner met a party of such vandals and found examples of their plundering. There was but one thing to do: regretfully he did it. He told the golf club to go. The result was caustic criticism; he was "a mean man," "he wanted to keep all his acres to himself," "wouldn't let the golf club," etc., etc. Every right thinking person should have said, "Those despoilers should have been taught a lesson even if it had required a jail sentence to do it."

There is the old story of boys in an apple tree who would not desist for kind words or pieces of turf; nothing availed but stones. It is that principle that necessitates laws, jails and state prisons.

There has been another marked example in Sound Beach. We have an exceptional example of a well-to-do man who has made serious efforts to benefit the public, and to scatter good things so that everybody might enjoy them. Mr. William L. Marks has spent a fortune on Laddin's Rock Farm and his joy in doing so was generous and altruistic; it centered wholly in his pleasure of doing for his fellow beings.

For years his gates were open to the public. His grounds were a public park maintained at private expense, but consider the ingratitude of a few who should be taught a lesson. Armfuls, wagonfuls, of his flowers and plants were carried off. Trees were broken down and fences overturned. The damage was appalling. That the rascals were few while those who properly used and appreciated the premises were many, is the only bright point in the whole of this awful spoliation. Mr. Marks was obliged to close the gates for at least a part of the time. He tried to do well, but was thwarted by the few who seem to have more power for evil than the rest of us have for good.

The Agassiz Association consists wholly of members who desire to disseminate good things in information and interests of Nature. That Association is established at ARCADIA, where information is given freely and the beautiful premises may be enjoyed by everybody. It exemplifies the missionary spirit of doing good to others, and yet how astonishing have been the obstacles placed in the way of these missionary efforts. There has been the wealth of knowledge or the wealth of money for such dissemination and both efforts have been discouraged. Few people seem to realize that the whole thing is free from all commercialism. They believe that some one has an axe to grind and that somebody is making money out of ARCADIA. For two years that opinion was prevalent. A catastrophe to old ARCADIA was needed to set things in the right light. There are a few that like to sneer; they laugh, and cry, "Crazy." Perhaps it is crazy to attempt to teach others they too may enjoy the knowledge, but, fortunately, those who think it crazy are in the minority. The ambition of The Agassiz Association and the management of its equipment at ARCADIA are missionaries laboring in the missionary spirit, so free from all commercialism, so open to inspection, both in books and in grounds, that any one who sneers at these efforts as commercialism, as a money-making scheme, is guilty of an indignity not much different from that that destroys the

shrubs and plants on the grounds of a private estate. It is only another example of the discouraging obstacles in the way of commendable efforts toward the disseminating of good things.

At first we thought that everybody could come freely and enjoy the ARCADIA grounds, but if we adopted that plan, the whole place would be annihilated within a month. We have been obliged to erect signs warning, not to keep out, but inviting to come in, yet stipulating that every visiting party must be accompanied by an attendant from the office. We desire to make the grounds as useful as possible, but we have so suffered that we have become suspicious of any one who tries to visit the grounds without such an attendant. It is those unattended visitors that have shot our squirrels, have felled our trees, have stripped the bark from others, pulled up botanical specimens, trampled the vegetation and destroyed valuable flowers. We have learned the lesson with others that there are a few who will fling verbal and physical obstacles in the way of every good deed, but can say, "Blessed be the fact that these few rascals are in the minority."

Commodore E. C. Benedict has magnificent premises, Indian Harbor. The gates have for a long time been wide open, and for the convenience of strollers beautiful rustic settees and other facilities have been provided, so that even a casual visitor may enjoy, without care or expense, the lake, the roads, the trees as does the owner himself. A visitor, in the right spirit, could enjoy these even more than does the owner, but the result is that a few rascals have stopped these efforts for the pleasure of the public because they have perpetrated all sorts of misdeeds. After the rustic settees had been thrown down, and pet fish that would take food from the hand had been stolen, but one thing remained to be done. The gates were closed. Yet there are people who say, "All men are free and equal and everybody should have the same amount of property." The ideal social condition will never come through politics. It will come only when all people shall be grateful to those who try to benefit others and when all have respect for the rights of all. What would

happen with universal ownership? The spoliation of everything, and in a short time the disappearance of everything worth having.

Dr. Robert T. Morris has been another victim of efforts to aid humanity. He has tried to propagate new forms of trees and has spent an immense amount of money upon the cultivation of better nuts or more profuse production. He has been a lover and popularizer of high grade evergreen trees, and yet some of his apparently friendly neighbors have cut down his most magnificent evergreens for Christmas trees to amuse their children and soon to be thrown out and burned. The results of Dr. Morris's labors are for future generations; he cannot hope to profit by them himself. I can conceive of nothing more altruistic than his work. It takes nearly a generation to grow one nut tree. We might suppose that humanity would give him every possible protection and encouragement, but instead of that ————!!

We are a long, long way from socialism, from universal protection and acknowledgement of the ownership of property when one has to offer a reward, as did Commodore Benedict, for the arrest of those who destroy his property. There never was any good reason for the saying, "The public be damned," but some members of the general public are saying by their rascally deeds, "The owner be damned." Every decent person in possession of great power of wealth or ability is glad to share it, to disseminate it from the center outward. We never knew of a singer who did not like to sing if others like to hear him. The godly man is always and naturally a missionary. The learned man delights in teaching others. The man of vast estate, of picturesque premises, beautiful plants and gardens, would gladly have everybody enjoy these beauties without an anxious thought or care, but he is not allowed to do it. I believe in socialism, not of the erroneous political species, but in community good will and of the free sharing of good things with others. But before universal friendship arrives, much work must be done to convert the minority that by mean words and meaner actions discourage the efforts

of the good to help the bad, of the rich to aid the poor, of those who know to tell those who don't. The universal dissemination of wealth in mental and worldly things would follow rapidly if it were not for these few discouraging people, discouraging by words and actions. The poet was right. There is a good time coming, but it is not rapid in its movement. Every one who wants to see that good time should help it on by trying to stop the mean insinuations and the dastardly deeds of the powerful few.

War on Poison Ivy.

The extermination of poison ivy is an appropriate subject for the consideration of the Board of Health of every town. It is a queer fact that the little annoyances that may come from mosquitoes, or big annoyances if you see fit to call them that, receive a great amount of attention and are much exploited in the newspapers; but more serious pain and discomfort have been occasioned by poison ivy, yet where is the Health Board that gives any attention to its extermination? It should not be destroyed by individual effort; that is too expensive and dangerous a process, and most landowners do not know how to rid themselves of this troublesome plant. They hesitate to approach it and they know nothing that will eradicate it.

Most persons are easily affected by it, some even becoming poisoned by passing near it at certain times when the wind is blowing strongly in their direction, although some scientists assert that the leaves must be touched in order to poison. I am aware that much is said about the poison being oil and not volatile and that it cannot be carried in the air but actual observation and experience influence us to doubt that dictum. I have myself known persons to be badly poisoned but who had no knowledge of having touched the plant, although there may have been an unnoticed contact. Yet Professor J. T. Burrill, late professor of Botany in the University of Illinois, has discovered and described, on the leaves of the poison, a microbe that he has named *Micrococcus toxicatus*. This he believes is the peculiar poison

for which the plant is noted. Transferred to the skin, the *Micrococcus* multiplies rapidly, penetrates the sweat glands and sets up the well-known inflammation. This would explain the transference of the poison by the wind. The minute microbe, torn loose by the breeze, might easily fall on a sensitive skin and there excite the annoying inflammation, as the cells of the microbe are exceedingly minute, measuring only one fifty-thousandth of an inch in diameter.

I have seen many a man pull up a plant and rub the leaves over his hands to show that he had no fear of deleterious effects. Such a man might be engaged by the Board of Health to exterminate the plant. The vine is not plentiful enough in any one locality to make it worth while to hire a man to eradicate it. The best and most economical method would therefore be to have the town, through the Board of Health, engage an immune man, at perhaps not much more than an ordinary laborer's wages, to visit all reported localities and do the work. Probably when the plant has been pulled up by the roots some chemical might be applied to the ground, perhaps common salt, that would prevent the revival of any tiny root fibres that may be left. The problem could be easily solved if some central authority would take the matter in hand. That the work of eradication would not be difficult is shown by the fact that the ivy is not very plentiful though few people attempt to destroy the plant. It would be far better if the five-leaved Virginia creeper were substituted for the poison ivy as a covering for old fences and walls. The bittersweet too would be a decorative plant for such places.

* * * * *

[*Micrococcus toxicatus* Burrill, (American Naturalist, Vol. XVII, 1883, page 319.) Cells globular, single or in pairs, rarely in chains, 0.5m in diameter; movements oscillatory only. In species of *Rhus*, believed to be the peculiar 'poison' for which these plants are noted. Transferred to the human skin, they multiply rapidly, penetrate the epidermis through the sweat glands and set up the well-known inflamma-

tion." See also "Synopsis of the Bacteria and Yeast Fungi," W. B. Grove, London, 1884. This explains the poisoning by the wind.—S.]

Famous Educator and Her School at ArcAdiA.

Mrs. Winifred Sackville Stoner, director and lecturer of the Stoner Summer Institute in Natural Education at The Scudder School, New York City, with her pupils spent Saturday at ArcAdiA. They visited the grounds, saw the spots on the sun through the telescope, had a picnic in the grove, became acquainted with the bees and then had a literary, musical and illustrative program in the Welcome Reception Room. Mrs. Stoner is known the world over for the remarkable manner in which she succeeded with her daughter Winifred, Jr., by following the laws of a natural education. Her little daughter could speak several languages and wrote for periodicals at the age of five and yet retained all the characteristics of a healthy, playful child. Though only thirteen years of age she has already written and had published ten books. Mrs. Stoner claims that what she has done in the remarkable development of her child in the earliest years can be done equally well, or at least to a very efficient extent, by any one who trains children. She says: "Natural Education will bring better bodies, better minds, loftier attainments, increased efficiency, and augmented personalities."

Appointment in Conservation.

M. L. Alexander has been appointed by the governor of Louisiana to be the Commissioner of Conservation of the new Department of Conservation created by the legislature of that state during its last session.

The Department of Conservation supersedes the former Conservation Commission of Louisiana, which was composed of three commissioners. The new department of state has but one head, the Commissioner. Mr. Alexander was the president of the former commission and his appointment to the head of the new conservation body is in the nature of a recognition of his efficient management of the old board.



Established 1875

Incorporated, Massachusetts, 1892

Incorporated, Connecticut, 1910

Local Nature Institutions.

To attempt faithfully and strenuously to sustain at least one outdoor and nature institution for the benefit of "Greater Greenwich and Stamford," is not overdoing the matter.

ARCADIA is generally known as beautiful, interesting, uplifting, educational and efficient. Could there be an institution whose managers give their time more unselfishly (without salary), more loyally or more devotedly in the interests of the public? Individuals, societies, schools and all sorts of organizations are welcomed "without money and without price." Although you may not be especially interested in nature, 'twere good you do something for the benefit of your community—especially for the young folks.

Please let the managers do their work; relieve them of the necessity of spending their time in worrying their lives out in attempting to pay actual expenses. These expenses are continuous even when the entire day is devoted to admiring visitors or to appreciative, enthusiastic students to whom our time is freely given.

Perhaps you are "not interested in such things." Then become interested for the good of the community. Start somewhere, somehow, and as you learn more and more of the work you will become more and more interested, will realize the benefits, and, what is even more important to you, will enjoy it.

We do not expect you to "give a million." Start in with a dollar a year subscription or a five dollar a year membership (which includes subscription).

Cordially and faithfully yours,
The Workers at ARCADIA: Sound
Beach, Connecticut.

Our Chattanooga Chapter.

An enthusiastic Chapter of fifty-six members has recently been organized in Chattanooga, Tennessee. The officers are: President, Mrs. Walter E. Ervin; Vice-President, Professor G. W. Gorrell; Recording Secretary, Mrs. Charles E. Beadish; Corresponding Secretary, Miss Harriet Greve; Treasurer, Professor Julian Shipp. The Curator of Collections is still to be appointed, but possibly will be Professor Gorrell. The Chapter is to meet on Saturday, once in two weeks, at different places of interest. The work is to be divided into the following departments, each to have its own director: astronomy, botany, ornithology, entomology and geology.

Hope and Encouragement.

I am personally familiar with the local situation in Chattanooga, having lectured at the university there, and for that reason I have great hopes for this Chapter and wish to extend to it every possible encouragement.

I have ascertained that there is great need of a scientific society that will care for the natural science and nature study interests of this great and growing city. In the near future, this Chapter will, I believe, take active interest in the establishment of a local natural history museum with auditorium, library and reading rooms. Here is a great opportunity for some philanthropists interested in Chattanooga to help this new scientific organization to develop the nature interests of the city. I have great faith in the future of this Chapter, organized partly under the auspices of the Chattanooga University and other leading educational institutions in the city.

EDWARD F. BIGELOW.

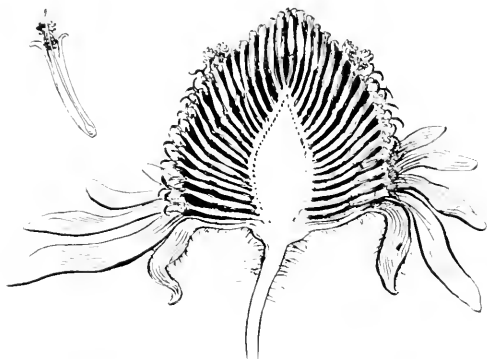
"Ingenious" September Flowers.

BY HERBERT W. FAULKNER, WASHINGTON, CONNECTICUT.

September brings countless members of the great family of the Compositae, such as daisies, thistles, elecampane

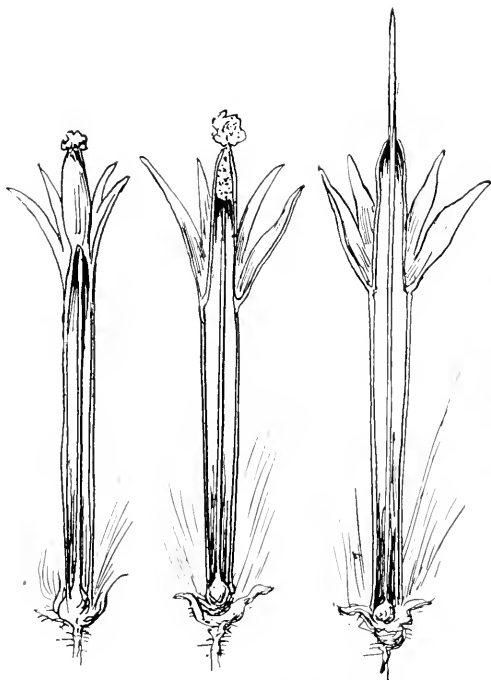
a perfect flower, with corolla, stamens and pistil.

Our sketch of the black-eyed Susan shows this flower in section with the



A SECTION OF FLORET HEAD OF BLACK-EYED SUSAN.

and asters, all of which possess an interesting fertilizing mechanism. The aster received its name because it is



THREE FLORETS FROM A THISTLE.

supposed to resemble a star, but it consists of a vast constellation of stars, enough to form a "Milky Way," each



THE BELLFLOWER.

numerous little florets packed close into a head, and one floret, greatly enlarged.

The stamens are united into a tube, and shed their pollen inward; then the

pistil, unripe and closed, elongates and pushes this pollen outward so that it may be gathered by the passing bee. When the pollen has been taken, the pistil develops, the stigma opens and soon is sure to be fertilized by pollen from another flower.

The lower florets in the flower head develop first, and shed their pollen in a golden ring. Each day this ring mounts higher and higher, followed by another darker ring of protruding pistils. A bee, coming with a charge of pollen from another black-eyed Susan, and crawling upward over this flower head, as is his habit, fertilizes the exposed stigma, gets a new charge of pollen and flies away from the unopened buds at the top, to begin the process again at another flower. He can thus visit hundreds of florets in a short time, getting honey and giving fertility to the embryo seeds as he goes.

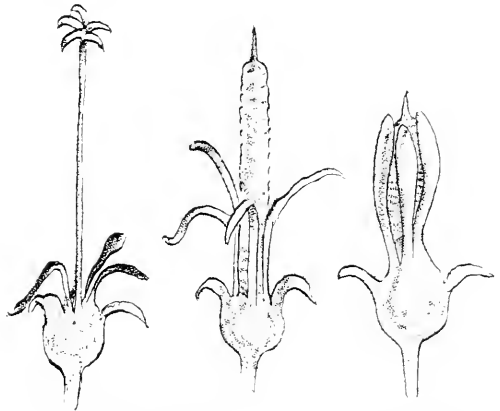
The next sketch shows sections of three florets plucked from a thistle. These florets show, first, how the stamens unite into a tube to hold the pollen; second, how the pollen is pushed out by the growing pistil, and third, how the pistil protrudes after the pollen is shed. Here the stigma does not divide, but becomes adhesive and sensitive to the magic of the pollen.

The bellflower, though unrelated to the Compositae, presents an interesting variation in the scheme above described. The larger sketch represents a spire of these charming blossoms, with buds above, and flowers more and more advanced below.

In the section of a bud the tubular stamens are discharging pollen about a central pistil. In the next below, in a bud about to open, the stamens are separating, and curling backward, leaving a column of pollen adherent about the pistil. In the flower below this, the pollen mass is still in place, like a candle around its wick, and lastly, in the lowest, the pollen is all gone, having been borne away by insect visitors, and the tip of the pistil has separated into a five pointed stigma.

The second sketch shows the stamens and pistils, apart from the flower, in their various stages of progress. With this mechanism complete, self-

fertilization cannot take place, and cross-fertilization is made certain.



STAMENS AND PISTILS OF BELLFLOWER.

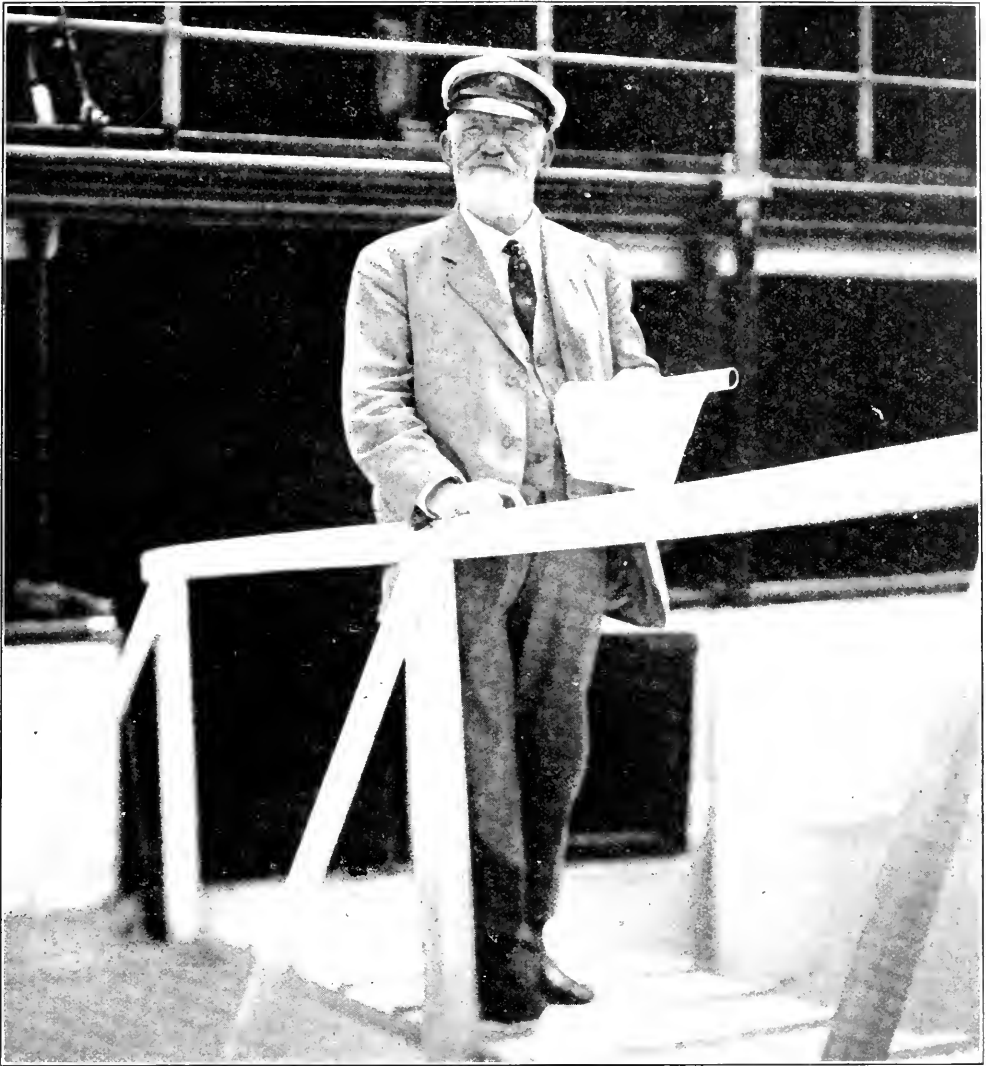
Pheasants as Insect Destroyers.

It is interesting to note the investigations that are being made by the commissioners of different states as to the habits of the ring-necked pheasant, with special reference to damage alleged to have been caused by it to crops, and further to determine whether this species is a destroyer of the brown-tail and gypsy moths. It has found in many instances that the birds ate freely of gypsy and brown-tail moths, and that in other places families had been rid of the pest of bugs on squash vines and plants through the birds. While doing this useful work, it is stated that they did not injure marketable truck.—N. H. Fish and Game.

For, to come into close touch with the very life of birds in field and forest, beside the myriad delights it gradually unfolds to the eye and ear and understanding out of one bright kingdom of earth, means also to feel the quickening thrill of all nature under heaven's great dome; so intimately is every other realm related to this, and so sensitive and subtle are the ties by which we ourselves have been joined to all created things from the beginning.—Augustus Wright Bomberger in "A Book On Birds."

Perennial Nature's welcome,
Her latching always out;
Do not neglect her primrose paths,
While tasks you go about.

—Emma Peirce.



"THE STEAMSHIP AT THE DOOR."
August, 1916.

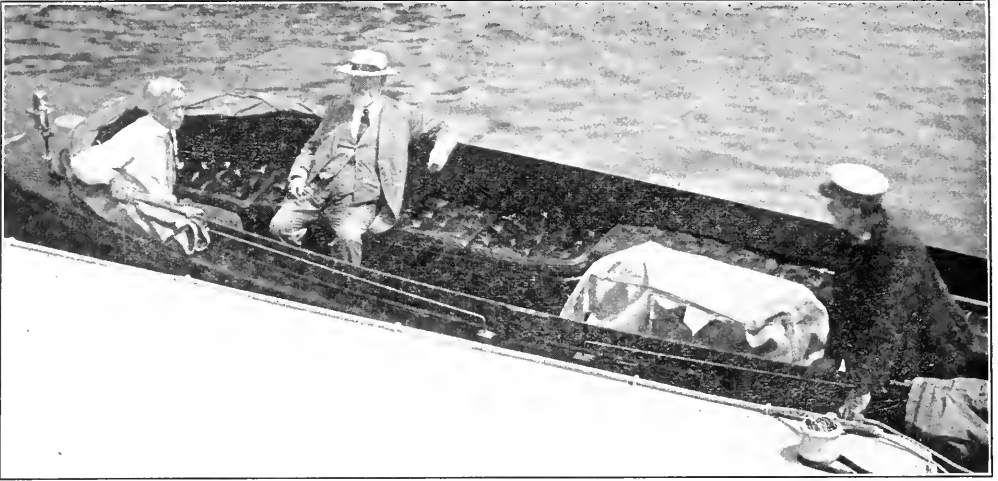
Commodore E. C. Benedict, Greenwich, Conn.

Ready to go on Another Yachting Trip

When the Commodore built his home at Indian Harbor he had the water in front dredged so that his yacht could make a landing at the foot of the stone steps. Last year his new English butler, one afternoon, stepped haughtily into the den, and said:

"Beg pardon, sir! Your Steamship's at the door."—"The Rudder, June, 1916.

One of the gems of poetry appearing in the log book, which Commodore Benedict prizes most highly, is the following written on board the Oneida by Charles Botsford:



ARRIVING AT THE DOCK FROM TROLLING.

August, 1916.

Commodore Benedict immediately went aboard the Oneida for a cruise with a party.
(See previous page.)

—oOo—

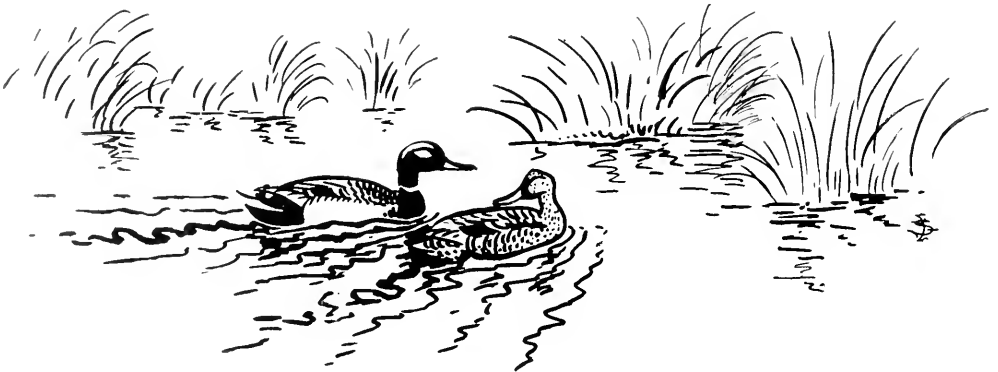
Call Him Not Old

Call him not old, who keeps the primal
joys,
The open door, the smile, the touch
of youth;
Loves earth, its small or splendid toys,
And turns a face resolute against
ruth.

Call him not old, to whom his friends
are charms,
And amulets to exercise each day.
Fate keeps such natures free from great
alarms,
Till greater joys bid heir blythe
souls away.

Then with life's harmonies made all
complete,
Across a sea where falls no mist, nor
tears,
They sail, with argosies than stars
more fleet
To welcoming music of the further-
est spheres.

—"The Rudder," June, 1916.



(Continued from page VIII)

Naturally this is the portion of the work that she likes best for she is thoroughly a woman and the building of pretty things appeals to her most.

The human side of business has not been neglected by Miss Manton. In fact she has not grown hard or stern as most people are wont to picture business women. She has always been kind and considerate to those in her employ and all who have helped her are now sharing in her success in some way or another. She has made a close friend of every one of her employees and some have remained by her side for longer than two decades and they now assert that she is the best and truest friend that they have in the world.

It is significant that early in her business-building Miss Manton selected electricity to do her work. In the Newark factory electricity is used to operate practically all the machinery, including big printing presses, wood-cutting machinery (used to build pattern racks) pattern-cutters, and a host of other appliances. Fifty thousand square feet of floor space is occupied by this big manufacturing institution, and the entire area is illuminated by electricity.

In all about twenty-five motors are employed in Miss Manton's factory. These range from a half horse-power to twenty and twenty-five horse-power. The central station serves this factory for all of its night work and a great deal of its day load as well, for when the factory is working up to top speed the electric service must be absolutely dependable in every sense of the word, and this dependability can only thus be secured.

Talks on Teeth.

BY DR. D. KATZ, STAMFORD, CONNECTICUT.

We often hear a mother say that it is useless to fill children's teeth, and that she would rather have her child's tooth extracted. Those mothers do not know that early extraction of teeth, be they temporary or permanent, will injure the child.

Often the six year molars, which are permanent, are mistaken for temporary teeth and are neglected, finally being extracted, thereby causing abnor-

mal occlusion of the teeth and irregularities, for the correction of which money must be spent, and the patient subjected to many unpleasant operations. I will speak about this part of dentistry in another article.

For this reason, many cities and towns have dental clinics in the schools so as to save the children from the evils which come to their mouths and later into their general system, because their parents have neglected to look after such cases. It would be fortunate if all towns and cities had such an arrangement.

Decayed teeth impair the general health. Decayed teeth not only give off millions of germs that are swallowed and poison the digestive tract, but they prevent the proper mastication of the food, which thus fails to afford full nourishment to the body. Such teeth increase unnecessarily the work of the digestive system, and the result is dyspepsia.

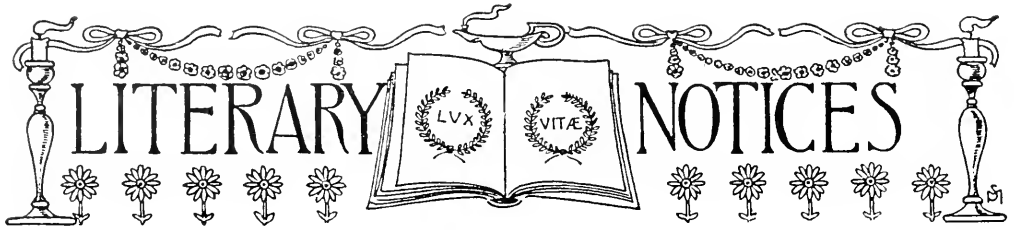
So much for the injury to health that decayed teeth produce. The least observation will prove that a great part of your success, whether in the business or in the social world, depends on your appearance. While you give much of your time to your outer apparel, do not begrudge your inner apparel. No amount of raiment will change the facial expression, the smile displaying stained or decaying teeth, the mouth puffing out offensive breath, sunken cheeks indicating missing teeth.

Decayed or missing teeth prevent thorough mastication and poison the digestive tract, and that, in time, ruins your health. Without good health there is absence of good appearance and presence of poor energy. Without appearance and without energy, can a person be successful?

Always keep your mouth in good condition. How can you do it? On this part of the subject there is an abundance of advice to be given to the general public. In the next article I will speak about this.

Flowery are the realms of Nature,
Scented are her wooded aisles,
Come and share with her your leisure,
Let her fill your day with smiles.

—Emma Peirce.



LITERARY NOTICES

NATURE'S SERIAL STORY. By Edward P. Roe. New York City: Dodd, Mead and Company.

The article by Miss Mary A. Roe on California insects in our number for July delighted many of our readers who are pleased to learn that she is continuing the work of the naturalist so well exemplified a generation ago by her brother, the late Edward P. Roe. "Nature's Serial Story," was welcomed as having the charm of a new discovery or of a new land, and though the book has for years been read and re-read, it will come to any nature lover as a charming portrayal of outdoor life. We cordially recommend it to our readers.

SUCCESS WITH SMALL FRUITS. By Edward P. Rowe. New York City: Dodd, Mead and Company.

More recent books may bring the subject more nearly in accord with the later investigations in horticulture, but no other book can incite in a more charming spirit a love for the cultivation of small fruits. The volume was originally published a generation ago, but we call attention to it now on account of the general interest aroused in the author by the publication of his sister's article in a recent number of *THE GUIDE TO NATURE*.

THE HOME ACRE. By Edward P. Roe. New York City: Dodd, Mead and Company.

A notice of this book is given for the same reason that induces us to recommend other books by the late E. P. Roe. This, "The Home Acre," contains valuable suggestions and is practically a continuation or an extension of the book on small fruits. It relates to the garden, the kitchen garden, the vineyard: to the raspberry, the currant, the strawberry, and others. One never tires of reading these charming volumes. They are written preeminently in the right spirit.

SHELLS OF LAND AND WATER. By Frank Collins Baker. Chicago, Illinois: A. W. Mumford, Publisher. Price \$2.50.

The shells in the ponds and streams and the creatures that inhabit those shells are seldom observed rarely understood, and are often considered too trivial for serious contemplation, yet they comprise a marvellously interesting field for nature study.

Professor Frank Collins Baker is an acknowledged technical authority, yet in this book he shows his sympathetic interest in the subject and his ability to aid the beginner.

A New Mineralogical Magazine.

We welcome the establishment of a new mineralogical magazine, "The American Mineralogist," published by Robert Rosenbaum, 605 South Third Street, Philadelphia, Pennsylvania. The subscription is a dollar and a half per year; single copy, fifteen cents. The editor is Wallace Gould Levison, assisted by Edgar T. Wherry, Samuel G. Gordon and W. Scott Lewis.

Our readers will recall that Mr. Arthur Chamberlain for many years published "The Mineral Collector," that magazine being merged into *THE GUIDE TO NATURE* in April, 1909, and there continued as a department occasionally although most of the material desired by the real workers in mineralogy is too technical or of too limited a general interest for a magazine of the character of *THE GUIDE TO NATURE*. We shall therefore continue to publish matter of popular interest along the line of mineralogy with more or less of regularity, but we recognize the fact that such publication does not meet the requirements of the mineralogist but is useful in bringing new recruits to the field. Those that *THE GUIDE TO NATURE* interests in the subject we feel sure will continue as students along the more technical lines of "The American Mineralogist." Those of us who have had experience know somewhat of the wonderful beauties and fascinations of minerals, but the fact remains that they form one of the most difficult fields of nature study in which to interest the general student. Every one who goes afield cannot fail to admire some aspect of the mineral kingdom or be attracted by some particular specimen, but it is equally true that it is difficult to develop that general interest into specific study. It appears that a real interest in minerals requires more than the characteristic of a student.

He must be a collector. A real lover of birds never desires to collect unless he is entering upon some special part of the scientific field. Some of our best ornithologists are content to observe and record. The idea of collecting is repugnant to them. But the collecting spirit must accompany the study of minerals as it accompanies the student or collector of postage stamps. The principle of studying the bird without a gun or admiring the rose without picking it seems inapplicable to minerals. Yet there is no part of nature study in which the mineralogist may so freely exercise his collecting instincts or exhaust his pocketbook as in the observation of minerals. To those who are entering into the subject deeply we heartily recommend this new semi-popular magazine, "The American Mineralogist."

Lectures by **Edward F. Bigelow.**

State Normal School, Athens. Professor D. L. Earnest, Department of Elementary Science.

With some this subject is a book; some talk about it, but you deal with things alive, where they live. This is pedagogy, sense.

C. S. Ryan, Executive Committee Clark County (Ohio) Teachers' Institute.

As the teachers of Clark County were unanimous in praise of their Institute this year, I wish to speak a word in commendation of your work as Instructor. We have had no Instructor for many years who gave more general satisfaction. Your clear, strong voice, your pleasing manner and your earnestness of expression carried conviction to every listener.

You did nothing which was not worth while. Through the strength of your personality, the sincerity of your purpose, and the simplicity with which you imparted your messages, you left an impression not soon to be forgotten.

Your instruction along Nature's lines was of infinite value to our teachers and will be the means of stimulating them to much greater effort in such study.

The Twenty-first Week within Twelve Years in Pennsylvania. The Gigantic Institute of over 2,000 Teachers in Allegheny County.

Samuel Hamilton, Superintendent Allegheny County Schools, Pittsburgh, Pa., September 8, 1915.

To whom it may concern:

Dr. Edward F. Bigelow was one of the Instructors of our County Institute at Pittsburgh, 1915. Our teachers were very much pleased with his work. Dr. Bigelow is an ardent lover of Nature and presents her beauties in such an attractive manner as to interest and inspire any audience. His subject matter is crisp and new; his point of view, admirable, and his presentation, intense.

Claude E. Cogswell, Superintendent of Schools of Orange County, Paoli, Indiana.

Dr. Edward F. Bigelow lectured in the Orange County Teacher's Institute, during our session, September 7 to 11, 1914. In his lecture of Pedagogy he pleaded for the recognition of the personality and individuality of a child while he is being trained to make himself a fit member for society.

His method of approaching the object and subjects of nature and agriculture is unique. He has studied these subjects not as a profession so much as from a standpoint of interest which will appeal to you. This enables him to appeal to all teachers instead of merely to those who desire to know nature as it surrounds them and they recognize the beauty of the commonplace.

In his lecture on Agriculture and Horticulture he shows how to present these subjects so that the pupils will be interested in the subjects.

All of his work is very practical.

H. D. Clarke, County Superintendent. Ashtabula County Schools (Ohio.)

Dr. E. F. Bigelow was instructor at the Ashtabula County Teachers' Institute this year. He immediately secured the attention and sympathy of the audience and kept it throughout the week. The teachers of the county are enthusiastic in their praise of his work.

The eighteenth volume of
Bird-Lore

begins February 1, 1916.

Volume I contained 206 pages and no colored plates; Volume XVII contained 560 pages and eleven colored plates.

The magazine has grown, but the price remains the same.

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The Guide To Nature

BEAUTY AND INTEREST

Besides, I myself have now for a long time ceased to look for anything more beautiful in this world, or more interesting, than the truth, or at least than an effort one is able to make towards the truth.—Maeterlinck.

Volume IX OCTOBER, 1916 Number 5

PUBLISHED BY

THE AGASSIZ ASSOCIATION

ARCADIA: SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

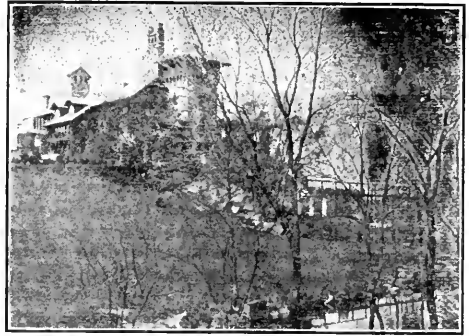
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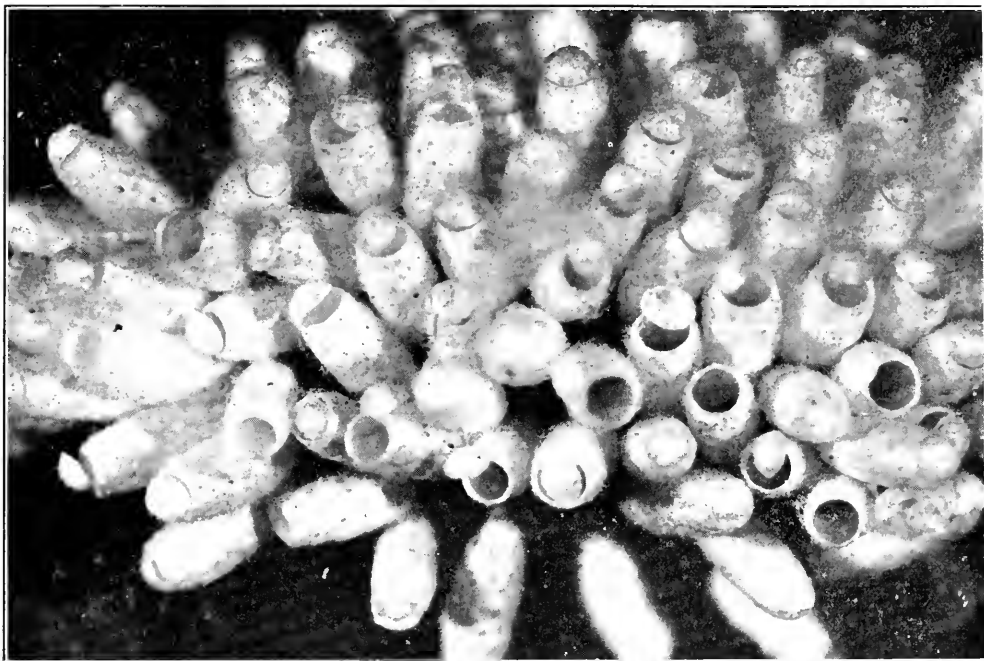
Especially of Local Interest

The Caterpillar in Bloom.

"In my garden I have found the strangest looking caterpillar that I have ever seen. It looks as if it were bursting into bloom." Thus telephoned Mrs. Walter N. Travis, of Stamford, Connecticut. The reply was that the caterpillar was probably the common large green "worm" to be found on tomato vines, sometimes on Virginia Creeper and known as the hog caterpillar of the vine. This parti-

one inch objective. Sometimes these cocoons are yellowish and are found attached to grass or other plants instead of to the caterpillar which the larva have destroyed.

Now is the time to look for these clusters of cocoons on the grass. I think that thus late in the year they are more frequently found in such localities than on caterpillars. So far as I have observed the cocoons are formed on caterpillars



THE "BLOOM" OF COCOONS ON CATERPILLAR FOUND BY MRS. TRAVIS IN HER STAMFORD GARDEN.

cular larva is often infected by a little parasitic fly of the genus *Microgaster*, that lays its eggs within the body of the caterpillar and when the eggs transform to the pupa stage the caterpillar is completely covered with tiny white cocoons that stand endwise on the victim. The end of each pupa lifts and, like a jack-in-the-box, a tiny fly emerges. These are extremely beautiful in appearance and extremely interesting to study. From the specimen brought by Mrs. Travis the accompanying illustration was made with some magnification to show how it appeared to her and Mr. Travis who brought the specimen to ARCADIA and viewed it under the microscope with a

early in the year and on grass late, but this may be due not only to the season but to the different varieties of this family of flies. William Hamilton Gibson has an interesting chapter in "Sharp Eyes" about "Those Puzzling Cocoon Clusters," with especial reference to the clusters on grass but in his "Eye Spy" he has an interesting essay with illustrations, entitled, "What Ails Him?" He writes October 20th:

"They may be found now almost any day in a short stroll through the rowen fields. I have picked over fifty clusters in one short walk across an October meadow. They are generally attached in a circular cluster about a grass stem,

thirty to fifty in number, and may be either white or pale sulphur yellow in color. To the casual observer they appear like tiny oblong eggs, but they are in truth firmly woven silken cocoons, and though we may discover hundreds of them in the grass, there are few observers who would be likely to guess their origin, for it is a rare find to catch the spinner at its work."

The Cornflower.

The cornflower borrows Heaven's blue,
And gives in lavish store;
Though gathering freely of its blooms,
It ever offers more.

—Emma Peirce.

John Flagler's musical home in Greenwich, where he was tuning a piano to be played with Albert Spaulding, a great violinist. Here Mr. Finney introduced his tiny family to many admirers and then brought the nest and all to Sound Beach, where he exhibited it at ARCADIA and to many admiring boys and girls.

Any one telephoning Mr. Finney and failing to get an immediate response may know that he, with family and associates, is absorbed in certain natural history pursuits.

Berries Were Plentiful

An English comedian named Mathews



THE NEST OF MICE IN A GLENBROOK PIANO, WERE SINGING "COME HOME." SEE MUSIC AT THE RIGHT.

Mice Evidently Fond of Music.

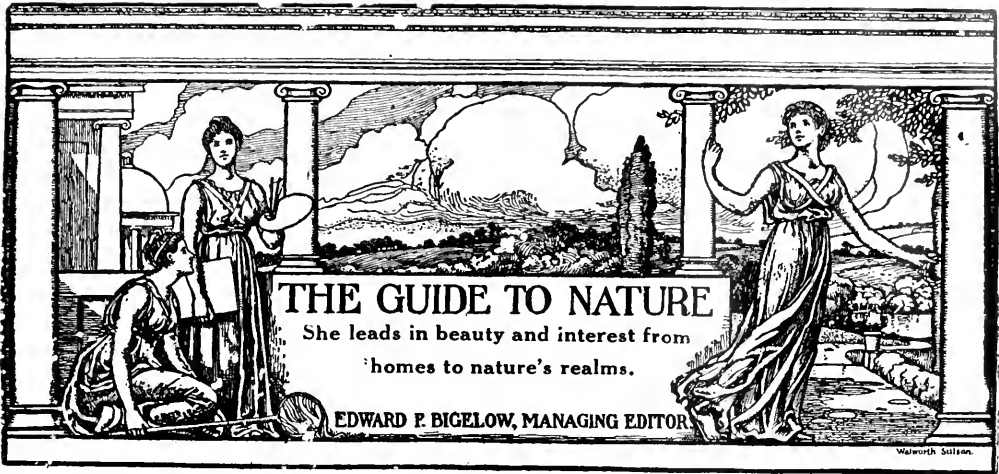
Mr. Wesley H. Finney received a hurried call to go to Glenbrook to ascertain the meaning of mysterious sounds within a piano. He responded promptly and found that mice were talking it over in the language characteristic of those little animals and that in the piano was a company of youthful members of the mouse family.

He took them all under his loving care and decided to encourage their musical tendencies. He carried them to Mrs.

traded with a grocer named Berry. On one occasion Berry irritated Mathews by presenting his quarterly bill before it was due. Turning upon the astonished grocer, he delivered this tirade:

"Here's a pretty *mull*, *Berry*. You have sent in your *bill*, *Berry*, before it is *due*, *Berry*. Your father, the *elder Berry*, would not have been such a *goose*, *Berry* but you need not look so *black*, *Berry*, for I don't care a *straw*, *Berry*, and shan't pay you till *Christmas*, *Berry*."

—The Youth's Companion.



Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
 Subscription, \$1.00 a year Single copy, 10 cents
 Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

OCTOBER, 1916

Number 5

How the Plant Scatters Its Seed.

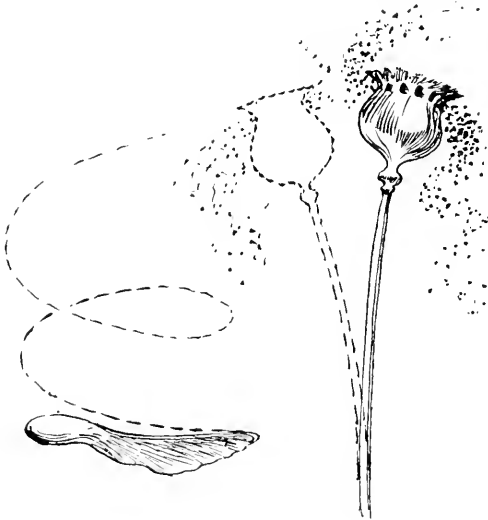
BY HERBERT W. FAULKNER, WASHINGTON,
 CONNECTICUT.

In October the cavalcade of the flowers has nearly passed by and most of their attendant insects have flown away or have

For a plant rooted to one spot the disposal of its seeds becomes a serious question. Seeds with wings like those of the thistledown and the dandelion parachutes are light as air and float where the wind wills. But maple seeds, shown in our first sketch, are much heavier and are planned to twirl in falling, like little boomerangs. They thus descend slowly and fly far.

So many seed vessels are like pepper boxes, and stand upright on dry stalks, that we wonder how their seeds get out. Approach a dried poppyhead, such as is shown in our second sketch, give it a gentle touch to set it swaying and see how it shakes out the seeds. Fitful breezes start it rocking and help carry the seeds to a distance. Some flowers which have hung down their blooming heads turn their ripening seed vessels upright. This we see in the various lilies and the little Indian pipe. If it were not so, their seeds would fall in a mass at their roots.

Many seeds have hooks and spurs to fasten them to the hair and wool of passing animals, which thus scatter them over many miles. I am told that certain seeds of this sort were imported into this country in bales of wool for the cloth

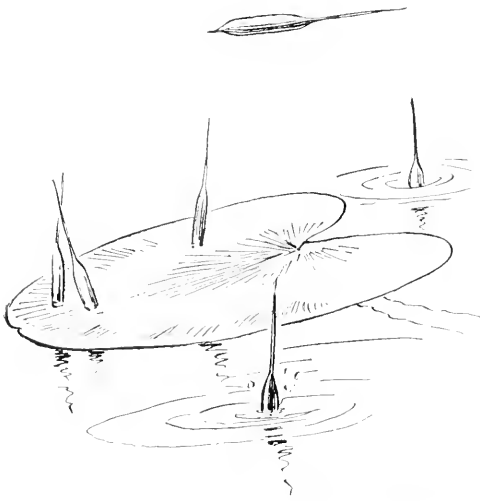


Winged Seed of Maple.

Poppy Pepperbox.

wound themselves in silken comforters to await the winter. We therefore turn to the seeds to learn how they are sown.

not spread downstream. Here were plants making huge numbers of seeds, and seedlings enough to choke the pond, yet



RICE "PINS" STICKING THROUGH THE LILY PADS.

none of the seeds got downstream to flourish elsewhere.

One day in the autumn I noticed a lily pad stuck full of little black spikes like a pincushion with black pins. I stooped to examine them and in so doing jostled a tall stalk of the wild rice and straightway brought down a shower of little pointed seeds, some of which stuck in the lily pad while the majority plunged into the water. The seeds had a sharp point for plunging and a long tail like the stick of a rocket to direct them straight downward. So the mystery was explained, for I remembered that the seeds of wild rice must be kept moist in order to grow. If they dry, they die. Nature intends that every seed shall fall straight into the water and plunge to the bottom; not float downstream, get cast ashore and maybe die of thirst.

The management of the American Museum of Natural History in New York City is planning to raise by private subscription the sum of seven hundred and fifty thousand dollars to build a new wing toward the southeast. No additional space has been provided since the building of the southwest wing in 1905, and the collection has become seriously overcrowded. These seeds travelled by steamer and rail.

Many plants actually shoot out their seeds by ingenious spring mechanisms. Some of the bean family are famous shooters. The lupine forms a stiff hard seed pod which on ripening, and drying to just the right point, suddenly bursts and curls into two spiral horns with such suddenness that the seeds are shot out in every direction. The lupine pods, both closed and open, are shown in our third sketch.

Next we see the seed of the jewelweed, appropriately called the touch-me-not. The pod resembles a small bean but at the slightest touch this springs into a new shape and so quickly that our eyes do not tell us what has happened, though our ears detect the scattering and fall of the seeds. These are enclosed in a pod with a central axis like a green ribbon. The pod divides at the top into narrow strips that curl downward and inward like a watch spring, squeezing the seeds in their spiral folds and shooting them right and left.

The seeds of many plants are scattered by water. Vast numbers float down our streams and lodge along the shores. Others are washed from the summits and slopes of hills to take root in the valleys.



Lupin.

CATAPULTS.

Jewelweed.

I was for some time mystified by the action of the wild rice which I planted on the shore of my little pond, because it did

Marengo Cave.

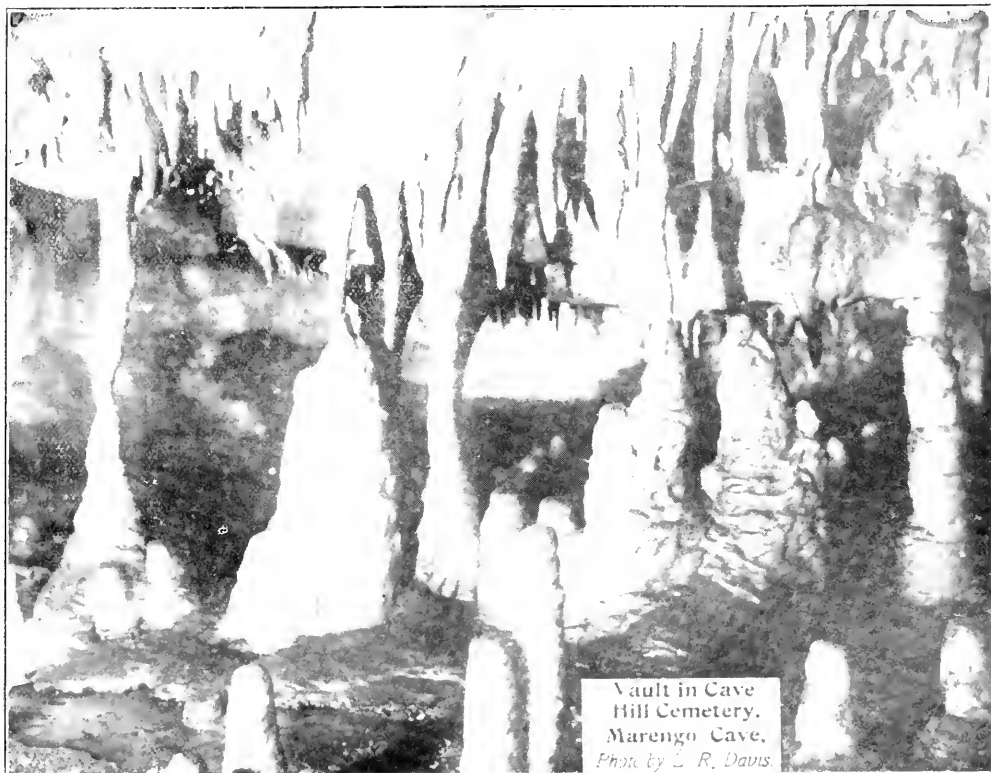
BY W. N. SPECKMANN, BALDWIN-WALLACE COLLEGE, BEAVER, OHIO.

Marengo Cave is situated within the corporate limits of the town of Marengo, Crawford County, Indiana, on the Louisville, Evansville and St. Louis division of the Southern railway, thirty-eight miles west of Louisville, Kentucky, and twelve miles north of the Ohio river.

It is said to have been discovered acci-

though this land has been the center of civilization for more than three-fourths of a century, and a little town with its places of trade and shops of industry had existed for nearly half a century, yet not until the year 1883 was it known that this grand work of nature lay hidden beneath the surface here."

The hill under which the Cave lies is rolling and gradually elevated above the surrounding country. On its sides are



dentally by hunters in pursuit of a rabbit which took refuge in a hole which led into the cave. Others say that parents missing their children while at play during the day watched their disappearance into an opening in the ground which was found to descend gradually into the mouth of the Cave, the first room of which had furnished an excellent hiding place and play room for the children.

The formation of the rock about Marengo is of limestone. A large limestone quarry has been opened on another side of the town adjoining the railroad track, and a considerable quantity of material has already been removed.

The existence of the Cave has been known but thirty years, having been discovered in 1883. A writer says, "Al-

outeroppings of limestone formation.

The present entrance is near a beautiful grove about two hundred yards north of a sparkling stream which is fed by the waters of two large springs in North Marengo. These springs issue from small caves in the sides of elevations. The one has a semicircular entrance with sloping stone ceiling from which stalactitic formations depend and is in itself worth seeing. Quite a stream of water flows from it and plants grow at the entrance.

The original entrance to Marengo Cave has been closed and another made which descends at an angle of about forty-five degrees and is some sixty feet in length. An upright door, secured by a lock opens into a cemented arch covering the stairway. Lanterns and torches are

used to light up the Crimean darkness. On the sides of the stairs one finds cave crickets, *Hadaenicus subterraneus*, which are colorless and blind.

The temperature of the Cave is especially noticeable on a hot day, remaining the same summer and winter, namely fifty-six degrees Fahrenheit.

The interior consists of avenues, chambers, domes and grottoes. Most of the walls, floors and ceilings are of limestone ornamented with formations in grotesque shapes. The floor of the greater portion of the Cave is dry, but where the most of the limestone formations are taking place, it is damp.

At the foot of the stairs is Grand Entrance Hall which leads into the portion of the Cave known as the Long Route; there are four grand divisions of the Cave called respectively, The Long Route, Washington Avenue, Western Avenue and Crystal Palace. A picture cannot do justice to Crystal Palace with its stalactites and stalagmites. One must see it to appreciate it. Tourists consider it "the most beautiful of any natural underground room that has ever been discovered".

Crystal Palace is about twenty feet wide, forty feet high, and two hundred feet long. The whole Cave varies in width from ten to seventy-five feet, in height from eight to forty feet, and the

total length of the chambers and passages is about three and one-half miles.

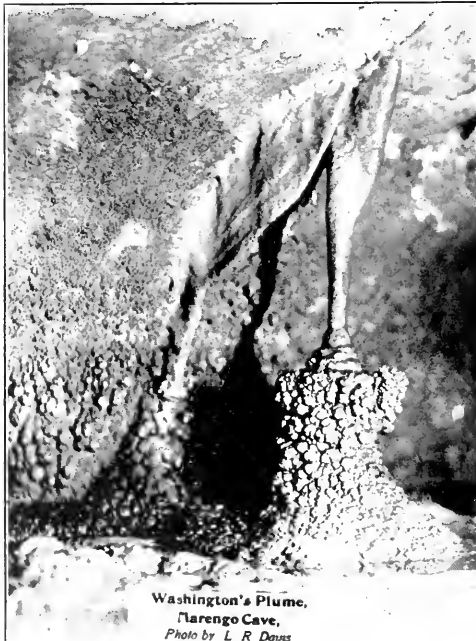
The four divisions of the Cave are subdivided into halls which have been named, usually by visitors, for their resemblance to the original: Statue Hall, Congress Hall, Odd Fellows Hall, Mammoth Hall, Music Hall and Elks Hall. Many of the beautiful formations have also been given names; The vault in Cave Hill Cemetery is an interesting example. Others are Charleston Jail, Prison Cell, Statue of Liberty, Tower of Babel, Baby Elephant, Jumbo, Elephant's Head, Diamond Dome, Leopard Ceiling, The Gods of Athens, Solomon's Temple, Fish Market, Lovers' Retreat, Niagara Falls and Mt. Vesuvius. The Railroad Crossing is a strange formation on the ceiling with what seem to be parallel tracks. One of the most wonderful formations is that of the Pipe Organ. The manager, who guided me through the labyrinthian passages of the Cave, struck several of the stalactites which resounded with musical tones. Other beautiful and curious stalagmites are Washington's Monument and Washington's Plume.

The formation of crystallized stalactitic and beautiful stalagmitic columns with glittering domes by calcium carbonate trickling from the ceiling is certainly interesting.

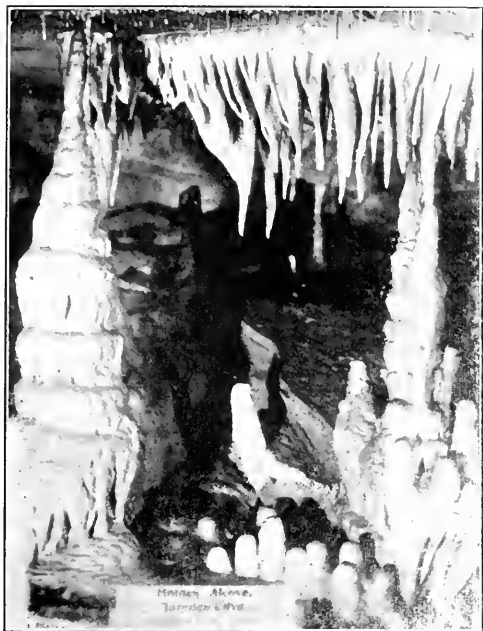
The underground water of that locality contains much dissolved limestone. Upon seeping through the roof of the Cave it begins to evaporate, losing its carbonic acid, and limestone is deposited on the ceiling around the edge of the drop of water. Other drops form below this one until a tubular pendant develops, which at first is hollow but later the opening is filled and successive layers are formed on the outside. When the stalactite thus formed reaches a certain stage, if the seepage is sufficient, the drops will fall to the floor and build up a stalagmite. These meeting the pendants from the ceiling form columns as shown in The Visitor's Wonder or Haines's Alcove.

The general yellow color of cave formations is caused by the presence of iron oxide. Most of those in Marengo Cave are translucent and some are almost snowy white.

In one part of the Cave beautiful stalagmites resembling bouquets of flow-



Washington's Plume,
Marengo Cave,
Photo by L. R. Davis



ers or stalks of celery may be seen. It is a sight of beauty and of wonderful ornamentation that makes a lasting impression on the mind of the observer.

Mr. J. S. Diller in a government publication says: "All caverns are not so beautifully ornamented. Mammoth Cave of Kentucky, although remarkable for its size, contains a very small amount of cave deposits such as are shown by the two illustrations", referring to Luray Cave in Virginia and Marengo Cave, Indiana.

The flowers, the sunbeams, the sparkling of dew,
Are all sweet allurements of Nature for you;
She woos you with beauty, with color, with scent,
In all to her fullness of life giving vent,
Oh can you resist her? Why wedded so long
To the life artificial, which multitudes throng?
Just live for a season a free, simple life
And you will have done with vexation and strife.

—Emma Peirce.

The Dayflower.

BY ROBERT CUNNINGHAM MILLER, UNION-TOWN, PA.

An odd little flower is the common dayflower (*Commelina communis*), a member of the Spiderwort family which we find growing in damp, shady places all

over the land. Its two bright blue petals so outshine the tiny white one that the latter often passes unnoticed, and the flower has a peculiar appearance, as though part of its petals had been blown away by the wind. The generic name of the flower, (*Commelina*) was intended by Linnaeus as a quiet little joke on the three Dutch botanists Commelyn, two of whom became noted through their scientific writings, while the third, Casper, although a deep student, never gained note through his failure to publish the results of his work. Like the inconspicuous white petal of the dayflower, he was overshadowed by the brilliance of the other members of the family.

In spite of the fact that the plant is so hardy, its blossoms are most delicate. Once while passing a colony of them near my home, I gathered a few specimens, intending to press them and add them to my collection, but before I had gone two squares they were hopelessly withered. At best they last but a few hours, until the work of pollination is accomplished. Like those of the morning glory, the petals of the dayflower roll together at noon, but they never open again, and from this fact the common name is derived. As a



THE DAYFLOWER.

little boy to whom I was explaining the habits of the flower once remarked, "I think it ought to jes' be called a half-day flower."

An Astonishing Hailstorm.

BY S. C. HUNTER, SUNAPEE, NEW HAMPSHIRE.

On a bleak day in winter the rain often turns to hail. Not so in summer. Summer hail has a different origin and is also a much more serious affair. On the afternoon of August 23rd, one of these summer hailstorms passed over Lake Sunapee and attained the proportions of a phenomenon. After several days of extreme, sultry heat the clouds began

worst of the storm was confined to a limited area and lasted for only about ten minutes. In this time, however, the ice was piled in places six inches deep and frightful havoc was wrought among the trees. Careful measurements showed that the hail ranged from the diameter of a camphor ball to full two inches. They were variously shaped and appeared to be irregular chunks composed of smaller particles welded together, sometimes flat, sometimes round. The flat specimens indicated a rotary formation, the centers



THE CUCUMBER SMASHED BY A HAILSTONE.

to gather, but nothing unusual was indicated. At the southwest end of the lake the clouds finally concentrated and the storm raged. At first it looked as if the lake district would be spared, but soon the encircling storm began its approach from due south and quickly swept the entire lake accompanied by the usual squall with thunder and lightning. Suddenly splashes appeared over the surface of the water, exactly like a miniature picture of a sea battle with the shot splashing and plunging. These splashes increased rapidly, supplanting the rain, and as a violent tattoo began on the roofs and boarded surfaces an ice bombardment was fairly under way. In a moment the rain of ice fell in a solid sheet. The water within the visible radius was lashed into fury, and the roar of the falling ice, accompanied by the commotion in the water, which resembled a wild and furious boiling, produced, with the thunder, lightning and wind, a scene of terrifying grandeur. The ice soon covered the ground and in a twinkling the landscape changed from summer to winter. Fortunately the

being much depressed. The round ones measured four and three-quarters inches in circumference, although, it is said, some were found measuring seven inches. Much of the ice was found next morning, showing it required fifteen or sixteen hours to melt.

The trees, principally the birches, were stripped nearly clean; even the hardy pines and firs suffered severely. As for vegetable gardens and flowers, they were laid low as if a mighty flail had pounded them to pieces. Scarcely a glass window that was not protected by a screen escaped destruction. The entire countryside looked as if a blast from the furnace had scorched it.

A similar storm occurred on Sunday, July 2, 1916, in Concord, New Hampshire, when the fall of ice was also limited to a small area. It would be interesting to know if there is any record of ice storms of greater severity. Had this storm lasted for a longer period it would have broken through the roofs of many houses. As it was, several old roofs were badly perforated.

My Visit to Pasquaney.

BY E. PALMER CAPE, NOANK, CONNECTICUT.

Perhaps there is no one development within the past years which signifies greater possibilities than that of boys' camps. It is because it is of such vital value to the youth of coming manhood that the absolute necessity of true environment should be demanded.

Just as in every work in life we find a running scale of quality and quantity, so in the "camps," which one becomes acquainted with is this particularly noticeable.

I was visiting Bridgewater, N. H. about a mile from Pasquaney and about eight miles from Bristol. I had gone for a few weeks' stay and was occupying myself with sketching the beautiful birches which grow so plentiful in this belt. The very name Pasquaney means the land of birches; and the charming lake snuggled so delightfully in the bosom of the hills was always known as Lake Pasquaney, until some unromantic souls changed it to the ordinary name of New Found, but all lovers of the Lake shall ever think of it by its beautiful Indian name.

Imagine yourself standing on the side of a mountain which gradually slopes to the lake's edge. Great pines and birches are on every side. Here is the Camp. The long cedar shingled houses filled with the necessities and comforts required for camp life, simple but well designed. It was not the delightful, truly perfect environment in which Pasquaney Camp is situated, nor the splendid outlay of every detail, from the roomy sleeping quarters, or the out door "sprays" where merry laughter and unconscious lessons of fine qualities of character building are developed; or the little hospital so daintily and hygienically clean and ready for emergency; it was not the long dining-rooms and outside porches; nor the beautiful chapel "under the trees," great pines which meet overhead like a vast cathedral arch, and the flickering bits of sunlight penetrating the thick green needles and various shades, gives one a sense of the play of light from stained glass windows. A lovely white birch cross standing on an altar of rough stones, which are

banked with ferns and wild flowers by the boys during the camping season, is most impressive. A sense of not only beauty fills one as seated on the simple wooden benches, but a reverence, a faith, a hope in the purest forces of life penetrate ones inmost being. It is as if this Chapel were truly "alive with God"

It is not the details of the outside of Camp Pasquaney, splendid as their are, that impressed me as the thing which was of such deep interest and importance; importance to all who are in any way connected with education, camp life, nature study or youth.

The great fact that stands out like a jewel in the sunlight is the Man at the head of Camp Pasquaney—Mr. Edward S. Wilson. Seldom in going through life do we find a character who has so many qualities to help perfect his work.. It is impossible to pass him by in silence.

Edward Simpson Wilson was born in New York and after the usual school days entered Yale and took his Ph. B. His father a Captain in the U. S. Navy, desired that his son become a physician and so the Columbia P. & S. was the natural course of events; but after a time young Wilson found that requirements of this profession did not appeal to him and he decided to pitch his life's tent into other quarters.

Captain Wilson after his retirement from active service had bought a large tract of land bordering on Lake Pasquaney, and one day a friend asked young Mr. Wilson to go to Holderness, some fifteen miles away, to visit her own boy who was at Dr. Talbot's Camp.

In those days Camps for boys had not developed and this one of Dr. Talbot's was the first of its kind. Young Mr. Wilson took the opportunity to go and see the Camp at Holderness and it was during that Summer of 1893 that the deep interest in character building for boys sprang like a flame into his heart, and never has been extinguished.

Seldom does one find a man with the talent and earnestness to make his life work as complete and noble as it has become in the actual results of the Director of Camp Pasquaney.

There is but one thing that makes for real success in Camp life and that is a spiritual comprehension as the

basis of all living. No shams, no ideas that sports and good food, outdoor life and merry-making is sufficient; no! the fundamental reason of "Mr. Ned's" (so the boys call Mr. Wilson) tremendous success is the wonderful methods and instinctive soul qualities with which he inspires every boy. "To have a boy with the right stuff in him, no matter what he may be, I can make a man of him," thus spoke "Mr. Ned." And again: "It is a perfect delight to watch the character unroll, and to find many a boy who has been cramped for advantages at home, advantages of character-building or knowledge regarding life's great temptations and struggles, actually become through gradual training, a boy, fearless, frank, controlled and a leader in the hearts of all."

* * * * *

Such truths spoken in a rich, quiet sincere voice brings the power of the man before one. Mr. Wilson is most modest as all big souls are: fearless of mind and splendid physique; strong features, clear firm blue-grey eyes and a poise of the head that is what sculptors call "finely set." His hand-grasp is real and one is conscious of the strong personality as one studies the sensitive mouth, decisive chin, and noble forehead.

It is after many years of study regarding the questions of character-building, of education of our youths, that I feel it not only a pleasure but a tribute I should like to pay to the man who has so far outstripped anything that I have found with perhaps one exception, and that is so like Mr. Wilson's ideas that they could almost be spoken of simultaneously; that one exception being the development which C. Hanford Henderson has brought to the splendid Camp idea and Education.

Mr. Wilson's entire feeling about "his boys" is that the development comes as an outward visible result, primarily from an inner experience.

The full meaning of the law of cause and effect is here understood, and the deeper inner strength which comes alone by lessons learned through love and kindness is an aspect which proves by the outward results the correct method used.

"True education is not only knowledge, but character-development," said Mr. Wilson, and "true civilization comes through the expression of social environment of the great lessons learned by youth before they go to college."

There is no way to-day, in these modern rushing, nervously hurrying times, to awake the great sense of personal value, personal worth-whileness, earnestness and fine feeling, as to have the out-of-door life, and all that it means in a boy's camp, with a man like Edward S. Wilson at its head. The "talks" which "Mr. Ned" every Sunday gives to his boys are chosen so as to gradually developed those qualities which during camp-life so wisely are made most important; such as: Opportunity, Thoughtfulness, Unselfishness, Honesty, Loyalty, Courage, Perseverance, Energy, Purity and Temperance.

It is not easy to describe the telling qualities which make for enthusiasm and ideals, but to be able to inspire others a man must have it within himself, and to reach middle life with the power to mould the characters of boys so that self-reliance, manliness, fearlessness, nobility, weave into their lives a pattern that forever after works out in the design of their lives, is a rare thing to do. An exceptional man in an exceptional place, with great transforming powers, makes the weak, strong; the lazy, active; the bully or tease, a helpful comrade; these are all accomplished at Camp Pasquaney and the Camp's motto, "Stop and Think" has caused many a lad to halt and choose to do the right thing.

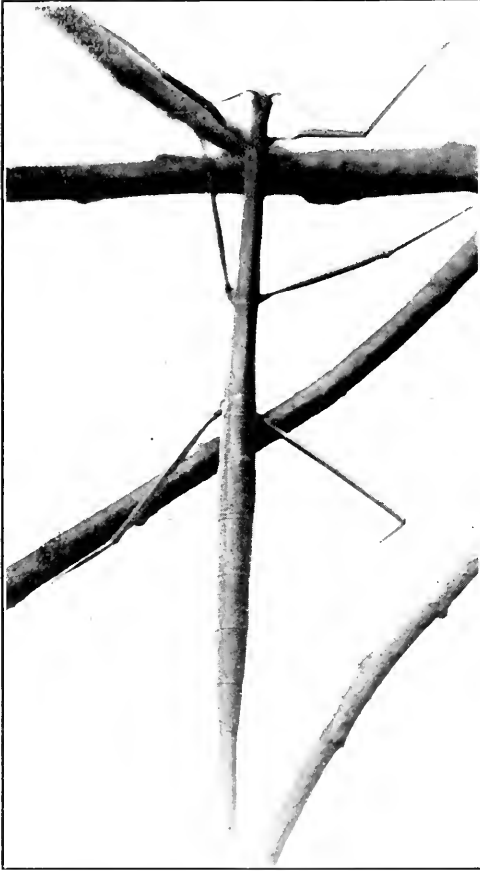
It is with admiration and gratitude that this article on Camp Pasquaney and its Director is given to others, for just to have spent a day and studied not only the Camp, the out-fit, the fine lads, but more than all the noble soul who has put his life's heart and work into it was an experience one felt the better for having had. One feels as they shake hands good bye, that indeed our little world is better for having had the heart of "Mr. Ned" in Camp Pasquaney.

When nature calls why not attend,
And end by making her your friend?
—Emma Peirce.

Insects That Look Like Sticks.

It starts; it moves; it seems to manifest life and yet looks like a mass of walking sticks, especially when we see several together as sometimes occurs, though usually they are found singly.

We are indebted to Miss Linda Worrell, Sound Beach, Connecticut, for the contribution of an interesting specimen,



MISS WORRELL'S STICK INSECT.

deep brown in color and closely resembling a twig. Others are sometimes seen of a rich green, harmonizing closely with the grass and leaves. It is a startling experience to see a mass of these animated twigs. I shall never forget the experience I had when a boy, as I sat on a fence and was thoroughly frightened by what I supposed to be dead twigs come to life, as several were moving on the ground and a few on the fence. I was astonished as Professor Comstock says one is apt to be when seeing the twigs supposed to be stiff and motionless suddenly walk off on long slender legs as awkwardly as if they

had never tried to walk before. He says,

"Strange and uncanny creatures are these walking-sticks with their long pointed bodies and with legs colored and looking exactly like twigs and leaf-petioles.

In the tropics their resemblance to foliage is made more perfect by wings which are veined like leaves. In the Northern States we have only one common species, *Diapheromera femorata*, and that is wingless. Walking-sticks feed upon foliage. Their eggs, which are large, are dropped on the ground under the trees by the mother, who trusts entirely to fate to preserve them."

He is right in his statement that the eggs are large. For the first time in my life I have seen a quantity of the eggs. They were laid by this specimen in a box in which it was put. They somewhat resemble the large eggs of the caterpillar but have peculiar markings on one end. I had planned to illustrate them but they were accidentally crushed. I hope sometime to obtain others.

Considers Scoke an Antidote.

Stamford, Connecticut.

To the Editor:

In the recent number of THE GUIDE TO NATURE you speak of the poison ivy or mercury. I write to say that I keep a plant growing in my garden the root of which is an antidote for vegetable poisons. It is called by different names—scoke, poke, etc. In the spring of the year the young shoots make the best kind of "greens." The fat root, which is poison, is the part used to counteract the poison. It is sliced and boiled in water for ten or fifteen minutes. With the water from the boiled root wash the parts effected from one to three times and you will be entirely cured. I have never known it to fail. I now have the plants with both blossoms and fruit. If any of your friends get poisoned I will give them a root. I shall be glad to show any one the plant.

Yours truly,

A. C. ARNOLD.

Valley Lilies.

Half hidden in their sheath-like leaves,

These tiny, ivory bells

Ring out sweet perfume on the air,

Which straight the secret tells.

—Emma Peirce.

A Beautiful Spider with an Interesting Cocoon.

Mrs. Isaac Ferris of Hilltop Farm, Riverside, Connecticut, sends to this office a beautiful specimen of the garden spider. It was in a match box. I had frequently seen specimens of this spider



THE GARDEN SPIDER AND ITS COCOON IN A MATCH BOX IN OUR LABORATORY.

and also had noticed their cocoons in the grass and attached to various plants, but never before have I seen a spider form a cocoon in captivity. This one suspended a beautiful piece of work of the kind in the center of the box. By carefully cutting off one end of the box, I was able to expose the spider and the cocoon so as to take the accompanying photograph. This whole family of garden spiders is intensely interesting, and now, in the month of October, is the best time to study them.

Sunrise Clouds.

Bright golden fleeces in a pale gold sky,
Await their Jason's quest in pastures high.
—Emma Peirce.

The Horse Got There First.

The late Marvin Day of Westchester, Connecticut, and his family were faithful attendants at church. One Sunday he went to the pasture to catch his old horse, but failed to find her in the lot. He and his family went to church, and found the horse already arrived and standing in their shed. The horse had recognized the day of the week and knew that it was time to go to church.

Observations of Spiders.

Stamford, Connecticut.

To the Editor:

I have been greatly interested in an occurrence in my garden, under the rose arbor. A spider, about three-eighths of an inch long, has taken up her residence there and is acting much as though she were a robber or a receiver of stolen goods, though I hate to think her guilty of either crime. She is evidently a species of garden spider though she has built no nest since I first discovered her. My garden has dozens of other spiders in it but I have not yet found one exactly like her. When I first saw her she was resting close to a tiny egg bag that seemed fat and full and was attached to one of the crossbeams of the arbor in a rather damp and shady place.

Soon after that I was delighted one morning early to see that the bag had burst and on it were dozens of the whitest little spiders. These stayed there for eight days, gradually getting darker, and one morning last week I visited them at about 5.30 and found only a few left and these disappeared before another day had passed. Before the spiders had all gone, however, I noticed another and slightly darker egg bag near the first one, and as I understand that after the female spider has had one family she has fulfilled her mission in life, I was desirous to learn where this second cocoon could have come from. Still more surprising was the fact that on two mornings following my discovery of the second I noticed two others that had not been there on the previous night. Madam Spider did not seem to pay any particular attention to the extra bags until last Monday, when I noticed, from the position in which it had been placed, that she was showing some interest in cocoon No. 2. Wednesday morning I discovered that this had opened and out of a tiny hole were marching very, very slowly a regular army of little spiders, not white as the others had been, but smoky gray! To-day, Saturday, the little gray beauties are still there but Madam is apparently interested in one of the other bags!

I have seen no other spiders while she has been there. I have thought it possible that they may indeed have arrived

OBSERVATIONS OF SPIDERS

at night and been vanquished in a fight leaving their property behind. But, if, as Fabre suggests, spiders have no maternal instinct, why does she mother these little foster spiders? Apparently she does not eat them—she has too much else to eat. One day I saw her feeding on a fairly large caterpillar. At another time I have noticed the remains of flies. Do you suppose she is a robber, or do you suppose, as I suggested, that she has fought off the legitimate owners of the other bags and confiscated their property?

JANE BATES.

* * * * *

Under later date Miss Bates writes as follows:

I feel sure that you will be interested in knowing that on my arrival home tonight I discovered that sometime during the day, from two to four hundred young, smoke gray spiders had arrived under the beam in the rose arbor. Some one suggested to me that the maternal spider had gathered the egg sacs in her trips about the garden and was waiting only to devour the young ones. This cannot be so as I have watched carefully, so carefully in fact that on Sunday night I had the pleasure of witnessing the departure of the second batch of spiders that had been gaining strength, apparently on nothing, since last Wednesday. This third batch is watched over by the same mother spider that attended the arrival of the first, the only ones that were white when they first appeared, but I too intend to keep special watch to satisfy myself that the old spider is as innocent as she appears to be.

My garden is small, twenty-two by seventy-five, but it is full of the most interesting things imaginable, a veritable

fairyland with delightful surprises everywhere.

Regarding this; Professor J. H. Comstock writes as follows:

"I think that the spider described by your correspondent is the domestic spider (*Theridion tepidariorum*) which you will find figured and described in my Spider Book at page 345. This spider is common both in buildings and out of doors. The female makes several egg sacs. The difference in color of the different broods of spiderlings may be due to an earlier emergence from its egg sac of pale breed.

Psalm of Life.

BY HAROLD GORDON HAWKINS, WESTFIELD, MASS.

Great spirit of the everlasting hills;
Of mystic forests and widespreading plains;
Of mighty rivers and the emerald lakes,
Of murmuring rills and surging seas;
Of gentle winds and tempests wild;
Of worms and beasts and winging birds;

Strength of my fathers, father of man,
Great God of eternal nature, grant to me
That I may live throughout the span of life
Thou hast in thy great mercy accorded unto
me,

Amidst the grandeur of thy handiwork,

Spirit of power, of strength, of love,
Grant that I may live to learn
From the mighty mountains an abiding faith
in thee.

From forests and from plains thy universality,
From rivers, lakes and seas the beauty of thy
works.

From zephyrs mild thy bounteous leniency,
And from the raging storms the power that
is thine.

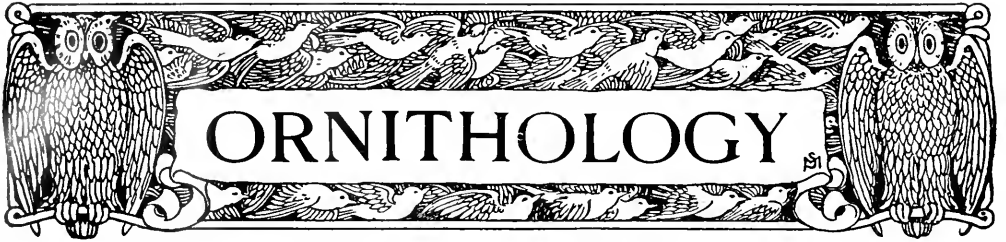
To destroy the breakers of thine immutable
laws.

Father of mercy grant that I may learn
From worm, bird, beast and flower, the
father's care

Thou hast for thy myriad children,
All of whom without that tender care
Would die like flowers in the winter's chill.

This, oh my father grant to me.





ORNITHOLOGY

All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

Remarkable Photographs of Gulls.

BY E. H. MATERN, SANDUSKY, OHIO.

Previous to my taking these photographs I had seen gulls only in the summer, and at distances of three hun-



A REMARKABLY GRACEFUL POSE.

dred to five hundred yards, but in February of this year thousands of these birds came to the wharfs at Sandusky, Ohio, to feed on the offal thrown on the ice from the fisheries. This pre-

sented an opportunity to study their character at close range.

Contrary to my former belief that these gulls were beautiful, peaceful birds which seemed to quietly harmonize with the placid summer settings of lake and sea regions, I found in reality a lot of wild, screeching, quarrelsome creatures making a scene gruesome and repulsive, from which emanated a great variety of uncanny screams and noises.

Soaring above at a great height (a gull is graceful only while flying) they would swoop down upon the barrells of offal as soon as the workmen had thrown it on the ice and departed. Grabbing ravenously right and left, they swallowed huge mouthfuls, getting their heads and bodies covered with gore. It is almost impossible to obtain an unblurred photograph at one three-hundredth of a second, so rapidly do their heads and mouths move in the act of devouring as much as possible before it can be eaten by the others. While gulping the food, they continuously flap their wings, trying to prevent others getting a share. Authorities on the subject have stated that they will eat two and three times their own weight without intermission.

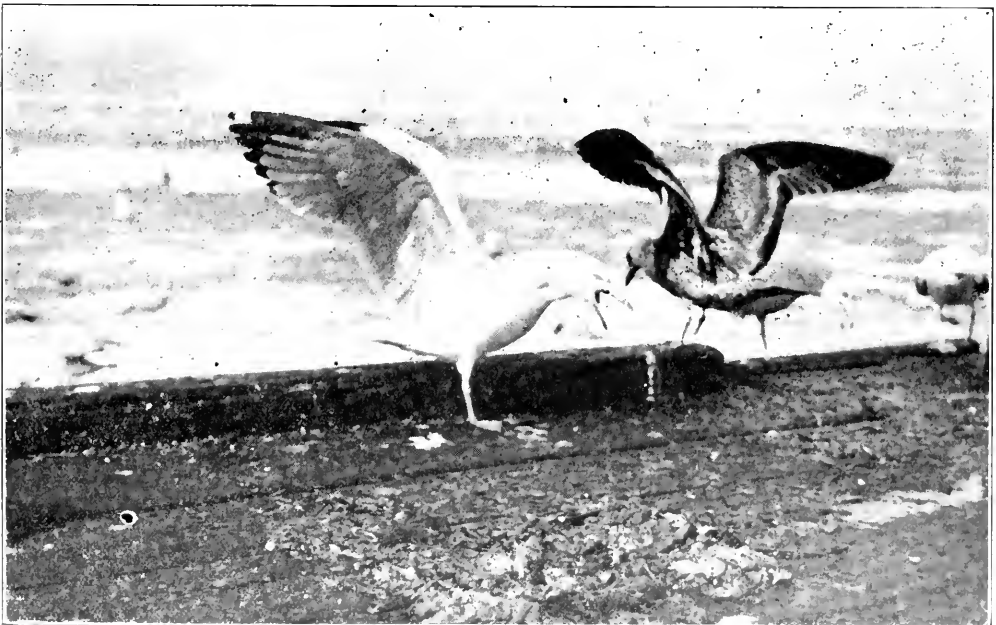
When the offal was entirely devoured and only very big fish remained, only the largest and strongest birds fed, and at this stage of the feast many scenes such as the following were witnessed, all being acted at the same time in different places on the ice. A large gull humps himself up and, with the swaggering stride and all the characteristics of some rough human of the underworld, will chase all the others to a distance of forty feet from the fish he is eating. These less powerful ones then stand in a circle facing the fish while he struts proudly back to it with his wings arched and his feathers fluffed. Gazing around the circle he



IN THE WATER BY THE ICE SHEET.

cackles his call of defiance—a loud, weird, shrill, prolonged, metallic series of notes: "Kankle, kankle, kankle, kankle, ki-ipe, ki-ipe, kipe." This done he folds his wings slowly and settles down to the task of ripping and tearing his fish. Meanwhile those in the circle creep up closer and closer. As they approach quite near, he repeats his

fight call, and the circle then widens again. Occasionally one is more brave than the others, especially if he is as large and as powerful as the one feasting. As he comes closer he challenges the other and the result is a fight quite similar to a cockfight. They screech, and peck furiously at each other, and slap and beat with their long powerful



"LET'S TALK IT OVER."

wings. Sometimes one will catch in its beak the tip of the other's wing, to which it will cling and tug with bulldog tenacity. This is usually the finish. The opponent screams like a hurt human and tries to beat the other off with its free wing. Tugging this way and that, the creatures slide and tumble on the ice until finally the several feathers are jerked out, when the injured one is glad to fly away. The other again returns to the spot where he left the fish, usually to find it stolen by some gull which has flown away with it, followed by hundreds of his screaming fellows, all intent upon stealing it; or, if it happens to be an extremely heavy fish, he finds it presided over by another large gull whose authority he is too exhausted to challenge.

Curious Action of a Cuckoo.

BY REVEREND MANLEY B. TOWNSEND,
NASHUA, NEW HAMPSHIRE.

Photograph by G. H. Higbee, Hyde Park, Massachusetts.

One June day a few years ago, the writer, in company with the editor of this department of *THE GUIDE TO NATURE*, took a canoe trip up the



TWO LITTLE CUCKOOS IN THE NEST.

Charles River in Eastern Massachusetts. The weather was perfect, the day entrancingly beautiful, and many nests with eggs and young birds were found. At the noon hour a landing was made in a shady spot and there we were so fortun-

ate as to discover the nest of a yellow billed cuckoo built low in a bush on the river bank. It was a frail structure, loosely made of twigs and so poorly constructed, in fact, that the young were visible from beneath through the bottom. There were two little fellows of different sizes. The cuckoo lays one egg and immediately begins to incubate it before the other eggs are laid. The result is a family of assorted sizes. In this particular nest, one bird, the larger, appeared strong and vigorous; the other was much smaller and appeared feeble.

As we were taking a picture, clouds rolled up and soon the rain was falling smartly. We crawled beneath our overturned canoe, and were enjoying the downpour in our dry shelter when we heard a rush of wings and saw the parent bird swiftly approaching. Alighting upon the edge of the nest she started to cover the young but hesitated and appeared to deliberate. Then occurred a curious thing. Making a sudden grab she seized in her beak one of her offspring, which subsequent investigation proved to be the weakling, and, pulling it from the nest, flew away! We looked at each other in amazement. What could it mean? What was the bird up to? She did not return and the rain having ceased we pursued our way. Had the cuckoo detected our presence and removed her young, and would she remove the other; or had she found the little fellow practically perished from exposure to the cold rain and decided to throw it away? We determined to investigate on our way back.

Many hours later, on our way down the river at the sunset hour, we landed at the nest. There was the other bird and it was warm, proving that the parent had just left, probably when she detected our approach. We therefore concluded that the weakling had been deliberately destroyed. Other animals, including savage man, appear to have this habit.

By keeping one's eyes open, many such unique observations may be made. This is the charm of nature study—there is no end to the interesting things to be seen.

When Nature shows her best to you
Just show your best to her;
Appreciation, gratitude,—
In these you could not err.

—Emma Peirce.

A Meadowlark Nest.

BY H. W. WEISGERBER, SALEM, OHIO.

The meadowlark may not be, strictly speaking, an "oven" nest builder, but



THE MEADOWLARK NEST.

the nest shown in the picture certainly belies that reputation.

Dawson in his "Birds of Ohio" says: "The nests are frequently arched over with dried grasses." The one shown was so completely "arched" that it had a side entrance, but not quite the tunnel of the ovenbird's nest. In fact, there was more than is shown in the picture, for the front straws had to be pushed back a little to exhibit the eggs. The



THE YOUNG MEADOWLARKS.

straws were replaced so as to conceal the nest as much as possible.

The other picture is of the same nest to show the young birds. It was taken a day before they left the nest that had sheltered them for the previous two weeks. But by this time the "arch" had been opened, for the old birds had an exit at the top as well as at the side. It had also been enlarged somewhat as the young birds grew and formed the grass walls outward. The picture shows it to be a "full house;" in fact, there was no vacant space "for rent" or otherwise.

A Beautiful Nest.

BY REVEREND MANLEY B. TOWNSEND,
NASHUA, NEW HAMPSHIRE.

On June 25th the writer found a red-eyed vireo's nest that seems worthy of note. It was built in the fork of a blossoming mountain laurel, not over four feet from the ground, on the shore of a little lake in Hallis, New Hampshire, and contained two newly hatched young and one egg in the last stages of incubation. The remarkable thing about it was the beauty of the nest and its environment. The laurel, in the full glory of its wonderful bloom, was growing under the shelter of tall trees, and the nest was so well hidden that not until the bird flew from beneath the hand as the laurel was examined was the nest discovered. It was an exquisite affair, a basket swung from a forked branch, closely woven of plant fibres of delicate texture, and firmly caught and fastened to the supporting twigs. The birds evidently possessed an aesthetic sense, for they had decorated the exterior with bleached spider's webbing and narrow strips of white birch bark. The effect was extremely beautiful—the lovely nest and the splendid laurel blooms made a combination to enrapture the soul of any lover of natural beauty.

October.

BY LOUISE WHITE WATSON, FALLSINGTON, PA.
I heard a song afloat in air,
And gazing into tree-top bare,
I saw the songster's tiny throat
Astir with life. Its every note
Was tuned to benediction, praise
For heaven-born October days.
I listened, lived,—all cares gave way
At jovous burst of roundelay.
O, song-bird sweet, to thee was given
To chord earth's song in tune with heaven.

A Song Sparrow's Nest.

BY H. W. WEISGERBER, SALEM, OHIO.

I believe that little birds are often hard pressed for ideal nesting sites, while at other times such sites are so numerous



A SECLUDED NEST.

that, like many a human, the bird scarcely knows which one to choose. The bird that built the nest shown in the picture must have been bothered somewhat in that way. Locations were numerous, in fact, too numerous, so she wisely selected a place which even a cowbird would have found difficult to enter.

The nest was so well hidden that the camera man nearly missed getting a picture of it. But three of the four eggs show. So far as I know the parent bird succeeded in raising her brood, for at my last visit to the place the nest was empty and did not look as though it had been disturbed.

Whenever photographing a nest I always stand as far back as possible and never touch nest or eggs. If any offending grass or brush needs to be removed I always use a stick or a pencil. The eggs too, if it is necessary to arrange them in any way, can be shifted by the aid of

the rubber tip on the pencil without fear of breaking them. At the best it is dangerous to take the picture of a bird's nest, for a varmint of one kind or another will often follow man's tracks, find the nest and thus get a meal of eggs or of young birds. Unless I step near a nest accidentally, I always keep three or four feet from it.

How Birds Soar.

BY NORMAN S. DAYTON, PALM SPRINGS, CALIFORNIA.

A boy, whose reasoning powers were not satisfied with half truths, having read that the condor and the buzzard can rise to great heights by merely balancing with outstretched wings, using little if any effort in their aerial climbing, could not accept the mystery without further questioning. Not having heard a plausible explanation of this seeming paradox, the conversation with this inquiring youth suggested to the writer the thought that this problem might be puzzling others who are not in a position to trace the natural phenomena that accompany these strange soaring feats.

Those not familiar with the extreme southwest of our land will by referring to the map notice the long arm of Lower California extending southward into the tropical ocean. The Gulf of California is an inland sea, its waters being accessible only to the tropical ocean. The upper end of this almost tropical gulf is filling, principally with the erosions of the Grand Canon of the Colorado. This vast delta of the Colorado River forms an enticing feeding ground for the migratory waterfowl tired by their long flights as they follow the coast.

On their northward journey when the summer's heat begins to urge, the great flocks rise, forming the usual broad V. The strongest bird, taking the center of the V as leader, begins to beat the air; the other birds each drop into the easy position where the force of the air is broken by the one next in advance. As the Colorado would lead them far from the Pacific if they tried to reach its source, they turn westward to a break in the mountains where the snow covered, towering sentinels of the San Jacinto and San Bernardino Ranges guard the travelers by their peaks two miles in height.

As this mountain pass requires a rise of half a mile and as the birds do not feel safe near the man with a gun, they must prepare for a steep ascent before they can glide down toward the deep blue of the Pacific.

Here nature comes to their assistance. All eastward of these mountain ranges, that lie generally parallel with the coast, is desert or semi-desert where the sun heats the barren rocks or the parched earth to the satisfaction of even the most exacting horned toad.

The air coming in contact with these highly heated surfaces ascends and is replaced by descending currents or by air that pours into this inland basin through many high gaps in the coast range.

When the winds are not too active these ascending currents rise in great columns, as is evidenced by the whirling of the dust which they gather and carry to great heights.

When the spreading V-shaped flock encounters an ascending air current it at once breaks ranks and each bird for himself adjusts his wings and begins to circle within a radius that will enable him to avail himself of the rising air. Thus with seldom the flap of a wing the birds often rise until they are scarcely discernible to the unaided vision.

When the energy of the ascending currents has reached the limit of useful lifting, the flock resumes the businesslike V form and glides with occasional wing movements down and through the great pass to the distant coast on their way to the land of the melting glacier.

The writer's many years in Florida permitted observations of the ever present buzzard in his lazy soarings. These like those in the desert occurred only when the air was so quiet that the sun's heat from a clear sky could by heating the earth's surface establish the well defined ascending areas of heated air. As the abundant vegetation of Florida prevented the dust from rising to supply visible evidence of the ascending current upon which the soaring birds could float, the observer must by watching them assure himself that they limit their ascents to certain areas. Any attempt of a willful bird to pass the limit of its well defined circling was immediately followed by active wing flapping until it could again find another upthrust of air.

Remarkable Nest on Water.

BY FLOYD T. WOOD, CALGARY, ALBERTA,
CANADA.

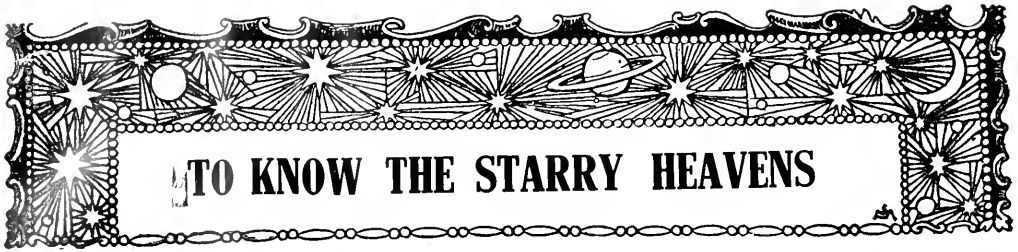
The nest is the home of what we call the hell-diver, which I understand is a species of grebe. There were at least three feet of water under the nest. Its



THE NEST ON WATER.

support was the dead branches of a small, scrubby willow. The mother bird went only a few feet away and returned to her charges as soon as I splashed my departure. I might add that four little hell-divers appeared in due season and lived quite happily in the pond where they were hatched. The picture was taken from the back of my saddle horse.

In several of our eastern towns and cities house wrens have appeared in the last season or two, where none have been previously observed for ten or fifteen years, and it is hoped that these friendly little birds may again become common in localities which they formerly inhabited, being supposed, in many instances, to have been driven off by the English sparrows. The abundance of bird houses now being constructed and placed about, will offer unusual protection and nesting sites, and should do much toward bringing back the wrens.



The Starry Heavens in October.

BY PROFESSOR ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

During the past month we have seen the complete withdrawal of the summer groups, Libra and Scorpio, from our evening heavens. The bright Arcturus

the Great Square of Pegasus and the large, bright group of Andromeda, near which latter constellation both Cassiopeia and Perseus are now seen high in the northeastern sky. In the extreme north the Great Dipper has now sunk completely below the Pole and rests in an upright position a short distance

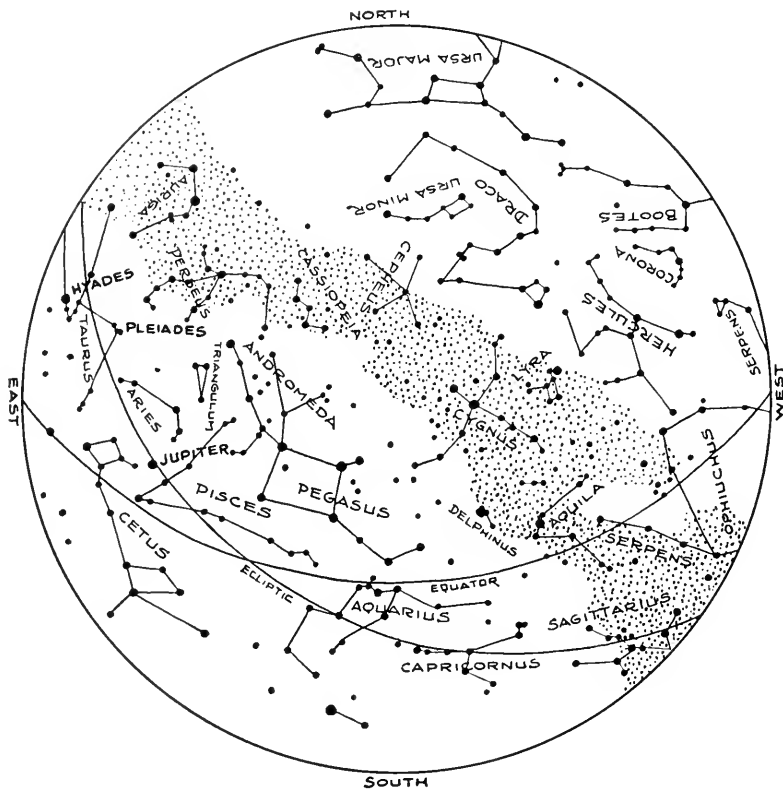


Figure 1. The Constellations at 9 P. M., October 1. (If facing south, hold the map upright; if facing east, hold East below; if facing west, hold West below; if facing north, hold the map inverted.)

has sunk below the ground in the west, while the interesting, though faint, groups of the Serpent and the Archer have both partly disappeared. Meanwhile the Royal Star, Fomalhaut, has been mounting steadily higher in the southern sky until now it is but a short distance to the east of the meridian, while above it there shines out

above the ground.

The bright, golden sun Capella has again appeared in the northeast, but most interesting of all is the entrance into our evening heavens of the great group Taurus with its two wonderful, though scattered, little clusters of the Pleiades and the Hyades.

Even to the naked eye the little dip-

per-shaped group of the Pleiades is a striking and interesting object, but it will be found that the smallest telescope greatly increases its beauty. On an ordinarily clear night six stars can be seen with the naked eye (though some observers detect several more), but a telescope of but one-inch aperture will show at least as many as are indicated in Figure 2, while no less than

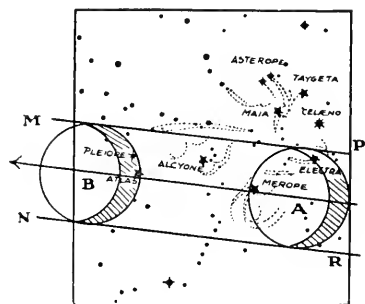


Figure 2. The passage of the moon over the Pleiades on the morning of October 14.

2000 are revealed on the delicate photographic plate.

The names of the brighter stars are given in Figure 2. Alcyone, a greenish star, is the brightest of all, and the delicate little triangle of three faint stars near it makes this a very attractive field in the telescope. Near the upper edge of the bowl of the little dipper is Maia, the first born and the most beautiful of the Pleiad Sisters; above this are the twin stars (usually just visible to the naked eye as one very faint star) called Asterope, while Pleione and Atlas mark the end of the handle of the dipper toward the east.

An immense amount of legendary reference to these stars, both as an entire cluster and also singly, has accumulated during the ages. With some nations their changing positions have been employed to mark the seasons and the beginnings of the years, while to very many they serve to indicate the times at which various agricultural labors are best undertaken or discontinued. Thus Virgil states the time of honey harvest to be when "Taygeta displays her comely face toward the earth," while seeding time should not be considered to have arrived until the "Fall of the Pleiades" from the evening sky.

The faint lines of Figure 2 show the location of a part of the extraordinary, faintly glowing nebulous matter which extends throughout the cluster and is especially associated with its brighter stars. Recent observations indicate that these inconceivably extended wisps and streams shine, at least partly, by light which is reflected from the stars of the cluster, and that thus they may be made up of dustlike or other opaque material. Altogether, the more it is studied the more remarkable and interesting the little cluster of the Pleiades is found to be.

* * * * *

The Occultation of the Pleiades.

This very beautiful and unusual phenomenon will occur during the early morning of Saturday, October 14; the hour is thus, unfortunately, somewhat inconvenient, but otherwise the entire phenomenon could hardly occur more favorably for observation. The amateur astronomer who is willing to undergo a little discomfort will be well repaid for foregoing a part of his usual sleep.

As seen from Washington, the advancing (east) edge of the moon will touch the first bright star, Electra, at about 3 hours 30 minutes A. M. (Eastern standard time). At this time the Pleiades will be high in the heavens in the west; Capella, the Hyades and Orion will be seen shining high in the south, the two Dog Stars, Sirius and Procyon, will have almost reached the meridian, while the bright Saturn will shine high in the east. As the occultation proceeds the observer will lastly see the very brilliant Venus rising a little to the north of the east point of the horizon, and by the time the entire phenomenon is concluded it will have climbed high up into the morning sky. Altogether the entire heavens on this morning will present a most beautiful sight.

On October 14 the moon will be three days past the full and will hence present approximately the appearance shown in Figure 2. As it is moving eastward over the heavens the stars will disappear at its bright edge, to reappear later at its dark (invisible) edge,

after having been hidden for a greater or less length of time, depending upon their position.

As seen from Washington, the center of the moon will move along the path AB, and all stars lying between

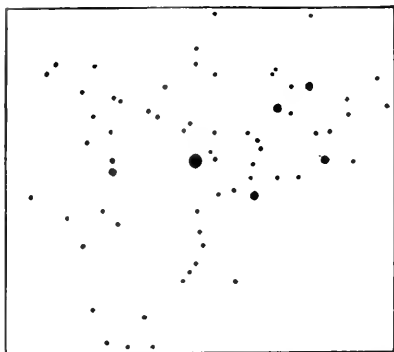


Figure 3. The Pleiades as they appear in an opera glass.

the lines MP and NR will be occulted. It should be carefully borne in mind, however, that this appearance varies with every change in the position of the observer upon the earth. Our satellite is so near us that an observer south of Washington will see its path projected higher among the stars, while to observers in the northern parts of our country the moon will appear lower down. Thus to an observer whose latitude is 42 degrees the lines MP, BA and NR will be depressed so far that the bright Electra will entirely escape occultation, while to one so far north as 49 degrees Alcyone will always lie above the moon.

In Figure 2 the moon is shown in two different positions. In the first its advancing edge has just touched the star Merope, whose disappearance will occur at 4 hours 10 minutes A. M. Electra, whose occultation began at 3 hours 36 minutes, is seen still hidden, but this star will emerge 18 minutes after Merope has disappeared. In the second position Atlas and Pleione are seen just emerging at about 7 A. M. These disappear at 5 hours 53 minutes and 5 hours 58 minutes, respectively, while the eastern heavens is already bright with the coming dawn. Since at their emergence the sun will have risen this part of the phenomenon cannot be witnessed except in the largest

telescopes. Alcyone, the brightest star of all, will be hidden at 5 hours 0 minutes A. M. and will reappear 1 hour 7 minutes late.

This most interesting phenomenon can only be viewed in the telescope. The observer should, if possible, protect the object glass from unnecessary moonlight by affixing a long blackened tube to the end of the instrument. Even then, if his lens is a small one, he may have difficulty in seeing the disappearance of the stars which are fainter than Alcyone; their reappearance at the dark edge of the moon is much more easily observed.

* * * * *

The Planets in October.

Mercury enters the morning sky on October 5 and reaches its greatest distance west of the sun on October 20. For a few days before and after the latter date it may be detected shining low in the southeastern dawn for about one hour before sunrise.

Venus, which attained its greatest distance west of the sun on September 12, is now slowly drawing nearer the sun's rays and also moving rapidly southward among the stars. On October 1 it will rise in the northeast about three and one-half hours before sunrise, and on October 31 it will rise two and three-quarter hours before the sun, almost at the east point of the horizon. It is the brightest object in the early morning sky.

Mars during the month runs rapidly eastward and southward among the bright stars of Scorpio; it will finally pass Antares on November 11. The sun, however, in its own, more rapid, eastward motion is steadily overtaking the planet. The latter's position, low in the southwest, its proximity to the sun's rays, and its great distance from the earth, all combine to render the conditions for its observation very unfavorable.

Jupiter shines brightly in the east, in excellent position for observation. The planet is slowly retrograding in the extreme northwestern border of Cetus. It will come to opposition, and so be on the meridian at midnight, at 2 A. M. of October 24.

Saturn is in the western border of Cancer, almost in a straight line with

the Twin Stars, Castor and Pollux. It now rises before midnight, and by sunrise is near the meridian in the south, at which time it is very high in the heavens in very good position for observation. Saturn is in quadrature with the sun on October 24 at 1 A. M., exactly one hour before Jupiter reaches opposition.

Mysteries.

The moon threw a bridge of silver
 Across the tranquil sea,
 As if beckoning us to come and learn
 What manner of moon she be.
 —Emma Peirce.

The Real and the Fictitious.

We congratulate Middletown, Connecticut, and in fact the entire state on its interest in astronomy and in its possession of a new astronomical observatory. At the dedication in June, Professor Frederick Slocum delivered an interesting address, in which he related some curious facts or points of view, and at the same time pointed out what should be the real interest in astronomy. We quote from his address as published in "Popular Astronomy."

"There is evidently much doubt in the minds of some people as to just what an observatory is, and what it is for.

"A teamster came up here some time ago with a load of window frames for the new dormitory. When told that he had come to the wrong place, that this was the observatory not the dormitory, he paused a moment and then asked, 'Well, what's the difference anyway?'

"An expressman one day enquired about the significance of the building, and when informed that it was for the study of the heavens, remarked that he hoped it would do some good.

"A neighbor reports a conversation with her maid, who asked about 'that queer building up on the hill.' When she was told that it was an observatory and contained telescopes through which the students looked at the sun, moon and stars, she replied: 'They'd much better look into their own hearts. That's what I think.'

"The building has been likened to a fort, and the dome to a bee-hive, and even to a sore thumb. The most en-

couraging comment on the exterior appearance of the structure is one by a member of the Wesleyan Faculty, which I take the liberty of quoting:

'Little bits of plaster,
 Little blocks of stone,
 Make a handsome building,
 When the ivy's grown.'

"In some cases the visitors have come apparently out of mere curiosity rather than through any interest in the subject of astronomy. However, such curiosity is, no doubt, perfectly legitimate, and I believe that the observatory ought to make some provision to satisfy it. It may be possible next year to set apart certain days and perhaps one or two evenings per month for visitors.

"As to the research program of the observatory, from some of the replies to the invitations to the dedication, I have been able to learn, to some extent, what is expected. For example one alumnus writes, 'We expect great results from you in the future. If you do not discover a tenth moon of Jupiter, we fully expect you to do some other work which the alumni will recognize and appreciate.'

"Now I have not the slightest idea of hunting for a tenth moon of Jupiter, and if I ever should find one, it would be purely by accident. In this connection I am reminded of a story which appears in the biography of Galileo. In the year 1604, while Galileo was a professor at Padua, a new star blazed out in the constellation of the Serpent and attracted great attention, chiefly, perhaps, because it apparently contradicted the teachings of Aristotle and the church, that the heavens were unchangeable, perfect, subject neither to growth nor to decay. Galileo was invited to give a course of three lectures on the new star. At the first lecture there were over 1000 people, and the second lecture had to be given in the open air because there was no hall in the city large enough to hold the audience.

"In opening his first lecture he took occasion to rebuke his hearers for thronging to learn about that transient phenomenon, while showing absolutely no interest in the far more wonderful truths about the permanent stars."

In 's dedication, Edward I. Vasey also gave expression to some stimulating thoughts. Among these good things is this:

"Astronomy is the foe of small thought. I do not know, I only wonder whether it was astronomy which developed in my father his great, his unusual love for truth, or whether it was his love for truth which drew him to astronomy. But this I do know, that its close connection with human thought was one of the reasons why he adored astronomy."

The stars in Heaven are torches bright
To light the way for the Queen of Night.
—Emma Peirce.

We Must Work! Work! Work!

There is another habit that is not so prevalent as formerly—the habit of work. Those who made the American nation what it is to-day worked long and hard. The spirit of hard work now seems to be lacking and we hear constantly that eight hours or less work a day is all that a strong, healthy man should do. Where would the United States now be if our forefathers had been content with eight hours' work a day? Where will the United States be in the race for future commercial supremacy among the nations of this spirit continues? We have ships to build, railroads to develop, an army and navy to be manned, and countless tasks to perform. Every patriotic man should give the best that is in him, not the least, if we are to avoid serious difficulties at home and abroad.—Howard Elliott.

For hand sectioning for the microscope, Professor George J. Peirce recommends the Gem Damascene safety razor blade set in the stropping handle of the Gem Safety Razor.

Chinchona, on the east end of the island of Jamaica, is under discussion as a permanent biological station for American students. Among other attractions are the neighborhood of a large tract of virgin forest, a very respectable mountain range close to the sea, "horse-tails" growing fifteen feet high, and fern thirty and forty.

It Is Good To Live.

BY HAROLD GORDON HAWKINS, WESTFIELD, MASS.

Ah, it is good to live, just live,
Close to the soil from which man sprung,
Far from the artificial city with its toil and strife,

And superficial gloss and pride of place.
It's sorrows and regret, it's vain ambitions,
And stamping out of individuality in man.

Yes it is good to live, to be alive,
To all the beauties of the country-side.

To hear the songs of multitudes of birds,
Flooding the air with glorious melodies.

To watch the ploughman breaking the distant field.

To smell the warm, moist earth just freshly turned

To find bright flowers of May beneath dead leaves.

To feel the warming breath of Spring upon one's face

To drink the waters of some limpid pool.
To bathe in it, and race upon its shore.

To sink at close of eventful day,
Into some quiet mossy bed.

To rest and gather strength for coming trials

Yes, it is good to live, just live,
To help the needy and the sore oppressed,
To comfort them when faith and hope have fled.

To love mankind and all the name implies.

To hold the hand of some grief-stricken friend,

And weep with him, and strengthen him.

To know that Life, sorrowing or rejoicing ever,

Abounds upon the wide-spread face of earth.

Yes, it is good to live, just live,

—Emma Peirce.

Hugo de Vries, the great authority on mutation in plants, has arrived at the age when by law he is obliged shortly to retire from his professorship at Amsterdam. He will establish a small private laboratory and botanical garden, and devote the rest of his life to his experimental work.

The new Hawaii National Park, lately created by Congress, boasts among other attractions the most continuously active volcano in the world, the largest active volcano, and the largest active crater. Kilauea, Mauna Loa, and Haleakala are all included in the tract. Haleakala, less familiarly known than the other two, has had an eruption within two centuries. Its crater is three thousand feet deep, and is said to offer at sunrise the grandest volcanic spectacle this side of the moon.



EDITORIAL

FOR THOSE WITH GOOD APPETITES.
If You Never Eat Don't Read This Department This Month.

Apple Turnovers Lost.

This lament for another loss is dedicated to the "Literary Digest" that thus far has copied all my plaintive moanings about the things that the human race has lost, especially the loss of potato seed and hominy. That these lost treasures are really lost is proved by the fact that even the large circulation of THE GUIDE TO NATURE combined with that of the "Literary Digest" has failed thus far to bring any potato balls to light except those that are decidedly vestigial, and none with seeds that I have thus far been able to germinate.

The correspondence in regard to hominy still goes merrily on and several stenographers are rattling away at their typewriters and telling innumerable correspondents that we are not searching for lye hulled corn but for hominy. We have had all sorts of grits, various things that look like Japanese rice, some like sheep's teeth, some like mush in milk and still others in all sorts of concoctions. But thus far, "Literary Digest," in spite of your jocose remark about "this startling revelation, etc., let it be known to you and others that not one ounce of real hominy has materialized at this office. I believe it to be a product completely lost, and lamented by man. Where is the gristmill that will make the old-fashioned hominy? There is a fortune in it for some one and I offer the suggestion without trade-mark, patent right, copyright or any mental reservation.

While speaking of the lost things, let me ask where is the old fellow who does not remember the delicious apple turnovers of his boyhood, especially if he is a New Englander? Now wait a moment. Stop right where you are. Do not deluge us with letters telling that when you make apple pies, you still take the apple that is left over, put it in a piece of crust and bake it. Do not tell us how you

stew apples and put them in dumplings. That sort of dumpling business is pot apple pie and not an apple turnover, so-called because it really was a turnover. If all New Englanders had lived by the seashore I am sure they would have called it an apple porpoise because the movements of an apple turnover, when dropped into boiling fat, are not unlike those of a porpoise rolling in the sea. How they were made so that the edges did not split open, I do not know. It is a lost art. Like the Damascus swords which, history tells us, could be bent from tip to handle without breaking, these apple turnovers were bent from edge to edge and the edges would stick. Oh, the delicious anticipations as they tumbled and rolled and turned over in that boiling fat!

Is there anything that brings more clearly to mind the domestic scenes in that New England kitchen than the vision of Grandma standing there, right hand poised in mid-air as if she were about to harpoon a porpoise, left hand on her hip, with calm complacency in her attitude that said, "I can make the most delicious mingling of apple and wheat that ever was made."

Apple turnovers as they disappeared, passed through a process of reversion. For a time, they were known in some New England restaurants, but the apple stuffing was crude, the crust was crude and the edges seemed to have been turned over and riveted down. No one would want to eat the edges of these degenerate turnovers.

So I set on the shelf the memory of those delicious apple turnovers in company with potato seed, hominy and milk, fried hominy, hominy pie, the real old pot apple pie, and—now go slow—huckleberry hollow! But that is another story. When my correspondents shall have showered me with letters and shall in vain try to prove that apple turnovers

have not vanished, then I will sing the threnody of huckleberry hollow. Until then, *hic jacet applus turnoveris; requiescat in pace.*

What Hominy Is and How It Is Made.

The most astonishing fact that an extensive correspondence regarding hominy has revealed is, that not one person in a hundred seems to know what hominy is as it is understood here in New England.

It is pathetic not only that primitive hominy no longer exists but that the name has been appropriated for a multiplicity of corn products. Out of a multiplicity of letters the only one thus far that correctly states the method of manufacture has been received from Mr. E. A. Morley of Westport, Connecticut. We think our readers will be especially interested in what he has written. The question now is: Where is the mill that can produce the goods?

"The mills used in grinding hominy are no different from any Burr mill or Stone mill that has to be pecked in order to keep it sharp so that it will grind. I remember the grit that sometimes was felt between my teeth when the stone, after pecking, had not been properly dusted. The secret of success in the making of hominy consists in taking the corn to the mill just after it has passed the milk stage, before it becomes hardened, or glazed, that it would crack easily and make what is now known as cracked corn. At this stage it is soft and is in condition to be made into hominy and samp. The only difference between hominy and samp is that samp is ground much coarser than hominy.

"The corn to be successfully used must be just right in hardness, neither too hard nor too soft. I remember that my father once took corn to the mill when it was too soft, and instead of being well ground it was crushed between the Burr stones and made into little worm-like rolls about an inch long an eighth of an inch in diameter.

"Let me tell you how hominy and samp were washed. Of course the hulls must be got rid of. The corn was put into a big pail, with an abundance of water, and well stirred. The hulls rose to the surface and were poured out. Fresh water was added and stirred and turned off,—after waiting half a minute or so for the

hominy to settle. Repeat the washing until the hulls are all washed away. Then you will have the long looked for hominy lying at the bottom of the pail, ready to be cooked like mush. Cook thoroughly. You know what comes next—good milk with all the cream in it.

"Now you have it. Keep it choice, for it is by the merest chance that you get it at all. I am now sixty-eight years of age and those experiences are as fresh in my memory to-day as though acted only a week ago."

Where Has Hominy Gone?

On page 59 of our issue for July was an editorial entitled "In Memoriam Hominum." This was copied by the "Literary Digest," New York City, under the heading, "Is Hominy Gone Too?" The editor jocosely, and perhaps with a gentle undercurrent of sarcasm, refers to it as "another frightful revelation." It is a revelation, but just how frightful has not yet been determined. It is, however, an interesting fact that we have to order another batch of stamped envelopes from the post office and that two stenographers have been laboring during those long hot, August days with the subject of hominy. From northern Maine to southern Florida, from the Atlantic to the Pacific, letters of condolence have come by every mail. The present indications are that the stenographic force will soon be exhausted from overwork attending to this enormous hominy correspondence.

There are, however, two interesting facts to be deduced from this mass of letters. First, few of our correspondents know what hominy is. They did not carefully read the original article, which, in the second paragraph, defines, with reference to the Webster family, what hominy is and how it is made. It is a curious fact that nearly all our correspondents talk about hulled corn, which the article distinctly states is not the loss that I am deploring, but that of real hominy from yellow corn. I will frankly admit that I liked hulled corn when I was a boy, and so did I like to eat sweet apples, to go fishing and to attend the circus. The correspondents say that I must have lost hulled corn. Perhaps I have, but that is not the subject under consideration. What I have lost is a real loss and there is no lye or lie in it.

There is a second interesting fact deducible from this mass of correspondence. Up to the present time not one particle of hominy has reached me, although I have had specimens of the modern hulled corn, some of it dried and some of it, a very excellent article, put up in cans with milk. We are doing our best, in view of the disadvantages of the hot weather, to attend to this correspondence, hoping that out of it we may at least get "only three grains of corn, mother," ground into the real hominy.

Sometime I am going to deplore the loss of real hulled corn from New England, though I judge from the letters that it is not wholly gone from the Southern States. But that is another story.

By whose authority have these two substances become so confounded, the one with the other? Hominy is hominy in New England and hulled corn is hulled corn—as clear, sharp and distinctly differentiated as your eyes are from your hands.

How Hominy Was Made.

Painesville, Ohio.

To the Editor:

Your article on the passing of hominy has attracted my attention and interest. While I can be of no service to you in your search for the desired article, yet possessing one item of information, which you confess you lack, I venture to describe the process of making hominy in Maine in my boyhood. The corn raised was a "short season" golden yellow variety, maturing without "dent." As soon as it was sufficiently ripe enough was gathered to make a "grist." The ears were husked and spread out to "cure." When thoroughly dry they were shelled and taken to mill. The upper and nether millstones were separated so as to grind coarse. In grinding the hard part came through about one-half or one-third the size of rice grains.

The preparation of cooking consisted of taking a sufficient quantity and putting it into a broad pan—a milk pan usually—filled with cold water. Stirring caused the hull or bran and the softer parts to float, while the coarse, deep yellow grains remained at the bottom. It was then an easy matter to float off the useless parts, and lo, the hominy was ready for cooking. This was accomplished by boiling for sev-

eral hours, with frequent stirring, in water seasoned with salt. When supper-time came it was served with freshly drawn milk. It was, indeed, a dish "fit to set before a king."

Sharing with you a longing for some genuine, old-fashioned HOMINY, I beg leave to subscribe myself,

Yours very truly,

GEORGE A. LORD.

The Chews One Chooses.

Professor M. A. Bigelow in his "Applied Biology" has an interesting paragraph on the value of mastication, which he says has been the subject of much discussion, and is still uncertain, "For there are some people who masticate little and have perfectly healthy digestion, and there are others who masticate extensively and claim to have thereby cured indigestion. The truth is that it is largely a question of the kind and amount of food and the habits of the individual." That is each individual chews as he chooses.

The range of choosing is wide. Probably the best example in all literature of a bolter of food, or a supposed bolter, is given by Dickens in his "Great Expectations." It will be remembered that Pip planned to take food to the convict on the marsh and that he had an interesting competition with Joe in eating bread and butter. While they were eating as usual, Pip, the really young boy, referred to by Joe, the older young boy, as "the old chap," planned to hide his bread and butter untouched "down his leg," supposedly within his trousers pocket. Suddenly the bread and butter vanished to Joe's wonder and consternation, who protests against such startling bolting of food as follows:

"I say, you know!" muttered Joe, shaking his head at me in a very serious remonstrance. 'Pip, old chap! You'll do yourself a mischief. It'll stick somewhere. You can't have chawed it, Pip.'

"'You know, Pip,' said Joe, solemnly, with his last bite in his cheek, and speaking in a confidential voice, as if we two were quite alone, 'you and me is always friends, and I'd be the last to tell upon you, any time. But such a'—he moved his chair, and looked

about the floor between us, and then again at me—"such a most uncommon bolt as that!"

"'Been bolting his food, has he?' cried my sister.

"'You know, old chap,' said Joe, looking at me, and not at Mrs. Joe, with his bite still in his cheek, 'I Bolted, myself, when I was your age—frequent—and as a boy I've been among a many Bolters; but I never see your bolting equal yet, Pip, and it's a mercy you ain't Bolted dead.'

"My sister made a dive at me, and finished me up by the hair; saying nothing more than the awful words, 'You come along and be dosed.'"

The dose referred to was Tar-water that Mrs. Joe always kept in the cupboard and believed that its virtues were correspondent with its nastiness. On this particular occasion both Joe and Pip were dosed. The incident described in Dicken's inimitable style makes an interesting classic story of bolting.

It is presumed that the advocates of Fletcherism have held up this record as an awful example. It is on many occasions argued that cows and sheep chew their food in a painstaking manner. There is only one flaw in this argument and that is that the human being is neither a cow nor a sheep! Professor M. A. Bigelow in the book referred to nicely expresses this:

"There are those who point to the rumination of cows and sheep for evidence that naturally animals masticate food for a long time; but this gives no rule for human guidance. In the first place, a cow's natural food is uncooked and otherwise unprepared; second, her digestive organs are quite unlike the human; and third, dogs more closely resemble man in structure and in foods and they never masticate. Obviously, it cannot be concluded that man should chew his food long because cows and sheep do. . . . Most people may safely forget their jaws while eating (i.e., masticate instinctively) *provided* that they do not eat too rapidly or in excess. However, it is well for each person to experiment upon himself, and thus determine how far special attention to mastication is important for himself."

In the words of the ancient philosopher, "Let us hear the conclusion of the whole matter," and what it is. It is this. Do not catch a good idea or a part of it and make it a hobby to the annoyance of everybody else either in preaching or in practice, in season and out of season. One rather sympathizes with Mrs. Joe in her application of drastic remedies to Joe and Pip, if they are going to swallow their food whole; but perhaps would sympathize even more if similarly drastic remedies should be applied to a person who insisted on making himself either a cow or a sheep when his internal anatomy does not resemble that of either, nor is the kind of food similar. There are many bolters; lots of those who chew and chew and chew are bolters. Sometimes one gets hold of a really good bite of bread and butter, or, in other words, of a really good idea and swallows it down at one gulp, thinking that he can assimilate it. There are others that catch on to an idea or a part of it and they chew interminably for the rest of their life to the great annoyance of everybody. Bread and butter, and I say this not only literally but figuratively of many forms of the staff of life, should be assimilated after a reasonable amount of chewing or practising. But when it is swallowed whole or chewed for twenty-four hours a day the neighbors are apt to rise up and complain and pray, "Oh, give us another Mrs. Joe to dose that victim with Tar-water." There is such a thing as sanity in the middle ground.

Fifty Years of Chewing.

If you glance down the aisle when you are again on a car, you will note that four out of ten fellow passengers are moving their jaws leisurely up and down, perhaps keeping rhythmic time with the sway of the car. These are the chewing-gum enthusiasts, and they have been at it for half a century. June brought the first real anniversary of 1916. It is well enough to speak of the Shakespearian tercentenary, but what are William's followers compared with the vast American army who could celebrate the birthday of their pet habit?

Strangely enough, whatever Mexico

may do to America in a political way, she can not undo the great service she did our country by introducing us to chewing-gum. According to the *New York Tribune*, it was General Santa Anna, of Mexico, when a candidate for the Presidency of that changeable country, who brought the new confection to the notice of an astute American friend. As the account runs:

On one of his campaign-tours for Revolving President of Mexico, General Santa Anna went in June, 1866, to confer with a friend at Snug Harbor, Staten Island. Little realizing what momentous results were to attend his action, came one Thomas Adams, Jr., to pay a social call on the distinguished thug. One word led to another, and before the afternoon was half over they had reached such a state of familiarity that General Santa Anna had gone to his bureau-drawer and taken out a little chunk of something resembling overshoeing and, placing a piece of it in his mouth, began to chew it with apparent relish, at the same time offering a sector of it to Mr. Adams and his son.

With a nice regard for convention, Mr. Adams asked the General what it was before he placed it in his mouth, and was informed that it was the gum of the zapote-tree, known to its friends as "chicle."

Thus reassured, Mr. Adams took a chance, and was at once impressed with the substance's possibilities as a commercial rubber. He asked Santa Anna to give him a piece about the size of a man's fist, and took it home with him for experimental purposes to see if it could not be vulcanized.

In conference with a chemist and a manufacturer of dental supplies, he tried to produce from it a substance that could be used as a base for artificial teeth, but the thing must have had some intuitive sense of what it had really been brought into the world for, as it successfully refused to be vulcanized and remained just what it was when it first came from Santa Anna's bureau—a potential stick of health-giving, circulation-building, teeth-preserving, digestion-aiding, brain-refreshing, chest-developing, soul-tuning chewing-gum.

One day as they sat around the dissecting-table gazing hopelessly at the defiant

mass of chicle, some one said in a pet that the only thing the darn stuff was good for apparently was to be chewed. And Mr. Adams, being of that type of men pictured in the encyclopedia advertisements who have, without a college education, worked their way from a line-cut fadeway in the background, representing a barefoot boy, to a half-tone picture of a man in a two-button sack suit, with his hand on an open volume, immediately answered back with "We'll fight it out on this line if it takes all summer," or Millions for defense, but not one cent for tribute," or some such historical phrase, and the manufacture of chewing-gum from chicle was begun.

The Adamases, father and son, managed to get together a capital of thirty-five dollars, and with this as a working basis, the account tells us, they began the manufacture of this new—what shall we call it, well, commodity. They started then what proved to be the greatest national movement America has ever seen, the jaw movement.

As to the actual manufacture of chewing-gum, we learn that it was very simple. The thirty-five dollars would go a long way, for we read:

The chicle was boiled on an ordinary cook-stove, like molasses candy, until it had the consistency of bread-dough, when it was rolled into long strips and cut off in inch-sections. These were hardened in cold water and packed, a hundred in a box, and the thing was done.

The chewing of gum in the early days of its manufacture was more a matter of conscientious application to the work at hand than it is to-day, for there was no such thing as flavoring to help along the delusion of having a good time. It was just chewing for chewing's sake, and the pioneers who gave their time and energy without even a trace of spearmint or blood-orange reward deserve all the praise due to men and women who blaze the trail for those who follow in effete enjoyment of the fruits of their hardships.

It was necessary at first to give away the pieces of gum with purchases of candy, so that the children might have a chance to take it home and try it over on their piazzas, with the idea that they would soon come back for more, once they

discovered what a source of annoyance it became to their elders. The psychology of this scheme was perfect, for the first retailer who tried it was besieged on the following day by, youngsters from the neighboring school, clamoring for more gum. In sheer self-defense, the parents took to chewing it also, and the habit was on.

It needs but a glance at current statistics to show to what tremendous heights it has risen. We have it on otherwise unimpeachable, authority that if all the energy expended in chewing gum were to be converted into calories we would have a force sufficient to propel a ferry-boat from Peck Slip, East River, eastward to Pier 19, North River, via Lisbon and Hongkong, or, in electrical terms, a current powerful enough to lift a weight of 43,305,000 tons 34,000 miles per minute per second per kilowatt-hour. This sounds staggering. It is. But it is a development of the gum-chewing habit that we must face without flinching and without pussyfooting.

The beneficial effects of this national pastime must not be overlooked. Chewing-gum came into a nation of tobacco-chewers and refined it and elevated its tone until Charles Dickens, the author, wouldn't recognize the old places were he to pay a visit to this country to-day.

It has contributed greatly to the neatness of the personal appearance of the nation, as it is estimated that in the mirrors on gum-machines there are 345,659,256 cravats and 756,586,589 wisps of hair adjusted during the calendar year.

And one need only look at the cards to see that the use of chewing-gum, especially when brought home in a box, has been the means of keeping the home life of the nation in a state of preservation. Were it not for chewing-gum what would there be for the little ones to run prattling to their daddy for as he appears at the gate? What would Christmas be without a crate of chewing-gum peeping from the top of each stocking? What would any dinner-party resolve itself into had not the hostess sufficient *savoir faire* to place a stick of gum at each place as a delicate reminder to her guests that one can never be sure just what goes on in the kitchen, and that it is better to be safe than sorry?—Literary Digest.

Which Was Artistic?

Here is a parable in which the reader is respectfully requested to point out the lesson.

Brown said, "I am a lover of the forest. I will dwell therein." He straightway gathered together his gun, axe and fishing equipment, went into the forest, built a log cabin and made everything as rustic as possible; but the forest said, "You cannot thus imitate me. You have desecrated the trees. You show neither civilization nor wild nature."

Smith went into the forest, built a little gem of a marble palace and carried to it every luxury that modern civilization knows. He did not mar the surrounding forest and the forest said, "You have honored me by thinking I am worthy of the highest arts of civilization. You have neither lost your dignity as a human being, nor have you desecrated me by feeble imitation. We like things that are unlike ourselves, but weak imitation of the real thing is pitiable."

"What is the editor aiming at?" the reader inquires. "What now is his philosophy; what lesson is he trying to drive home?" Perhaps he is merely stating a fact. Perhaps you will evolve a lesson that is not in his mind. Perhaps it is a joke in that it fulfills the definition of a joke, a juxtaposition of incongruous concepts.

Did the log cabin insult the forest and lower the dignity of civilization? Perhaps the reader will decide that question.

The great number of people who study birds in the parks of the large cities of the East, and of the Pacific Coast, will be interested in the comparison afforded them by an article on the birds of a park in Colorado Springs, in the August issue of *Bird-Lore*.

There are other articles of general interest, photographs of wild birds, and two full-page plates in colors. Also, the Audubon Societies, whose official organ *Bird-Lore* is, run a large department of reports, etc., including a section for teachers and school-children; with a timely article on bird-study in Shakespeare's day.

At the Grand Canyon.

Down swept the mist, and hid our glowing vision.

But only for a fleeting moment's space;
And then in graceful spirals, it upward
wound to Heaven,

Like incense rising in a holy place.

—Emma Peirce.



Our Meriden (Connecticut) Chapter.

Our Chapter has held a number of afternoon *work* meetings besides evening meetings for business and reports. At these work meetings some have used the microscope to observe the Protozoa, minute worms and Crustacea in the jars of water in the laboratory; others have studied the stones in the cabinets and identified some of the unnamed specimens while others have worked on insects.

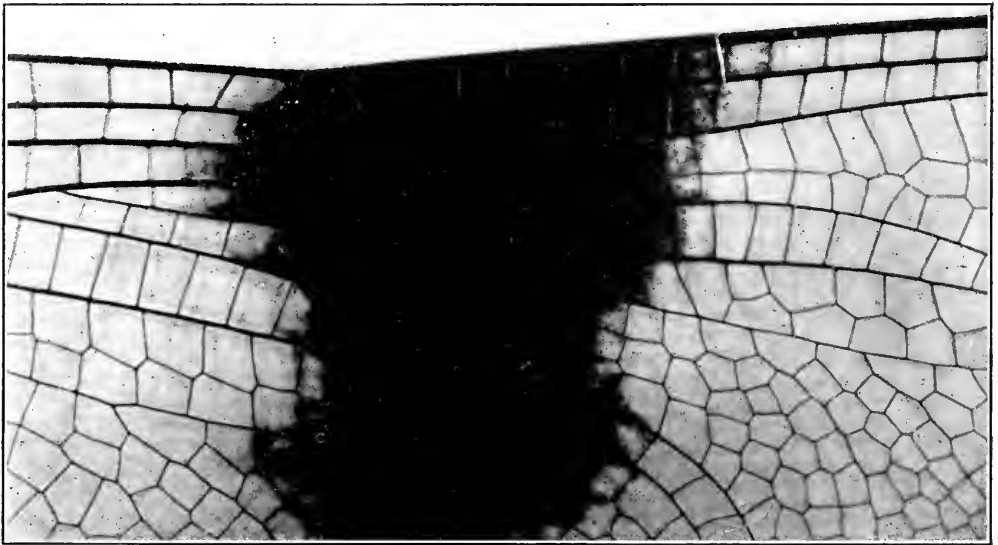
CAROLINE J. HITCHCOCK.

twenty-four good sketches and seven pages of closely written description.

Ehner D. Call has been studying minerals and finds it "most interesting" though he expresses his belief that "to some it would not mean anything." Accompanying his observations is a list of minerals with his observations regarding each.

In a paper entitled, "Examine Insect's Wings," Mildred A. Whiting writes:

"In looking through a small microscope at the various insects, I found the



THE WING OF A DRAGON FLY VIEWED WITH A POCKET MICROSCOPE.

Accompanying this report is an interesting, detailed series of observations with four plates of drawing of the Hydra carefully made by Ruth Konitz of this Chapter. This has been so well done, so extensively detailed that to publish it would take more space than we can give. Here is an unusual case. A report is too good for publication. We congratulate our young friend upon these detailed studies of the Hydra, to which are devoted

butterfly and the dragon fly the most interesting. The various color represented on the butterfly's wings are magnificent and look like small patches of velvet. When I study the wings of the dragon fly, I find that I have before me a splendid display of network.

"I have secured a Florida grasshopper and one of our little green grasshoppers. In comparing them I find that our little grasshopper, when stretched out, just

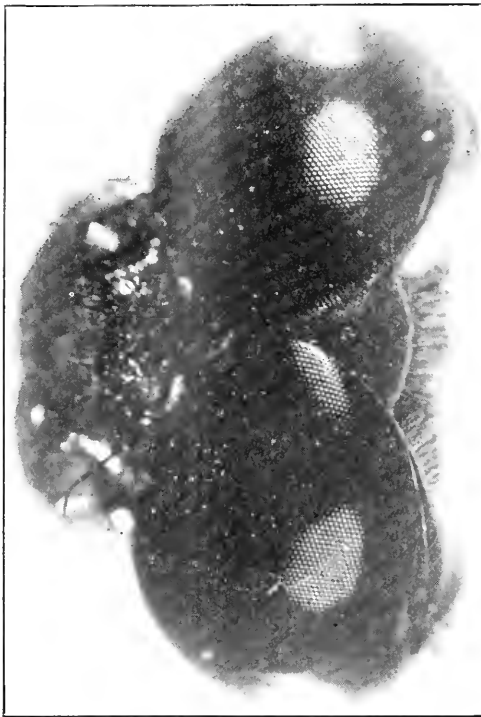
Potatoes Grown in Darkness.

A few years ago the editor of this magazine published, in the "Technical World," now the "Illustrated World," an article entitled, "The Magic of Potato Growing." Practically the statements there made have been made in lectures before various audiences and were ridiculed by some, while others proved the assertions by actually growing potatoes in darkness without soil or chemical feeding. Here is one of the letters that tell of success with the method. It is written by William Lofton, Milltown, Indiana.

"I did not believe your statement last year, when you said in our institute, that you could without sunlight, grow potatoes which would contain starch. I had my agriculture class make the experiment, but we had had no results when the school closed.

"This summer while attending a normal school I told my instructor in botany what you had said and that I was making the experiment but as yet had had no results. He hooted at me and said that I would never get such results.

"Last week I examined the experiment and found one potato larger than the original one. Upon testing for starch, I found it was present but that the potato was more watery than the one with which I compared it. I am writing to my instructor and telling him in detail what to do to convince himself. Had the potato not contained starch I would have written to you. Your advice, 'Be willing to try,' has left a lasting impression upon me."



THE HEAD OF A DRAGON FLY.

comes to the largest bend in the Florida grasshopper's leg. The main color of the Florida grasshopper is brown, but it has black dots on its legs. Its wings are pink and green with little black dots on them, whereas our little grasshopper has brown and green legs."

The two photographs on this page and the one on the previous were taken by Edward F. Bigelow especially to illustrate this report and to stimulate other Members in observations.



PART OF THE WING OF A MONARCH BUTTERFLY VIEWED WITH A POCKET MICROSCOPE.

The Dentist and the Squirrel.

An item has been going the rounds of the papers to the effect that a dentist in Greenwich had a pet squirrel that had a broken tooth which the dentist capped with a crown. This is interesting but the facts are even more interesting as evidenced by the following letter written at the request of the editor of this magazine:

Greenwich, Connecticut.

To the Editor:

In reply to your letter I would say that the story in newspapers, of my having crowned the tooth of my pet squirrel, is like the reported death of Mark Twain—greatly exaggerated.

The facts are as follows:

Several months ago I noticed a grey squirrel on the Library lawn next to my office. As he seemed to be hungry I bought peanuts and tried to coax him to me but failed; so I left the nuts on the ground. As he continued to appear every day I watched for him, fed him and kept getting a little better acquainted with him, until finally he would eat out of my hand, climb on my shoulder and sit there while he ate. He calls on me twice a day for his food, and I no longer watch for him as he now watches for me, and will come when I whistle. He rests on my arm and allows me to stroke and pet him if I do not try to pick him up.

I have not crowned the squirrel's tooth, but several days ago I gave him an uncracked, hard shelled nut. He bit through the shell when suddenly he dropped the nut, scampered from my arm and ran up the tree, where he was very restless. I had difficulty in coaxing him to return. When I succeeded, I tried to feed him the kernel of a nut. He took it into his mouth, dropped it and ran up into the tree where he was again restless, jumping about as I had never seen him do. I finally coaxed him back. I thought something must have hurt him, and I decided to investigate. Up to this time he had not allowed me to put my free hand on him. I knew that I must grab him quickly, as I did by the shoulders and the back of his head so that he could not bite. I took him to my office and found a piece of nut shell like a large sliver wedged between his teeth.

I removed it and let him go out of the window. He ran down the side of the building, which is covered with vines, and disappeared. I did not see him again for two days. He now visits me regularly, twice a day, crawls all over me and allows me to stroke and pet him. It is strange but true that the nut on which he apparently hurt his tooth was the only one he ever attempted to open while resting on my arm. He runs away with every uncracked nut I give him and buries it in the ground, then comes for more.

DR. O. D. FLANAGAN.

Who Can Beat This?

Sound Beach, Connecticut.

To the Editor:

Enclosed find a photograph of a few wild carrots which we think remarkably



MISS WORRELL AND THE TALL WILD CARROT.

tall, some measuring six feet four inches, and the tallest, six feet eight inches. They grow behind our barn in ordinary uncultivated soil.

LINDA WORRELL.

Why hang back when Nature calls?
Why a prisoner in four walls?
Don't you know her gifts to be
Generously, wholly free?

—Emma Peirce.



A Hymn of God's Mountains.

BY JOHN A. SHEDD.

"I will lift up mine eyes unto the hills."—
Ps. 121.1.

Come With Me and See the Glory of God's

Mountains!

Thy footstool of rocks, the eye of man hath never seen, thy ancient foundations are of the Beginning.

Thy royal hills wear right regal robes. Hemlocks of grace, lordly pines, the beauty of the elm, the mighty strength of the oak, all these and more are draped upon thy granite shoulders, O Mountains of God.

Look up! Behold the rich tapestries of clouds woven on the looms of Heaven, the handiwork of majestic fingers, royal purples, cerulean blues; rich reds and wooly whites, shot through with threads of golden fire, all from Thy palette, O Artist Everlasting!

Behold! The crown of the Mountains! Snows eternal glisten in it, lightning flashes play around it.

Listen to the music of the King all glorious! Heaven's organ is playing. Hear the thunder, peal on peal.

Hark! 'Tis ten thousand birds chorusing anthems in leafy choir-lofts of vivid green. A thousand crystal brooks tinkle over mossy banks, a score of waterfalls sing their parts, while millions of water diamonds sparkle a moment and are lost forever.

See the clouds of mists, float sparkling in the sun, as incense before an altar.

O Brooks! O Waterfalls! You have been singing every day and every night for ten thousand years, and yet you are not weary for you are from the hand of Him who never is tired.

The carpets of thy palace courts, O Mountain, are the green velvet of mosses, sprinkled with ten thousand ferns and flowers.

Thou art the birthplace of Liberty, O Mountains, and thou art still her abiding place!

Thou art, O Hills, the home of Nature undefiled.

I Have Seen the Glory and Wonder of God's Mountains!

What is man in the presence of thy Mountains? O King Eternal!

What are our tiny labors before the mighty works of God's fingers?

When I forget Thy beauty, Thy power or Thy might, I will climb up to Thy hills, O God, Maker of Mountains!

Thou hast planted my feeble feet upon the Rock Immortal, and I am safe forever more; in the fortress of Thy hills I am secure.

Mount Meenagha, N. Y.—The Christian Advocate.

Weeds in Sunday School.

BY EDITH CAMPBELL, ERIE, PENNSYLVANIA

My microscope often goes to Sunday school with me for to me Nature is God's Book of Revelation. One Sunday I had a daisy, the fleabane and the hawkweed. "Weeds" we call them but I prefer to call them flowers from Nature's garden for they and their ancestors occupied the ground ages before we came to usurp what belonged to them, to use for our needs and to cultivate what we call "flowers" beautiful to be sure, but not more beautiful nor often as wonderful as what we call "weeds" with their mechanisms that help them in their struggle for existence and to overcome difficulties, as Mr. Faulkner's delightful articles show us.

When one of our farmer lads saw my cluster of flowers, he exclaimed, "Oh, those weeds! How we farmers hate them." "I know you do." I replied, "put wait until you see the daisy."

I put it under the microscope and he looked, looked long and intently, and when he lifted his head there was a beautiful expression on his face. "Why," he said, "I have been three years trying to raise one Easter lily and there in the center of that daisy is a whole bunch of them." Then he and the children looked at the wing-scales or feathers from a butterfly's wing, and as each grain of dust that clung to their fingers was resolved into a beautiful shape and they saw that each of those scales or feathers had its color and its place in the color pattern on the butterfly's wing, awe spread over their faces and they could only exclaim, "Oh!"

Hail! to the hills and mountains,
Those breezy uplands fine,
Where we may find ozone and health,
Our souls a touch divine.

—Emma Peirce.

Blackberry Vines in Autumn.

Trailing robes of beauty
O'er many a lowly weed,
Behold our humble neighbors,
The blackberry vines, indeed.

Lending to the roadside
Its deepest, warmest shades,
A riot of rich coloring
Before their glory fades.

Giving luscious fruitage
When in livery of green;
Now resting from their labors,
Resplendent as a queen.

—Emma Peirce.



Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT
—Addison: Cato

Removal of C. G. Willoughby.

Charles G. Willoughby, he of untiring energy and square-deal fame—now located at 810 Broadway, New York—has leased for a period of ten years the premises at 110-114 West Thirty-second Street, opposite Gimbel's department store, where he expects to be settled about November 1. This location probably is the busiest business-section in Greater New York, if not in the Western Hemisphere. Within two blocks' distance from Willoughby's new quarters is the Pennsylvania Railroad Station; within a stone's throw are the Manhattan Elevated, the Hudson Tube and most of New York's surface-lines, Seventh Avenue and Broadway stations of the new subway which is to be completed in 1917, and the new ten-million-dollar Pennsylvania Hotel, now under construction. Willoughby's new stock-rooms are nearly three times as large as the present quarters on Broadway.

The new firm will be incorporated under the name of Willoughby, Inc., and be so arranged that the employees will participate in the earnings. After carrying, personally, great responsibilities for about eighteen years, Mr. Willoughby wishes now to share the same with those who have assisted him to acquire whatever success has come to him. With a continuance of the alertness, precision and integrity that have ever characterized Mr. Willoughby's business-dealings, in buying and selling, there is every prospect that the new firm will enjoy that confidence and support that have been accorded Mr. Willoughby without stint.—Photo-Era.

Seeing Things.

He—"My dear, where did this awful big spider come from?"

She—"James, you have been drinking those horrid cocktails again. That's my new hat."—The Farming Business.

Snowflakes on the Necktie.

At the suggestion of W. D. Bowdoin, an expert microscopist of New York City, neckties ornamented by a snowflake pattern have been put on the market by James McCurrach & Brothers, manufacturers of men's neckwear.

The ties are dainty and this going to nature for a pattern is a good notion. It has often been a wonder why more frequent use has not been made of snowflake forms in ornamental manufactures. Their forms are beautiful and in great variety, and we think that Mr. Bowdoin made a praiseworthy selection when he supplied this neckwear manufactory with such pleasing patterns.

The following letter was received a few weeks ago by the Bird Food Specialty Department of Spratt's Patent, Limited, London, from a British "Tommy" "somewhere in France.":

"I will now try and tell you a little about the bird life out here and what I have seen and heard. The larks are quite as good as our own from a singing point of view, and it is splendid to hear them when we are in the trenches. What is more remarkable is to hear several larks singing in the air and at the same time shells bursting all round at the airmen, but it does not stop the larks. The finest bit of music I have heard out here was the song of a thrush. It came and sat on an iron chimney in front of the billet where I am now staying and sang for quite an hour, and it has been seen and heard there several times since. It was really the best thrush I have ever heard. The place around here is thick with chaffinches, and it is nothing unusual to have two or three singing at once along the fire trench nearby, but they have not a good finish to their song from a chaffinch singer's point, though I have seen some good specimens for the show bench. I have seen birds of all kinds here, but I was surprised when

I found the house martins in the cowsheds and stables. There are dozens of nests in the ceilings, and of course anyone can have a good view without interrupting them. I shall be able to tell you all about them when I come home."

Good Bread and Cake at Last.

Any one accustomed to good cooking must despise the stuff sold by most of the bakers, even by the so-called high class bakers, under the name of bread or cake. About the only really good things obtainable from these places for the last quarter century are their cup cakes, cookies, lady fingers and macaroons. The bread seems to be intended for those who do not know what bread is and the cake tastes like pine sawdust. For more than twenty-five years the editor has advised many a baker, and has pleaded with him to make his bread and cake as good as the housekeeper's common kitchen average. Such remarks were kindly intended but were met with long statistical arguments to prove that no baker can afford to do better than he is doing.

It is a delight not only from the housekeeper's point of view but from personal experience to know that at least one concern has crushed all this opposition and argument by making the real thing. For the last quarter century, bakery products have been far below the standard of almost everything else sold to the public. (Read that sentence again.) Not only the methods of production but the bread itself has been objectionable. Not many years ago the editor had occasion to take an early train out of Stamford. He was in the street at about daylight on the morning of Good Friday. In front of a bakery he had to swerve into the road because the entire sidewalk was covered with flat tins filled with rolls or biscuit. A boy with soiled clothes, and a dirty apron that once might have been white, had a pailful of whitewash and a brush. If that fluid had been examined it might have proved to be, not whitewash, but a sugar mixture. The brush was an ordinary whitewash brush. With it that dirty boy was painting the top of those buns. Think of that! A sticky liquid put on the top of biscuits in a dusty street! That occurred several years ago.

Probably the custom has been abandoned. Let us hope so. For the last fifty years or more the bakers have been behind the times. For the last half century, clean things have been obtainable from almost any mercantile establishment except a bakery. It is said that the Ward Baking Company is pushing out the small bakers because the company is a "combine" with an enormous capital and the ability to do things on a large scale. It is a puzzle to know how the Wards can compete with a local bakery with the local baker's limited expenses and with no expense for transportation, but the company does it successfully. The Ward Baking Company makes cake as good as that grandmother or even mother used to make. The high price of lumber, or something else, has prevented them from flavoring their cake with a pine board, although some others continue to use it.

This is not an advertisement for the Ward Baking Company. We have never sent them a copy of the magazine nor even solicited an advertisement. We will not do so now. Whether they take an advertisement or not is for them to decide. The only purpose of this article is to tell a simple truth in a plain and simple manner. It is not our intention to wound any one's sensibilities. We are not angling for something from the Ward people. The proper feeding of the human race, the taking of the material from old mother nature, comes within the scope of this magazine's mission. When we see anybody going to nature, taking her materials and putting them into commendable form for human food, then we think that person deserves words of unstinted praise. Such we unstintedly give to the Ward's people for their Tip Top bread and cake. There may be others just as praiseworthy; we hope there are.

I believe that we who are living at present are seeing ushered in a new era of bakery by the Ward people and perhaps a few others, notably such concerns as The E. L. Bradbury Company of Bridgeport whose "old-fashioned" doughnuts and crullers are meeting with great success. By the way, speaking of crullers, it is extremely interesting to note the great popularity of those sold at the Thompson's Restaurants in New York City. People flock there for those

three crullers at five cents and a glass of milk at five cents as if they had discovered a new era of the cruller. And so they have. It is doubtful whether elsewhere in all New York City can be found so really tasty crullers as are sold at these Thompson's Restaurants. The judgment of the people is unerring and the call for these has been so great that they are featured in enormous piles. Now why has not some baker supplied from house to house just such thoroughly good crullers?

These establishments stand for more than even they now realize in the developing of the human race in the arts of civilization. The general inferiority of the old-time baker must stop. That this inferiority is general is evinced by the establishment in many places, even the small villages, of "home cooking" establishments. Many restaurants advertise pies and so forth "home made." Every such announcement means bakery stuff isn't fit to eat.

* * * * *

A copy of this article was sent to a scientific friend in a large city. He wrote:

"What you say about some of the baker's bread of the present day applies here. We live on home-made bread, but at long intervals we are compelled to take a baker's loaf. The other morning at breakfast, we could hardly eat the bread for laughing. If the baker had mixed sawdust with water and hardened the mixture in the sun, the result could not have been more tasteless, more 'crumbly,' more amusing or more offensive. You are not alone in your trouble. One man down here makes bread as good as any baker's bread can be, but he is the shining exception. And sanitary handling-----phew! On many an early morning stroll, I have seen loaves of bread lying uncovered on the doorstep, on the porch floor, or leaned against the side of the house.

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The eighteenth volume of
Bird-Lore

begins February 1, 1916.

Volume I contained 206 pages and no colored plates; Volume XVII contained 560 pages and eleven colored plates.

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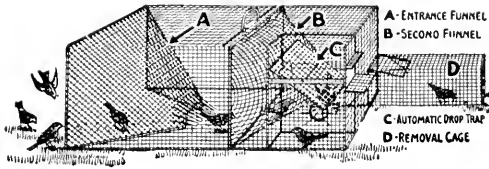
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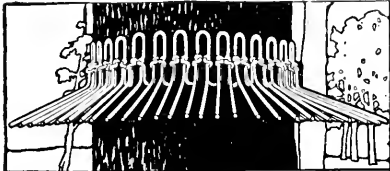
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LECTURES BY EDWARD F. BIGELOW

Dr. David R. Lee, Director, Summer School of the University of Chattanooga, Chattanooga, Tennessee.

I have thought again and again of the wonderful week you gave us in June. The auditorium was well filled at the first of your five lectures but when you gave your fifth lecture of the week on Friday you will remember that there was not standing room after the appointed hour. This was a source of deepest satisfaction to me.

You captured our teachers because you did more than give them lectures. You gave yourself. You have the missionary spirit of Nature as the good men of old had it for the Gospel. You were not content with the mere enrichment of our minds but deeply impressed the message of river and forests upon our affections.

Your stereopticon slides, even had not a word accompanied them, would have repaid a long journey and a large sacrifice of a teacher's usually pitiful savings, but when there was added to these a delivery that was as irresistible as a torrent and an enthusiasm clearly born of deep study and long intimate acquaintance with God's out-of-doors, it was no exaggeration when a teacher said as she left the hall after one of your talks, "These lectures alone are worth the whole cost of our attendance at the Summer School."

You surely have a style of your own, a style unique and unusually effective, to the persuasive grip of which your audiences yield themselves with ready cheerfulness.

Wholesome, inspiring, awakening, refreshing were these talks. They were just what our teachers needed. Keep Chattanooga on your lecture list.

Dr Bigelow has stirred the hearts of the school teacher to a greater realization than any other speaker that has been at the Summer School in many a season. All of his lectures were poetical, inspirational and educational.—University of Tennessee weekly publication, "The Orange and White."

A Letter from Dr. David R. Lee, Summer School, Chattanooga, Tennessee, to Professor Harry Clark, Knoxville, Tennessee, and published by him in the city papers.

My dear Clark:

You can little guess the treat that is in store for you and your Summer School in the lectures by Dr. Bigelow. He is irresistible, and from the opening sentence holds his audience in a most willing attention. His learning (he seems to have been an omnivorous student) is entirely hidden by a most popular style, vivacious, powerful, pointed, playful, and then again pumping tears out of the most flinty listener. I wish he could have stayed two weeks here. His audiences grew daily, and on Friday there was no room for those who did not come early, gallery and all being packed.

University of Georgia, Athens. Professor T. J. Woofter, Superintendent of Summer School.

These lectures were a source of inspiration to many teachers. They feel that it was a great privilege to hear and to know so great a naturalist as you are.

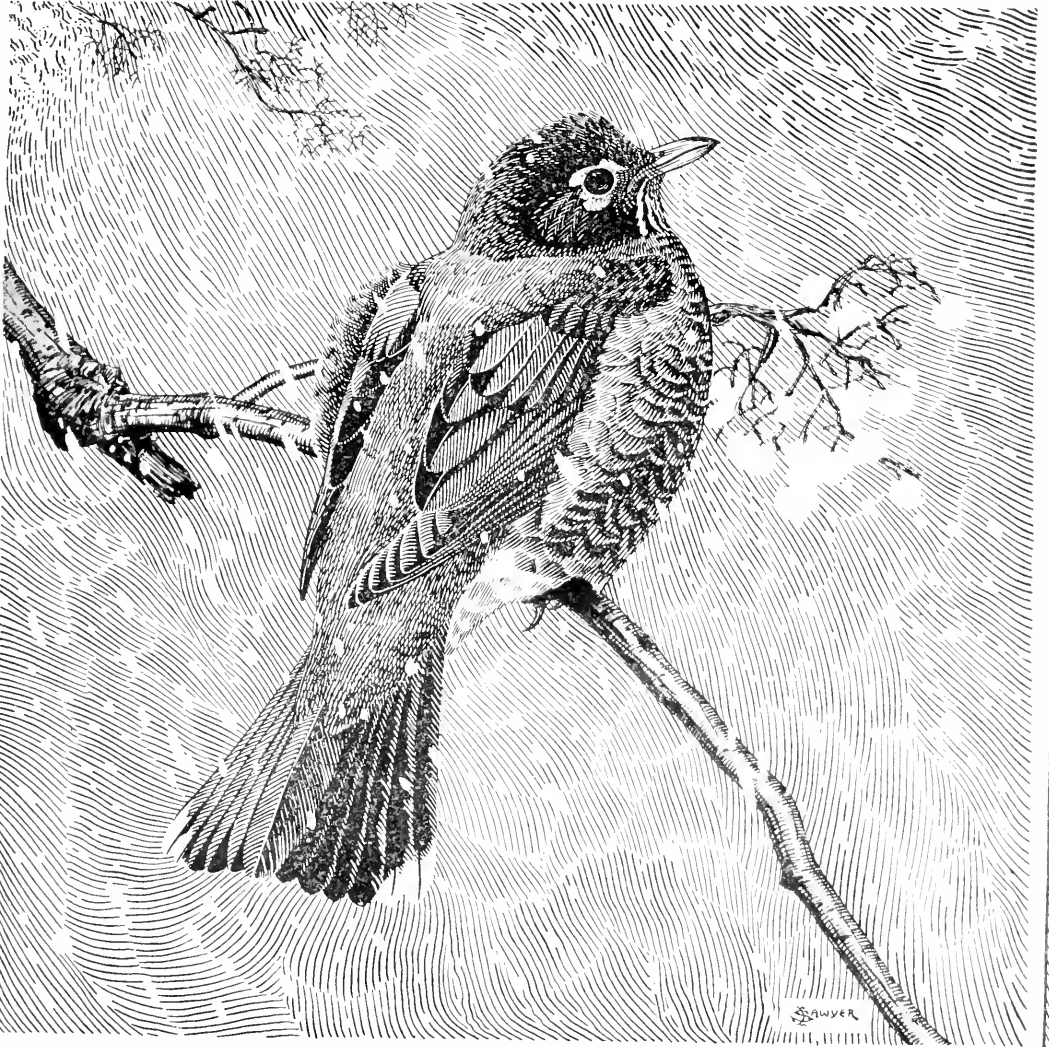
Holds up "The Cup of Life."

Dr. Bigelow sees beauty in the commonplace and good in all. He takes the cup of life and holds it up so the light may fall on every side. He takes present day problems and discusses both sides. There is one thing he does not do—he does not attempt to definitely settle these problems but insists on each and every one doing his own thinking. On hearing his lectures one cannot fail but think.

* * * * *

Dr. Bigelow's lectures are the most widely discussed topic on "the hill." He is a most interesting personality and he is "different" from the usual lecturers on educational topics because he has not pet theories he is trying to "cram down the throats" of the unsuspecting and ambitious teacher.—"The Knoxville Sentinel," Knoxville, Tennessee.

THE GUIDE TO NATURE



THE NATIONAL GEOGRAPHIC SOCIETY

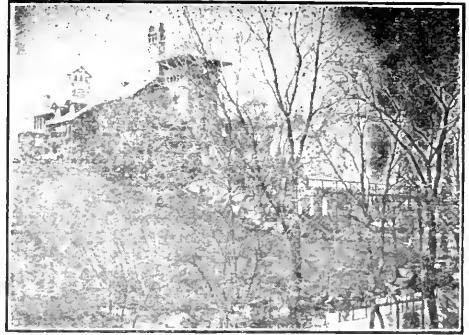
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GREENWICH NURSERIES

LANDSCAPE GARDENERS AND NURSERYMEN

GREENWICH, CONN.

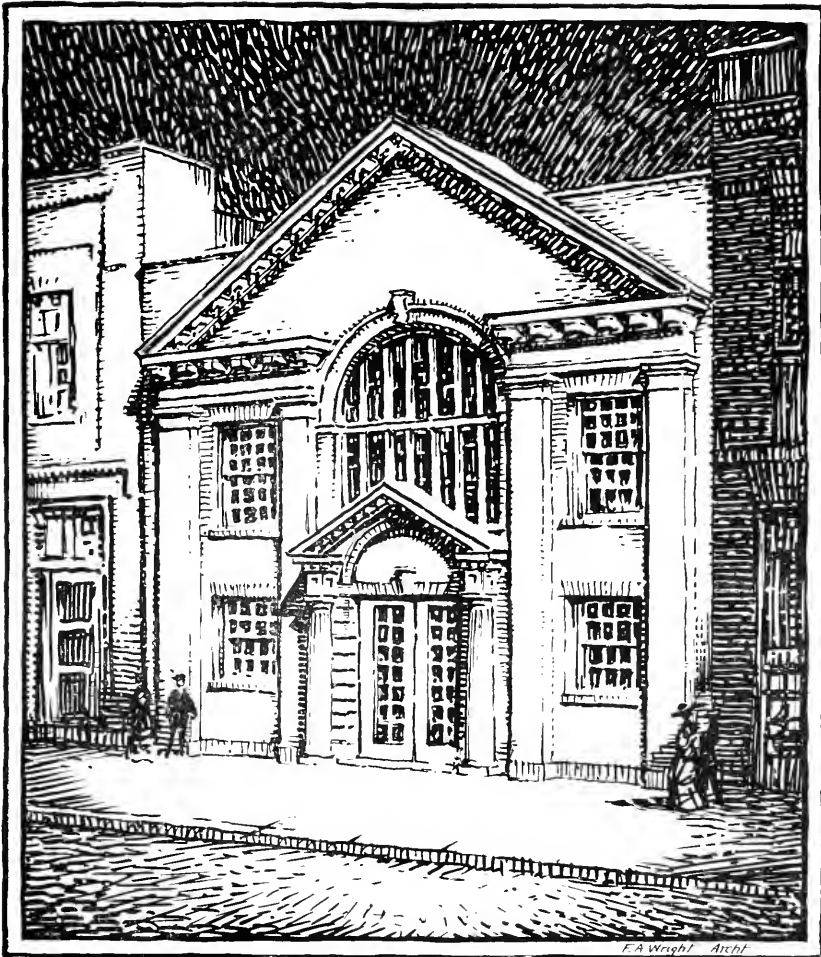


Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT
—Addison: Cato

A Beautiful and Tasty Building.

The Putnam Trust Company of Greenwich, Connecticut, will soon have a fine new home that will be not only convenient for this rapidly growing bank but a

revered structural designs of Colonial days, which seem especially appropriate in the typical New England town. The result is a thorough modern building suggesting in appearance the finest architect-



THE PUTNAM TRUST COMPANY'S NEW BUILDING

great architectural ornament to Greenwich Avenue. The architect has combined simplicity and beauty, keeping the

ure of the past. The entrance porch will be in white but the general effect will be mellow, for the face of the building will

be of a golden tone. The architect is Mr. Frank A. Wright of New York.

Such is the general shade throughout. A glimpse in the interior will reveal a dome of gustavono tiling supported by slender columns of moulded face brick. The interior walls, the counter railings, as well as the stairway construction to galleries at either end of the building, will be of this same moulded brick.

A further examination of the interior will show a large, modern and superbly built burglar, fire and water proof vault with a circular door, and this vault will be of manganese steel. It will be fitted with safe deposit boxes of the most approved pattern. In the rear will be a compartment separated by a grill door for the company itself. The base of this great vault will be in the basement, the plan being to use the lower part for the storage of packages, silver and trunks, and a special compartment for fur storage.

This vault is the last word in vault construction. It is the result of long years of study, by the firm of Mosler & Co. It is not only burglar, and fire proof, but water proof as well so that renters of safe deposit boxes can feel assured of security from theft and fire and also water damage to valuable documents.

The interior plan provides open space for the officers accessible to customers, with reception room under the front gallery for conferences and a further space in the gallery above to be used as a writing room; in the center under the dome the tellers' cage and behind these, desks for the bookkeepers and the clerical force.

A grill door entrance opens into a large vestibule with coupon booths for the use of the renters of the safe deposit boxes. To the right of the grill door, will be a writing room for the use of women patrons. The rear gallery will be enclosed for directors' meetings with casement windows overlooking the general office.

The building will be entirely of brick, cement and terra cotta, and will be absolutely fire proof. There will be no wood used in its construction excepting as will be necessary for window frames and doors. The floors will be of polished cement in a tone to harmonize with the soft, restful color scheme.

The directors should feel confident that

with this new building and the services offered by the company that their deposits and customers will be afforded banking facilities equal to any offered them by companies in New York or elsewhere.

The building is nearing completion and will be ready for occupancy sometime during November.

More Dining Cars Ordered.

An additional battery of four dining-cars has been ordered for the New Haven road. The cars are to be built by the Pullman Company, and are to be all steel. The New Haven now has 15 dining cars in its service and the patronage has been so great that two cars have been needed on some of the trains.

According to statistics of the New Haven's dining-car service, the 15 cars now in service have furnished more than 42,000 meals a month. The daily average has been above 1,350, or more than 90 per day on each car.—The Daily Advocate.

* * * * *

There are several reasons why we are delighted to republish this item from a local daily. First, perhaps because it appeals to one's pride as a Connecticutian. Here is a railroad that can furnish food without robbing the people and without racking their stomachs and still make the service successful. For one dollar and twenty-five cents this New York, New Haven and Hartford Railroad Company supplies a first-class table d'hote meal that is fully equal in tastiness and satisfying qualities to that obtained at a de luxe dinner at a New York Hotel making a speciality of a table d'hote at the same price. So far as the editor has observed in his somewhat extensive tours through the western and southern states this is the only road that gives good table service at a reasonable price. On most of the western and southern roads the service is a la carte. No one would object to that, indeed, occasionally a fellow traveler is found who says he prefers a la carte but such people are rare. A railroad train is the one place on earth where one is forced to take plenty of time to eat a meal. It is a regular banquet at which one kills as much time as possible because there is not much to do and the scenery is more

(Continued on page IX)



THE GUIDE TO NATURE

EDWARD F. BIGELOW, Editor

Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,

Subscription, \$1.00 a year

Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume X

NOVEMBER, 1916

Number 6

The Home That Is Set in the Primitive Wilderness.

By Edward F. Bigelow, ArcAdiA: Sound Beach, Connecticut.

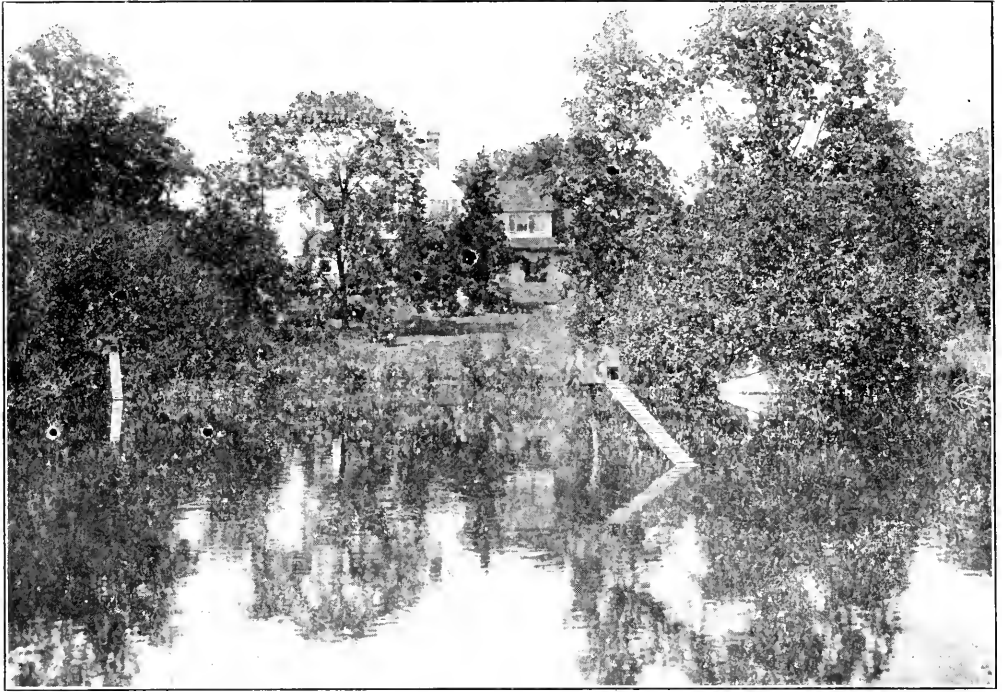
The heading of this department becomes this month somewhat of a misnomer. It should not read "Homes near to Nature" but "A Home in Nature." That describes Mr. Morton C. Nichols's home in Greenwich. While it is close to the village, it almost adjoins the famous Put's Hill that visitors come from afar to see, where General Putnam made that famous downward dash to escape

from the British soldiers. He took to the woods in a hurry and was remarkably successful in doing it.

That is what Mr. Nichols has done. He evidently was tired of the din and confusion of cities, tired of the display of wealth and the extravagance, tired of formalism, and here escaped in haste from these enemies to the real happiness of mankind and betook himself to the re-



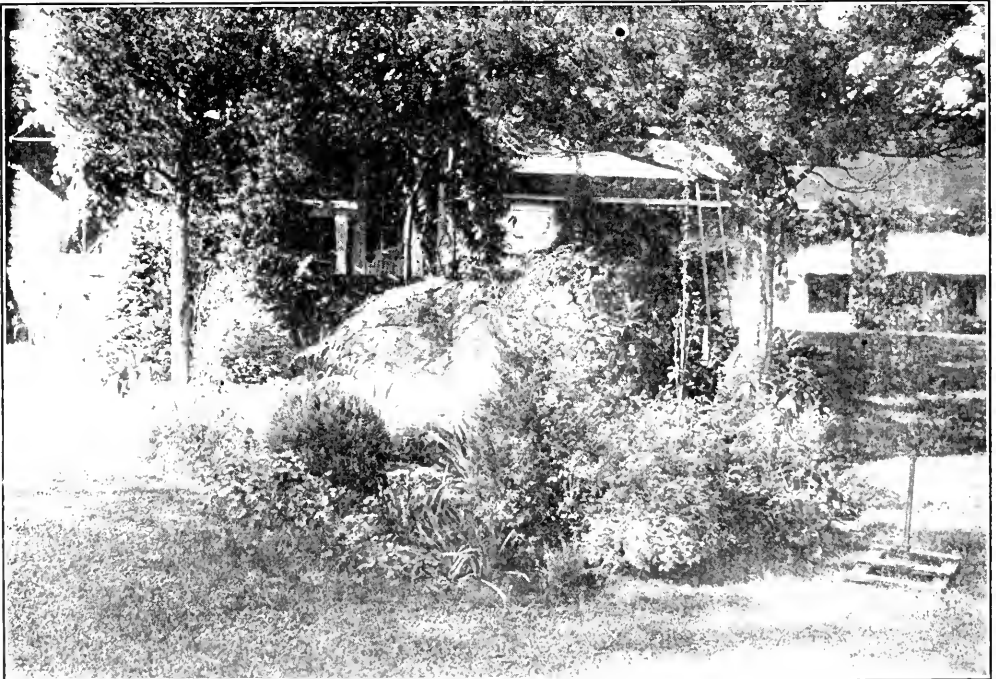
THE HOME IN WILD NATURE.



A VIEW FROM THE MIDDLE OF THE POND.

cesses of wild nature. It is curious that such a bit of property was obtainable so close to the very heart of wealthy Greenwich. Almost everything else has been denuded by the axe and the bush scythe, and

shaved level as if laid out by the formal landscape gardener, and cut and carved into the precision of geometrical walks. Such treatment may have its place but it evidently has none on Mr. Nichols's



JUST A FROLIC GROUND FOR THE LAWN MOWER.

premises. As I stroll through fields of tangled goldenrod in glorious profusion, and purple Eupatorium, Mr. Nichols said, "Now, Bigelow, I must apologize for not having fixed up a cement walk rather than only a single swathe mowed through this nature garden." In amazement I looked at him. He had a solemn countenance, a characteristic when he springs his best jokes.

The front of the property up to the polished asphalt of the Post Road, over which automobiles roll in both directions at the rate of about one in every fifteen

and noble trees and clinging ivy. This little Yosemite valley, surprising as a wilderness of nature unrestrained. Mr. Nichols has had the rare good sense to leave as it is rather than to make it a despoiled, denuded, naked ravine. He has left tumbling in every direction, in beautiful confusion, this relic of the past. What was in the days of the early settlement of Greenwich a power pond is now a lake of dreams for ducks that there float lazily and occasionally welcome the untamed members of their family that they attract from their migration north-



THE BROOK THAT WAS NOT COVERED UP.

seconds, suggests a property remote, far in the recesses of one of the abandoned farms of Connecticut. It was abandoned, but before he went the farmer, who could not grub a living out of it, built a cider mill close to the edge of the road. Here within massive walls he placed huge old-fashioned wooden wheels, and here they are to this day, not only as an exhibit in the civil history of Greenwich, but as a charming addition to the natural beauty of this delightful spot. In the rainy seasons the waters formerly dashed like a miniature Niagara through the picturesque pile of boulders and tangled weeds

ward and southward under the sky. The pond has been touched a little here and there by Mr. Nichols's skillful hand, but only to intensify the wildness and the beauty of the islands. In years gone by, a brook rushed and leaped along the glen and fed the pond, but now except at the times of unusual rainfall it is only a laughing little stream that bubbles and ripples through the picturesque ravine. From this the place is known as West Brother Brook.

Said an old-time resident apologizing for what he regarded as a defect in the property. "You see, these are pretty good



THE IRIS THAT MEASURES SIX FEET SEVEN INCHES.

premises with the exception of that stream, but you can easily get rid of that. Put some stones and concrete on the

sides. Lay short pieces of old railroad iron across your cemented ditch, cover it over with earth and then you can run the



THE IDEAL TEA ROOM IN PICTURESQUE SETTING

lawn smoothly from the house without interruption by this ditch."

What fun it would have been to stand near when that remark was made to Mr. Nichols. I will guarantee that his face was longer and more serene than ever; it becomes more sedate as the joke becomes more hilarious. Instead of bringing concrete and pig iron, Mr. Nichols brought ferns and plants that love moisture and shade and the ravine is now with its laughing waters and undulating plumes one of the beauty spots of the premises.

plied the plant. So far as the public is concerned, it was my interest in this iris that led to my discovery of the delightful place. Visiting it to photograph this gigantic iris, I requested permission to bring out the beauty spot where Putnam had discretely fled from danger, as I once more wanted to tell our readers of happiness that may be obtained by leaving nature untamed and untrammelled.

Yes, there is a little spot on one side of the house where the rattle of the lawn mower is heard but that little touch of the artificial, amid so much delightful



THE CIRCUITOUS PATH OVER IRREGULAR ROCKY STEPS.

Near to the home is an ideal outdoor tea room in a picturesque setting. Farther up the stream is perhaps the most remarkable collection of iris to be found anywhere in this vicinity. Our common iris, *Pseudacorus*, is said in Britton and Brown's botany to attain at times the extreme height of three feet, a nursery catalogue gives its utmost height as five feet; but as will be seen in the photograph, Mr. Nichols is holding up a leaf that measures fairly and honestly six feet, seven inches. It is undoubtedly the largest *Pseudacorus* that has ever been known. So says the iris expert who sup-

rusticity on every side, only makes the place all the more charming.

There is no path to the front nor to the back door. An interesting fact. There is no rear door. Every side of the house is the front. I had to ask, "Which is the front of the house?" But I decided that the other side was the front, but in courtesy to my host I made no strong expression on the subject. You can enter either way. You may choose between the lawn or the top of a boulder. There is no other access to the home except by flying machine to a window. Even the automobile is recommended to keep its

distance. There is no elaborate carriage porch nor porte cochere. So far can you go and no farther. Then you get out and walk and you have the choice of grass or of the top of a rock.

Going to this home from the ravine, if one takes the direct path or what would naturally be supposed to be the path, the visitor must push aside clumps of rhododendrons or climb around a circuitous path over irregular rocky steps. Perhaps this is a goat-like initiation to a lodge to make the visitor get an initiation into wildness.

But with all the wildness that has been assimilated, and I know of no better word because the wildness of it has become a part of the home, a bit of the heavens also has been brought in. The decoration in one of the rooms is composed of the signs of the zodiac impressively worked out. With their own hands, Mr. and Mrs. Nichols have given loving touches, or prevented others from giving destructive touches to wild nature, that have resulted in just the right combination. Original ideas have been exemplified in a manner that shows the owner's appreciation of nature as it is, that it does not need to be cut and carved and straight-

laced to bring out its beauty. It is a delight to go back to the entrance for a moment to note that the goldenrod is permitted to grow close to the electric trolley line, and why shouldn't it? The public does not own the goldenrod nor the tangled wild flowers within the road proper, and these are as pleasing a decoration for the roadside as a bit of mowed grass would be. These grounds exhibit the sign where every passer-by may see and read, "Nature is beautiful in herself." You may perceive that in every bit of shrubbery, in every tree, in the profusion of wild flowers; even in winter it must be picturesque. Then it must possess the beauty of an old farm remote from the village. I have seen many homes set within natural surroundings but I would award to this delectable spot the first premium, as an exemplification of the beauty of wild nature attained by putting a home actually in a part of nature, rather than near to it. Perhaps the best of it all is the spirit in which Mr. and Mrs. Nichols approach these wild beauties and offer them loving appreciation. Nothing is done for effect. The spirit of appreciation is genuine. Here one feels that the home is not insulted



THE LAWN EXTENDS UP TO THE DOOR—NO PATH.



OVER THE TOP OF THE BOULDER TO THE DOOR.

by neglect although the wild woods come to the very door, nor are the wild woods, tangled thickets and profusion of gracefulness in the ravines offended by being told that they are out of place and must be annihilated. Civilization and modern culture here sit hand in hand with primitive nature. The partnership here is complete and perfect.

Out West.

BY CAROLINE CLARK HINTON.

Open skies
And bare, brown hills,
The hush of dawn,
The hour that thrills.

A wind
That sweeps the desert clean,
And sweeps the heart
Of all that's mean.

Mountain flowers
In hardy soil:
Blooming far from
Strife and toil.

Down below
The orchards ripe,
The strolling sheep,
The new born light.

Sage brush,
And the coyote's call.
A world that's free:
A place for all.

The Russets of November.

The russets of November
Have a beauty all their own,
Which they offer for our pleasure,
When brighter tints have flown.

The leaves of beech and oak tree
That cling the winter through,
Are warmly rich with color,
As the sun comes filtering through.

Birch saplings lend their yellows,
The larch and aspen too,
And fill the world with sunshine,
When clouds make dark the view.

Along the country roadsides,
The lingering blackberry vines
Give richness to the picture,
In vivid, glowing wines.


And everywhere black alders,
With berries all aglow,
High lights of scarlet proffer,
E'en after fall of snow.

The evergreens add freshness,
With their welcome, living green,
And in the woodside borders,
The Christmas fern is seen.

The blue of distant mountains,
And the deeper blue of sky,
Add brilliance to the pageant
Which we are passing by.

And so November russets
Are but the lower tones
Of a symphony of color,
Which for the cold atones.

—Emma Peirce.

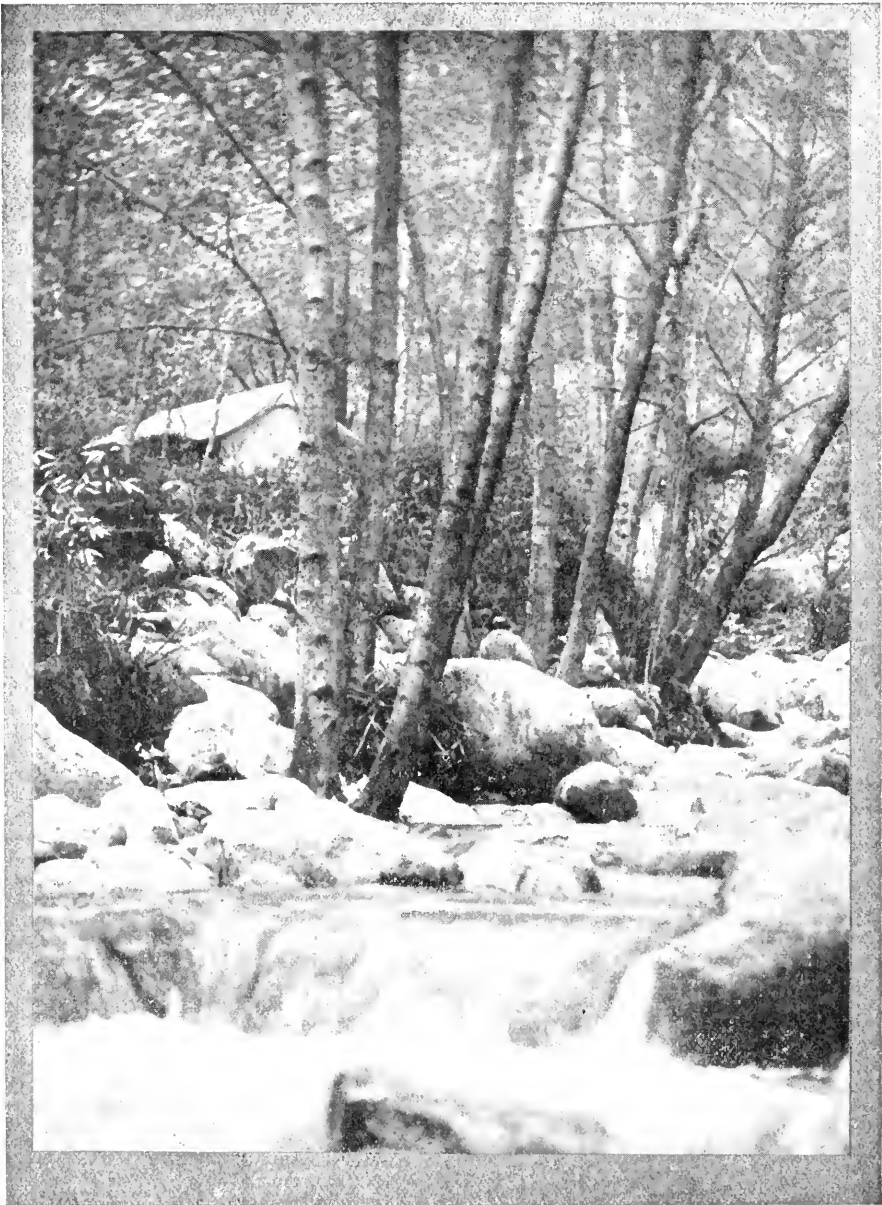


THE OUTDOOR WORLD

Where Rippling Waters Flow.

We are indebted to "American Photography" for an interesting photograph of

wild nature, taken in California by F. W. Preston. We requested the loan of this cut because it possesses an atmosphere



RIPLING WATERS THAT HAVE A MEANING.

of wildness and also of a human presence studying that wildness, a combination found in comparative few photographs. A picture of a brook may be void of human interest, but here are shown rippling waters that have a meaning for mankind. It is not only a beautiful piece of nature work but an artistic portrayal. The man by the rock is nicely posed, yet he is not made conspicuous in the slightest degree, still his presence gives the picture a dreamy human effect. Neither is the tent made too prominent. There is not one photographer in a hundred, perhaps in a thousand, that would not have directed that man to stand out in the open, or have said, "I will get a different point of view so as better to show our tent," or, "I want the brook alone to show wild nature for herself," but wild nature for herself does not mean anything. I must frankly confess that there is wild nature in many parts of the world in which we, as nature lovers, have not the slightest interest for the reason that it is unexplored and unknown and is void of every human element.

Let those photographers that are deluging us with scenic views that contain not the slightest particle of human interest, give careful study to this photograph. Civilization has not marred it and yet mankind is not left out. Do not give it merely a passing glance. Study it for five minutes, look at it intently, and you will learn much about the partnership of humanity with wild nature.

Why the Purple Florets?

Grantwood, N. J.

To the Editor:

When I receive my copy of *The G. to N.* I read it from cover to cover. Among the other good things in the October issue, is the mention of an exceptionally tall wild carrot. I have written to Miss Worrell for a few of the seed-heads, and I hope to raise some plants even taller than hers, if rich soil will do it. It might prove an interesting experiment for you, too.

An attempt to increase the height, might result in something more important than the mere gratifying of the experimenter's curiosity. To me, the lace-like umbels, these clusters of "Queen Ann's Lace," are more beautiful in their dainty, foam-like delicacy, than many of our cultivated and highly-prized flowers. If I

should be entirely frank in expressing my opinion, I would say that I like the simple wild flowers better than the forced and deformed specimens from the shops of the florist.

Another peculiarity of the wild carrot pertains to the blossom rather than to the height. Probably you have noticed that each umbel carries one, sometimes more than one purple floret at its center. It is only the exceptional head that is without one. I can surmise no reason for this condition of things, but there must be a reason. I should like to know what it is. Perhaps some of your readers may know. If they do not, an effort to ascertain might afford them considerable entertainment.

Sincerely,

CLEMENT B. DAVIS.

Deer Plentiful and Tame.

Stamford, Connecticut.

To the Editor:

The deer have been hiding and peeping at us all summer until they grew bold in their patronage of an enticing corn-field in the river meadow on the Horton estate. The meadow is in full view of our porch, so imagine the delight of the



VERY TAME WILD DEER.

children who one morning saw them playing on the other side of the hedge, not thirty feet away! They were not at all worried by the children's merriment, though they paused to investigate, "with antlers lifted" and "nostrils to windward." We were delighted to learn a few weeks later that Mr. Morehouse, our neighbor across the road, had succeeded in snapping them with his camera.

Very truly and sincerely,

(Mrs.) CLARA HOYT LOCKWOOD.

White-Foot's Dining Room.

BY H. W. WEISGERBER, SALEM, OHIO.

I wonder how many people have been puzzled by the wild cherry and dogwood pits or the various seeds that are often found in old birds' nests, hollow fence rails, knot holes and in other

rest of the day. The next day the lake was rough and we could not decide whether it repeated its conduct or not. When the water is quiet it will rise and fall for from one to five inches. From one "high tide" till the next is about thirty-five minutes. We have noticed this



DINING ROOM OF WHITE-FOOTED MOUSE.

out of the way places that have had, as shown in the picture, their kernel extracted.

The hollow maple limb of the fallen tree shown in the picture was only the dining room of a white-footed mouse.

While white-foot is nocturnal in his habits, he still uses considerable discretion while feeding, for owls are generally about and ready for the dainty morsel that his small body would give them. And while he must gather his food in the open, he is very careful and carries it to a place where he can eat it at his leisure without being disturbed by any sudden surprise of an enemy swooping down upon him.

A Lake's Remarkable Action.

Summerland, British Columbia, Canada.
To the Editor:

Okanagan Lake in British Columbia is about seventy-five miles long, from one to three miles wide and very deep. We live about fifteen miles from the south end.

One day as we were sitting on the beach we noticed that the lake was rising. It rose for about three inches, went down, came up again and thus continued for the

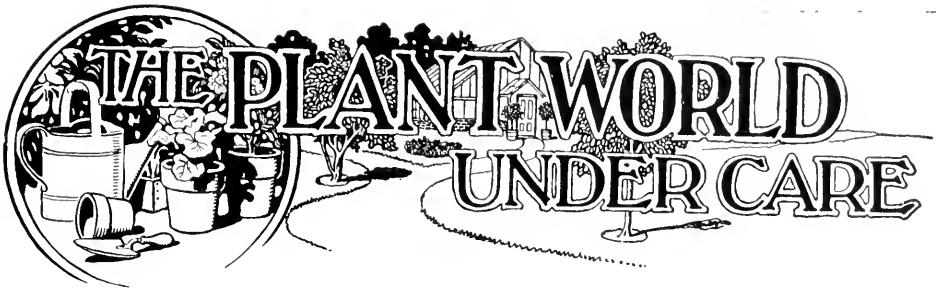
for several years. We shall be glad if you will explain it.

F. H. VAN HISE.

The phenomenon referred to has been noted on many of the lakes of the world and has been described by a number of scientific men.

The oscillation has been generally ascribed to differing barometric pressure in different parts of the lake. Geikie's Text-book of Geology says,—

"The water of many lakes has been observed to rise above its normal level for a few minutes or for more than an hour and then to descend beneath that level, and to continue this vibration for some time. In the Lake of Geneva, where these movements, locally known there as *Seiches*, have long been noticed, the amplitude of the oscillation ranges up to a metre or even sometimes to two metres. These disturbances may sometimes be due to subterranean movements; but probably they are mainly the effect of atmospheric perturbations, and, in particular, of local storms with a vertical descending movement."—William McInnes, Directing Geologist, Canada Geological Survey.



Some Suggestions Regarding Corn

Developing Seed Corn of High Grade.

All honor to the person who most successfully exhibits the riches of Mother



MR. ARBA BRUTUS.

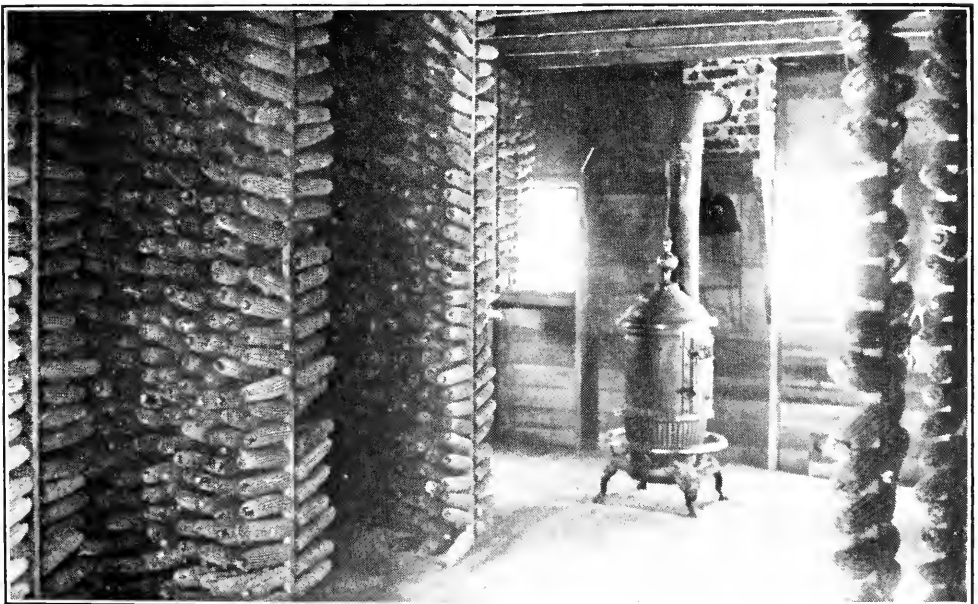
Nature. She will give lavishly of her good things if one knows how to entreat her.

In the last few years many workers have accomplished wonders in the cultivation of Indian Corn. A type of these successful investigators is Mr. Arba Brutus, Pine Village, Indiana, who writes to *THE GUIDE TO NATURE* as follows:

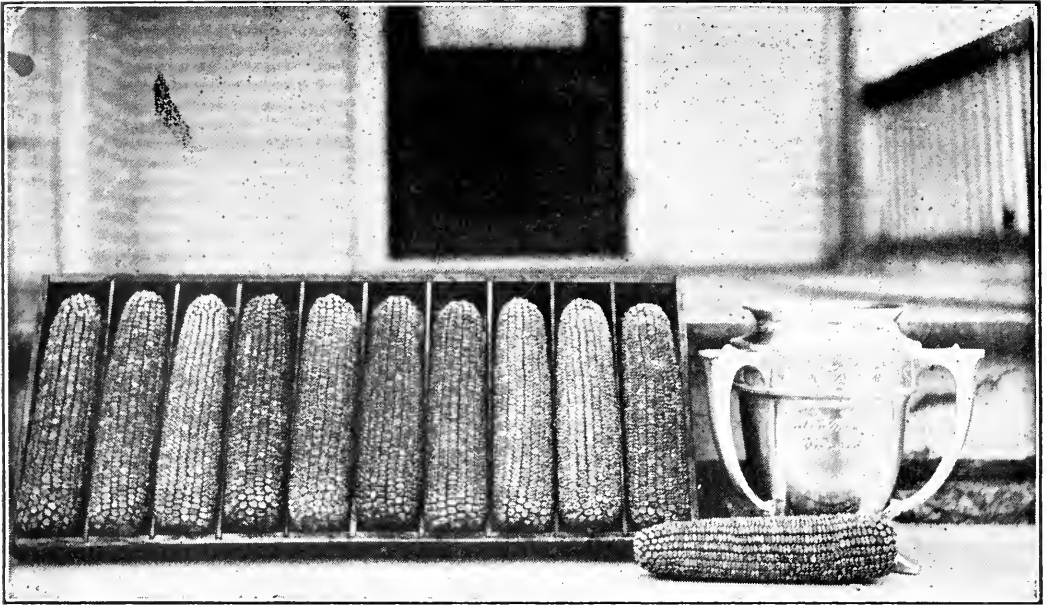
"Corn is king in Indiana. It is one of the best paying crops in the central states, excepting on some of the poorer land. In Indiana and Illinois failure of the corn crop is scarcely known.

"If a person can increase the weight of each ear of corn by one ounce the yield will be increased by ten bushels per acre. This and more can be done by the careful breeding of corn. In show corn we strive to establish type. When corn has this, it has the ability to reproduce itself uniformly."

We shall be pleased to hear from other



IN THE DRYING ROOM.



PRIZE WINNERS.

workers who have successfully improved Indian corn, or in fact any other of Mother Nature's crops. We should like to tell from time to time of achievements in horticulture and agriculture. For this purpose we cordially invite our readers to keep us informed as to those who are accomplishing results in dealing with nature. We believe in the love for nature. We believe in the educational training obtainable through careful observation of the interesting details of nature; but more than all this, we believe that the man or woman, boy or girl, who is making closer the relation between nature and humanity is doing service that should receive honorable mention. We should like to have a hall of fame for those who are accomplishing results that are worth while in the cultivation of nature.

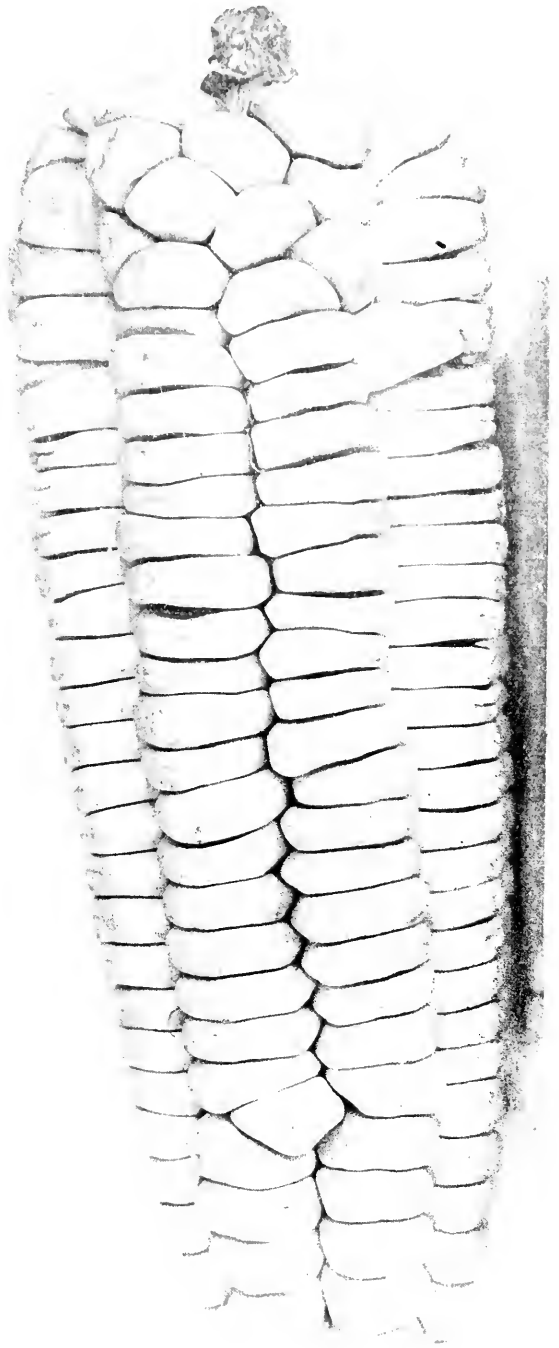
Ear in Corn Tassel.

Every student of corn knows that the plant is a grass and, like most of the smaller grasses, originally grew its seed in the head. That habit still lingers, as one might say, in the very "blood" of the plant and occasionally some kernels are produced in the tassel, but it is seldom that a plant so far forgets itself as to revert in its evolutionary history and develop a modern sort of ear in the tassel; when

the kernels do grow in the tassel they are usually not ear-like. But fact is stranger than fiction. A specimen from Mr. H. E. Zimmerman, Mt. Morris, Illinois, shows that a well developed ear has abandoned its ordinary position



THE EAR IN THE TASSEL



Cut by courtesy of the Pan American Union, Union of American Republics, Washington, D. C., U. S. A.

on the side of the stalk to flourish luxuriantly in the tassel.

We shall be glad if our scouts will make observations in the cornfield this autumn and if an ear is found in the tassel more fully developed than this we hope it will be forwarded to this office.

Earth's cramm'd with heaven,
And every common bush afire with God.
—Mrs. Browning.

Joy in Nature.

There is no pleasure more pure and exquisite than watching the growth of a tree or plant in which one is interested. If you have planted it yourself, so much the better. You then have a feeling of proprietorship in each opening bud or leaf which can be gained in no other way. But, at any rate, cultivate the friendship of the plants and trees, not simply for the flowers and fruit which they furnish, but for

the pleasure of seeing them grow. It has been said that any square foot of soil, if intelligently studied, will give occupation for many hours. The growth of the simplest plant is a wonderful process. Perhaps you cannot go to Europe or the mountains or the sea, but you have an opportunity for unlimited recreation and diversion if you have a small plot of grass and plants with which you have not become acquainted.—Selected.

CUZCO CORN.

May be grown in the North by starting in cold frame or within doors and then transplanting.



Comic Insect-Photography.

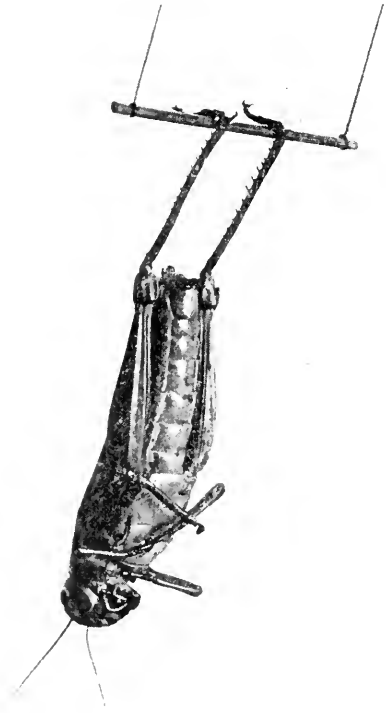
BY LEHMAN WENDELL.

Taking comic insect-photographs is one of the most peculiar, as well as one of the most interesting, of all photographic diversions. I have tried a good many different photographic hobbies, but I have found nothing so truly fascinating as this new pastime. It brings us close to nature, and we unconsciously train our eyes to see the little things that are so lavishly scattered everywhere. Barren, indeed, must be the life of the man or woman who has never learned to enjoy nature and to get strength and inspiration out of it.

In order to meet success in this line of photography, three things are essential: first, good taste and judgment in composition; secondly, an unlimited amount of

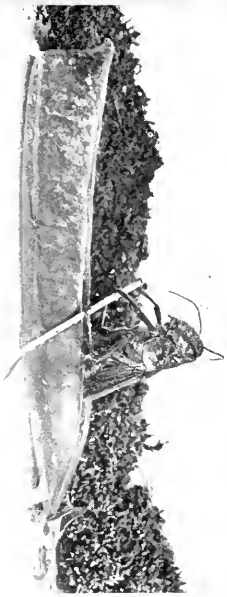
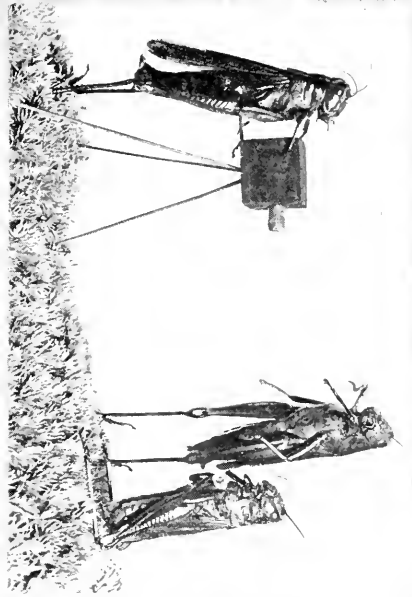
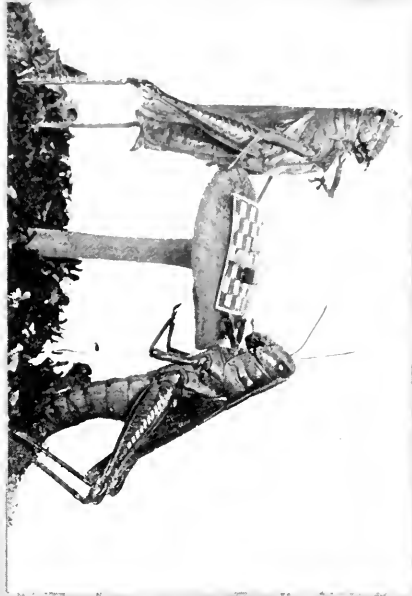


Copyright, 1916, by Lehman Wendell
WAITING FOR A BITE.



Copyright, 1916, by Lehman Wendell
THE ACROBAT.

patience and perseverance, and last, but not least, a suitable camera. I know hardly which one of these three things is the most important; if any one be lacking, failure will be the result. By this I do not mean to discourage the photographer. It is true that this kind of work is not so easy as going out and taking a snapshot of a dog or a hog or a frog; but the very fact that innumerable little difficulties will be met only adds zest to the hobby. No



THE GAME OF CHECKERS,
THE DANDY

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AT THE PHOTOGRAPHER'S
AN OLD SALT.

true knight of the camera will be deterred from going after certain pictures simply because they cannot be had for the asking.

Patience and perseverance are matters of acquirement. If you have to spend an hour or two in setting up a picture, and

find that it topples over just as you have begun to make your exposure, do not feel that you are having worse luck than your neighbor. I spent just a day in photographing my astronomer. It was no easy matter to get the frail little telescope to point at the Milky Way while Miss Katy-



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IN SEARCH OF A NEW COMET

did hold her eye close to the instrument. One of the two was bound to topple over, and it seemed impossible to get both to stand up at the same time. For the benefit of those who are losing courage I hasten to add that the astronomer was my first comic-insect-picture. Meanwhile I have learned to overcome many difficulties which at first seemed insuperable,

so that now I am able to set up a picture and photograph it successfully in much less time.

And now a word about composition. Perhaps it should not be included in an article of this kind; but it plays such an important part that a somewhat detailed description of the subject may not be amiss. In landscape-photography nature

has arranged or composed the picture for us, and all we have to do is to choose the proper viewpoint, the proper time of day, etc., etc., and then make our exposure. In comic insect-photography the camerist himself must compose the picture, and in order to do this successfully he must understand the laws of perspective, balance, harmony, values, etc. In fact, he must be sufficiently conversant with the fundamentals of art so that he can tell a good picture from a bad one, and know why one is good and the other is bad. Without this knowledge he will stumble into errors which will often make his pictures seem ridiculous.

As for equipment, any plate-camera that has a long bellows-extension and an anastigmat lens will serve the purpose. A so-called miniature camera is preferable to a large one, because, by reason of the short focus of the lens, it has a greater depth of field, and all parts of the picture can be brought into sharp focus at the same time, giving a wealth of microscopic detail throughout the picture. Needless to say, pictures of this nature are interesting in proportion to the amount of detail show. Another reason why I advocate a small camera is that it is far easier to handle than a large instrument, and that goes a long way towards keeping one's temper unruined. Again, the small camera can be operated cheaply, and plate after plate can be exposed without bringing up immediate visions of the poor-farm.

The pictures that accompany this arti-

cle were all staged and photographed indoors. It would be out of the question to take such pictures out in the open, where the slightest movement of the air would be sufficient to upset the whole scheme of arrangement. The insects themselves were first captured, then anesthetized and posed. The great variety of poses needed for pictures of this kind, of course, would preclude the use of dry museum-specimens. The reader, perhaps, will wonder

Female Jealousy.

This summer, for once in his experience, Mr. Pritchard happened to make a mistake of one day in his figures. Two bars of cells were left a day too long; and the first virgin out, true to her instinct, immediately slaughtered all her unborn sisters. With the one passionate idea of reigning supreme or not reigning at all she tore great holes in the sides of the other cells and mutilated the helpless inmates, the bees meanwhile organizing a "wrecking-crew" and clearing up after her as best they could.

The engraving shows one of the bars of cells, every cell a complete wreck. Whether the young queen tore all of the side of the cell away herself in her frantic efforts to kill her rival, or whether the bees removed a part of the wax in cleaning out the remains, I do not know.—"Cleanings in Bee Culture," Medina, Ohio.



Cut by the courtesy of "Cleanings in Bee Culture," Medina, Ohio.

AFTER THE BATTLE.

By accident a hatch of queen bee cells was left a day or so too long in a cell building colony. The first virgin that hatched, true to her nature, waged an unfair war upon her helpless sisters still in their cradles. Every cell was ruthlessly torn open and the little white queen inside killed. A virgin queen will not stand for competition.

why I do not kill the insects outright instead of merely anesthetizing them. I have found that the insects are apt to become limp if killed outright, and this would result in an unlikelike picture. Furthermore, grasshoppers often turn a bright red soon after they are dead, and this would be recorded by the camera as black.

Chloroform is perhaps the best anesthetic to use. The simplest method of administration is as follows: moisten a pellet of cotton with the chloroform and place it in the bottom of a small wine-glass. Next drop the insect into the glass and cover with a small sheet of glass. This will prevent the chloroform from evaporating, and complete anesthetization will follow in from two to five minutes. The staging of the picture should be done immediately, and the exposure made, before the insect has had time to recover from the effects of the chloroform.

Naturally, one of the main difficulties is to get the insects to stand upright; but a little ingenuity on the part of the photographer will soon solve each individual problem. In many cases all that is necessary is to balance the insect against some object, as was done with the checker-players. In other cases a prop of some sort will be required, and this should be cleverly concealed behind the insect so that it will not show in the finished picture.

In most of my pictures the foreground consists of some species of moss. This can be found growing in abundance in rocky localities or in low swampy woods. A great many varieties exist, so that sameness in one's pictures may be avoided. Where bushes are needed to break the monotony of the landscape, I use a certain species of lichen, which grows luxuriantly in many parts of the United States. It is found in rocky localities, and grows in dense masses many feet in circumference. By carefully separating a small portion from the mass an excellent imitation of underbrush will be obtained. These same lichens, if separated into individual growths, will be found to simulate dead trees closely, and by placing these where the composition would require such an item most interesting effects can be procured.

I almost invariably use a white background, as this seems to set off the insects to best advantage. A sheet of white paper is well suited for this purpose, but care should be taken not to employ a glazed variety, as it is likely to reflect too much white light into the camera and produce a fogging of the plate. A paper with a matte surface should be used, or better still, a pale blue paper, as this will photograph white. For a black background I use a black sheet of paper such as is used for the wrapping of plates and papers. This gives a sufficiently dark ground for all practical purposes. In case an intense black background is wanted, I photograph against a box lined with black paper, much as one would photograph against the mouth of a tunnel.

Occasionally clouds will be found to enhance the picture greatly by hiding its artificiality. These may be printed-in from special cloud-negatives made for such a purpose. It is advisable to have several dozen such negatives on hand, so that a repetition of the same cloud-effect may be avoided. Just how clouds are printed-in we need not explain here; any booklet on enlarging will make this clear.—By courtesy of "Photo-Era."

Helped the Butterfly Farmer Through College.

We take pleasure in offering to the reader the excellent portrait of Miss Ximena McGlashan, the butterfly farmer, that we here publish. Several months ago we introduced Miss McGlashan herself in several articles. She writes that The Agassiz Association by reason of the publicity that it gave to her butterfly farming helped materially in putting her through college. The accompanying portrait of Miss McGlashan we are able to publish through the courtesy of "The Inland Printer," Chicago, Illinois. In response to a request Miss McGlashan writes to THE GUIDE TO NATURE as follows:

"I was graduated from Stanford University in May, having paid my way through college by my butterfly farming. Since my graduation I have been resting as much as my correspondents have per-



MISS XIMENA McGLASHAN, "THE BUTTERFLY FARMER," WHOM THE GUIDE TO NATURE HELPED THROUGH COLLEGE.

mitted. My future is problematical at present, as the war has well-nigh ruined the markets. There is still good money

in rare moths, and I may devote the future to the rearing of these for market. Many of my pupils have become ardent

entomologists, regardless of the pecuniary profits. One sent me a moth today that I feel sure is new to science. I am selling the lessons at one dollar now, as that will fully reimburse me for my outlay, and I have pledged myself to make no profit on them. If you wish an article I will gladly prepare one to fill any space at your disposal. My gratitude to you is beyond expression. You helped materially to put me through college."

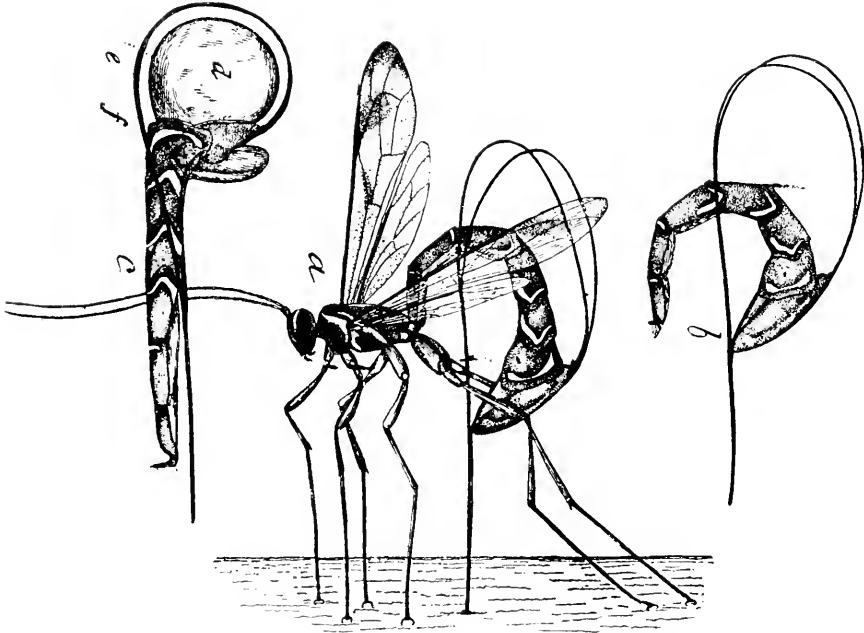
A Needle Insect Threaded.

West Hartford, Connecticut.

To the Editor:

I have seen an insect that is entirely new to me. I have never seen any other like it. It resembled a dragon fly, only at the end of the body, which was like a hard shell and as large around as a lead

Thalessa lunator is one of the larger of our ichneumon-flies. Its body is two and one half inches long, and it measures nearly ten inches from the tip of the antennae to the tip of the ovipositor. It is a parasite of the wood-boring larva of the pigeon horntail. When a female selects a place which she judges is opposite a tremex-burrow, and, elevating her long ovipositor in a loop over her back, with its tip on the bark of the tree, she makes a derrick out of her body, and proceeds with great skill and precision to drill a hole into the tree. When the tremex-burrow is reached she deposits an egg in it. The larva that hatches from this egg creeps along this burrow until it reaches its victim, and then fastens itself to the horn-tail larva, which it de-



(From Riley, U. S. Dept Agr. Insect Life)

THALESSA LUNATOR.

A, female in act of ovipositing; b, abdomen showing outer sheaths in slightly different position; c, abdomen stretched to its utmost, as when first inserting or finally withdrawing the ovipositor, and shewing the coil of outer sheaths (f), the distended membrane (d) and the ovipositor coiled around inside it at periphery (original).

pencil, there were two stiff hairs, two or three inches in length, which made it look like a thread. I told Fred if he wanted to do any sewing there was the the needle ready threaded. I have seen but one. It was flying around outdoors. A day or two later it came into the house and I killed it on the screen door.

MRS. JENNIE A. PALMER.

stroys by sucking its blood. The larva of *Thalessa* when full grown changes to a pupa within the burrow of its host, and the adult gnaws a hole out through the the bark if it does not find a hole already made by the Tremex. Sometimes the adult *Thalessa*, like the adult *Tremex*, gets her ovipositor wedged in the wood so tightly that it holds her a prisoner un-

til she dies.—“A Manual for the Study of Insects” by John Henry Comstock and Anna Botsford Comstock. Drawing by courtesy of Entomology, Washington, D. C.

Desires Lists of the Larger Moths.

Some three years ago, I became interested in butterfly and moth farming and since then I have found it to be one of the most enjoyable avocations. There seems to be a dearth of literature at moderate prices, especially concerning moths, and only a few more expensive books within the reach of the average beginner, which help in identifying the specimens. It is my purpose to write a leaflet describing the forms common in the United States, with their larvae and pupae. But in order to ascertain which of the many kinds are commonest and most widespread in this country, I desire to obtain lists of fifteen of the larger moths arranged according to frequency and general familiarity.

If you are acquainted in even the smallest degree, or know of some one that is so acquainted with the moths of your locality, will not you or your friend make out and send to me two lists of fifteen moths each, in the groups Sphingidae, Saturniidae and Ceratocampidae; one arranged according to order of personal familiarity and the other according to order of frequency in your locality?

If you desire to refer to a book on moths, you will find Holland's as good as any, although there are several others.

In case you have had experience with moths, I wish you would take into consideration the frequency of larvae, pupae and imago in preparing the lists.

In order to make the series of statistics as accurate and as great a help in the study of nature as possible, there should be numerous lists, from all sections of the country, for comparison. Your help will be greatly appreciated.

I shall be glad to correspond at any time with any one who has been raising Lepidoptera or desires to learn anything along these lines.—Russell T. Des Jardins, 310 North Monroe Street, Albion, Michigan.

The Eggs of the Walking-Stick Insect.

White Plains, New York.

To the Editor:

It was with great interest that I read your account of the walking-stick insect and looked at her picture. Now is the time to get others. At this period of year the insects reach maturity. They feed mainly on the oaks. The females drop their eggs as they walk about, and where they are at all abundant, it is said that the eggs as they strike the dry leaves under the trees make a sound like the pattering of raindrops. There are two species here, as I am told by my friend, Mr. W. T. Davis of Staten Island, who is well informed on the grasshoppers and their allies, the roaches, the Orthoptera or straight winged insects, to which group the Diaperomera belongs. You will receive in a few days some eggs that I obtained last year from specimens caught in the fall. Some of the eggs hatched out in the spring just as the trees were budding in tender leaves. I could not give the young proper care so they failed to survive.

Sincerely yours,

J. R. DE LA TORRE BUENO.

A Diamond Day.

Do you know what is meant by a diamond day?

All sparkle and sheen and shine,
When it really seems that this staid old earth
Is fired by a spark divine?

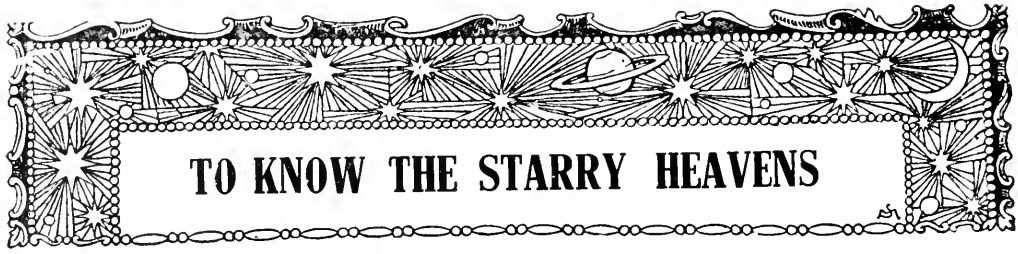
When gone are the swirls of drenching rain,
The vapors of yesterday
And the west wind blows, and the clouds depart,
And the sun comes out to stay?

Oh then we see a beauteous world,
And could almost dance for joy;
With the blue so blue, and the green so green,
It is like a brand new toy.

And the sun is a-shimmer upon the trees,
And the up-turned face of the field,
And the flowers have all had their faces washed,
And the lake is a silver shield.

And the feathered folk are so full of life,
It is like a great beehive:
A new made Heaven, a new made earth,—
How good to be alive!

—Emma Peirce.



The Heavens in November.

BY PROFESSOR ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

Throughout this month the sun is gliding rapidly downward among the stars toward the winter solstice, so that the steady shortening of the days is very noticeable. On November 1, the day is three hours shorter than the night, but by November 30 the inequality has increased to five hours, which is only one-half an hour less than on the shortest day

of the year, but it is at this time of the year that the heavens are seen in their greatest brilliance and beauty.

* * * * *

The November Stars.

Even at the very beginning of November we may witness the entrance of the brilliant Orion and Gemini into our evening sky, while by November 30 these constellations will at the same hour be high above the ground, and the beautiful Dog Stars, Sirius and Procyon, will be seen

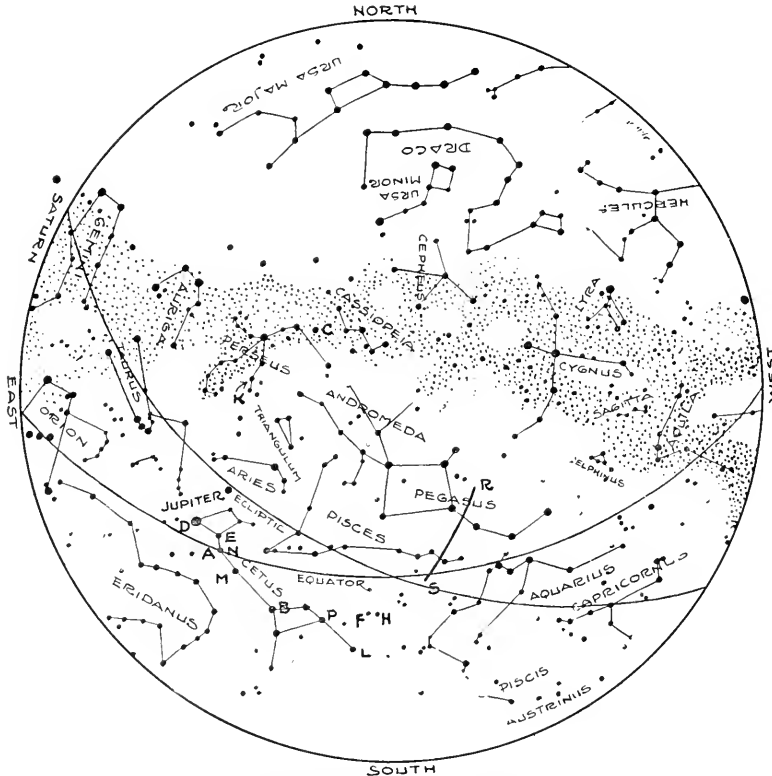


Figure 1. The constellations at 9 P. M. November 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west hold West below. If facing north, hold map inverted.)

of the entire year. Though to many people, and probably to most, this rapid lessening of the hours of daylight is far from welcome, it is of the greatest advantage to astronomers. Not only do the long nights give many additional hours for ob-

just rising. By this time the leaders of the brilliant winter groups will have filled the whole eastern part of the heavens; the very bright group, Taurus, will have nearly reached the meridian and the Milky Way will form an arch over the entire

heavens from the east to the west.

It is the conspicuousness of the Pleiades at this time which has given to November the name of the Pleiad month. It was with this month that many of the primitive people began their year; on the "Pleiad Night" which was the night on which the Pleiades were found due south at midnight, no petition was presented in vain to the ancient kings of Persia. The Pleiad Night of the present year will occur on November 20. A memory of the midnight rites of the Druids on the first of November still survives in our Hallow-eve.

Probably nearly every reader of these monthly articles is familiar with the three brilliant winter constellations now shining just above the ground in the east. They have examined the wonderful golden star, Capella, and perhaps traced out all of its constellation, Auriga, and also the interesting Perseus now just above it. They have perhaps many times examined the wonderful double cluster of stars at C, figure 1, and watched one or more of the eclipses of the remarkable variable star, Algol, at K—the star which loses no less than five-sixths of its light at the constant interval of a little less than sixty-nine hours.

But many observers are not aware of the wealth of interesting objects to be found within the borders of any one of the fainter, little known, constellations. This month, for example, the widespread group of Cetus, or the Sea Monster, is in excellent position for observation, and will well repay a careful exploration with a small telescope.

Its brightest star, at D, has a bluish, fifth magnitude companion west of it which is easily visible in a small glass, while the stars at E, B and P are also all beautiful doubles. The first of these is the most beautiful double star in this part of the sky, its principal sun being golden and its companion blue; around the last there are many distant companions, one of which, lying due north of it, is an interesting double star.

The most interesting feature of Cetus, however, is the remarkable group of variable stars which are found within its borders. One of these at the point F, a little to the left of the line joining H and L, varies from the seventh to the tenth

magnitude in a period of eleven months, while the star at N changes from the seventh to the thirteenth magnitude in one-half of this time.

* * * * *

The Variable Star, Mira.

But the most remarkable of all the variables is the bright star at M, Figure 1, which is known as the Mira, or the "Wonderful Star." This great sun increases in brightness sometimes fifteen hundred-fold at a quite regular interval of about eleven months. And its wonderful increase of brightness will take place during the present month when the constellation is favorably situated in our evening heavens; the observer will therefore have a very unusually favorable opportunity of witnessing it.

On November 1 the star may be seen with some difficulty with the naked eye, though with a pair of opera glasses it may readily be found, almost on a straight line between the brighter stars, A and B. As the weeks go by, it will at once be noticed that its brightness is increasing very rapidly indeed, until by the end of the month it may become a conspicuous naked eye star. The date of its greatest brightness will be about December 5; it will remain thus bright for a week or ten days and then rapidly fade away.

Sometimes when at its brightest this star has been known to almost equal Aldebaran; at others it has been but little brighter than the Pole star, while a very few of its outbursts have been so feeble that it has even been scarcely visible to the naked eye at all. We cannot therefore predict to exactly what brightness the star will rise during the present month, but it is quite certain that it will furnish a most interesting object for study. As to the causes which lead to such enormous increases in its light and heat, we are, as yet, wholly ignorant.

Eclipses of Jupiter's Satellites.

Several letters have been received from those who have been observing Jupiter's satellites, asking for a more complete explanation of the, at first sight, peculiar behavior of these little bodies. One observer has noticed that while the first and second moons are never seen to go into eclipse, yet they are seen to emerge from it, and that the third moon, after it has passed behind the planet and again re-

appeared into view, later both enters and emerges from the planet's shadow. The fourth moon is not eclipsed at all during the present month.

A glance at Figure 2 will, it is hoped, make the reasons for these appearances

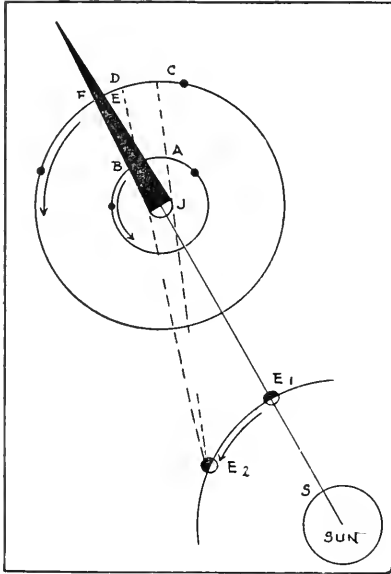


Figure 2. Diagram to illustrate the phenomena of Jupiter's satellites. (Not drawn to scale.)

entirely clear. Jupiter passed opposition on October 24; that is, the sun, earth and Jupiter were in the positions, S, E, 1 and J, or in one straight line, on this date. Since this time, the earth has moved forward to the position E₂, so that the great shadow of Jupiter, which stretches out into space directly away from the sun, no longer points directly away from the earth.

It is therefore evident that a moon whose path, A, B is small, as the paths of the two inner moons are, will be seen to pass behind the planet when it has reached the point A of its path; while still hidden by the ball of Jupiter it will enter the shadow, and will not be seen from the earth again until it finally emerges from the shadow at B. The third moon, however, moves in a path so large that after disappearing behind the planet at C, it reappears at D, and some time later is seen to pass through the shadow at E and F.

For example, on the evening of November 16, this moon will be occulted at C at 4 hrs. 58 min., P. M.; it will emerge from

behind the planet at D at 6 hrs. 26 min.; it will enter eclipse at E at 7 hrs. 17 min., and it will finally emerge from the shadow at F at 9 hrs. 4 min., P. M. (Eastern Standard Times.) Similar interesting phenomena will occur on the nights of November 3, 5, 10, 12, 19, 23 and 26.

* * * * *

The Planets in November.

Mercury will not be visible during the present month, for although it enters the evening sky on November 24, it does not attain its greatest distance east of the sun until next January 3.

Venus is still very brilliant in the morning sky. It rises three hours before sunrise on November 1, and this time is decreased to two and one-half hours by November 30. The planet is by far the most brilliant object now in the heavens, shining with one hundred times the brightness of a first magnitude star.

Mars may still be seen low in the southwest, where it sets about one and one-half hours after the sun. The planet is now far below the celestial equator and is rapidly moving still farther southward. It will pass the winter solstice on December 1. Throughout the month it is in very favorable position for observation.

Jupiter is now high in the southern heavens in the position shown in Figure 1; it is moving southward among the stars, and also retrograding, or moving westward.

Saturn, almost in a line with the Twin Stars, Castor and Pollux, rises at 9 hrs. 30 min., and so is just behind the borders of our evening map. Toward midnight it is high in the heavens in excellent position for observation.

* * * * *

A Distant Comet.

There is a most interesting comet now in the sky which was discovered on a photographic plate so long ago as April 27 of the present year. At that time it was nearly 400,000,000 miles away from us—almost as far away as the planet Jupiter, and it consequently appeared extremely faint. But the fact that it could be seen at all at so great a distance leads us to believe that it must be a very unusually large and bright object. Since its discovery it has been steadily approaching the sun; it will not attain its least distance from that body, however, until next June.

As seen from the earth, it will, from June to September, follow the path RS, Figure 1. At present this comet is so very distant that it still appears very faint, but it is hoped that during the coming summer and autumn it will become easily visible, and perhaps even strikingly conspicuous to the naked eye.

Observation of an Aurora.

Washta, Iowa.

To the Editor:

I am writing you a description of an auroral display which took place here on the evening of the 26th of August. At about 8:50, it began low down in the northern horizon; but soon spread to the northwest and especially to the northeast. Great, shivering, dancing streamers of grayish white light shot up toward the zenith and passed ten or fifteen degrees beyond, toward the south. There were two features about this display that to me were remarkable. Rising about fifteen degrees south of the east point was a huge banner, tapering at first but gradually widening as it approached the zenith. It passed over Delphinus, between Vega and Altair, over part of Hercules and on towards the northwestern horizon. I particularly noticed that high up, where the streamer was near the meridian, the stars in the Galaxy, Albireo of the Cross and some of the stars in Hercules were blotted out by the light.

I especially noticed this because some writers say that the stars can always be seen through the light. This streamer did not appear to be at any great distance overhead. The stars could be plainly seen through those that came from the north, northwest and northeast. About 9:30 I observed one shooting up about ten degrees from the southeast point; Fomalhaut was just above the horizon. It passed over Aquarius, Capricornus, and was lost over Ophiuchus and Serpens, but the stars were not hidden by its light. What seemed exceptional was the fact that the streamers came from the southeastern horizon. The display lasted until twelve o'clock, the light during most of the time being like that of the moon at her third quarter. The northeastern sky had the appearance of daybreak, but with a kind of weird light. There was a marked

counter glow in the southern horizon, extending for about thirty degrees.

For several evenings I had been trying to catch Mercury soon after sunset and, much later on, I feasted my eyes on the beautiful starry vault of the summer sky. At about 9:30, Capella emerges from the northern horizon; next comes Fomalhaut almost on the southeast point; soon after, Jupiter blazes but a little north of the east point. Starting in the northeast and extending overhead and downward to the southwest, is the glorious stream of the Galaxy, now at its best. Perseus in the northeast; the beautiful northern cross overhead, Sagittarius and Scorpio in the south and southwest, eight stars of the first magnitude in full view:—Spica low down in the southwest; Antares, Fomalhaut, Altair, Deneb, Vega, Arcturus and Capella. No moon all night. If the grandeur does not equal that of the winter sky, the comfort of the observer at this season more than makes up for the deficiency. I observed Saturn emerge from behind the moon at about 3:15 in the morning of the twenty-fifth. The planet was behind the moon when she rose. Our latitude here is 42½ degrees north.

FRED S. CARRINGTON.

* * * * *

I have had several letters about the aurora of that evening. It was an interesting display, but we must expect this as we are now near a sunspot maximum. Doubtless the aurora was still finer farther north, for it was evidently widespread. Notwithstanding the thousands of observations of auroras there is much that we do not yet know about them. Northern observers sometimes report them as actually on the ground and tell of electrical cracklings which accompany them. Here, however, they are certainly high above us and too far away for us to hear any sounds. They are undoubtedly electrical; their spectrum shows krypton, argon and other elements of the atmosphere.—Eric Doolittle.

High altars unto Heaven,
The mountains in our sight;
Their shining altar vestments,
The snow that fell o'er night.

—Emma Peirce.

Visible Occultations of Algol for the Season of 1916-1917.

The following table gives the visible minima for the occultation of the variable star Algol for the seasons 1916-1917. The time given is the middle of the occultation, which begins five hours earlier and lasts five hours later, waxing and waning as the dark companion sun passes over Algol. The time given is U. S. Eastern Standard Time.

November 6,	12:15 (Mdt.)
November 9,	9:00 P. M.
November 12,	5:50 P. M.
November 26,	1:45 (Mdt.)
November 29,	10:35 P. M.
December 2,	7:25 P. M.
December 19,	12:30 (Mdt.)
December 22,	8:30 P. M.
December 25,	5:20 P. M.
January 8,	2:00 (Mdt.)
January 11,	10:50 P. M.
January 14,	7:40 P. M.
January 17,	4:30 P. M.
January 31,	12:45 (Mdt.)
February 3,	8:30 P. M.
February 6,	5:20 P. M.
February 20,	2:25 (Mdt.)
February 23,	11:15 P. M.
February 26,	8:05 P. M.
March 1,	4:50 P. M.
March 15,	1:00 (Mdt.)
March 18,	9:50 P. M.
March 21,	6:40 P. M.

—The Monthly Evening Sky Map.

To the Owners of Small Telescopes.

BY WILLIAM TYLER OLCOTT, NORWICH, CONN., CORRESPONDING SECRETARY.

The American Association of Variable Star Observers has just completed its fifth year of work observing variable stars with a total to date of 59,500 observations.

More recruits are needed for the work, which involves no mathematics, and the details of which are easily mastered. All that is required is a star atlas and a telescope of three inch aperture or larger.

The Secretary will be glad to furnish information regarding the details of observing, and pleased to assist any one who is willing to co-operate with us.

Here is the chance to do some telescopic work that is really worth while, of fascinating interest and scientific value. No obligation is imposed on members of the association save a willingness to observe variable stars when it is convenient.

The Stars.

"No man can study the stars," says Dr. John Brashear, Pittsburgh's distinguished astronomer, in the "American Magazine," "without becoming bigger and better. The earth is too much with most of us; and we are inclined to be too much with and within ourselves. We have an exaggerated sense of our own importance in the world, and of the importance of the world in the universe.

"Most folks consider this old world a pretty big place, but, if you tossed a cube 1/7,000th of an inch in diameter into Lake Erie, it would occupy the same relative space in that great inland sea that our earth occupies in a universe terminating at the nearest star, Alpha Centauri, and extending a similar distance from our sun in all directions. Such a universe contains 15,625,000,000,000,000,000,000,000,000,000,000,000 (fifteen thousand six hundred and twenty-five undecillion) miles, but it is only an infinitesimal dot in the actual universe. Our sun itself is one million three hundred thousand times as big as the earth, but photometric measures have shown that the heat-giving of our solar system is greatly exceeded in size by perhaps a majority of the millions of stars that stud the heavens."

Nature's Thoughtfulness.

BY WARREN KIMSEY, LATHROP, MO.

Did you ever see a green vine that had completely covered a rough old stump? The unsightly object had become a thing of beauty. This is Nature's way.

Those who do less in every day life are unworthy. They are unworthy to live and move and have their being in a world that was intended to be beautiful. After all, there is beauty in suffering and sacrifice if only one has the ability to see it.

This world is a mighty good place in which to live. But you've got to do your best in your place if you get the joy and happiness that is in store for you. There is a likeness to a wild bee tree.

You must get out and find the tree. Then you may get stung. But the honey is there, and it's great when you sit down and put it into your mouth. Your neighbor may be eating some of the wild honey of life, right now! Perhaps you are not. Why? The answer is within yourself.

RECREATIONS WITH THE MICROSCOPE

Some Old-time Microscopes.

BY THEODORE W. SMITH, NAPERVILLE, ILL.

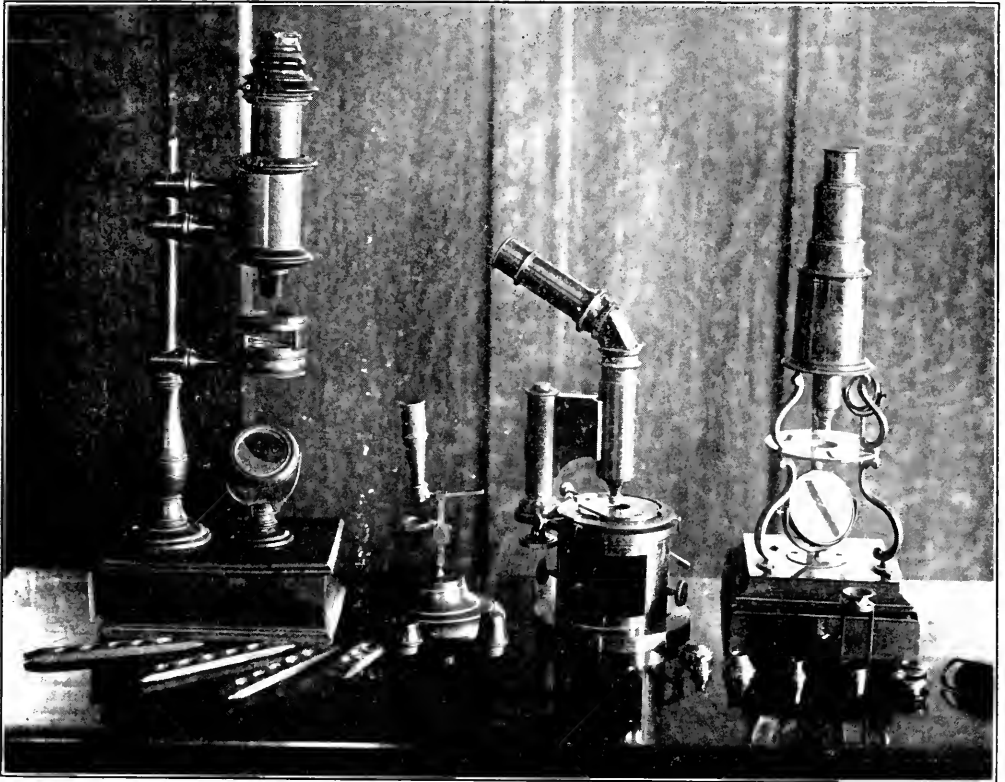
The accompanying illustration shows some old-time microscopes which are interesting examples of early types of the instrument. For reference, these may be numbered from left to right, 1, 2, 3 and 4.

No. 1 is a large microscope, 19 inches high, made almost entirely of wood, and is

held in place by a metal ring in the wooden objective mount.

No. 2 is a small microscope made by W. Cary of London about 1826 and is stage-focusing.

No. 3 is a microscope made by Nacet of Paris about 1850. Instead of having a joint for inclination, there is a prism in the body-tube for the more convenient

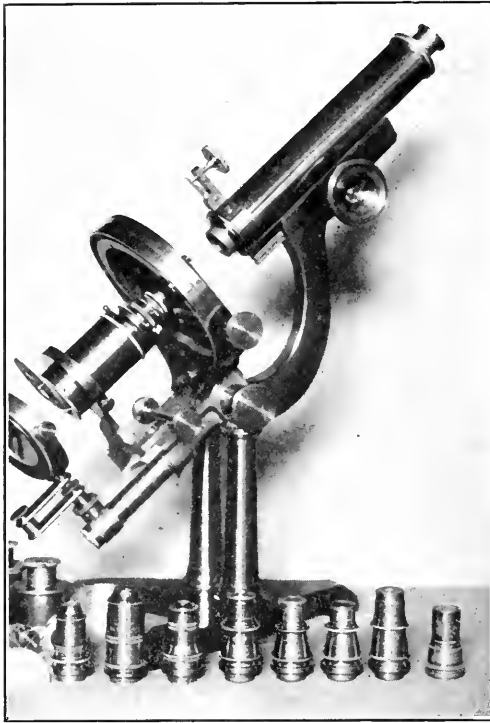


INTERESTING EXAMPLES OF EARLY TYPES OF MICROSCOPE.

probably a Nuremberg microscope dating from about 1740. Some wooden "sliders" are shown in front of the instrument, each "slider" containing several specimens mounted dry between two pieces of ordinary glass held in place by metal rings. The objectives, of which there are three, consist of a single lens

use of the instrument. This stand has a mechanical stage of peculiar construction and the objectives are of the achromatic French triplet variety.

No. 4 represents the Culpeper model which was made by several London opticians during the eighteenth century, this particular microscope having been made



MICROSCOPE STAND MADE BY R. B. TOLLES,
BOSTON.

by George Adams of London about 1790. The drawer in the base of the stand contains several accessories of the period, including a "fish-plate" for examining the circulation of the blood in the tail of a fish or in the web of a frog's foot. There are also several ivory "sliders" containing various objects mounted dry.

The history and evolution of the microscope are exceedingly interesting and would require much space to go into detail, therefore only a few of the most important points will be noted in this brief article.

Microscopes are either simple or compound, the former consisting of a single lens or system, while the compound microscope contains two or more lenses or combinations, the image formed by the objective at the lower end being magnified by the eye-piece at the upper end of the tube.

It is recorded that crystal lenses or magnifiers were used by Roger Bacon, a Franciscan monk, in 1276, and he may be considered the inventor of the simple microscope.

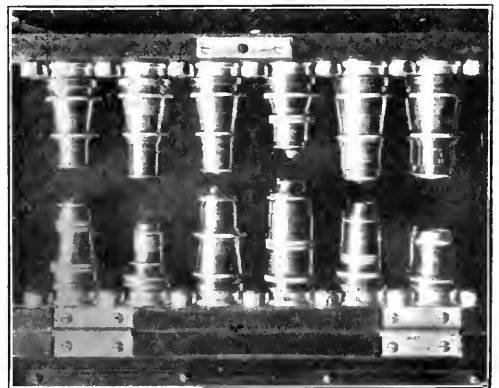
The discovery of the compound microscope has been attributed to Hans and

Zacharias Jaussen, spectacle makers of Middleburg, Holland, between 1590 and 1609, although there are grounds for believing that Galileo, the inventor of the telescope, was also the inventor of the compound microscope at about this same period.

During the seventeenth and eighteenth centuries, many varieties of the compound microscope were made, such as Campani's microscope (1660); Hooke's microscope (1665); Divini's (1668); Bonanni's (1691); Marshall's (1704); Hertel's (1716); Joblot's (1718); Culpeper and Scarlet's (1738); Martin's (1780); George Adams' (1771) and Jones' (1798):

The result obtained with the compound microscope of that period, on account of poor definition and loss of light, were far from satisfactory, and the simple microscope was thought by many observers to be more reliable than the compound instrument; and indeed all the wonderful discoveries of Lceuwenhoek (born 1632, died 1723) sometimes referred to as "the father of microscopy", were made with the simple microscope consisting of single lenses ground by himself.

When the achromatic principal was finally applied successfully to the compound microscope about 1825, great advances and important discoveries were made, and during the following fifty or sixty years, the microscope stand, objectives and accessories were developed to a high state of perfection both in this country and in Europe. Microscopical societies were formed in every community and great interest was taken by amateurs in "fight-



TWELVE MICROSCOPIC OBJECTIVES MADE BY
R. B. TOLLES, BOSTON.

ing" objectives and resolving difficult diatom tests, and to this fact the improvement of the microscope objective was largely due. During this period, or more particularly from 1800 to 1880, very elaborate and costly instruments were made by Tolles, Bulloch, Zentmayer, Spencer and others in this country, and by Beck, Swift, Watson, Baker and Powell & Lealand in England. Objectives made by Robert B. Tolles and the Spencers were considered by many microscopists as superior to any others ever constructed.

Accompanying this article is a photograph of a large microscope stand and several objectives made in 1882 by Robert B. Tolles of Boston. These large, elaborate, costly stands have, during the last thirty years, been displaced by the more practical, compact and comparatively simple model of the present day, the principal manufacturers in this country being the Bausch & Lomb Optical Co., of Rochester, N. Y., and the Spencer Lens Company of Buffalo.

Although the compound microscope has become, in recent years, more of a scientific "tool" for the laboratory, at the same time so much pleasure and profit may be derived from its use by lovers of nature, that more popular interest should be stimulated in the use of the microscope.

An interesting little book entitled "The Microscope and Its Uses" by Wilfred Mark Webb, is published by Sully & Kleinteich, New York. Wood's "Common Objects for the Microscope" is also an excellent book for the beginner.

Milkweed Butterflies in Migration.

Des Moines, Iowa.

To the Editor:

I read with interest the different articles written by your members, and, I think, subscribers too. They are all so delightful. It is almost as though we were all friends and were talking over together the incidents that befall us in our walks with nature.

An exquisite experience came to me all unexpectedly one day recently.

As I was going to the car, I noticed how blue the sky was how clear, without the sign of a cloud anywhere. On looking up over a meadow, I saw some

winged creatures flying high in the air. At first I thought they were birds, but on examining them closer found they were butterflies. There must have been twenty-five or more, some flying very high, where the birds fly, some lower, but all seemed conscious of each other, to be flying up and down, back and forth, together, as though they had come out to while away an hour in delight that way. They were deep orange in color, and made a bright picture up against the blue sky. I had often seen them flying from flower to flower on the ground but never up high like that before.

Yours very truly,

HELEN GRIFFITHS.

Potato Seed Balls.

The only suggestion I can offer regarding the failure of potatoes to produce seed balls more abundantly in Connecticut is that the climatic conditions are not favorable to a normal development of the potato plant during the period of growth in which the blossoms are developing. The failure to set seed balls is primarily due to a lack of viable pollen.

Some years ago, Dr. E. M. East was able, at New Haven, Connecticut, to produce seed balls almost at will on his potato experimental plant. I am well aware, however, that in New England, at least outside of the northern portion of it, potato seed balls are more or less of a rarity.—William Stuart, Horticulturist, United States Department of Agriculture, Bureau of Plant Industry.

The Russians are planning to establish a biological station at Lake Baikal, in southeastern Siberia, and have already secured by gift eight thousand dollars toward the project. Lake Baikal, the source of the Lena River, is the largest body of fresh water in Eurasia and the deepest in the world. Some of the fishes are ancient forms, apparently survivors from Upper Tertiary times when Siberia had a sub-tropical climate. In other respects, also the fauna is unique.

If you make a friend of Nature,

You will ever bless the day,

When you put your trust in something

That will gladden all your way.

—Emma Peirce.



THE AGASSIZ ASSOCIATION

Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

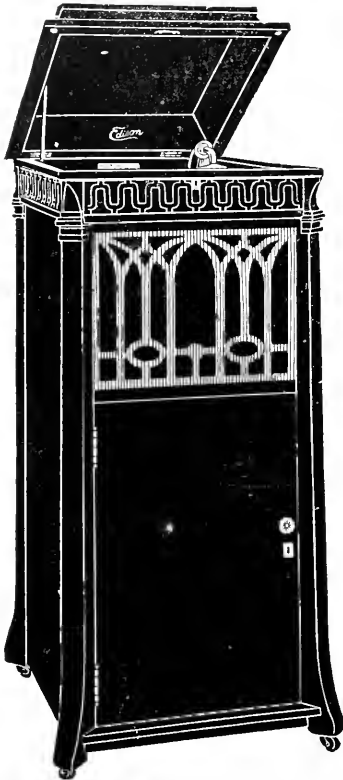
Thomas A. Edison Makes a \$500 Gift to The Agassiz Association.

Thomas A. Edison invited Edward F. Bigelow to visit the factory and laboratory, October 13th, at Orange, New Jersey. This invitation was gladly accepted and Dr. Bigelow spent the afternoon in

ferring to his interest in every phase of nature and science. He says that he reads and investigates everything, not knowing from what may come one of the best suggestions for development. He expressed much interest in the work of The Agassiz Association, inquired especially as to the present members of the Agassiz family and spoke of the great work of the younger Agassiz (Alexander) as well as that of the father, Louis Agassiz.

The dissemination of nature knowledge and love from ARCADIA interests him greatly and that interest was very practically expressed in a gift of the latest Laboratory Model of the Diamond Disc Phonograph in finest mahogany finish valued at \$250. To this he added a selection of Re-Creation Records amounting to an additional \$250. Three-fourths of these will include the best things now on hand while the others will be from the best things issued in the future.

This gift will receive the hearty gratitude of the many visitors and students who use ARCADIA freely and will add greatly the facilities of entertainment. It will be remembered that local ladies a few months ago presented The Agassiz Association with an exceptionally fine Kroeger piano.



THE LABORATORY MODEL OF THE DIAMOND DISC PHONOGRAPH.

conversation with Mr. Edison, saw some of his chemical experiments and visited the huge plant under guidance of managers of various buildings and departments. Mr. Edison told of the progress of the work and the rapid growth, re-

The phonograph which arrived with a number of records on October 21st bears a metal plate with the following inscription:

PRESENTED TO
THE AGASSIZ ASSOCIATION
BY
THOMAS A. EDISON
OCTOBER, 1916

Additions to Our Membership.

Corresponding:

- Mr. H. Stuart Dove, West Devonport, Tasmania, Australia.
 - Mrs. Adda Bauman, Pittsburg, Pennsylvania.
 - Miss Helen R. Hubbard, Lake Elmo, Minnesota.
 - Mr. Charles P. Titus, East Orange, New Jersey.
 - Mr. J. Ford Sempers, Aikin, Maryland.
- Sustaining:
- J. H. Kellogg, M. D., Battle Creek, Michigan.
 - Mr. Ray Stannard Baker, Amherst, Massachusetts.
 - Dr Robert Unzicker, Chicago, Illinois.
 - Mrs. M. Louisa Ross, Hastings-on-Hudson, New York.
 - Miss M. G. Folsom, Boston Massachusetts.

For Growth and Efficiency.

Members and other friends who have aided in the expenses of The Agassiz Association.

- Reverend Charles Morris Addison, D. D., Stamford, Conn. (\$5.00 and \$1.00).....\$ 6.00
- An Amateur Astronomer--surplus to general fund after payment of remainder of loan to fund for astronomical observatory77.80
- Rogers School Chapter, Stamford, Conn.....2.50
- A Lover of Astronomy, Massachusetts—balance of payments of \$25.00 per month for one year75.00
- A Subscriber, Stamford, Conn.1.00
- Mr. Harry B. Rood, Poultney, Vt.1.00
- Miss Frances M. Tollett, Great Kills, Staten Island.....1.00
- Mrs. Hubert P. Main, Newark, N. J.....1.00
- Mrs. M Louisa Ross, Hastings-on-Hudson, N. Y.....5.00
- Tuesday Night Club, Sound Beach16.00
- Mrs. D. Haug, Sound Beach.2.00
- Mr. H. E. Valentine, Boston, Mass.1.00

- Professor Edgar T. Wherry, Washington, D. C.....50
- Dr. William J. Long, Stamford, Conn.....50
- Visitors at ArcAdiA.....15
- Mrs. T. C. Luther, Mechanicville, N. Y.....1.00
- Visitors at ARCADIA.....25
- Miss E. D. Ferguson, Stamford, Conn.....6.66
- Mr. C. H. T. Jaffray, Stamford, Conn.....3.33
- Mr. C. L. Andrews, Seattle, Washington50
- Mr. S. C. Hunter, New Rochelle, N. Y.....10.00
- Mr. Morton C. Nichols, Greenwich, Conn.....\$10.00
- Mr. R. L. Agassiz, Boston,.....25.00
- Mr. Theodore W. Smith, Naperville, Ill.....10.00

Contributions for Nature Work with the Boy Scouts of America.

- Mrs. Charles E. H. Phillips, Glenbrook, Conn.....\$10.00
- Miss E. D. Ferguson, Stamford, Conn.....3.34
- Mr. C. H. T. Jaffray, Stamford, Conn.....1.67
- Reverend Charles Morris Addison, D. D., Stamford, Conn.....4.00

Miscellaneous Contributions to ArcAdiA.

- Winifred Sackville Stoner, Jr., Wilmington, N. C.: Pixie moss reported by a botanist to be found only in Wilmington and somewhere in New Jersey.
- Mr. Philip H. Hartman, Superintendent Department of Fisheries, Erie, Pa.: Specimens of gar pike—alligator gar and common gar pike.
- Mrs. Charles Somerville, Glenbrook, Conn.: Exhibition glass.
- Miss Marie Madeleine Reynes, Sound Beach: Miscellaneous shells and stones from the beach.
- The Misses Wörrrell, Sound Beach: Two interesting specimens of black-eyed Susan.
- Mrs. William N. Travis, Stamford, Conn.: "Tomato worm" larva covered with the cocoons of a parasitic fly.
- Mrs. Robert McGinnis, Sound Beach: Four large and rare shells.

Mr. Clyde T. Ford, Sound Beach: Horned toad and trapdoor spider from California.

Mr. A. C. Arnold, Stamford, Conn.: Nest for woodpeckers made from slabs.

Mr. H. E. Deats, Flemington, N. J.: Grapevine galls.

Master Joseph Palmer, Sound Beach: Sea horse.

Mrs. James W. Brice, Sound Beach: Remarkable potato.

Mr. Wiliam Mann, Sound Beach: Pupa of sphinx moth.

Miss Edna S. Knapp, Caryville, Mass.: Two paper cutters, one whittled from barberry and the other from huckleberry.

James McCurrach & Brother, New York City: Three neckties ornamented by a snowflake pattern.

Mr. Thomas A. Edison, Orange, New Jersey. Latest Laboratory Model of the Diamond Disc Phonograph in finest mahogany finish valued at \$250, with a selection of Re-Creation records to an additional \$250.

Mr. Paul Lockwood, Waterbury, Connecticut: Unusually long dandelion stems, one measuring thirty-two inches.

United States Government and a number of other contributors: Potato seed balls. None have been received from Connecticut.

Paying the Remainder Due on the Land of The Agassiz Association.

An effort is being made by The Agassiz Association of Sound Beach to pay off the remainder due on the land belonging to that Association. This was purchased some five years ago and payments have been steadily made. President Edward F. Bigelow recently wrote the following letter to a few friends. Responses have come back sufficient to encourage a general effort. The following is a copy of the announcement:

"FIVE YEARS November 1st since we settled in this ArcAdiA. We originally purchased seven lots, each sixty feet front—five on the installment plan for The Agassiz Association and two for the Bigelow family. On the AA lots we have paid off all but \$1,250.87. Please help us on that. Let us clean it up, that our efforts may be devoted directly to the work of the AA.

"We moved five buildings and placed them on firm foundations. We have erected and equipped the Welcome Reception Room and an Astronomical Observatory. There are no claims on any of the buildings or their contents.

"In the recent great increase of regular expenses, this monthly payment on the land becomes a serious problem. If we could be free from that burden and worry, we could carry the rest and do better the work which steadily increases."

In response to this appeal the following letter was received from Commodore E. C. Benedict, Greenwich, Connecticut:

"In response to your letter of September 29, in regard to paying off the debt of \$1,250 on ArcAdiA, I beg to state I will be one of five of our citizens, or its equivalent by any other number subscribing \$1,000, to make up the amount you wish to pay off.

"In a great rich town like this, I feel sure if the work you are doing was as well known generally as I know it to be, the \$1,000 to call my bluff would be promptly subscribed, and you can show this letter to anyone you please."

As showing the interest in distant places, a lawyer in Kansas City, Missouri, writes as follows:

"I am in receipt of your favor of the 3rd inst., wherein you speak of \$1,250.87 still owed on The Agassiz Association lots.

"I feel that you should be relieved of the burden. Is it possible to raise that money by monthly payments of a small sum? If fifty of us would contribute \$1 per month each, we could soon 'wipe out' the debt.

"I will give \$1 per month if you can secure forty-nine others, or I will give \$2 per month with twenty-four others and continue the payments until the indebtedness shall have been paid."

Mrs. E. H. Hooker, Greenwich. . \$25.00
Mr. Thomas A. King, Sound Beach 10.00
Miss E. D. Ferguson, Stamford . . 25.00

We quaffed of the mountains greatness,
Of the heights we felt the thrill,
And the thought of those diamond moments
Inspires in memory still.

—Emma Peirce.

(Continued from page VIII)

pleasing and varied when seen from the dining car than from any other. I have talked with people all over the country and they are enthusiastic in their praises of the service on the New Haven road. I have not yet found more than one or two who speak even favorably of the service on other roads, even the first-class roads. Much of the material served on various western and southern roads is indigestible and unappetizing. It is unpleasant to mention names but as marked copies will be sent to the dining car departments of these roads it is expected that they will know who is meant. The most deplorable, outrageous service on many of these roads is the bread and butter. The butter is pretty good but it must be ashamed to appear in the company of such bread. In recent months a rule has been established by which ten cents extra are charged for bread and butter, regardless of the cost of the rest of the order. That in itself is not objectionable but if you paid a dollar for bread and butter you could get no bread fit to eat. What New England housekeeper would allow such stuff on the table as is served by these western and southern roads? Any person who respects his stomach will tell the waiter, "Carry that away; if you haven't anything better bring me crackers." But here in New England food supplied by the New York, New Haven and Hartford Road has the flavor of the good old-fashioned New England housekeeper's cooking. The bread is tasty and everything else is delicious. Conscience may be accusing some of these western and southern roads as they print on the menu a quotation from the "Hotel Register" that tries to answer many of the questions that passengers are supposed to ask in regard to prices. It is a case of conscience accusing the managers in advance, a premonitory accusation. No evidence is given as to the price paid for the words printed in the "Hotel Register" and copied from it. Possibly it is free but that does not alter the fact that it has a ring of apology. The situation should be such that an apology should not be necessary.

The grasses, all the finest things,
Familiar in their places,
Aesthetic value have for us,
As Mother Nature's laces.

—Emma Peirce.

The Famous Goerz Lenses.

We have been informed by the C. P. Goerz American Optical Company, 317 East Thirty-fourth Street, New York City, that adverse conditions caused by the European war have compelled them to cancel and withdraw all former prices. The company reports that while the war has somewhat interfered with the delivery of their cameras, yet, as regards lenses, they have been more fortunate. Prior to the war, they had imported a large quantity of genuine Jena glass which their completely equipped optical factory in New York City has been turning into GOERZ LENSES without interruption. At present the company is in a position to supply nearly all its lenses with but few exceptions. A new catalogue, containing a list of such goods and accessories as they are able to furnish in reasonable quantities, is now on the press. It will also contain the new list prices which are about ten per cent in advance over the prices in force prior to October 1, 1916, and will be ready for general distribution within a short time.

A Publisher's Puzzle.

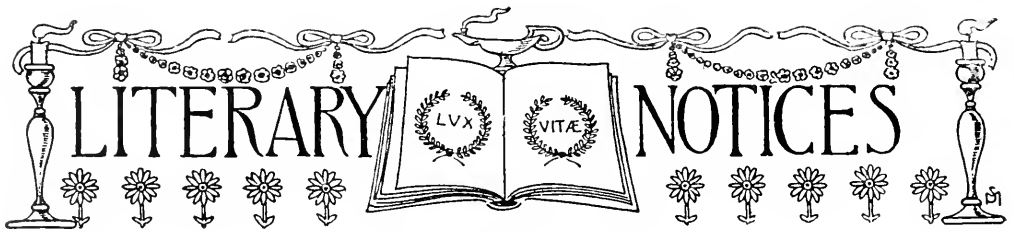
After the proofs of our October number had left the editor, something queer and unexplainable happened to the opening article, "How the Plant Scatters Its Seed." While it is annoying and while I presume that even the printer could not explain the accident, the reader easily understood that the two lines at the bottom of the first column of the second page, should have completed the first page and that the two columns on the second page were transposed.

Hints on Dog Feeding.

Spratt's Patent has issued a very interesting booklet entitled, "Hints on Dog Feeding from Puppyhood to Old Age." We advise all our readers to address this well-known business house at Newark, New Jersey.

When you see the tiny cloudlets
Melt away into the blue,
Then be sure the weather prophet
Has in store good days for you!

—Emma Peirce.



THE STORY OF SCOTCH.. By Enos A. Mills.
Boston and New York City: Houghton
Mifflin Company.

This book is the complete life-story of a faithful dog by a loving master. Living as he did high up in the Rocky Mountains and belonging to a master like Enos Mills, Scotch had more adventures than fall to the lot of most dogs, and the story of his happy, heroic useful life and his tragic death will be enjoyed by all who are fond of good stories of adventure as well as by all dog lovers.

BIRD FRIENDS. By Gilbert H. Traiton. Boston and New York: Houghton Mifflin Company.

This is a book for the general reader who wants to know something about the birds without becoming a special student. It includes concise and interesting accounts of migration, song, nesting, the rearing of young, and plumage; a chapter on how to know the birds; and full discussions of the economic value of birds as insect eaters, weed seed eaters, and destroyers of rodent pests, of the few harmful birds, of the enemies of birds (natural enemies, the English sparrow, the cat and man himself), of bird protective agencies (the Audubon Societies, bird clubs, the state and federal governments), of the propagation of game birds, of the methods of attracting birds (nesting boxes, winter feeding, fountains, shrubs, etc.) and of the teaching of bird protection in the schools.

LET US GO AFIELD. By Emerson Hough.
New York City: D. Appleton and Company.

This pleasing book of outdoor life is especially adapted to the sportsman's point of view, yet in spite of all that it says about the gun, it still exhibits the commendable spirit of the naturalist. The author is quite a philosopher. He says:

"The real pleasure of life consists in dreaming of things we want to do. The most interesting reading in the world is that which tells us about ourselves as we would like to be, or about things we would like to do, or about how to get things we want to get."

He is fond too of baseball when he plays it himself, but finds it rank nonsense when paid players do the playing. Here is his way of summing up the whole matter.

"But paid spectators of sports do not produce that sort of blood for very many generations, not unless they have other forms of sport as well, individual sport, actual sport, sport on the

earth, under the sky, by the waters, in the woods—building blood which tells today and tomorrow. If a son of mine contracted the sneaking habit of going fishing whenever he got a chance I am not sure that I would lick him for it. But if he developed a predilection for pop and cigarettes, if he did not know how to walk or shoot or hide, if he came home and told me all about Comme McGraw and Willie Collins and nothing about the trees and flowers, methinks I would keep a large paternal slipper in pickle for his anatomy.

"All this, however, in strict confidence, gentle reader. Who am I to chide you? I do not chide you. But the long years of the future will chide if you are not a man."

Aftermath.

November winds are with us
And yet, in garden beds,
Despite the chill of autumn,
Brave blossoms lift their heads.

The phlox all rosy brightness,
Myssum still so sweet;
Though sister flowers, awary,
Lie drooping at their feet.

The lupin wears its purple,
And maid-in-mist is seen,
Her blue eyes almost hidden
By lashes long of green.

As spicy as carnations,
The gillies scent the breeze,
Though from their late gyrations,
We miss the roving bees.

Great pansies, clad in velvet,
Look up as gay, serene,
As if the time were summer,
And June still wore her green.

November winds bring bleakness,
But do not call it drear,
When, in gardens and in woodlands,
So much is left to cheer.

—Emma Peirce.

During the past year or two there has been a most alarming spread of rabies among wolves, coyotes and other wild animals in the West. Domestic animals, especially stock, are being bitten, and even children have been attacked.

"The Bible of All Garden Folk"

Volume V Now Ready

The New Standard Cyclopedia of Horticulture

Edited L. H. BAILEY



Containing 24 plates in color, 96 full-page halftones and over 4,000 text illustrations. To be completed in six volumes, Volumes I, II, III, and IV recently published. Volume V now ready. Sold only in sets by subscription.

\$6 per volume. Bound in leather, \$10

"Its publication is the most important historical event of the last decade, as this great cyclopedia stands among growers and lovers of plants in the same relation as the great English encyclopedia in the field of general knowledge."—*Town and Country*.

"No one who knows anything at all about the literature of gardening needs to be told that the cyclopedia is unique."—*The Nation*.

Send for a large illustrated circular describing this important cyclopedia in detail.

THE MACMILLAN COMPANY, Publishers. NEW YORK

"The Higher Dignity of Naturalism."

Stripped of the dignity of formality and custom and like a pure breath from the open, saturated with the tang of the salt marshes, or the woodland spring, bubbling up in pristine purity, was the message of protest delivered to the teachers of the Cincinnati Public Schools yesterday afternoon, at Hughes High School, by Dr. Edward F. Bigelow of Sound Beach, Connecticut.

Robed in the higher dignity of naturalism, as contrasted with the dignity and formality of methodism, Dr. Bigelow held the large audience of teachers and principals figuratively in the hollow of his hand, as he played with their emotions and heart strings. He talked to them as grown-ups and then as little children and kindergarteners, and drove home his protest against the unnaturalism of past and present methods of teaching.—"Commercial Tribune," Cincinnati, Ohio.

DUITAL—The King of All Developers.

\$1.00 per oz. \$15.00 per lb.

AMIDO I—85c per oz. \$10.00 per lb.

SERCHOL (British Made) \$1.25 per oz.

\$16.00 per lb.

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W I L L O U G H B Y

Broadway and Eleventh St., N. Y.

AQUATIC LIFE

An Illustrated Monthly Magazine on the breeding of goldfish, tropical fishes, and their care in the home aquarium. Edited by W. A. Poyser.

Per year, \$1.00. Per copy, ten cents.

JOSEPH E. BAUSMAN, Publisher,
542 E. Girard Ave., Philadelphia, Penna.

Goldfish, rare, hardy varieties of choice stock. Water plants, food, globes, artistic aquariums. Circular free. Any size aquarium made to order, slate or iron bottom. Dealers write for lowest wholesale prices. Pioneer Aquarium Works, Racine, Wisconsin.

THE BRYOLOGIST is the only magazine that will help you to study Mosses and Lichens. It is the bimonthly organ of a live society of 200 members, The Sullivant Moss Society, which includes moss students of all grades of achievements from the college professor to the beginner, all anxious to help each other. **Subscription, \$1.25 a Year.** \$1.50 pays for membership in the society and a year's subscription to the *Bryologist*. Address **Edward B. Chamberlain** 18 West 89th St., New York City.

The eighteenth volume of
Bird-Lore

begins February 1, 1916.

Volume I contained 206 pages and no colored plates; Volume XVII contained 560 pages and eleven colored plates.

The magazine has grown, but the price remains the same.

Annual subscription \$1.00

D. APPLETON & CO.

29 West 32d St. New York City



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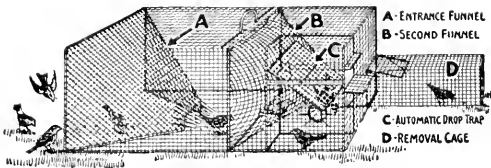
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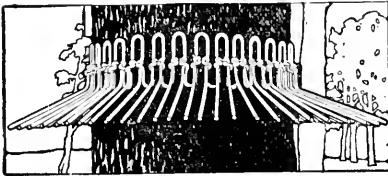
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LECTURES BY EDWARD F. BIGELOW

University of Virginia Summer School.
 Professor Charles G. Maphis, Director,
 University, Virginia.

I write this hasty note to tell you again of my hearty appreciation of the excellent series of lectures which you delivered before the Summer School. They were interesting, instructive and entertaining and met with a hearty approval on the part of those in attendance. Your work as a whole was entirely satisfactory and you left behind you many new friends. I trust that circumstances will be such that we can have you with us again next session.

Theodore T. Martin, Superintendent of Hendricks County Schools, Danville, Indiana.

Dr. Edward F. Bigelow of ARCADIA: Sound Beach, Connecticut, did a successful week's work in the Hendricks County Teacher's Institute this year. He lectured on Nature Study and Social Problems. In his work on Nature Study he created a desire among the teachers to study nature in nature's way. His lectures on "Patriotism and Religion" and "Sissies and Tomboys" were the strongest lectures that I have ever heard on these problems. He is a forceful speaker, a congenial worker, and a good man.

The Twenty-second Institute. Over 800 Teachers in Washington County: L. R. Crumrine, County Superintendent Washington County, Pennsylvania.

I am very much pleased with the result of your work in our Institute.

Your thorough mastery of your subject and the forcible manner of expression make your lectures an inspiration to all teachers. We hope to have you again.

Lee Mullen, Superintendent Perry County Public Schools, Cannelton, Indiana.

Dr. Edward F. Bigelow of Sound Beach, Connecticut, was one of the instructors in our county Institute this year. His work was not only practical but inspirational. The teachers and public were well pleased with his work.

C. S. Ryan, Executive Committee Clark County (Ohio) Teachers' Institute.

As the teachers of Clark County were unanimous in praise of their Institute this year, I wish to speak a word in commendation of your work as Instructor. We have had no Instructor for many years who gave more general satisfaction. Your clear, strong voice, your pleasing manner and your earnestness of expression carried conviction to every listener.

You did nothing which was not worth while. Through the strength of your personality, the sincerity of your purpose, and the simplicity with which you imparted your messages, you left an impression not soon to be forgotten.

Your instruction along Nature's lines was of infinite value to our teachers and will be the means of stimulating them to much greater effort in such study.

J. H. Craig, Superintendent, Ashtabula County Public Schools, Ashtabula, Ohio.

Dr. Edward F. Bigelow was one of the instructors at the Ashtabula County Teachers' Institute last August (1914). His work was very satisfactory. He has a strong personality, and this added to a unique and interesting method of expression made his lectures "take" much better than do the usual institute lectures. His lectures abound in humor, but they seldom miss the mark. The teachers all felt an uplift and an inspiration from his presence among them.

Fred J. Bierce, Irvington, New York.

Your lecture here gave entire satisfaction. You held the closest attention of your audience for an hour and a quarter. Many of your hearers have expressed to me personally their appreciation of your lecture.

If you spend in the open a part of each day,
 It will sweeten and freshen the whole of your way.

—Emma Peirce.



The Guide To Nature



Vol. IX
December
1916
No. 7



PUBLISHED BY

THE AGASSIZ ASSOCIATION

ARCADIA, SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

Subscription \$1.00 a Year. Single Copy, 10 Cents

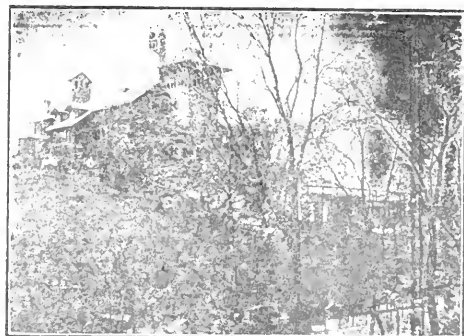
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Design by May Manton.

9131 (With Basting Line and Added Seam Allowance) Gathered Blouse, 34 to 42 last.

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This collar that gives the cape effect and at the same time that is high at the back is a very new one and a very smart one, and the blouse is attractive in every way. The sleeves are novel, the front closing is one of the latest and altogether it is of exceptional interest. Here, the edges of the collar and the front edges are scalloped and scallops always are pretty, and just now there is a very great fancy for needlework of all kinds. As a matter of fact, it may be somewhat due to the shortage of trimming which results from conditions abroad and the need that the designers find for creating a finish of their own, but to whatever the influence is due, however the fashion came about, it is a pretty one and one that women will welcome. Such simple embroidery as scalloped edges comes easily within any woman's reach, there is nothing difficult or intricate while handwork always means a certain distinction of its own. This blouse is all white, but a great many white blouses are scalloped with color, and a great many colored blouses are scalloped with white. The pattern No. 9131 is cut in sizes from 34 to 42 inches bust measure. It will be mailed to any address by the Fashion Department of this Magazine, on receipt of ten cents.

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Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT
—Addison: Cato

The Development of a Big Store.

All over the southern part of Fairfield County The C. O. Miller Company store of Stamford has for many decades been a household word. Probably in no other locality has any other store had so nearly one hundred per cent. of the patronage of a community. But this community is growing and has been growing rapidly. This necessarily has had an effect on the store. To meet the greater Stamford and the rapidly increasing needs of this part of the county, this famous dry goods establishment has been forced to increase its floor space by more than six thousand square feet and completely to remodel and change the building. It always has been a model of its kind. It now is a model on a larger scale with more than double its former capacity. As we enter the front door we shall see a magnificent new cabinet for kid gloves and a special counter where ladies may with every possible advantage and ease make a selection. On the other side will stand the latest forms of cabinets for laces, veilings, trimmings, objects in which women delight. The hosiery department is entirely remodeled and fitted with magnificent mahogany cases in which the goods will be displayed. The dress goods department has been forced into a larger and more commodious part of the store.

The men's department will be especially well supplied with the latest styles of shirts, neckties, underwear, objects in which men delight. An attractive feature will be a large case in which umbrellas for men, women, boys and girls will be advantageously displayed. In the rear part of the enlarged store will be an attractive department for wash goods, domestics and bedding. This alone covers about

three thousand square feet of space. On the floor above is a similar space for the exhibition of carpets. A new department for linens and other white goods occupies about one thousand square feet. The new offices alone occupy about nine hundred square feet. The old office will be converted into an art department furnished with cabinets having disappearing doors and the entire back of glass. In what was formerly the old art department will be new cases for the display of Butterick patterns. There will also be a new ribbon department with convenient cases in the middle of the store as heretofore. The basement contains a large stock room and a new boiler room. A department also in the basement has been provided for upholstery and all sorts of work pertaining to carpet forming and laying. A new cash system of the Lamson style has been installed on the ceiling, having stations at all the departments, with rapid transit movements to the new cash desk. Customers will not be kept waiting for change as the action of the system is practically instantaneous.

The store's standard has always been high in quality of goods at reasonable prices. It is famed throughout Stamford and the adjoining towns for the invariable courtesy and cordial good will that the customer experiences in every nook and corner of the place. The proprietors' long step ahead is therefore not merely a matter of congratulation to them, but an index of community growth and an attraction for residences in this part of a county that is literally a Fair Field.

City and Country.

How refreshing to come from the city's
crowds

To a rainbow tangled in sunset clouds!

—Emma Peirce.

A Magnificent Display of Orchids.

Lager & Hurrell of Summit, New Jersey, well-known to our readers as dealers in orchids, had a magnificent display at the horticultural show in Greenwich. It was so gorgeous that it was a center of attraction, and proved that this enterprising firm owns the headquarters for choice orchids. The marvelous flowers have an exquisite beauty of their own. They are not comparable with anything else. It is not generally known that their cultivation need not be limited to wealthy people because almost any one, at a very moderate outlay, can obtain one or two plants and cultivate them in the house.

Living Pupae for Sale.

We are frequently asked for advice in regard to the purchasing or selling of pupae, moths, butterflies, etc. Let us say to one and all that the place for all such transactions is at Ward's Natural Science Establishment, 82-104 College Avenue, Rochester, New York. This is the headquarters for everything

of the kind. We cordially recommend our dealers to correspond with them.

A Question as to Locality.

A new railroad through Louisiana strikes some of the towns about a mile from the business center, so it is necessary to run a bus line. A salesman stopping in one of the towns asked the old darky bus driver about it:

"Say, Uncle, why have they got the depot way down here?"

After a moment's hesitation the old darky replied: "Ah dunno, boss, unless dey wanted to git it on de railroad."—Country Gentleman.

"Any rattlesnakes around here?"

"What's your business?" asked the boy with the big straw hat.

"What has that to do with it?"

"Well, the last man who looked around here for summer board asked me a lot of questions like that, an' when I told him there wasn't any rattlesnakes or mosquitoes or anything, he said he was a naturalist an' he guessed the place wouldn't suit him."—Washington Star.

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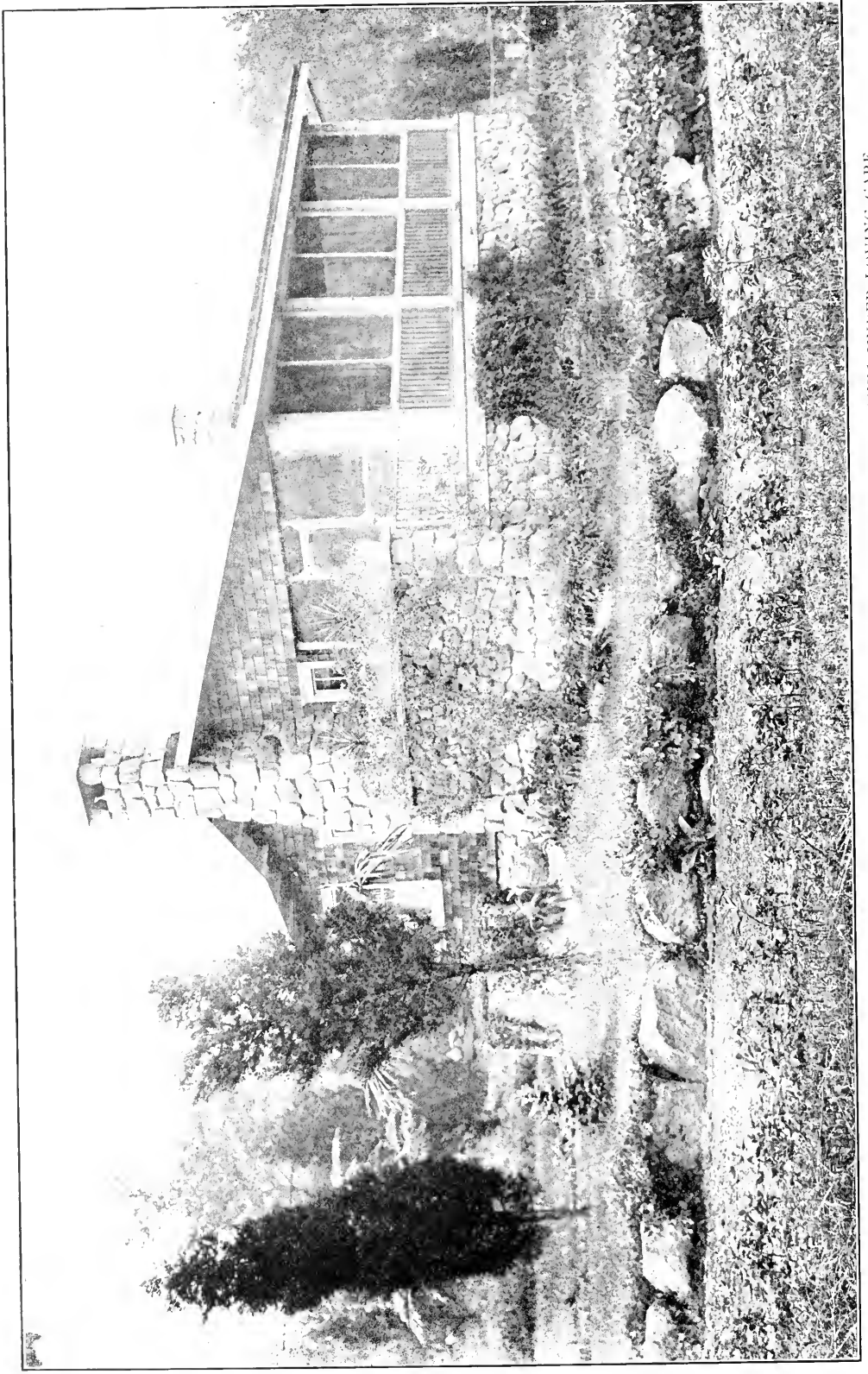
TELEPHONE CONNECTIONS



To a Friend

By Harold Gordon Hawkins, Westfield, Mass.

O my friend if thou art weary
With thy life's unceasing strife
If thy soul doth burn with anguish
And passion in thy heart is rife
If the burden of thy sorrows
Seemeth more than thou canst bear
And the thought of dead ambitions
Deepens into dark despair
Come with me into the forest
And list to nature's deathless psalm
That ringing o'er the eternal hilltops
Will instill thy heart with calm
There the spirit of thy sadness
Will be soothed and set at rest
There the anguish of thy sorrows
With sweet peace will soon be blest
So come my friend and let us wander
O'er the wide spaces of the hills
Let us wander forth and harken
To the songs of birds and rills
Let us piece the broken fragments
Of our hearts with Nature's calm
And with all our burdens lightened
We too may join that deathless psalm.



THE NATURE HOME OF MR. FRED McDERMANT, SURROUNDED BY THOUSANDS OF PLANTS UNDER LOVING CARE.



THE GUIDE TO NATURE

EDWARD F. BIGELOW, Editor

Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
Subscription, \$1.00 a year Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

DECEMBER, 1916

Number 7

From Plates, Puddings and Pies to Plants.

By Edward F. Bigelow, ArcADIA: Sound Beach, Connecticut.

Every one of the many frequenters of the Stamford Lunch in Stamford, Connecticut, has admired not only the excellent service but the decorations of the room. It needs only a glance to observe that the proprietor, Mr. Fred McDermant, is at heart a lover of nature. The entire upper part of the walls is decorated by that master artist and naturalist, Mr. R. Emmett Owen, whom we have previously gladly commended in our pages. When first the restaurant was opened to the public, I inquired about the artist, sought his acquaintance and told the public of his wonderful talent. I knew, however, that more is involved than the talent of the artist. I knew that the proprietor must have desired to have such decorations, and that that desire must have emanated from his love of the great out of doors. Later I inquired of Mr. McDermant and found that his entire recreational resource and relief from the nerve racking details demanded by the managing of a popular restaurant are to get near to plants, to love them and care for them. Mr. McDermant has a beautiful home in the wilderness north of Stamford, surrounded on every hand by innumerable forms of the beautiful flowers that he loves. One sees in the daintily furnished ver-

anda and in every room in the house evidence of care and good taste. The plant decorations, beautifully arranged by a man, an unmarried man, show none of the ordinary bachelor's awkward touch and the absence of feminine skill. The work has been done in a charming way by the bachelor, Mr. McDermant; he has done it for the love of it and done it skillfully.

His home is on a sunny hillside, where tall, sentinel cedars stand in the mellow sunshine like weird ghosts in the moonlight, with geraniums, gladioli and innumerable other plants covering the ground at their feet.

Perhaps in no one thing does Mr. McDermant show his love of the "truly rural," united with his affection for the plant world, better than in his novel decoration of buckwheat sowing. Almost apologetically he said, "Some persons would not have cared for it, but I wish you could have seen it when it was blooming in the fields. I sowed buckwheat because I love its flowers." There is "really truly rural" taste. When one turns to all the cultivated flowers, they seem to have engaged the artistic skill of an expert landscape architect, and the magnificent growth of the plants appears to show that they have been under the

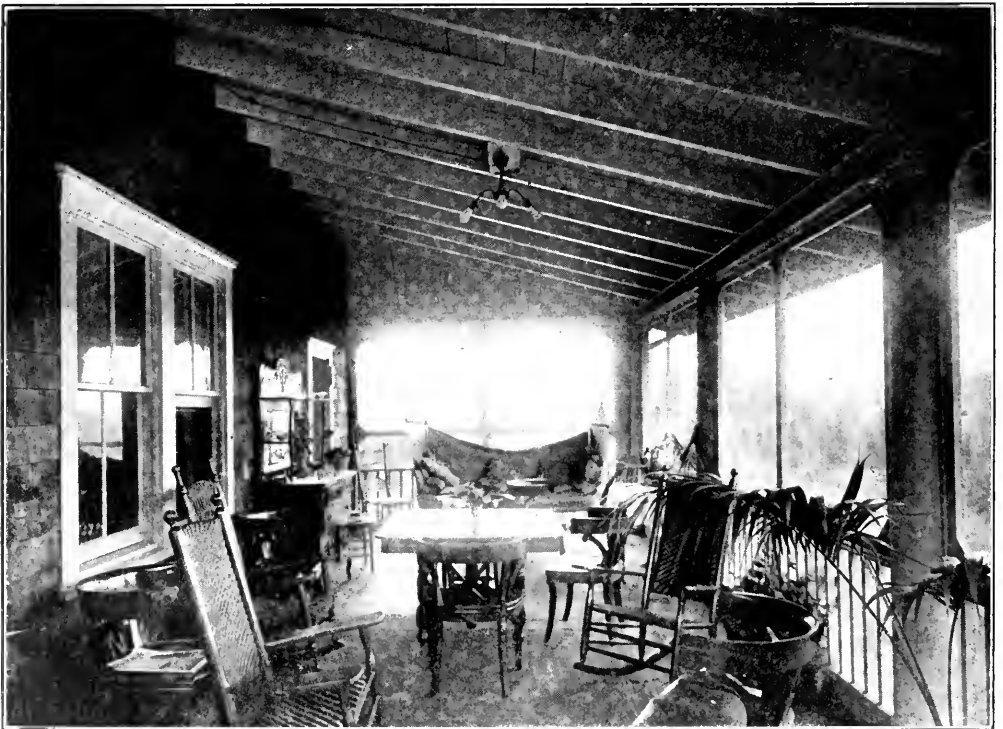


THE ATTRACTIVE VIEW FROM THE ROAD.

care of a skilled gardener. But Mr. McDermant is the only artist, the only gardener there. The arrangement, the massing of the colors, the relations of the plants to the house and the loving care given to them exhibit a combina-

tion of artistic taste and a landscape gardener's skill.

Why has *THE GUIDE TO NATURE* selected Mr. McDermant and his premises for exploiting before its readers? Because we have discovered that here



THE SPACIOUS VERANDA FOR OUTDOOR LIVING.

is a man who although he is conducting a business that requires the closest of attention, unlike other business men, does not tell us, "I have no time for such things," but he proves by the aspect of his home and grounds that he

Mr. McDermant has done others may do. We publish this article and the illustrations because we believe that his example is a good example. THE GUIDE TO NATURE has been accused of exploiting only magnificent estates.



REAL JOY IN TAKING UP HUNDREDS OF GERANIUMS.

has plenty of time for such things. The exacting care of the restaurant is practically the same as the exacting care of these premises, yet he has proved that work may be rest. A change of occupation is the best vacation. What

We have been accused of tantalizing our readers when we show what can be done by millions. I remember a few years ago that we had an extended article descriptive of a magnificent estate on which was an artificial lake

made at an expense of several thousands of dollars, and on that lake many kinds of waterfowl. In regard to it a reader said: "That is not guidance to nature. That is exhibiting to us what to us is unattainable." I retorted, "Do you really want a little bit of water and are you interested in waterfowl?" "Yes, certainly," he said, "I would have them if I were rich." "Would you really?" I still insisted. "Then in that little pool in your back yard, why do you not keep at least a duck or a goose?" "That would not be a lake." "It would be water and a waterfowl. You are not admiring nature so much as you are admiring this lake and these waterfowl as you are admiring the millions that made them possible." If the reader says that we are tantalizing him when we show him that beautiful lawn with its shrubbery and its magnificent trees, the question may well be asked, Are you interested in the things or in the money that makes them possible? If you love plants you can get at least one shrub for your front yard, or one plant in a pot of earth. There is the lesson that Mr McDermant is teaching. He shows us that real love of plants, even when one has not hundreds of acres for exploiting them, may be a resource and recreation in life. When American people with their clamorings for eight hours of sleep, eight hours of work and eight hours of rest shall have learned how to use to better advantage those eight hours of rest in the simple resources of nature, then we may be ready for even shorter hours of work and longer hours of recreation. I firmly believe that the big problem before the American people is not shorter hours of labor, but how to make the eight hours of recreation more helpful and beneficial. Having a lake and waterfowl is one method, having gladioli, geraniums and buckwheat, if you please, is another. There are still others as we from time to time shall continue to prove. But the lesson that we learn this month from Mr. McDermant is that plants not for the dollars and cents that may be in them as a resource in life are really worth while. Here is a good point in guidance to nature and here is the reason for this article.

It will be of interest to our readers to know the arrangement and the extent of plants, shrubs and bulbs in which Mr. McDermant has taken especial interest for the summer of 1916.

East Wall: Gladioli, Princeps, 1500; Phlox, Drummondi, 300; Hemlocks, 100.

South Wall: Petunia, Rosy morn, 2000; Gladoli, Princeps, 1500; Spirea, Van Houttei, 40; German Iris, 1500.

West Wall: Rosa Rugosa, 40, Hybrids, 100; German Iris, 1500.

Drive Border: Paeonies, Grandiflora Rosea, 100

Circular Beds: Cannas, King Humbert, 200; Salvia, Splendens, 300; Geranium, Grant, 200; Tuberous Begonia, 250.

Old-fashioned Garden: Perennials assorted, Conifers in groups.

Up Pond.

Up pond, what a cool retreat,
Away from the village street,
With its noise and dust and heat!

Up pond, where the wild flowers grow,
That are sprinkling its banks with snow,
That so silently come and go.

Up pond, where the tall pines stand,
A most dignified little band,
Left intact by the woodman's hand.

Up pond, that is fringed with ferns;
Where, at all its sinuous turns,
New beauty one discerns.

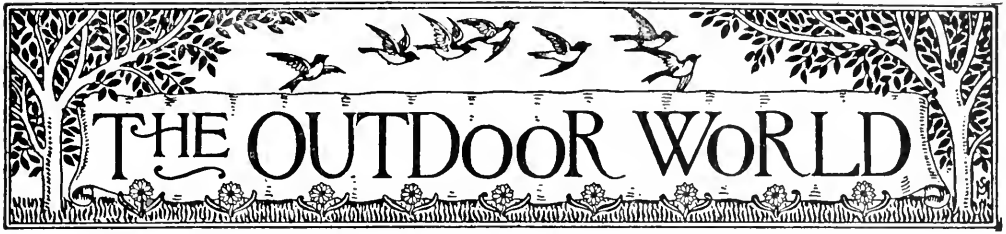
Up pond, to the island, where,
In a bower of all things fair,
The water nymphs comb their hair.

You never have seen them then?
You must go at the moment when
They are visible to men.

And when is the moment, pray?
That is not for me to say;
You'll find out for yourself, some day!

—Emma Peirce.

Mr. Charles Dawson, discoverer of one of the oldest of known human fossils, *Eoanthropus dawsoni*, has lately died at the age of fifty-two. He was strictly an amateur naturalist, a lawyer by profession, who devoted his leisure to the study of the fossils of a local quarry. Quite incidentally, therefore, he made one of the greatest finds in the history of paleontology.



Astonishing Performances of Plants.

BY HERBERT W. FAULKNER, WASHINGTON,
CONNECTICUT.

The splendid poinsettia seems as if it had been created specially to add lustre to our Christmas decorations, and to enliven with its gorgeous color-



THE POINSETTIA.

ing the festivities of yuletide. We think of it as a flower of brilliant scarlet, but are surprised when we discover that the true flowers are little, button-like affairs in the midst of a huge crown of scarlet leaves. Another surprise awaits us when we examine these inconspicuous flowers, one of which, greatly enlarged, is shown on the lower right-hand side of our sketch. Here a tulip shaped calyx is seen, surrounding a group of odd and irregular stamens and, at its side, a large nectary, shaped

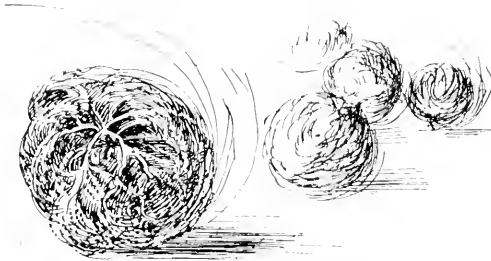
like a French roll and full of a sweet, adhesive fluid. With the point of a pin, touch one of the brittle stamens, and see it jump off and fly away in a mad somersault. Try it several times and you will see some of the stamens fall, by chance, into the gummy nectary and there stick fast. What is the meaning of these odd pranks and acrobatics? They mean that the flower is arranged for cross-fertilization. Let an insect come to drink of the nectar, and the chances are that he will carry away the pollen or perhaps an entire stamen, and with it brush against the pistil of the next flower that he visits.

The Poinsettia is a foreigner, from some distant and warmer clime, and we do not know what particular insect it strives to attract and please, but its fragile stamens and their lively ways are entertaining.

In the states of our Middle West grows a plant called the *Amaranthus graecizans* or tumbleweed. All the spring and summer it seems to be a commonplace weed, with nothing peculiar to distinguish it or to make it interesting. But when the autumn comes, its drying branches curl inward, till the plant forms a spherical tangle, then the stalk breaks loose from the root, and its wanderings begin. Over the meadows and prairies it rolls, the sport of every breeze, but not alone. Hundreds of other weeds of its kind are rolling with it. So they go, charging in mass formation, retreating, charging again. Then the whole battalion takes refuge under a fence and awaits marching orders from the wind. At length, one weed leaps the obstruction, others follow, and all go leaping and bounding, helter-skelter, wherever the wind wills. These antics seem merely comical till we discover that this is the way in which the tumbleweed sows its seed. If we examine the

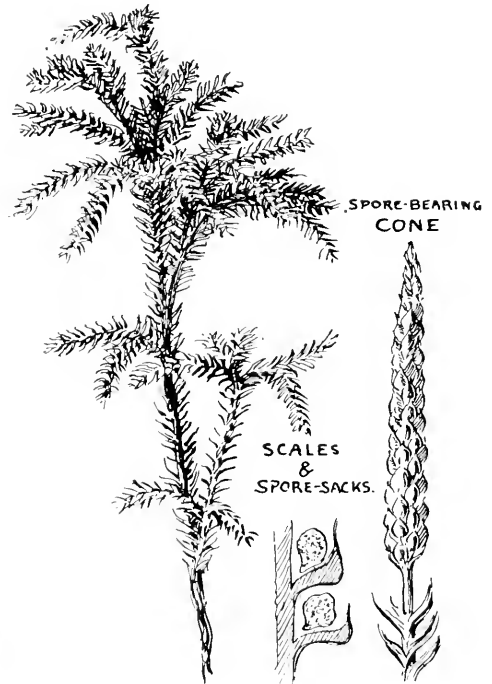
dried weeds, we shall discover that seed pods are concealed among the withered leaves, and that thousands of little black seeds, like jet beads, are concealed in them, ready to be shaken

The ground pine, or *Lycopodium*, is closely associated with Christmas and its decorations, for it has been used in wreaths and garlands for many a year.



THE TUMBLEWEED.

out as the plants roll and leap over the land. A friend kindly brought me from Michigan the specimens from which our drawing was made, and it shed hundreds of seeds on my study floor, all of which I carefully swept up and burned, lest they should take root here and add to our farmers' troubles. The reader would doubtless be amused at seeing the tumbleweeds at play, but we have another miniature acrobat with us that is quite as comical in its way. The flowers of Queen Anne's lace or wild carrot curl inward as they dry till they finally resemble a miniature bird's nest full of seeds. These in winter, breaking from the tall, slender stems, go rolling and sliding over the snow, and thus scatter their seeds far and wide.



THE GROUND PINE.

It resembles a little Christmas tree at all times, but still more so in summer when it bears what seem to be Christmas candles. If the reader will spare the ground pine now and look for these candles when they appear he will be rewarded by an interesting discovery. These "candles" are composed of numerous scales, as shown in our drawing, and within these scales are concealed spore bags filled with yellow powder. This powder consists not of pollen but of myriads of spores, for the plant is flowerless. The spores are strangely inflammable, and burn with a quick explosion. You can shake out the spores on a sheet of paper and set them off by sprinkling them over a lighted candle. If you wish to make the experiment immediately, you can buy the powder at the pharmacy, where it is used as packing for pills. It was formerly used in the theater to produce stage lightning, till electricity displaced it. Though the ground pine

forms its spores in great quantity, not many new plants are produced, and these are slow to grow. For this reason, let me beg my readers not to gather it for Christmas greens, if they truly love the wild flowers. For owing to the many raids made on it this plant is in danger of extermination. It is peculiarly interesting as it is a remnant of great antiquity, dating back to the Carboniferous Period, when its ancestors formed huge forests in company with the gigantic ferns and horsetails.

Another Opening for the Study of Wild Flowers.

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

If there be one time more than another when nature students are to be congratulated, it is when some fine publication, devoted to the study of one or more of the departments of natural history, sees its way to broadening its field of operations, to the extent of increasing its pages for the purpose of establishing another avenue, in which may appear contributions to an additional field of inquiry. An excellent example of my meaning was seen when *THE GUIDE TO NATURE* made the venture and gave us its Department of Ornithology; for, much as there has been written about birds and always will be written in this country, there are only too few publications and magazines here in which may appear the new pictures and the new thoughts about them.

I remember very well when, some fifteen or sixteen years ago, the late Mr. A. C. Gould determined to incorporate into the pages of *Shooting and Fishing* a department to which he gave the name of "Gleanings from Science." At the very start this section of the paper came under my editorial management; and, although I had conducted similar sections in other journals and magazines, I was very much surprised to note the interest that was immediately taken in this particular venture. Then, too, it was successful financially. One day Mr. Gould informed me that the new department was responsible for having very substantially added to his list of subscribers, to the extent of several hundreds, if my memory does not fail me.

Within the last few weeks a similar undertaking has come into my work, and this time the wild flowers of the country is the department of nature to which my energies are to be devoted.



FIG 1. SWAMP MAGNOLIA BLOSSOMS.

Through an exceptional piece of good fortune, I have been given the editorship of this newly established department in no less well known and influential magazine of the best class than *American Forestry*, of which Mr. Percival S. Ridsdale is Editor-in-Chief. It is the plan of this journal, in so far as the Wild Flower Department is concerned, to deal with the flowers of the United States along popular, as well as to some extent scientific lines. Considerable attention will be given to structural as well as to physiological botany; the blossoms of our trees, shrubs, and plants will be described in terms that all can comprehend, and in such a way as to lead to the recognition of the species described whenever met with in nature or elsewhere. Special stress will be placed upon the conser-

vation of our wild flowers; upon inducing children to learn the names of the more common species, and generally interesting them in the subject. It will be part of my duties to reply to all correspondence sent in to the department in which inquiry is made about

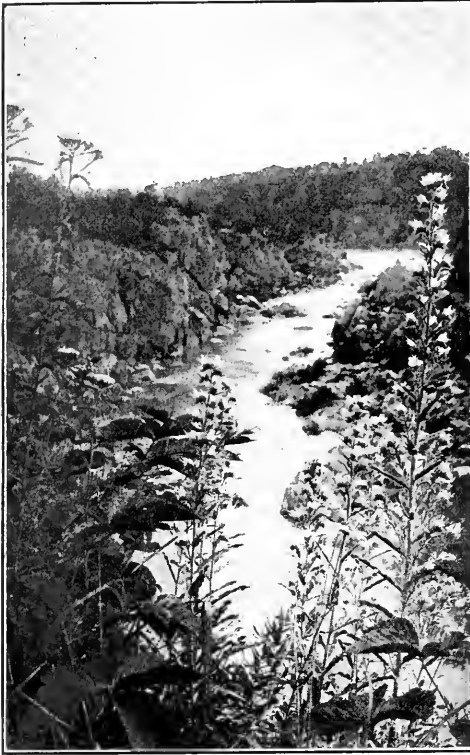


FIG. 2. POTOMAC RIVER GORGE AT GREAT FALLS, MARYLAND. BUGLOSS AND YARROW IN THE FOREGROUND.

the wild flowers of the country. If of sufficient interest, letters will be published, and in some cases the flowers inquired about will be illustrated from my own flower negatives, of which I have a large collection to draw upon; in fact, the pictorial feature of the department will be well cared for. Numerous heretofore unpublished pictures of flowers; parts of flowers, and localities where certain species are to be found, will appear in every issue.

As examples of these reproductions of photographs, I here offer, by way of illustration, two of my recent successes. In Fig. 1 we have two flowers of the swamp magnolia—or what is generally known as the swamp magnolia. These I secured from beneath the tree upon which they bloomed, and several

such trees adorn the banks of the justly celebrated water-lily gardens of Mrs. L. Helen Fowler, at Kenilworth, one of Washington's suburbs. These gardens are known as the "Shaw Ponds," and upwards of an hundred species of water lilies are cultivated there.

In Fig. 2 we have a picture I secured of the upper Potomac river on the Maryland side, just below Great Falls; the main river is seen in the distance. In the foreground we see a most beautiful collection of wild flowers, including very tall specimens of yarrow and of bugloss.

Through the influence of *American Forestry*, it is hoped that an added interest will be taken in our flowers and the preservation of them in many parts of the country.

In Japan.

BY S. C. HUNTER, NEW ROCHELLE, NEW YORK.

We were visiting Nara, once a famous capital with a population of 250,000, but now a small town nestling among beautiful hills in the southeastern part of Nippon, the largest of the group of islands that comprise the Kingdom of Japan. Our object in stopping off was to see the colossal image of Buddah, the giant among Japanese idols. Within the walls of an ornate and beautiful temple this curious figure of copper, gold and wax had been seated for centuries. It measures fifty-three feet in height, sitting in Japanese fashion with the feet under the body, and weighs nearly five hundred tons. Everybody touring Japan visits this temple to view the great Dai-Butsu and also the beautiful and celebrated natural park in which the temple is located. This park is called Nara-Koen. It is laid out in a wild and hilly country, is about half the size of Central Park and is left in nature's design. Finely graded paths afford charming access to many attractive nooks and vistas; but the chief feature is the herds of tame deer that loiter about everywhere, supremely indifferent to the presence of their arch enemy, man.

These beautiful animals, chiefly prized on this continent as a target for

rifle bullets, here walk about as man's companion and equal. For instance one is surprised in rounding a sharp turn to almost stumble on half a dozen superb specimens quietly resting. To go on it was necessary to pick a way between the prostrate bodies, as they would not move nor even notice us, and the Japanese runners refuse to disturb or molest them. Scarcely any domestic animals we know, except possibly a dog or cat, is so tame. Even a cow or horse when free and untrammelled is shy and wary; but these Nara deer seem absurdly free of fear. For generations they have roamed freely in this park until they have grown to be the petted and spoiled favorites of the public. A point of great interest is where about a hundred of them hang around waiting to be fed by the passerby. Cheap cakes are sold for a trifling sum and these seem to be highly prized delicacies. The deer watch the bargaining and then in a moment moist noses and beseeching eyes are thrust forward begging for food. All sorts of liberties of petting and patting are permitted in return for the sweet morsels, and so at last one's longing to caress a real deer is fully gratified.

At evening it was interesting to watch the herds gravitate towards the grove of cryptomerias and oaks where they spend the night. Here in the gloaming, although hundreds of them were lying about, the subtle merging of their mottled coats into the surroundings afforded a most effective and unconscious protection from observation.

Our entertainment at Nara did not end with the deer. Another exhibition of unusual life calls for special mention. We were told that in a certain pond there were goldfish three feet long. This was such a good fish story we felt impelled to test its veracity. The pond, which was near-by, looked like a two acre mill pond, but so muddy nothing at all could be seen in it. On a small stretch of muddy beach a woman was selling a queer kind of bread for feeding the fish, which we were invited to purchase. As we saw no signs of fish and doubted any decent fish could live in such a mudhole, we naturally hesitated, but were finally induced to buy

two long rolls of this fish food. Then the woman stepped to the edge of the water and clapped her hands. Within a radius of about one hundred feet the water suddenly became alive with goldfish and snapping turtles, plunging and jumping towards us. As we fed them the bread a battle royal began for the possession of the morsels, and sure enough there were the giant goldfish, really enormous—great, big, fat, pink fellows with white bellies. They snapped and thrashed right and left. As the feeding progressed others kept joining the fray, until the water was boiling with the struggle. Besides the extraordinary size of the fish it was extremely interesting to note the fact that they could live at all in such a medium. This was indeed a revelation and seems to indicate that goldfish are not so particular about the water they swim in as we think they are.

Furthermore, this fish story would be incomplete if it omitted the statement that we did not actually measure the fish; but it seemed to us no one could seriously question the accredited dimensions.

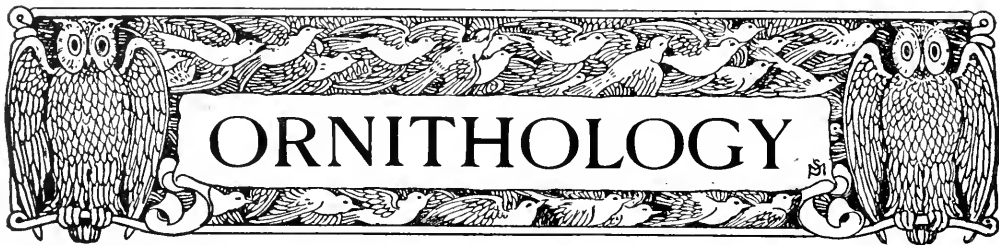
A Terminal Moraine.

A terminal moraine of the Great Ice Age that seems to have been completely overlooked heretofore, is reported from eastern New England. The moraine was formed during the retreat of the ice sheet, when the region was depressed and the ice front stood in the sea. For this reason, its appearance is by no means typical, a circumstance which explains its being overlooked.

The formation has now been traced from Saco, Maine, through Wells, South Berwick, Dover and Newburyport to Newbury, Massachusetts, a distance of sixty miles. Parts of it rise from forty to one hundred feet above the surrounding country. Whether it connects with the long-known Cape Ann moraine, does not yet transpire. A more complete report is promised by the United States Geographical Survey.

“ ’mid all this mighty sum
Of things forever speaking.”

—Wordsworth.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor

The Warbler and the Spiders.

BY M. B. TOWNSEND, NASHUA, NEW HAMPSHIRE.

This summer I made an interesting ornithological observation. It occurred at a summer cottage situated on a long narrow peninsula that separates China Lake, Maine, into two divisions. Birds galore haunt the peninsula, flitting through the birches and nesting all about—hermit thrushes, veeries, vireos, song sparrows, phoebes, wood peewees, cuckoos, wood warblers and many others, while ospreys, loons, great blue herons and bald eagles haunt the lake, living there on the abundant fish. It is a veritable ornithologist's paradise.

Many of the smaller birds are remarkably tame, permitting a close approach and coming fearlessly about the cottage. One day, as we sat on the porch that extends around three sides of the building, we noticed a black-and-white warbler in the immature plumage that denotes a young bird, come quietly on the porch and begin to pick at the small spiders that infest the place. The bird went about his work systematically, covering every inch as he progressed around the entire circuit of the porch. The webs appeared to bother him and every few moments he stopped and cleaned his bill from the clinging silk. His tameness struck us as remarkable. We continued our conversation but he paid no heed. The cracks all explored, he came hopping across the floor searching everywhere, all about us, under our chairs, and finally hopped on a round of the chair upon which I was sitting and stood there with perfect unconcern. Not until he had cleaned out the spiders did

he leave us and then only to fly to the porch of the next cottage to continue his good work. As these spiders are great nuisances, biting sharply and rendering sleeping in the porch a discomfort, the little bird's good work was greatly appreciated. The birds about the place are strictly protected, and efforts are made to avoid disturbing them. They never fail to respond to such treatment.

Song Birds that Seek a Human Audience.

BY MISS MARY A. ROE, WATERTOWN, NEW YORK.

As I read in the August number of *THE GUIDE TO NATURE* the interesting article on the brown thrasher, I realized how seldom I have heard that bird sing, although I often see him in the woods. But this fact suggested a thought of gratitude. We humans should be thankful for the social qualities of the robin, the catbird and other songsters, including the mocking birds of the South, all of which build their nests near our dwellings and cheer us with their sweet melodies. When I was a girl in my home near the banks of the Hudson, my father would not allow a cat on the premises. Consequently, nearly every shrub and tree near the house was tenanted by song birds, including the veery and the wood thrush that paid us with their beautiful music, for the English sparrow had not then arrived.

Every one familiar with birds must have noticed that, like human beings, some are endowed with much greater vocal power and variety of notes than their comrades. They are aware of this gift, and not only tolerate but often seek a human audience. Two remarkable instances that recur to my memory illustrate this quality.

One May morning, as my father and I were seated on the front porch of our home, a catbird perched on a tree close

by. We had many of these birds around us every season but this one sang the most beautiful song I ever heard from any of them. After father had listened for a while he went down to the garden at some distance from the house. The bird followed him and, as he sat on a bench under a large plum tree, perched just above his head and repeated its song. Again the bird followed him to the house and continued the song as long as he sat on the porch to listen. This performance was continued for weeks. Friends visiting us quickly noticed and remarked not only on the bird's charming song but its unusual devotion to father. This was the last year of my father's life. The next season I was far away. I do not know if that bird ever again returned.

Another remarkable incident occurred while I was spending a summer in northern Vermont. One evening, while sitting with some friends under a tree close to the house, a hermit thrush perched in full view and began his song. I had never before heard a hermit thrush and was delighted by this opportunity. One of my friends, however, expressed great surprise, saying that the hermit thrush is a shy bird, heard only in retired places. This one had an unusually fine voice. I spoke of my experience with gifted singers and proposed that we all return to the house to ascertain if this bird would continue its song. We did so but the bird immediately flew away. The next morning my friend took me to a grove at a distance from the village, where a number of hermit thrushes had their nests. Several were singing but we could not mistake the voice of our visitor. He was a perfect Caruso among his fellow musicians. Great was my delight when some evenings later, as we were again seated under the same tree, that thrush came and from the topmost bough poured out his exquisite melody through the long June twilight, perfectly conscious of his human audience.

White Pines.

Stateliest trees in the forest,

Monarchs of all they survey,

Silvered with age in the moonlight,

Buoyant with youth in the day.

—Emma Peirce.

The Migratory Bird Law Sustained.

The recent successful campaign of The Audubon Society in defeating the proposed amendments to the Migratory Bird law, so that spring shooting might be permitted in the breeding zone of wild fowl and other game birds, is a cause of much rejoicing among friends of the birds. They are now campaigning for the ratification of the treaty which will extend protection under the federal law for all migratory birds throughout entire North America north of Mexico, and also the passage of an Enabling Act by Congress with appropriations for the enforcement of the same. This treaty has already been ratified by the United States Senate, and should settle once for all the question of a constitutional right of the Federal Government to enact laws for the protection of migratory birds. The treaty had been previously ratified by the Canadian Government.

Bitter attempts have been made during the past year to nullify this law by claiming that it was unconstitutional, but it has been generally sustained and upward of two hundred violaters have been prosecuted in the courts. An appropriation of Fifty Thousand Dollars for the enforcement of the law was almost unanimously carried by the Senate after a fair presentation of the matter was brought to their attention. There are still, however, many enemies of bird protection, and further attempts by men of influence and wealth are looked for to secure the passage of acts or amendments which will offset the good already accomplished by this law.

It is hoped that all friends of the birds will now make a final rally to the support of these protective measures and secure for all time the sane and reasonable protection, which for our own interests should have been secured many years ago, and which even now will repay us many fold in the practical and aesthetic value of an increase of useful birds throughout the country.

Two different companies that have tried to utilize the peat in the great bogs of Wisconsin, have failed to compete with coal and have gone under.

Why Doesn't the Fish Escape.

Bristol, Connecticut.

To the Editor:

On one of my numerous walks in the country last month, I came to a pond nestling in a little hollow and surrounded on three sides by a forest. As I stood admiring the beautiful sheet of water in its arboreal setting, I noticed a signboard nailed high up in a tree. It read, "No fishing in the pond under penalty of the law." Beneath this was the name of the owner. I had no sooner read the sign than I heard what seemed to be a low scream of derisive laughter and a kingfisher settled on that sign. As plainly as as possible he said, "I intend to fish in this pond as much as I please!" To him the sign was only a joke.

As I passed down the road I pondered the question that has often puzzled me, one that I have never seen discussed in my somewhat extended reading upon subjects connected with natural science. Why does a fish submit to capture by a bird? I have watched the osprey catch fish at the shore. It rarely misses its quarry. The bird would circle for at least twenty feet in the air above the water then suddenly dive, making a splash so great that it should have alarmed every fish within a hundred yards. For four or five seconds it would remain under the water, then emerge with a fish in its talons. The kingfisher makes a lesser splash when it dives, but great enough to attract the attention of any one in the vicinity.

A fish is built for submarine rapid transit. It can dart forward with great rapidity; it might put scores of feet between it and the fisher during the time the bird takes to reach it from the surface. Why not?

Two explanations have occurred to me: one is that the fish is so paralyzed by fright when the splash occurs that it becomes incapable of motion; another is that a school is so busy feeding that the approach of the diver is not noticed. Is either answer correct?

MILTON LEON NORTON.

The Pepper Tree.

A fount of lace-like green with roseate spray,

Its cooling touch it lends to summer day.

—Emma Peirce.

The Value of the Species.

Were it not for the fact, constantly being called to our attention, that birds in general are of great benefit to mankind from an economical point of view, we ought to admire them none the less, and should seek just as earnestly to protect them and preserve them from extinction. Unfortunately, however, too many of us must be shown in dollars and cents the value of a bird to the community or the individual before we are willing to give our support to laws that will protect them.

Does not the bluebird mean more to us than the amount of insects which it devours in our orchard, and is not the screech owl a part of the very spirit of the dusk and the evening, irrespective of the number of field mice or meadow mice which it catches? Those of us that attempt to weigh the robin in the balance with the earthworm that he pulls from our lawn, or to check against him the fruit that he takes from our garden, surely miss much in setting a value on the bird. We have not weighed his beauty or his song, and who, then, can estimate his total value?

When the passenger pigeon disappeared from our country we lost a feature of bird life that has never been replaced; and if we were to allow such birds as the great blue heron, the turkey vulture and the pelican to be exterminated, something upon which we cannot put a cash value would be forever absent from our landscape, and we would unnecessarily deprive those who come after us from partaking of the pleasures which we now possess as a priceless heritage from our forefathers.

There are but few who do not note and appreciate the difference between a barren desert and a shady woodland; a forest devoid of wild life and one in which it abounds; a silent area of woodland and meadow, or one ringing with the happy songs, and bright with the flashing colors of the birds. Whether it be trees, flowers, birds or animals, we should think long and carefully before we destroy life to extermination, or allow others so to destroy it. We know little enough at best, of the intricate relations of one form of life to

another, and the dependence of one individual species to another, which may at times seem at variance, to make a complete harmony of the whole. The tendency of growth and development of all life is onward and upward when it is left to work itself out in accordance with nature's laws. New life is being constantly evolved as it has always been, and what we are pleased to call "the balance of nature" is more often disturbed by an act or through an agency of man than through any other cause.

Why, then, should we ask, "Of what particular value is this or that bird?" or "What good does this flower or this animal do?" To yearn for knowledge is an excellent thing, and to search for the mysteries of animal or vegetable life is praiseworthy, but because we cannot answer our own questions, we should not proceed to exterminate the objects of our study. This is precisely what is being done when we advocate the destruction of certain birds for no other reason than our failure to measure their value, or to understand the cause for their existence.

Could we but know one bird, one tree or one flower, we should have learned more than the universities can teach us, for we should know life. Let us stand in awe of those things that we cannot comprehend, and let us be slow to destroy that which it is not within our power to replace.

Telescopic Observation of Migrating Birds at Paterson, New Jersey.

Paterson, New Jersey.

To the Editor:

I lately witnessed a remarkable flight of migrating birds, of which a description may be of interest.

On the night of October 7th at my home here, I was looking at the moon, then a little more than half full, through a telescope affording a magnification of thirty-six diameters, and was surprised to see what appeared to be dark specks passing before my eyes with considerable frequency. I soon noticed that the specks had a realistic appearance and that they passed in almost exactly the same direction—a little west of south. Upon trying an eye-

piece of x 200 I found that these "specks" were resolved into flying birds. While each bird remained in the field of view for an exceedingly short time and while they appeared only as silhouettes against the moon, and I could not distinguish their kind or color, their outlines suggested those of a robin, but seemingly with a longer tail, and I should judge that they were considerably larger. I feel that they must have been at an immense height—perhaps several miles—and there were probably thousands of them in flight.

It was impossible to determine the width of the flying column, as only those that flew between the moon and the telescope could be seen, but as an estimate I should say that I saw on the average rather more than one bird a second when the whole moon was taken in the field of view. At times several passed over the moon's face at once and again perhaps ten seconds would elapse without a bird being seen. While all were high, some seemed considerably higher than others; perhaps, as an extreme, twice as high.

The night was fine, with a slight chill in the air. I first saw the birds at about half past seven in the evening and from then until half past ten I looked at the moon at frequent intervals and the birds were always passing at about the same rate.

Possibly you or some of your readers may be able to suggest what kind of birds they probably were.

H. R. FENNER.

* * * * *

The migrants referred to in this interesting observation may have been cuckoos or brown thrashers. Night-hawks and whippoorwills might also be passing through that territory at the time mentioned. The determination of the species from the foregoing remarks is, of course, only a conjecture. We should be glad to receive other reports of this nature.—H. G. H.

Start early to put out food for the birds, and be sure to keep up the supply through the winter. While thus employed you cannot fail to get much enjoyment in watching and studying their ways.

Inquiries About Birds.

Pomona, New York.

To the Editor:

As crested flycatchers are plentiful here every spring, I have a box with a suitably sized hole for them but they never use it. Do they need a box of special design?

What has become of the chickadees in this region? I haven't seen one this summer nor fall.

October 11th, 1916, one female and three male bluebirds came to a nesting box near the house, a box that had been used by bluebirds earlier in the season. They talked in a friendly, soft, autumnal fashion, went in and out of the box, often two at a time wholly disappearing inside, and once three at a time. The box had been cleared out ready for spring. Two often stood on the perch at the same time and others waited near. The next day there were four males instead of three. This performance has been repeated every day, until today, October 17th, which is very windy. Sometimes there seemed to be more than five, but only one female. They visited two other nesting boxes near-by, but only for a short time. Several times one bird has had straws in its bill. Can you tell me if this is an unusual experience for October?

MRS. C. S. HARTWELL.

The Bittern's "Wooden Pump."

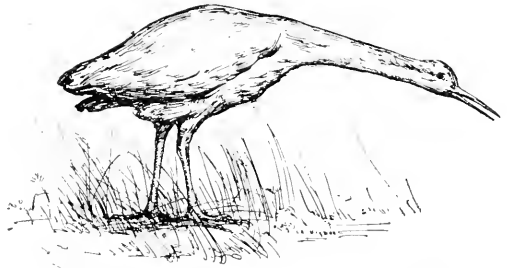
BY EWING SUMMERS, WASHINGTON, D. C.

Since few people have the opportunity to see a bittern in the act of utter-



THE BITTERN'S POSITION FOR THE FIRST SYLLABLE.

ing his heavy guttural notes let me venture here to describe the movements of one that I recently saw about twenty rods distant when he was un-



POSITION FOR SECOND SYLLABLE.

aware of my proximity and I had a good field glass.

The utterance comprises two syllables, the first, in the case I witnessed, being *oog*, apparently sounded as deep down in the throat as possible, with the head and neck up in the ordinary position of watching for a fish; and the second, *squat*, accented, with a shallower, gulping sort of sound, with the head and neck stretched forward and inclined downward for about thirty degrees from the horizontal.

But these guttural syllables are not uniform in articulation. Sometimes they seem to say something like *plum puddin'*, and often they utter other sounds. In any event, their double utterance sounds much like the working of a heavy, old-fashioned, wooden pump. Hence the bird is called by some "slough pumper." Also their performance generally sounds like the stroke of a hammer on a stake in the mud, giving rise to the epithet, "stake driver." It is always a wild, weird note.

Indoor Occupation.

"You must take an interest in outdoor sports," said the physician.

"I do," replied the indolent citizen, "They provide my main reading every day."—Washington Star.

Learned Astronomy from the Doctor!

"Now, Willie, what are asteroids?"

"I know, teacher. They're the things the doctor cuts out of your nose when your folks want to make a good boy of you."

An Interesting Diet.

According to the report of A. H. Cahn, Assistant in the Biological Department of the University of Wisconsin, an experiment was made to ascertain the amount and variety of food consumed by a Virginia rail in two consecutive days, with the following result.

On the first day, this bird ate one hundred and forty-four small marsh insects, twelve grasshoppers, twelve meal worms, three water bugs, a water scorpion three inches long, two sunfishes, each an inch and a half long, one stickleback fish, two and a half inches long, a caterpillar, and fifteen flies.

On the second day the bird ate in addition to all of the foregoing morsels, five live hornets, a crawfish two inches long, a frog an inch and a half long, and a grass snake eight inches long; an amount equal to more than its own weight. It is stated that the rail swallowed the snake eight times and each time the victim wriggled out again to liberty, until the plucky bird finally killed its prey before swallowing it, and then succeeded in keeping it down.

For a bird no larger than a robin to consume this amount of food in two days' time may give us some notion of the immense amount of good which these birds do and which might readily be overlooked were not such instances recorded. Many similar records have been made to show the quantities of weed seeds and destructive insects that some of our common birds, like the song sparrow and the chickadee, devour to our mutual benefit.

No Spring Slaughter.

Events have moved rapidly within the last month. As announced in our September number, the effort to break down the bars on spring wild fowl shooting failed utterly, the new regulations having held firm on that point.

The victory is one that means much. It spells the preservation of a number of species of valuable wild life, and a continuance of reasonable good sport for a large portion of our population in the future.

But over and beyond that incident, which otherwise would be written as

the most important and encouraging of the year, the ratification of a treaty between the United States and Great Britain, making the protection of migratory birds international as between this country and Canada, stands supreme.

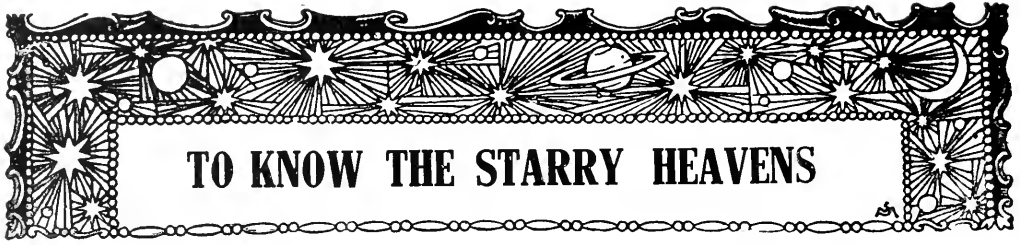
The migratory bird law, be it remembered, is still the law of the land, and will be until the Supreme Court declares it unconstitutional. That it has not yet done. The case is on for a rehearing, and learned lawyers are of the opinion that no court will go as far as to rule that a law which forms the basis of an existing treaty with another nation is to be set aside on merely technical grounds.

* * * * *

The real point is that the spring shooters have been defeated, and defeated beyond hope of resurrecting their cause. Many who opposed the migratory law did so because of honest conviction. Some claimed to have just ground for their attitude. Perhaps they had. But as good citizens they cannot do else than to bow to the will of the majority. This they will do. So far as they are concerned, there will be no necessity of staging any visible manifestation of the majesty or authority of the decree of the people, in the form of wardens or special officials. The law says that there shall be no spring shooting. That is enough for the honest sportsman.—"Forest and Stream."

The experiment of providing perches for migrating birds about some of the lighthouse towers in England has proved successful, and where hundreds of birds formerly dashed themselves to pieces against the walls being blinded by the light, it is now rare to pick up dead birds about any of these towers.

In all the wide range of human endeavor, in the presence of the most forceful exhorter of any creed, no power exists that will so permeate the human soul with the reverence and love for our Creator as will the impressive solitude of the wilderness.—Kit Clarke, in "Forest and Stream."



TO KNOW THE STARRY HEAVENS

The Heavens in December.

BY PROFESSOR ERIC DOOLITTLE, OF THE
UNIVERSITY OF PENNSYLVANIA.

At no time of the entire year are the heavens more beautiful than now. In the south and east are the magnificent groups of Orion, Taurus and Gemini,

The December Stars.

In the east also there has now appeared that strange, faint, little group of the Crab, with its interesting cluster of stars (at A, Figure 1), and a little to the right and above this there is the bright planet Saturn, almost in a

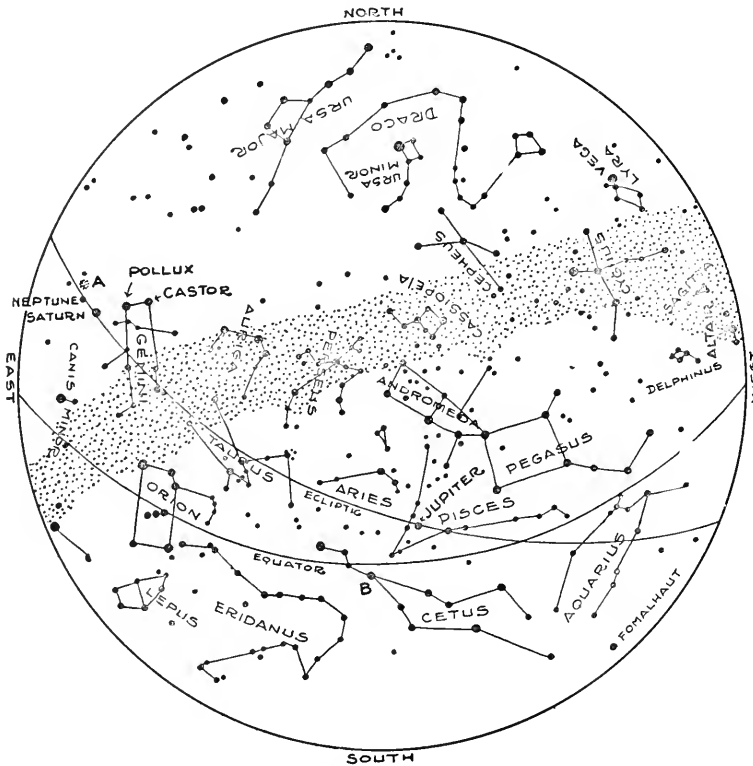


Figure 1. The Constellations at 9 P. M., December 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

whose entrance into the evening sky we have been watching for the past many weeks; above these there shines out the golden Capella, while lower down are seen the brilliant Dog Stars, Sirius and Procyon, which for the first time since last winter have been brought by the slow, seasonal change of the heavens within the borders of our evening map.

line with the Twin Stars, Castor and Pollux. Saturn is now a beautiful object in the telescope and will well repay examination and study. It is very high above the celestial equator; its southern pole is presented toward us so that we view its south hemisphere and the south side of its rings, which latter in the telescope are seen to be widely opened out.

A little past the meridian in the south Jupiter shines out with sixteen times the brightness of a first magnitude star; on account of its great brilliance it at once attracts the attention of every observer. Nor should the reader fail to notice the less conspicuous, but nevertheless equal, beauty of the western skies. Here he will see the bright, bluish stars, Vega and Altair, almost setting, while the very perfect figure of the Northern Cross now apparently rests in an upright position on the western ground.

* * * * *

A System Made Up of Five Suns.

Even a very small telescope will show that the bright star, Castor, is a double sun, the brighter star of this close and beautiful pair being about twice as bright as the companion. The

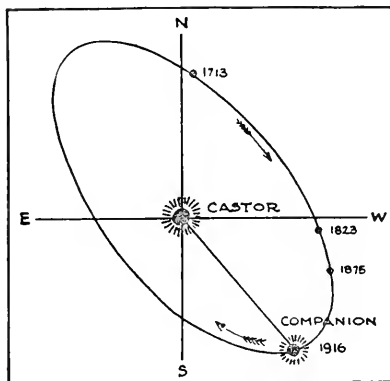


Figure 2. Path of the companion star about Castor.

angular distance between them is now a little less than six seconds and is about equal to the angle subtended by a line one inch long placed at a distance of half a mile. Yet this is a very wide separation for the two components of a true double-star system.

The companion of Castor is moving around it in a great orbit of the general form shown in Figure 2, a complete revolution being probably accomplished in about five hundred years. Twenty years ago it was discovered that this companion star is itself attended by a massive but invisible companion, which revolves around it in a period of three days, while ten years later the surprising discovery was made that the brighter star was also double, its invisible attendant completing a revolution about it in a

little more than nine days. The two suns of the first pair are about 800,000 miles and those of the second about 1,000,000 miles apart. Thus when, in these early evenings of December, we look at this bright though very distant star, we may try to picture to ourselves what a wonderfully complicated system it is, with its four great suns ever moving about one another.

As if this were not enough, there is seen in the telescope a faint star, far to the west of the pair, which is being carried along with Castor as the latter rapidly drifts through the depths of space. Thus it undoubtedly belongs to the system, so that there are here no less than five great suns, forming a single system together.

The southern one of the Twin Stars, called Pollux, is seen in the telescope to have no less than five companions within measurable distance, and at first sight might promise to be almost as interesting an object as its neighbor. But Pollux is drifting over the sky at the rate of two-thirds of a second a year (a motion which will change its position an amount equal to the apparent diameter of the moon in the course of about three thousand years), and but a few careful measures are needed to show us that in this motion it is leaving all of its companions behind. Thus these stars have no real connection with the lesser Twin Star; they are probably immensely more distant, and they only happen to lie in the same direction as seen from our earth.

A few centuries ago Castor was the brighter of the Twin Stars, but Pollux now exceeds it more than two times in brightness. The brilliance of one of the stars is thus slowly changing, but the change is so slow that it has not been detected by observations of recent years, and we cannot tell which of the stars is the variable one.

* * * * *

The Variable Star, Mira.

The reader has probably noticed the gradual brightening of this remarkable star, which has now become a very easily visible object. It is situated below and to the left of Jupiter, in the position B of Figure 1. Having found it, it will be a matter of interest to look at it from time to time during the com-

ing weeks in order to witness its gradual fading away. It will be seen to diminish in brightness much less rapidly than it rose, its general behavior being well illustrated by Figure 3. This figure represents the actual measures of its light during one variation. It shows that Mira increased from great-

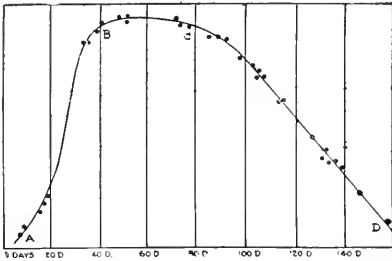


Figure 3. Observations of Mira. The dots show the observed brightness and the line drawn through them is the "Light Curve."

est faintness, at A, to its greatest brightness, at B, in about thirty days. During the next forty days it diminished but little in brightness, to C, while to completely fade to the faintness D required no less than eighty days more. The suddenness of the rise in brightness is very remarkable, but this is a characteristic of all long-period variable stars.

* * * * *

The Planets in December.

Mercury reaches its greatest distance east of the sun on January 3, and therefore may perhaps be detected during the last few days of December, shining far to the south in the sunset glow for a short time after sunset. It is, however, far below the celestial equator, and therefore in an unusually unfavorable position for observation.

Venus is still brilliant in the morning sky, rising in the southeast two and one-half hours before sunrise on December 1, which time is diminished to but two hours by December 31. This planet is also far below the celestial equator, and is therefore always low in the sky.

Throughout the month Mars sets very far toward the south, only an hour after sunset; it is therefore in a very unfavorable position for satisfactory observation. On December 22 Mercury will pass to the east of this planet, and the two may be seen in

the same field in a small telescope, Mercury being at this time 1 degree 10 minutes to the north of Mars.

Jupiter and Saturn will readily be found with the help of Figure 1. Interesting phenomena of Jupiter's moons will occur on December 3, 4, 5, 11, 12, 18, 19 and 28.

Neptune is in Cancer, between Saturn and the Prasepe, but it is not at present near any bright star.

On December 21 at 10 hours 59 minutes P. M. (Eastern Standard Time), the sun will reach its lowest point in the heavens. This will therefore be the shortest day of the year; it will be no less than 5 hours 34 minutes shorter than the following night.

* * * * *

An Eclipse of the Christmas Midnight Sun.

A very remarkable eclipse of the sun will occur on the afternoon of December 24, but it will be wholly invisible from all northern stations on the earth. The great shadow of the moon will, in fact, miss the turning earth altogether, stretching out into space many thousands of miles below the South Pole. Hence from nowhere on the earth will the sun be seen to be completely hidden, but from a very small region the black edge of the moon may be seen to cover a very little of the disc of the

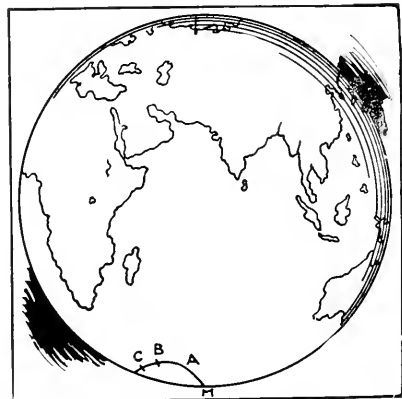


Figure 4. The solar eclipse of December 24 to December 25, 1916. This will be visible only from within the small region M A B C.

sun. Yet by so little does this eclipse miss being wholly invisible from the earth that at no time will more than a mere one-hundredth part of the sun's diameter be seen to be covered.

The beginning of the eclipse will first be seen from the point A, Figure 4; the greatest eclipse will be seen from B, and the last view of it will be had from the point C. It is very remarkable that the course of this eclipse over the earth is thus from east to west, instead of from west to east, as is almost invariably the case. As the date of its occurrence is not far from that of the longest day in the southern hemisphere, it also follows that there are regions within the Antarctic Circle from which it may be viewed as an eclipse of the midnight sun.

Scientific Work for Leisure Hours that Any One Can Do.

BY WILLIAM TYLER OLCOTT, NORWICH, CONNECTICUT.

If some great man, noted as a scientific investigator, should come to you and say, "How would you like to work in my laboratory, and assist me in the line of research work in which I am engaged?" and you had a little spare time (and most of us have some) would you not jump at such a chance? You would perhaps feel diffident and hardly qualified to attempt such work realizing your mental limitations, but when you were assured that any one blessed with a certain amount of patience and perseverance could be of service, you would, I feel sure, accept such an offer.

This is the position, I am inclined to think, in which many are placed—they would like nothing better than to employ their leisure time to promote scientific knowledge, but they feel hopelessly unqualified to do such work; they believe that one must have a knowledge of mathematics or a knowledge of chemistry or physics, or of higher education generally, to engage in any scientific research work, and this is of course in great part true. However, there is one line of scientific research in which any one possessed of normally keen eyesight, and only average intelligence, can engage, and which many are now taking up to employ to good advantage their leisure time.

I refer to a certain phase of astronomical research work. Now do not let this allusion to astronomy discourage you with the idea that the work is abstruse and beyond your mental capabil-

ities. Nothing is farther from the truth, for I reiterate that any one can do this work, and it does not call for even a knowledge of arithmetic. It is purely observational, and surely any one can use their eyes if they are told what to do with them.

The A B C of the work which must first be mastered is a knowledge of the constellations, those time-honored figures wrought in stars on the night skies. All you need for this work is a simple guide to the stars or a star atlas, to be had at a nominal cost.

Only a short time ago picture puzzles were much in vogue and thousands of people spent hours in matching little bits of wood to form a picture. It always seemed to me that they really missed the greatest puzzle picture of all, and if only they had turned their eyes to the heavens they would have beheld in the star array the grandest puzzle ever presented to mankind. It is so easy to make the pieces fit, for you have the key in the guide before you, and the search for the pictures is fascinating and intellectually profitable. There are only about fifty constellations to be seen in these latitudes (the latitude of Boston and New York) and if you had twenty-four consecutive hours of darkness you could see them all. Only half that number can be seen at any one time, so your task is not great or in any way exacting. Many of the constellations have only a few bright stars in them which are easily identified; for example, Aries, the Ram, and Triangulum, the Triangle, have only three bright stars in each, which renders their identification an extremely simple matter.

It is not a case of trying to see the many quaint forms the ancients thought they saw in the heavens—this is too great a tax on any one's imagination,—but a matter of tracing out a number of geometrical figures formed by joining with imaginary lines the bright stars. By this method you have only to discover an obtuse-angled triangle formed of bright stars halfway up the eastern sky, say at 9:00 p. m., November 1st, and you have identified the constellation Aries. Above it you will see clearly outlined an isosceles triangle of stars lying on its side, and you have identified the constellation

Triangulum. In the North you have the Dippers and Cassiopeia, and in no time you have located half a dozen constellations; a little more effort and you add the others. Not very difficult is it? And yet this simple bit of knowledge, which it is a pleasure and a recreation to acquire, is fundamental, and paves the way for telescopic work of a high order of scientific value, a knowledge of which is almost as easily acquired.

Even an opera glass is of value, as many stars that present enigmas and astrophysical problems can be studied with the simplest optical means, and observations made with them that have scientific value.

Here then in this great laboratory of the starry night science calls you to do your bit, and offers you a splendid opportunity of spending your leisure time profitably.

Even if you go no farther than acquiring a knowledge of the constellations, you have done something worth while, for aside from the pleasure of knowing the stars intimately, and being able to call them by name, you have in them a never failing compass which may be of great service to you, and which is an essential bit of information for the Boy Scouts to acquire. To my mind the qualifications of first-class Scouts should include a knowledge of all the constellations, for you cannot always see the North Star, while other stars may be visible from your point of view. After all a knowledge of the constellations is so easily acquired that every one should pick up this useful bit of knowledge.

When you know the geography of the heavens, and have observed many of the beautiful colored double stars, the brighter nebulae and star clusters with your opera glass, you will long to possess a telescope, and it is one of the best investments you can possibly make, for unlike most things it does not depreciate in value as time goes on, and it yields rich dividends in pleasure and mental profit. I may say here that small telescopes are not nearly as expensive as many people think, for you can often pick up a glass of three inch aperture, which is admirable for ordinary telescopic purposes, in a secondhand shop for comparatively little. Many optical stores offer rare bargains in secondhand telescopes, which are

quite as good as new, practically speaking.

When you have your glass you will first wish to observe the moon, planets and the hosts of wonders that await your inspection, but after a short time when you have surveyed these marvelous sights your interest will begin to wane a bit, and then it is that science makes its appeal to you, and urges you to devote your spare time and valuable glass to advance our knowledge of the universe.

We want to know why several hundred of the stars fluctuate in brightness. Why are they sometimes bright and sometimes dim? Why is there irregularity in their variation in brightness, faintness, range and period? Surely this is a wonderfully fascinating problem to investigate, and it is in the power of the possessor of a small telescope to take an active part in the determination of the law that governs these mysterious stars.

The method of observing variable stars is extremely simple, any high school boy can comprehend the details of the method employed. It is purely a case of constant practice in observing, and the eye soon becomes trained to the work so that accurate and valuable observations can be quickly and easily made. It is merely a question of recording what you see, and surely any one can do this with a little practice.

Now I have told you how you can aid science if you only will. I have assured you that the work is not at all difficult, and that any high school boy or girl or Boy Scout can engage in such work, and I have endeavored to make you see that in telescopic work there is a mine of enjoyment within your grasp.

It will be a pleasure to hear from any one who reads this who is willing to enter our laboratory and co-operate with us, and such persons are assured a hearty welcome as members of the American Association of Variable Star Observers. It will be a privilege to assist all who wish to know more about this useful and interesting work, and who wish to aid science by observing the fascinating and mysterious variable stars.

Astronomy Overcomes a "Distinct Handicap."

Mr. Edward Bok, in an editorial in "The Ladies' Home Journal," discusses self-consciousness in answer to an inquiry from a reader that writes: "I feel a distinct handicap in my relations with my fellowmen in being self-conscious. Is there an actual, practical, common sense cure for this?" In his six answers it is interesting to note that Mr. Bok places astronomy in the third, well up toward the front. He says: "Study astronomy, thus acquiring a deep sense of human littleness."

Mr. Bok is right, but only about half right. Astronomy shows the littleness of human nature but it also shows the bigness. One that looks across the whole realm of the universe to the sun, the planets and the little spot of earth on which we stand, realizes more and more surely that human beings are the end and aim of it all. Russell Alfred Wallace arrived at this conclusion in his ripe old age, after years of profound study of all phases of nature. One that has become self-conscious after long thinking that he is nobody and that everybody is more important than he, will find astronomy encouraging. He will realize that just as everything in the universe has its place and is adapted to its own order, so he has his place and part in the great scheme and design of human life. But there are some phases that make one appreciate the bigness of human nature. Any one that has used the "Ephemeris" published by our Naval Observatory at Washington will take off his hat in respect for that stupendous performance of the human mind. To see the moons of Jupiter circling around that gigantic planet is admirable but it is more admirable to think that the human mind can predict their exact position, to the fraction of a second, several years before they assume that position. My friend, you that feel your own littleness, stand up in the might of your manhood. Study astronomy, as Mr. Bok advises, to make you realize your littleness but only occasionally give way to such a feeling. Get in touch with the great things of nature and you will feel your individual great-

ness and will be willing to stand upright on your own feet. Associate with filthy things and you will become filthy; with the pure and you will become pure; with the great and you become great. As Tennyson said, "I am a part of all that I have seen."

O Luna, had we ventured

On that shining, treacherous sea.

We had come without warning, face to face
With a far deeper mystery.

—Emma Peirce.

Bananas Grown from Seed?

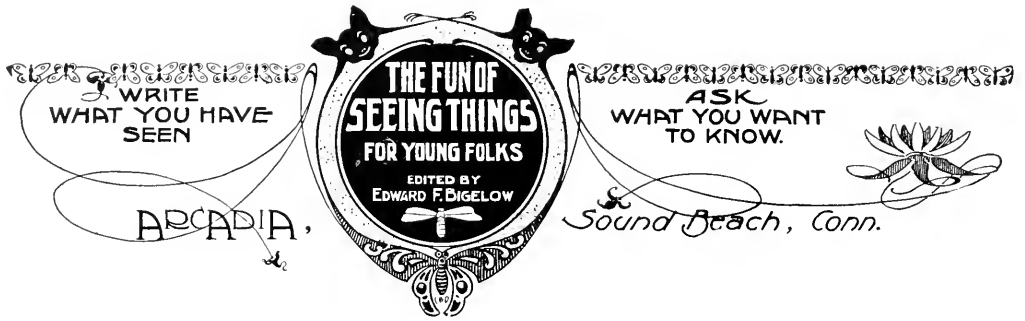
Can the common banana be grown from seed, and, if so, is this seed found in the fruit we use? I understand that it does not produce seed that will germinate.—B. D. Miller, Schenectady, New York.

* * * * *

The best authorities hold that the common banana can be grown from seed but that the occurrence of seeds in the common banana is very rare indeed and is seldom or never found under natural conditions. Experimentally, however, the ordinary bananas of commerce have been fertilized with pollen from the Red Jamaica and with pollen from some of the wild species of bananas and seeds were thus secured. It was intended to plant these seeds in the hope of securing new and valuable varieties but the experimental planting was destroyed by a hurricane. You will find more detailed information on this subject in the book entitled "The Banana—its cultivation, distribution and commercial uses," by W. Fawcett, published by Duckworth & Company, London, England.—E. D. Vosbury, Scientific Assistant, Bureau of Plant Industry, Washington, D. C.

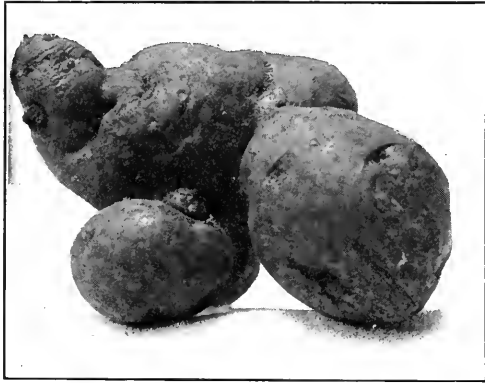
What the Old Tune Did.

A country boy that had often heard his parents use the quaint expression, "The tune the old cow died of," often wondered what that tune was. He was told that it is a very old-timer. At his first opportunity to attend a country fair he heard a band play "Yankee Doodle." His father explained that that was a tune very popular in the early days of this country. The boy said, "It that the tune the old cow died of?" "No," replied the father, "it is the tune that John Bull died of."



Does This Look Like a Dog?

This potato, kindly sent to us by Mrs. James W. Brice of Sound Beach, has by some been fancied to look like a dog. But it is only an unusual growth of the tuber. Who can suggest a reasonable explanation? I remember that



WHAT ANIMAL IS THIS?

a few years ago I sent a curious, finger-like growth of sweet corn to the Professor of Horticulture at the Connecticut Agricultural College. He replied to my request for an explanation of such growths in words of weighty wisdom that frequently recur to me. He said, "I cannot explain why it is that the sweet corn grew in this hand-like formation. My studies have not progressed thus far. I have not yet learned why it grows in the usual form."

The Opening of the Chestnut Burr.

BY H. W. WEISGERBER, SALEM, OHIO.

I have often jokingly remarked that I can photograph an ordinary stump and get a more artistic picture than many amateurs can obtain by "shooting" at

the finest subject. This picture, "The Opening of a Chestnut Burr," proves the assertion. It has been admired by all who have seen it, even by my severest critic, a professional photographer.

The whole picture is "chestnut." The burrs no doubt were cut down by a red squirrel and placed on the chestnut stump, while the background is a chestnut tree from which the burrs with the nuts probably came.

The picture has plenty of contrast, yet it is not overburdened by high light and deep shadow. There is also as much detail as one could wish for in so commonplace a subject.

Out of the large number of people of our cities who eat their share of these delicious nuts, there must be many thousands who have never seen the burrs nor have had the painful experience of handling the "prickly" things. The surprising part to me is



THE OPENING OF A CHESTNUT BURR.

that the little squirrels manage them. They evidently handle them but how they do it and not get their paws full of "needles" is more than I can understand.

Goose Flower.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

This plant is a native of Guatemala, and is a climber. The large goose-like flowers emit an obnoxious odor which attracts numerous carrion flies. These enter

essary to their habits of life. At other times it is of minor importance and the animal can and does get along well enough without it. Very often it is mainly ornamental.

In the cat the tail is used to balance the body in leaping and help it to alight in the right position. It is not very necessary for this purpose, as the Manx cats manage very well without any. But they always *look* awkward, and I think they really are somewhat clumsy



YOU MAY WELL CALL THIS PLANT "A GOOSE."

through the dark purple opening and continue their course up the interior of the goose-neck to small window-like openings. While encircling these openings the flower is pollinated. These flies very rarely find the exit, so perish within the flower.

What's the Use of the Cat's Tail?

Alliance, Ohio.

To the Editor:

I come in contact with some students and we have raised the question of the function of the cat's tail—or the tail of any animal for that matter. We are unable to get any light on it from any source. Can you furnish any information through *THE GUIDE TO NATURE*?

Fraternally,

WILLIAM WALLACE BURTON.

* * * * *

The tail in different animals serves quite different purposes. Sometimes these purposes are important and nec-

essary by comparison. Without the tail there would be more tendency for the animal to get turned around in the air, and land sideways instead of head forward. The tail serves somewhat the same purpose as the tail of a kite. You can see this much better in a squirrel in which the tail is bigger and fluffier and is a very useful affair in leaping from bough to bough. I suspect though that a tail in a cat is more ornamental than useful. A fox has a big fluffy tail too, but he cannot have much use for it. Probably it is mostly ornamental in his case.

In monkeys the tail is used for balance in leaping, and in many kinds it is also prehensile and serves as a sort of fifth leg, helping them in swinging from branch to branch.

In the large hoofed animals the tail is useful chiefly as a fly-flapper. They are stiff jointed and compactly built so that they could not reach insects on

some parts of their bodies except with the tail. The lion I believe uses his tail for the same purpose.

Aquatic animals use the tail in swimming, and here it serves a very important function. If they have not any—as the seals—then they must adapt their hind feet to serve the same purpose, working them around until they lie almost in the position of a tail. A beaver uses his tail not only in swimming but also to carry loads of mud.

Kangaroos use the tail as a balance weight in leaping. Here it is heavy enough to balance partly the weight of the body in front of the hind legs. Lizards, when they run on the hind legs, do the same thing, as you can see from photographs of the Australian frilled lizard, etc.

A crocodile uses his tail for swimming and also to strike at his prey. Snakes and other legless animals use it to help them writhe along on the ground. I don't know of any particular usefulness in a tortoise's tail, but it is probably some help to the turtles in swimming.

Broadly speaking, a tail is an organ that was very necessary and important for the aquatic and amphibious ancestors from which the higher animals are descended. When they took to terrestrial life and to walking on all fours, the tail became more or less superfluous. It tended to dwindle away, and finally to disappear unless it could be made useful for one or another minor purpose. In this case the remains of the tail were adapted for these uses, and very often it is modified into an appendage chiefly ornamental.—W. D. Matthew, American Museum of Natural History, New York City.

A Catalogue of Uses.

The function of a tail, or any other structure, may be determined by a study of the use to which it is put. A cat uses the tail as a balancer in walking on a narrow branch, as a means of increasing its apparent size when in danger of attack, as an emotional outlet in excitement, and in many other ways. Thus the function of a cat's tail is complex.—Professor H. H. Newman, Chicago University.

Because It Can't Help It.

I don't suppose a cat has a tail in order that the tail may perform a certain function. The cat has a tail because it can't help it. Having a tail, it flourishes it about in accordance with its nervous connection.—Chas. B. Davenport, Cold Spring Harbor, Long Island, New York.

The Tail End a Big Subject.

Greenwich, Conn.

To the Editor:

In reply of yours of November 8th; it would take eleven large volumes to discuss the functions of a quadruped's tail. It is commonly believed that the original ancestor of quadrupeds was aquatic and used its tail for a sculling oar; but, since then, it has taken countless, different, additional forms. In the giraffe and the elephant as a fly-flapper; in the South American monkeys as a fifth hand; in the alligator as a flail; in the skunk as a warning to enemies, the same in the rattlesnake. In the flying squirrel as a helm for volplaning; in the gray squirrel as a parachute to break a dangerous fall; in the whitetail deer as a signal to the young ones. In the pocupines as a dangerous weapon of offense; in the fox as a muffler for the feet in cold weather; in the cat its service is not very obvious, but it seems to be used as a directive mark when signalling one of its kind from behind, this is achieved partly by the color pattern and partly by the nervous twist of the tip. These are only a few of the uses which occur to me and each illustrates another development of the tail. I would add that in the beaver it is used as a plunging paddle in diving, as well as a signal sounder.

Yours very truly,
ERNEST THOMPSON SETON.

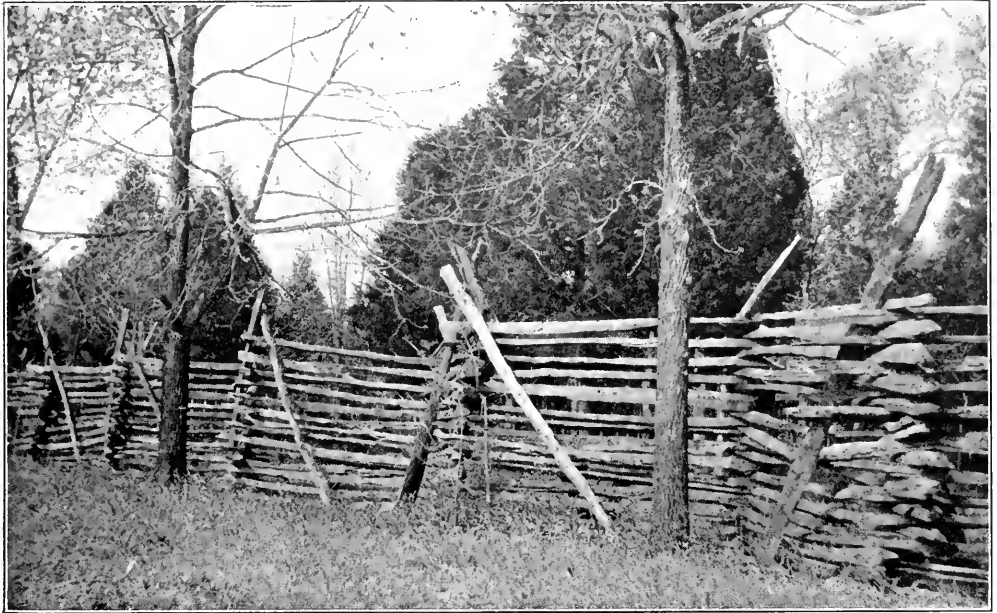
Redwood poles on the Hanford line of the San Joaquin Light and Power Company in Southern California recently had to be replaced because of the activity of the birds in using them as a storehouse for winter food. One pole in particular had been in service 17 years and was filled with hundreds of acorns which birds had deposited there.

Squirrel Fences High in the South.

I recently met a man in Maine who said that he had traveled from Texas and had seen the corn run backward into the ground. In a southern trip this spring I saw the corn rapidly growing taller. When I left Connecticut it was just coming up through the ground;

been reported from Connecticut. Dr. A. J. Savage, Colorado Springs, Colorado, has sent a quantity, culling the best from all he could find in a potato patch, and none that he sent us has developed. They are very vestigial. He says:

"It may interest you to learn that



DID YOU EVER SEE A "SQUIRREL" FENCE WITH MORE RAILS THAN THIS?

when I arrived in Tennessee it was about three feet high. But imagine my surprise when I saw the rail fences grow higher the further south I went. But I hasten to state that I believe the climate has nothing to do with it.

It is, however, a fact that in the north squirrel fences are made of large rails and usually not more than six or seven rails in height. But in Chattanooga, at a country home, I saw a fence twenty-three rails high. I am indebted to my host in Chattanooga, Mr. Robert S. Walker, for the accompanying photograph.

Potato Balls are Disappearing.

Notwithstanding the occasional claim from some part of the country, potato balls are disappearing. From a number of packages received here every one is vestigial except a few that were sent to us from Maine by the United States government. None have

since I sent you the first package I had another conversation with my Swedish friend, Mr. Olaf Johnson, who informed me that he has resided for thirty-three years in the United States—twenty-five years in Kansas, the rest in Colorado—all the time on farms, and that this is the first season in which he has observed a potato ball in the United States. It is quite different in Sweden though. No wonder the native-born citizens of the United States often do not know what they are."

Acacias.

Cascades of golden sunshine,
Are lighting all the way;
To soul and sense a feast they give,
And brilliance to the day.

—Emma Peirce.

Editor: "Do you know how to run a newspaper?" Applicant: "No, sir." Editor: "Well, I'll try you. I guess you have had experience."—Puck.

THE AGASSIZ ASSOCIATION

Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

A Mineralogist and an Astronomer among the Bees.

A few months ago a local newspaper editor speaking of the delights of ARCADIA made the rather astonishing assertion that those that come to scoff remain to pray. That pleases us be-

a conversion. "Oh, no, no," exclaimed the visitor, "you don't get me near those bees. Ever since I was very young bees have had a grudge against me. I know some people can do anything with bees but I am different—" "Now, stop right there. We have



DR. KUNZ AND HIS DAUGHTER IN THEIR FIRST ACQUAINTANCE WITH HONEYBEES.

cause we do try to impress our visitors with the sacredness of nature.

But there is another point of view, and the editor might truthfully have said, so far as the honeybees are concerned, that those persons that come to run remain to fondle and to love. Time and again the managers at ARCADIA have had the satisfaction of seeing such

heard that remark four thousand six hundred and seventy-five times; we know what you are going to say; don't take time to finish the sentence. Come and see the bees."

It takes a little persuasion at first but after a while we are delighted to see the visitors get into the very heart of the hive and become intimately ac-

quainted with the interesting queen.

Among our recent prominent visitors, perhaps none had less acquaintance with bees, or were more afraid of them, than two parties, one coming about the first of August and the other a few weeks later. On a beautiful August day we received a telephone message from Stamford from Dr. George F. Kunz, the expert mineralogist of Tiffany & Company, New York City. He said that he and his daughter would like to visit ARCADIA and eat their lunch in the Agassiz Grove. We of course cordially invited them not only to do as they suggested but to inspect the entire premises. Dr. Kunz said that he should like to see everything and get acquainted with everything except the bees. He wanted to keep as far away from them as possible. I told him that he need not hesitate to come to ARCADIA on account of the bees, for we have a long ladder and a good field glass so he might climb a tree in the Agassiz Grove and view the apiary from a safe distance. That seemed to assure him, since about ten minutes later he and his daughter arrived. After they had attended to the contents of mysterious little packages and Thermos bottles, they were invited to the apiary. They thought they would not go near unless they could be provided with sheet iron gloves and veils of wire netting. I explained that these bees are different from others. They are not the kind that believe in peace by preparedness, but in peace by good will on this part of the earth. It was further explained to the famous expert on diamonds that these honeybees wore glittering jewels in their head, large, bulging, compound eyes and three, little, simple, single gems on the top of the head, and only by leaving off gloves and veils would it be possible to see such beautiful jewels. I also explained that the customs at ARCADIA must not be confounded with those of a New York drawing room for here full dress means shirt sleeves rolled up and the absence of hat and coat. Dr. Kunz believes, as any good scientist should believe, in adaptation to environment, and when he learned that that was the custom here, off went coat and hat and

up went shirt sleeves. A little jolly-ing met with the desired result, and Dr. Kunz resolved to do if he died in the attempt. Like the brave man that he is, he responded to the call, went immediately to the front and soon forgot what he had read about bee stings in his delight in the close examination of the dainty, little features of the queen and in pointing them out to his daughter. You will see in the accompanying illustration that he has the small queen on the tip of his index finger and is manifesting as much enthusiasm as I have seen him show in Tiffany's store when he put his finger on the \$100,000 diamond and said, "Isn't she a beauty?"

* * * * *

But the students of the jewels of the earth are not the only ones who search for treasures in our beehives. A few weeks ago came that master mechanic and enthusiastic astronomer, Mr. Worcester R. Warner of Tarrytown, New York, well-known as the senior partner in the firm of The Warner & Swasey Company, Cleveland, Ohio, builders of the largest telescope mountings in the world. In his yard he has an exquisite gem of a Warner and Swasey mounting with an objective by that master, John A. Brashear, Allegheny, Pennsylvania. Here Mr. Warner is accustomed to gaze at the Praesepe, the Beehive of the skies. He peers at the Pleiades and talks about "fireflies tangled in a silver braid." He looks at the condensation of sixteen hundred suns in 13M Hercules and facetiously says that he has discovered the Pussy Foot in one of the twin clusters of Perseus. He is perfectly at home in the swarms of suns that glitter in the Milky Way. He is an expert on beauty of any kind and he enthusiastically told how he can set his movable right ascension circle to find that queen of beauty, Venus, in the daytime. It was with no little delight that that master of the swarms of the sky and the beauties of infinite distance was welcomed at ARCADIA.

"But, no, sir," he said, "None of that for me. I will stick to Job's Coffin rather than be stung to death by bees." An old saying is that there is safety



MR. WARNER AND HIS FAMILY WITH THE BEES.

in numbers. Encouraged by that recollection and personally encouraged by some of the company with him, he, his wife, daughter, friend and chauffeur, together with a bee demonstrator at ARCADIA, explored the mysteries of a hive as shown in the accompanying illustration. We publish this photograph with considerable hesitation because we fear that the many astronomers who read this magazine may think that we may destroy some of Mr. Warner's interest in astronomy. But he has astronomical enthusiasm in superabundance. He will continue to do justice to the observatory at his beautiful residence at Tarrytown, with enough spare time to give proper attention to the apiary that as he solemnly assured me in a burst of strict confidence he, with the assistance of John, would establish near the garage.

Poet—"There are few things more beautiful than sunrise in springtime."

Gusher—"Oh, I could just watch it all day long."—Life.

The Superiority of the Edison.

There surely is a difference between the Edison Diamond Disc Re-Creations of music and the variety of makes of "talking machines." We want to say a word very strongly in favor of the Edison, but not because it was presented to The Agassiz Association by Thomas A. Edison himself. We have already said that and thanks could be extended to him in a few words. Neither Thomas A. Edison nor his rapidly growing factory needs our commendation, but to our readers and to every friend of The Agassiz Association we desire to make a plain statement based on our reputation as a scientific establishment. The new Diamond Disc has been in our Welcome Reception Room long enough for us to become thoroughly familiar with it and we unhesitatingly say that it is distinctly different and far superior in that difference to any similar machine that has practically the same general appearance. Even in its own appearance it has that fine

distinguishing air of superiority that is not approached by any other. We want our readers to know for their good just how we feel in this matter. Ever since the Reception Room was built the Trustees, members of the family and our immediate friends actively interested in the work of The AA have occasionally discussed the question whether there should be a talking machine in the room, that is generally recognized as possessing the dignity and the solemnity of an exquisitely finished little chapel of nature. The unanimous decision at every discussion has been, "No, we don't want any of those scratchy, screechy things. It would belittle the place." In fact in a room lighted by a Swiss cross it would be almost sacrilegious. But we feel that this magnificent instrument adds to the dignity of the room; we know that it pleases our visitors and students, and is in perfect harmony with the scientific aspect of the optical projection work there accomplished. One could praise some other forms by calling them models, if the hearer would take into consideration the specific definition of the word "model" as "a small imitation of the real thing." Everybody knows that Edison was the prime inventor of the phonograph; it is not necessary for us to explain the cause of the big but temporary sales of similar machines; it is not necessary for us to eulogize Edison. Every one knows that what he has done has been done in a masterly manner.

I remember that a few years ago I made a careful investigation of some of the common phonographs. It was before I had heard the Edison. I remember a remark made by the exhibitor: "You see," said he, "that machine has a tone of its own distinct from all others as, for example, the tone of the Kroeger, Steinway, Knabe or of any other high grade piano is distinct from the ordinary cheap makes." I felt instinctively that that was not what I wanted. The phonograph must reproduce any tone and do so perfectly; it must wholly eliminate its own personality in its re-creation of sound. One must forget the phonograph and hear only the speaker

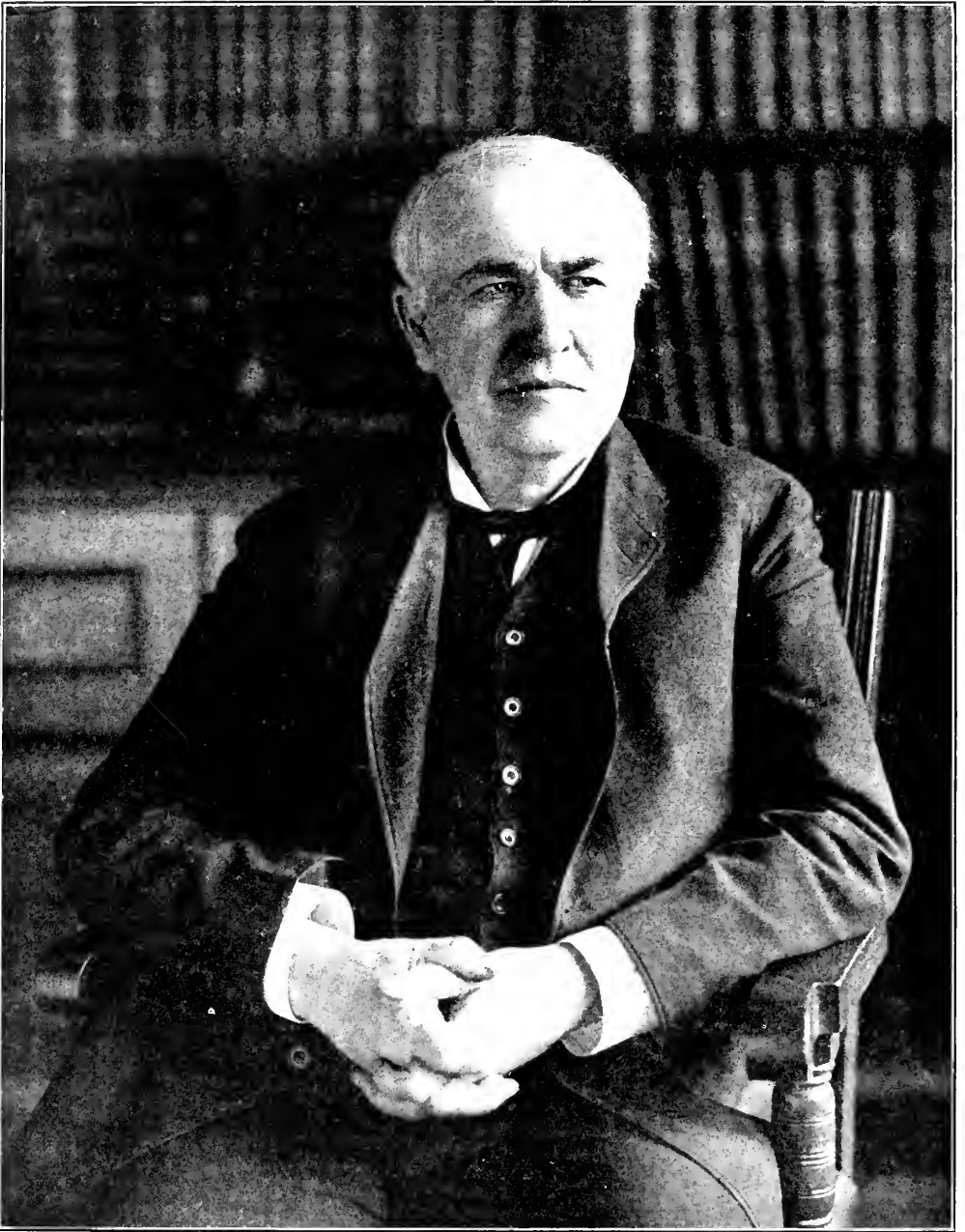
or the singer. This is exactly what the Edison does for us. When we hear it we do not think it is a good machine. We say, "Isn't he (or she) a good singer?"

It is curious how some things come about. I am sure that the reader, recognizing the fact that I am writing simply to give him good advice, will pardon a little personality. The first time I ever heard an Edison Diamond Disc was in a Teachers' Institute at Springfield, Ohio, some three or four years ago. I felt hurt at the time, as did my esteemed colleague, that our addresses should be set aside for what we supposed was "a talking machine." We thought that we were sufficient along those lines. But as the first notes of a soprano singer came from that re-creation instrument, my colleague turned to me and said, "Did you ever hear anything like that in all your life? That is not screeching; it is singing." We and the audience of teachers felt that there was something new, something really worth while. Immediately after this demonstration I had a long chat with the demonstrator and for the first time learned of the diamond principle and why the Edison is superior to everything else of the kind.

Until recently there have been no local stores of the Edison machine in either Greenwich or Stamford and in listening to phonographs of other makes at other stores I had become more and more convinced that those machines would be out of place in our Welcome Reception Room.

Our readers can hardly imagine the surprise and delight that Mr. Edison's generous gift has brought to all those who have been working faithfully for the perfect equipment of ARCADIA for its work and for the entertainment of its visitors. We extend to all a cordial invitation, to every one who is contemplating purchasing a phonograph to hear the real thing.

Edison has been praised so much and so justly that words of encomium to him would be like throwing a pail of water into the Long Island Sound in the hope of increasing its depth, but we believe these words of plain honest statement about the superiority of this



FROM A PHOTOGRAPH INSCRIBED, "TO EDWARD F. BIGELOW, PRESIDENT OF THE AGASSIZ ASSOCIATION. THOMAS A. EDISON."

instrument will save some of our readers from misspending their money in the purchase of another make. Said a friend soon after the announcement in local papers of the gift, "So I see you have secured a phonograph for your Welcome Reception Room." "No," I replied, "you are in error. We have secured *the* phonograph."

Bird Lovers' Club of Brooklyn.

George A. Schoonhoven, a good Member of The Agassiz Association, has associated with him in Brooklyn several bird lovers who are holding meetings on the first Saturday of each month during the season. The club has done good work and is ambitious to increase the extent of its usefulness.

Contributions Toward Payment of Remainder (\$1,250) Due on The Agassiz Association's Land in ArcAdiA, Sound Beach.

Commodore E. C. Benedict, Greenwich	\$250.00
(Conditional upon securing the remaining \$1,000).	
Mrs. E. H. Hooker, Greenwich	25.00
Mr. Thomas W. King, Sound Beach	10.00
"Enclosed you will find my check for \$10. I trust and believe you will be able to pay off the debt on ArcAdiA. You and yours have worked diligently and deserve to succeed."	
Miss E. D. Ferguson, Stamford	25.00
Mrs. M. Louisa Ross, Hastings-on-Hudson, N. Y.	5.00
Mr. S. C. Hunter, New Rochelle, N. Y.	100.00
Anonymous	250.00
"I tried the other day to tell you how much I respected and admired your disinterested and unworldly devotion to the spreading of a popular interest in science. As a token of my appreciation I enclose a check of \$250 for the fund to pay off the debt on the land."	
Mr. Oliver D. Mead, Greenwich	50.00
Avres Bros., Hoit & Company Stamford	50.00
("The last \$50.")	
Honorable Zenas Crane, Dalton, Mass.	50.00
Mr. Charles A. Brunn, Kansas City, Missouri	10.00
Mr. Arthur L. DeGroff, New York City	25.00
Mrs. A. A. Anderson, Greenwich	10.00
(Conditional on securing the entire amount.)	
Mr. E. C. Converse, Greenwich	100.00
Mr. W. C. Squier, Greenwich	10.00
Dr. Lewis Henry Jones, Ypsilanti, Michigan	5.00
Mr. John A. Brown, Stamford	5.00
A Friend, Stamford	5.00
Mr. George R. Close, Stamford	5.00
Mr. Harry Bell, Stamford	10.00
Mr. Edward B. Close, Greenwich	10.00

Total\$1,015.00
Only \$235 more needed.

Miscellaneous Contributions to ArcAdiA.

- Mrs. Paul Lockwood, Stamford, Connecticut: Copy of Upton's "Star Atlas."
- Master Joseph Palmer, Sound Beach, Connecticut: Miscellaneous specimens from the beach.
- Mrs. Frederick Gotthold, Cos Cob, Connecticut: Very large hornet nest *in situ* around branch of a locust tree.
- Mr. Fred McDermant, Stamford, Connecticut: Katydid, walking stick insect and very active pupa.
- Mr. Theodore W. Smith, Chicago, Illinois: Twelve unusually interesting and instructive microscope slides.
- Miss Harriet P. Knapp, Caryville, Massachusetts: Miscellaneous specimens. The summarized list contains twenty-one items covering a variety of subjects and a wide extent of territory.
- Mrs. A. N. Phillips, Glenbrook, Connecticut: Horned toad from Nogales, Arizona. This toad was brought north by a member of Company K, First Regiment C. N. G.

Experienced Microscopists Take Notice.

One of the good friends of The Agassiz Association desires to obtain information in regard to Tolles lenses or apparatus of which the owner may be willing to dispose. Has any one ever had an Objective (any power) with the broad gauge or "Butterfield Screw?" Has any one any knowledge of Arthur J. Doherty who advertised microscopical preparations in "The Microscope" and some other journals in '89 or '90? He was located in Manchester, England. Who has any of his slides to dispose of? Information in regard to any other high grade work of the expert mounters of those days will be acceptable.

Identified by Color.

A lady was entertaining her daughter's caller, who was just back from a summer outing. The conversation had been somewhat spasmodic, finally she decided to try him on some of the new books:

"Have you read 'Freckles,' Mr. Johnson?" she ventured.

"No, ma'am," he stammered blushing, "mine are the brown kind."—The Christian Herald.



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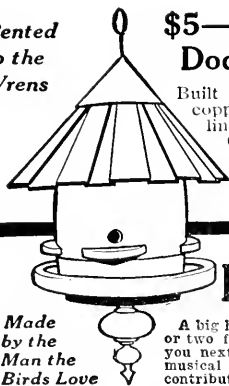
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Paralyzingly Bland!

We have a new slogan, and for it are indebted to two young women whose interest in nature we hope ARCADIA may sometime stimulate into something greater and better than chewing gum. But even with their slight interest in nature, as manifested by a visit through the premises with an attendant, we are indebted to them for an extremely good, though paralyzing bland, statement.

We have three or four specimens of the tallest Turk's-cap lillies that any one has ever seen, so far as we have been able to ascertain. They are more than eight feet in height, and we have expected every visitor to go into ecstasies over such unusual growths, but the aforesaid young women gazed rather indifferently at these towering specimens, and one of them paused in her diligent gum chewing and nonchalantly said: "Kinder beautiful, ain't it? Why don't cher have a lot of 'em?"

The attendant was resuscitated by a liberal supply of cold water and stimulants, but the fun that these young women have

provided for the regular workers at ARCADIA is more than they realize and worth all it cost. Everything that occurs nowadays and is extremely good or unusual is "Kinder beautiful, ain't it? Why don't cher have a lot of 'em?"

If ever I go to Washington and my guide points out a tall and graceful monument I shall be ready for him: "Kinder beautiful, ain't it? Why don't cher have a lot of 'em?"

I hope sometimes that I may climb to the top of Pike's Peak. If ever I do, I am ready for the situation. I shall wave my hat and shout to the thirty-two points of the compass, "Kinder beautiful, ain't it? Why don't cher have a lot of 'em?"

Recently I was staying at a hotel in a distant city. In the office I saw a man with some traveling show, who was indeed the tallest man I have ever seen. He was several inches more than eight feet in height. I was glad to respond to the introduction, and I cordially pressed both his hands, shaking them heartily and exclaiming: "Kinder beautiful, ain't it? Why didn't your mother have a lot of 'em?"

JANUARY, 1917

THE GUIDE TO NATURE

VOL. IX

No. 8



EDWARD F. BIGELOW, Managing Editor

PUBLISHED MONTHLY BY

THE AGASSIZ ASSOCIATION, ARCADIA: Sound Beach, Conn.

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A Bargain.

A farmer rushed up to the home of a country doctor in the village late one night and asked him to come at once to a distant farmhouse.

The medicine man hitched up his horse and they drove furiously to the farmer's home. Upon their arrival the farmer asked:

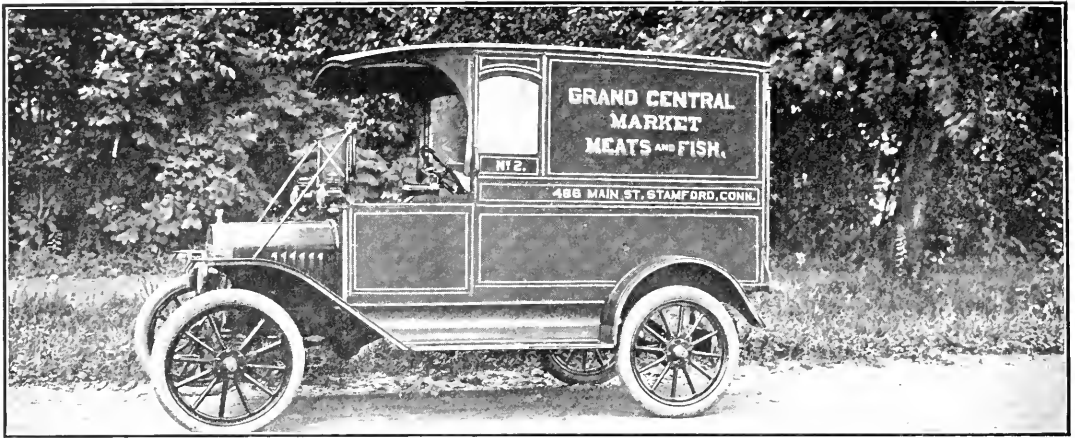
"How much is your fee, doctor?"

"Three dollars," said the physician in surprise.

"Here you are," said the farmer, handing over the money; "the blamed livery-

man wanted five dollars to drive me home."—Country Gentleman.

A new project for the tree borders along the state highways of New York involves a wide departure from the conventional straight row, equally spaced along each side. The planting is to be done in clumps, with openings carefully planned to show the vistas of the landscape or to bring out special views. The ideal is a more park-like effect, with varied features and outlooks.



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The following is an exact copy of a letter received by a young lady who wished to spend a holiday in a small country town, and advertised for a room: "Dear Miss—We think we kin suite you with room and bord, if you prefer to be where there is musick. I play the fiddell, my wife the orgin, my dotter Jule the akordion, my dotter Maray the Bango, my son Hen the gittar, my son Jim the fload and kornet, and my son Clem the base drum, while all of us sing hims, in which we would be glad to have you take part, both vocal or instrumental, if you play on anything. We play by ear, an' when we all git started ther is real musick in the air. Let us know if you wat to come here to bord."—Tit-Bits.

The earth is not selfish. It is open and free to all. It invites everywhere. The naturalist is not selfish,—he shares all his joys and discoveries, even to the extent of publishing them.—L. H. Bailley in "The Holy Earth."



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"What is your name, Uncle?" a traveler asked him one morning.

"George Washington, suh," said he with dignity.

"That's a pretty familiar name to everybody in this country," said the tourist.

"Ah reckon it orter be, suh," was the ducky's pleased reply, "cos Ah been a-drivin' dis yere stage ebber since de wah."—Country Gentleman.



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This is just a simple one-piece frock with body and skirt cut in one, but the pockets are exceedingly smart and attractive and together with the two belts that are arranged at the waist line, they serve to give it distinction. The material here is one of the pretty plaid wools and the collar and cuffs are made of taffeta, but mothers will find the model a good one for washable materials, such as linen, galatea, pique and the like, as well as for wool, while if something more dressy is wanted, it could be made of taffeta. Taffeta with trimming of broadcloth or of serge would be pretty, and the taffeta could be either plain or plaid or striped as liked, and this season the stripes are exceedingly attractive.

For the 12 year size will be needed, 5 3/4 yards of material 27 inches wide, 4 1/4 yards 36 or 4 yards 44 with 1-2 yard 36 inches wide for the collar and cuffs.

The pattern No. 9200 is cut in sizes for girls from 8 to 14 years. It will be mailed to any address by the Fashion Department of this magazine, on receipt of fifteen cents.

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LITTLE JAPAN

Improvements in the Agassiz Grove.
The trees of the Agassiz Grove at Sound Beach, Connecticut, including those throughout Arcadia and those upon Arcadia Road, have been placed under the care of The F. A. Bartlett Company of Stamford, Connecticut, and work-

Agassiz Grove more formal in appearance. To that end the underbrush is being reduced and the trees trimmed. Several trees direct from Japan with numerous native hemlocks and rhododendrons were set out last spring. We have commenced the work on a Pavilion, a



WORK HAS COMMENCED ON THE SERVING HOUSE OF LITTLE JAPAN.

The floor timbers of the Pavilion show at the right. The Rest Cottage is to be east of these in a part of the Agassiz Grove not shown in this photograph.

men from this well-known and efficient firm have been busy for many days in putting these trees in the best possible condition. When five years ago possession was taken of Arcadia we planned to keep the grove as a wildwood forest with its underbrush and the aspect of a bit of untamed nature. But on account of the increasing number of visitors to Arcadia, we have decided to make the

Rest Cottage, and a cook room for the accommodation of the larger parties and companies of students that may visit us. To that end some lumber and about one hundred dollars in cash have been already contributed. It is estimated that the complete equipment will cost about two thousand dollars. For five years Arcadia has given its services freely to the public and to these visiting parties, and we believe

that philanthropists and the local public in general will respond to this appeal to put a grove so centrally located in first-class condition for the pleasure of such companies, schools, churches, farmers' clubs and others. The development will hereafter be known as "Little Japan," in view of the fact that the Japanese people, perhaps more than those of any other nation, so thoroughly enjoy nature in her simplicity. They require no form of sensational entertainment to induce them to value the grand out of doors. In recognition of this spirit Little Japan will be developed within The Agassiz Grove. Perhaps no notion of the spirit of Little Japan can be better expressed than in these quotations from Lafcadio Hearn. "In a Japanese Garden" in his "Glimpses of Unfamiliar Japan", he says:

"It is inborn in the Japanese; the soul of the race comprehends Nature infinitely better than we do, at least in her visible forms."

* * * * *

"Now a Japanese garden is not a flower garden; neither is it made for the purpose of cultivating plants. In nine cases out of ten there is nothing in it resembling a flower bed. . . . As a rule, a Japanese garden is a landscape garden; yet its existence does not depend upon any fixed allowance of space. It may cover one acre or many acres. It may also be only ten feet square. It may, in extreme cases, be much less."

* * * * *

"No effort to create an impossible or purely ideal landscape is made in the Japanese garden. Its artistic purpose is to copy faithfully the attractions of a veritable landscape, and to convey the real impression that a real landscape communicates. It is therefore at once a picture and a poem; perhaps even more a poem than a picture. For as nature's scenery, in its varying aspects, affects us with sensations of joy or of solemnity, of grimness or of sweetness, of force or of peace, so must the true reflection of it in the labor of the landscape gardener create not merely an impression of beauty, but a mood of the soul. . . ."

Therefore were gardens contrived according to the character of the owner,

whether poet, warrior, philosopher or priest. In those ancient gardens (the art, alas, is passing away under the withering influence of the utterly commonplace Western taste) there were expressed both a mood of nature and some rare Oriental conception of a mood of man."

* * * * *

"The object of the gardener has been to develop to the utmost possible degree their natural tendency to rugged line and massings of foliage,—that spiny sombre-green foliage which Japanese art is never weary of imitating. . . . The pine is a symbolic tree in this land of symbolism. Ever green, it is at once the emblem of unflinching purpose and of vigorous old age; and its needle-shaped leaves are credited with the power of driving demons away."

Gift of Japanese Decorating and Goods to The Agassiz Association.

Mr. Irving E. Raymond of Stamford, through his well-known house, A. A. Vantine & Company of New York City, will supply the decorators and one hundred and fifty dollars' worth of goods for the development of Little Japan in the Agassiz Grove at ARCADIA, Sound Beach. Mr. Raymond has for a long time taken an active interest in this development. Nearly a year ago through his managing decorator he made many valuable suggestions in the matter and the plans have been maturing in accord with this advice. An eighteen by thirty foot building of Little Japan, known as the Rest Cottage, will be strictly Japanese in both exterior and interior equipment and decorations. The following letter was recently received by the management:

Mr. Edward F. Bigelow, President,
The Agassiz Association,

ARCADIA, Sound Beach, Conn.
Dear Sir:

I am glad to send our decorator to your place at Sound Beach any time that you say, and give you his services free of charge, and will also donate Japanese goods and decorations to the amount of \$150.00. I remain,

Very truly yours,

(Signed) IRVING E. RAYMOND.

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Dawn

By Harold Gordon Hawkins, Westfield, Mass.

The loving morn has kissed the warm, chaste
earth,
And decked her forth in jewels of priceless
worth.

The lark has risen on triumphant wing.
And at the gate of paradise doth sing.

The river rousing from a silent sleep,
Joins in ecstatic hymning with the mighty
deep.

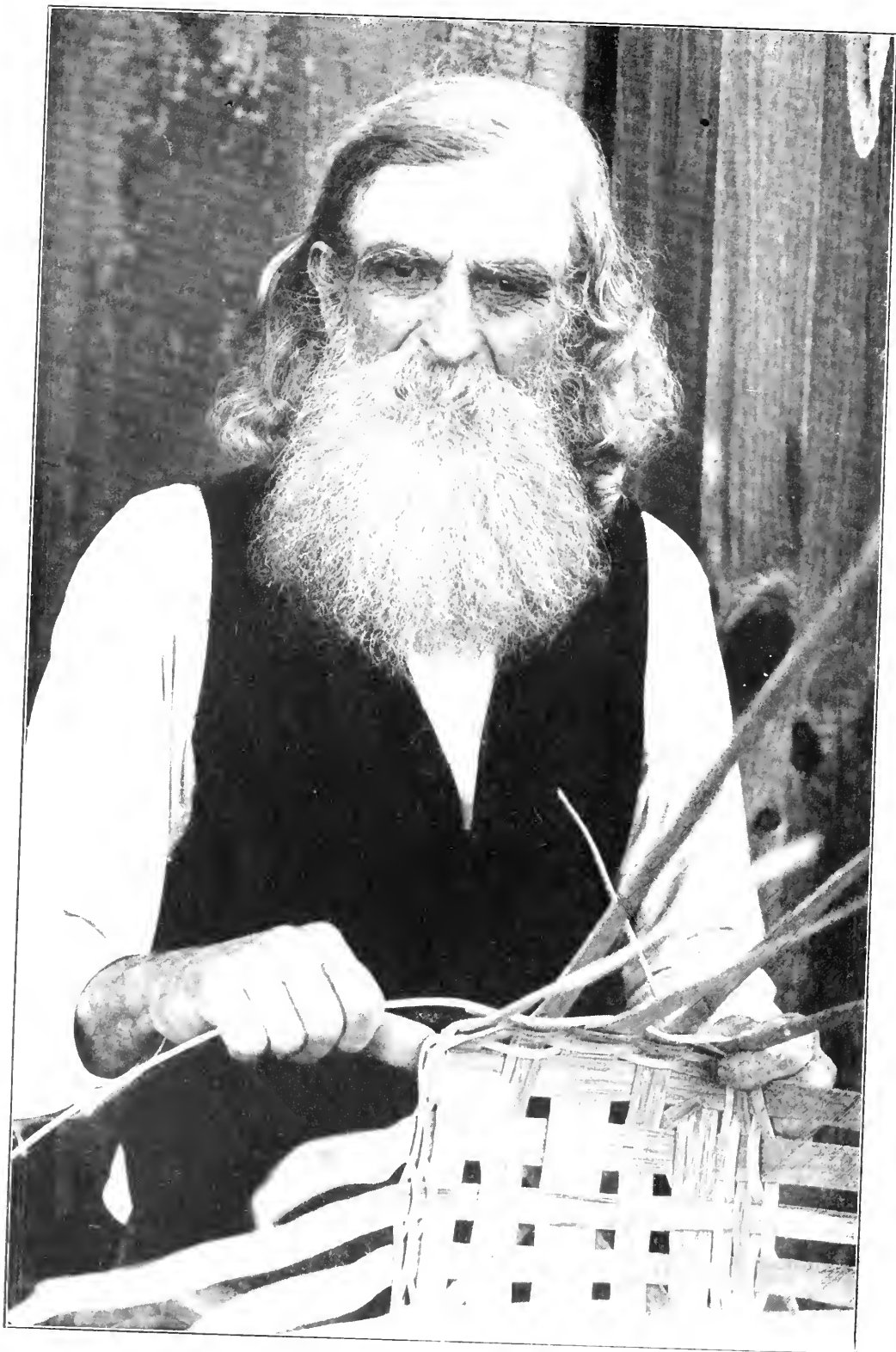
The ocean wakened by the coming day,
Throws off its surging coverlet of spray.

The everlasting mountains shake their hoary
heads,
And stretch themselves in their primeval beds.

The drowsy forest rising with a sigh,
Lifts its great arms up to the arching sky.

The busy nations hail the coming day,
Another space in which to work, to weep, to
play.

His many tributes gathered by the conquering
sun,
He rises in splendor and the day is come.



MR. REZZO WATERS, STAMFORD, CONNECTICUT.



THE GUIDE TO NATURE

EDWARD F. BIGELOW, Editor

Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
Subscription, \$1.00 a year Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

JANUARY, 1917

Number 8

The Beauty of the Worker and the Work.

By Edward F. Bigelow, ArcAdiA: Sound Beach.

BEAUTY, like happiness, may be defined, in the terms of the biologist, as adaptation to environment. The old-timers embodied this in some of their quaint, old-fashioned sayings. They recognized that a pig's nose may be beautiful from the sow's point of view, and that in certain places a diamond may be decorative. They used the expression as typical of incongruity when they referred to a thing as being as out of place as a jewel in a pig's snout. Homely? Yes, but true.

"Blessed are the pure in heart for they shall see God," is but another form of expressing adaptation to environment or specific congruity. It is only the pure that shall know the highest purity. It is only to the merciful that mercy comes; it is only when we carry in the heart the appreciation of beauty that we see beauty. It is love, not fight nor hatred, that begets love. Blessed is the man who has found his work, because in work is real happiness. Strange, is it not, that human individualities are so diverse, and occupations so varied, yet how beautiful is the eternal fitness of things. President Wilson

and Abraham Lincoln, though rather long faced and rather awkward when engaged in some occupations, are each really beautiful as presidents because each looks like a president, and is a president in nature. Have you ever thought, aside from all questions of the tariff, aside from all political differences, that many people in the past were not destined to become presidents of the United States because they did not look like presidents? There is a destiny that shapes our ends, even if the faces are hewn rather roughly.

Walt Whitman sang of the beauty of the colored man on the truck wagon, because he was beautiful. The man had found his job, and he harmonized with his surroundings. Humor has been defined as the juxtaposition of incongruous concepts. There may be a joke in things. That is why a circus clown is so funny, even when he says nothing. He does incongruous things, and we recognize the joke. It would be a huge joke if a company of lawyers, ministers or bankers should take pick-ax and shovel, and get into a ditch. Would you not laugh until your sides were tired, at a company like that in such a place. What makes us laugh so

heartily when a washerwoman is portrayed on the stage as becoming suddenly rich and entering "society," or when the hodcarrier inherits a hundred thousand from some distant relative, and immediately hires a \$150 chauffeur to run his Packard. We feel that something has gone astray. That is a joke.

Some one has told us that a tobacco dealer and typical old-time tobacco chewer has inherited a million, and is ambitious to enter "high society." He proposes to have an estate, and to paint a coat of arms on his automobile. He confers with an expert on family crests and seals, and says, "I want a picture put on my automobile door that will be emblematic of an aristocratic family." It so happened that the expert was not only well versed in the ancient lore of aristocratic families, but he had an undercurrent of humor, and recognized the fact that this tobacco merchant, suddenly transferred to an automobile, would be ridiculous with a false coat of arms, and decided to give him something expressive and classic too. Therefore he suggested, *Quid rides*, which might mean, "Why do you laugh," or the Quid rides.

Beauty like happiness, is only another form of fitness. The greater the adaptation, the greater the beauty or the happiness. There is, it is true, a fitness in the little child's dancing along by the roadside. We speak of it as the beauty of youth, but there is no less beauty in even the infirmity of age. The artist's eye perceives that as well as the beauty of youth. One likes to study an old man or an old woman as an ideally beautiful form, provided the setting is correct. But is there anything more ridiculous than a gray-haired man or woman who assumes the gewgaws of youth, and tries to defer the approach of age by aping the manners of the young ones, insisting that he or she is as young now as ever. If, at my age, I should try to dance, I think I would do it alone in an empty room, and not make myself ridiculous, as some very elderly people do, by trying to be as lively and gay as they were sixty years ago. The precocious boy or girl is ridiculous, but the youthful octogenarian is more so.

As we pass along the road of life, let us emulate the chameleon which alters his color to harmonize with his chang-

ing surroundings. It is only thus that we can avoid the absurdity of incongruity.

Pardon these soliloquies, my kind reader! A naturalist must necessarily be a student of beauty. He revels in it, and sees it everywhere in nature, because nature is never incongruous. It is only silly human beings that try to struggle with the passing years. St. Paul was wise when he said that when he was a child he thought as a child, but when he became a man he put away childish things.

I wish that a greater number of human beings could see beauty in the eternal fitness of things. It is only from this point of view that real democracy will be attained, and all class distinction fade away. The man with the hoe is a subject for the best painter or poet of the land. The hodcarrier climbing a ladder with his load of bricks is as beautiful and noble, provided he is fitted to his surroundings, as is the banker at his desk or the preacher in the pulpit. The little children in their folk dances upon the lawn, or when circling around their Maypole, are charmingly beautiful, but fully as pleasing or perhaps even more pleasing are those two old Italian women, plainly dressed, trudging along the country road and carrying a bundle of sticks on their heads. Appreciation of beauty will attract the artist's brush or the photographer's camera and as agreeably to the one as to the other.

In searching for beauty I have for a long time admired an aged basket maker that lives in the northern part of Stamford. He has been pictured in our pages, but the more I consider his patriarchal, picturesque beauty, the more have I desired to let the reader see him again. The artistic eye of the sculptor, the famous Gutzon Borglum, selected him as the original of *The Pioneer* in one of his equestrian masterpieces of that name. This has made Mr. Rezzo Waters famous, and he has been sought by merchants everywhere to demonstrate in their show windows the art of basket making. It is not the making of baskets, nor the man that is doing it, that attracts attention, but the unusual portrayal of beauty.

Human beings are lovers of beauty. Wordsworth, speaking of a charming young girl, said: "Her beauty made



BRINGING HOME A STICK FROM WHICH TO MAKE THE SPLINTS.

me glad." Beauty gives pleasure. That is our reason for printing Mr. Waters' picture in this number of *THE GUIDE TO NATURE*. For the same reason he is shown by the sculptor, or in the window of the enterprising merchant. A crowd might gather around a drunken man, but the point of view would be that of ridicule or pity, because we recognize the fact that a human being in that condition is out of place.

Basket making is one of the disap-

pearing arts. It savors of the days of long ago. There is an old-fashioned quaintness about it that seems to harmonize with colonial houses and old-fashioned customs. It is fitting that a basket maker should be well advanced in years. I know that basketry is taught in the schools of the present day, but I never think of it as real basket making. It is only busy idleness.

You may not be interested in bas-

ket making, and we have no desire to initiate you in the art, but to make careful study of things that are naturally fitting, pleasing and adapted to their environment comes within the scope of this magazine. We therefore present with no little personal satisfaction these photographic studies for your careful inspection, and we extend to Mr. Rezzo Waters our hearty thanks for his kind permission to make the studies.

Nestlenook.

BY CHARLES NEVERS HOLMES, NEWTON, MASSACHUSETTS.

Down in the woods where the brown thrush sings

And whisp'ring winds through the pine trees sigh,

There's a hidden glade where echo rings

And sparkling brook bubbles blithely by;

A sun-kissed glade where the butterfly

'Mid flowers flits upon gorgeous wings,

A meadow gay with the daisy's eye

Where honeybee to the clover clings,

Deep in the depth of the woods where lie

Shadows from dawn until dusk draws nigh,

Down in the heart of sequestered things

Is this hidden glade where echo rings,

A Nestlenook 'mid the pine trees high

Where whisp'ring zephyrs softly sigh.

—"Forest and Stream."

Plants and Climate.

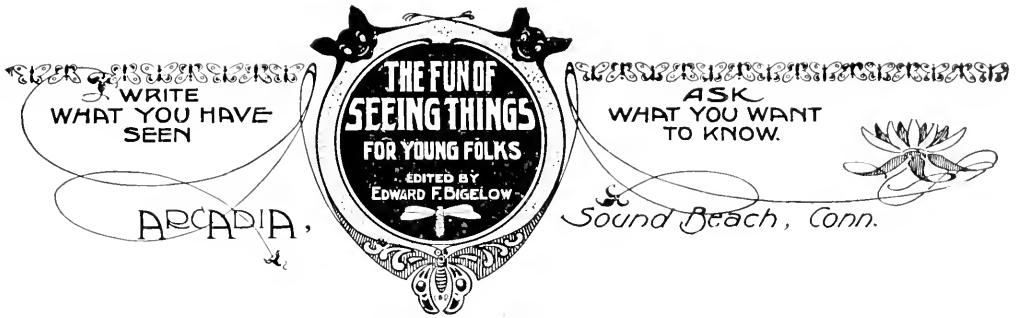
Species of herbaceous plants, points out Dr. E. W. Sinnott in *Science*, are vastly more numerous in cold regions than in hot. Thus, of the flora of the lowland valley of the Amazon, only twelve per cent of the dicotyledoneous species are herbs, all the rest being shrubs or trees. In Brazil, and the West Indies, a quarter of the plants are herbs; in the Florida Keys more than half. In northern United States, Spain, Germany, Russia, and Great Britain the proportion rises above three quarters. Iceland, the Faroes, and Ellesmereland all have at least nine-tenths of their plant species herbs. The reason appears to be that in a cold climate, the species stands a better chance of survival by passing the winter as a dry and resistant seed than as a woody plant, so that only a few, comparatively, of the more hardy types can afford the luxury of a tall trunk.

For the same reason, following the warm climate of preglacial days, there seems to have been a marked increase in the proportion of herbaceous species almost everywhere.

If I Were Old

By Don C. Seitz, Cos Cob, Conn.

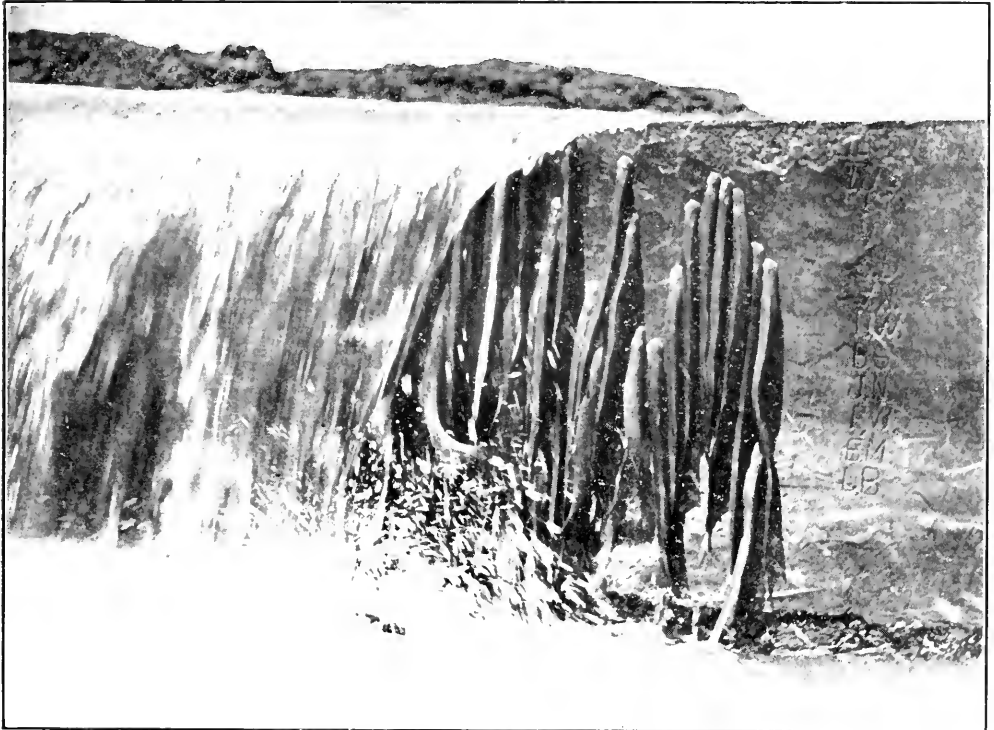
If I were old, I think that I
 Would dwell upon some mountain high—
 Where I could sit and look away
 O'er purple peaks to distant bay;
 And watch the sinking sun go down
 Far from the clamor of the town.
 If I were old!



Lampreys: A Remarkable Photograph.

Has any one ever seen so remarkable a picture as this of lampreys in the act of climbing a waterfall and clinging to a rock wall? The photograph is contributed to our magazine by the American Museum of Natural History, at the request of Mr. John

of hard rock. Very interesting were the numerous lampreys, *Entosphenus tridentatus*, about as long as a man's arm, which were clinging to the rock borders of the river, endeavoring to work their way upstream against the current. At one point a flat-topped masonry wall had been built to make



FUN IN SEEING LAMPREYS WORK SLOWLY UPWARDS.

Treadwell Nichols. "The Aquarium" has published the following article, written by Mr. Nichols in explanation of the remarkable photograph.

"In the summer of 1908 the writer was employed by the U. S. Bureau of Fisheries and stationed at The Dailies, Oregon, where the Columbia River shoots in gigantic rapids over ledges

the direction of the current more favorable for the operation of a nearby salmon-wheel, and on the side of this wall hung a great mass of lampreys, moistened only by an occasional sheet of water which the swinging current sent over their backs. They clung firmly to the vertical surface with their strong sucking mouths, and by sideways hitch-

ing of the head worked slowly and painfully upward, endeavoring to reach the right angle at the top of the wall. The feat was usually too much for them and they dropped off into the pool below, but occasionally one more fortunate than the others managed to get hold on the flat top of the wall, across which it quickly wriggled and disappeared upstream."

Young Red Fox.

BY H. W. WEISGERBER, SALEM, OHIO.

The picture is that of a young red fox that was more than half grown. The expression is one of intelligence.



HE HAD HIS EYES ON US.

but this was only for the moment for it could be changed in a twinkling if necessary.

All of the fighting qualities of a wild beast could be shown in a few moments' time; in fact, they were. Then, in almost as short a time, all would be lovely again. A month's period of captivity had somewhat tamed the animal but it had not succeeded in subduing it; it was still as wild as though it had never seen man.

It would fight and bite, as the writer can well testify, for it caught him by the hand and held on with a bulldog grip until it had its jaws pried open by another man's hand. The mistake I made was in trying to handle it with bare hands after the poor animal had been on exhibition in a store window. But after putting on a pair of heavy leather automobile gloves I had no further trouble.

This beautiful young animal was the only one of a litter of five that came through the fire alive. The den hap-

pened to be in a slab pile on a farm, and as the farmer thought that they would run away from a fire he applied the match, for he also wished to get rid of that pile of waste material. But the poor little animals for some reason did not come out or else were smothered by the smoke before they realized their danger.

I often think it a great pity that a few of the wild animals of our woodlands cannot be allowed to exist as of old. But it seems as if man is as savage as the beasts of the jungle whenever any wild beast shows itself.

The Hairs on the Wasp's Wing.

The wing of the common wasp is studded with hairs that merit attention, on account of their remarkable structure. They have been known to microscopists and, I suppose, to entomologists, although all entomologists are not microscopists. This, therefore, is not the first time that the subject has been put into print, but it is so peculiar that it will bear repetition. The special structure is conspicuous, after it has once been detected, or after the observer's attention has been directed to it, yet it is minute and demands careful scrutiny with a comparatively high magnifying power. I saw it only after one of my correspondents had called my attention to it.

The hairs are so deeply furrowed spirally that they appear to be twisted, and a remarkable and seemingly inexplicable phenomenon of the spiral is that in some the furrow winds toward the right, in others toward the left. Of two hairs standing side by side, one may have the right-hand twist, the other the left-hand; and of two parallel rows of hairs, one row may be formed of the one kind of members, the other the other kind. This fact I have never seen in print, nor heard mentioned. So far as I know, I may claim it as a little discovery of my own. I hope it is, but I am not making any positive assertions. The peculiar structure may exist on the wings or on other parts of other insects, but I have never seen such nor heard of it. I know it only on the wing of the wasp.

The furrows are visible with the one-inch objective and the five (two-inch) eyepiece, provided the microscopist's eye has been well educated in the detec-



HOOKS AND HAIRS OF A WASP'S WING.

tion of minute objects, and provided, too, that he knows for what he should look, but it is not an easy microscopical task. It becomes easier, and the furrows more distinctly apparent, if the one-inch objective will bear a high power eyepiece, but even then they call for attentive looking. With the one-fifth inch objective and the two-inch eyepiece, even the novice can hardly fail to perceive the twisted surface. But in any event, the hairs are worth seeing and studying. The wing should be mounted in Canada balsam.

—A. C. S.

The Black Alder.

A modest shrub the summer through,
Its tiny blossom all unseen,
Unless, perhaps, by roaming bee,
That finds them midst the living green.

And when the autumn glory comes,
And earth is teeming with its sheaves,
E'en then 'tis half in hiding still,
The berries covered with its leaves.

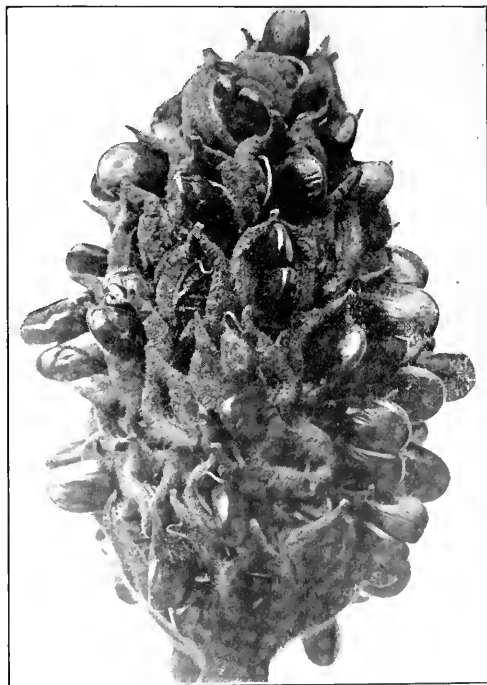
But when at last the leaves are gone,
It blazons forth in all its pride;
Its scarlet berries light the way,
And brighten all the country side.
—Emma Peirce.

The Seeds of Magnolias.

In many gardens one of the most showy of the small trees that bloom in early spring is the magnolia. The large, showy, tulip-like flowers that adorn it attract general attention. Many of us seem to forget these trees after they drop their showy flowers, but the true tree lover early learns the fact that the grace and beauty of the magnolia with its interesting foliage merit admiration during the entire summer.

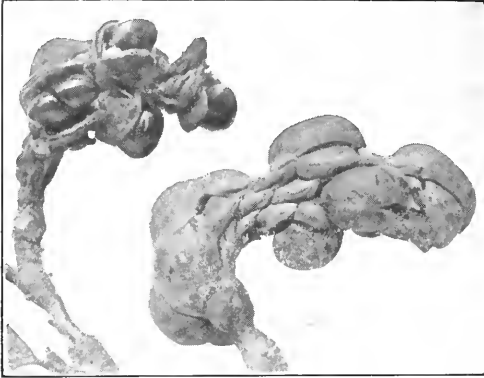
There are many types of these trees, some natives of our country, others of Europe and the Orient. Most of them are hardy in the North. The spring bloom is followed by slowly developing seed pods which during the summer are green and not conspicuous. With some species, these grow to be several inches in length and somewhat resemble a cucumber, so much so in fact that one of the species is known as the cucumber tree. As these cones mature they pop open at the sides, and show the intensely brilliant carmine fruit.

Why not become more intimately acquainted with these trees? Collect



MAGNOLIA SEEDS FROM CHATTANOOGA.

some of the ripening seeds and, if you will follow these instructions, by the middle of another summer you will have the joy of seeing some nicely de-



OUR NORTHERN MAGNOLIAS ARE FAIRY-LIKE
IN FORM.

veloped treelets that, with a little care and watchfulness, will in time make beautiful trees that in their turn will gladden the heart of those that may be fortunate enough to see them.

The magnolia seed is impatient of much drying. By imitating nature's way as closely as possible, the reward will be yours. When the seeds fall in a natural way, those that start to grow in another season have been fortunate in finding lodgment in mellow soil where they have been protected by autumn leaves from drying and from destruction by rodents, birds, etc., which are ever on the lookout for their own welfare.

If you wish to experiment in a small way, gather a few of the seeds, secure a small tin box with a tight cover, make small punctures on all sides, put the seeds in this box and fill it with clean, moist sand. Secure the cover tightly and bury the box either in the earth where it will remain moist or in a similar place where it will freeze during the winter but where it will not be wet for any length of time. In the early spring take the seeds from the box, plant them about half an inch deep in the garden and cover them with a flat stone or other similar protection. Lift this cover from time to time to see if the young plants are showing above the soil. If so, then remove the cover permanently. The two little seed leaves

first appear and are soon followed by the normal type of leaf. Before the summer is over the plants will have become, in many instances, several inches high. During the first winter, they should be protected by leaves or other suitable covering, but after that time, if the location is favorable, they will begin to grow more rapidly and after three or four years will be nice little plants ready to be transplanted to their permanent location.

To have successfully reared at least one magnolia from a seed, will mean that you have learned intimately the life history of at least one tree. This acquaintance will lead to a keener appreciation of some of the mysteries of nature's ways, and this wonderful world will possess a newer and keener interest.

The magnolia is not the only tree that can be raised this way from the seed. Practically all the trees that so abundantly adorn our landscape and make up our woodlands grow primarily from seeds sown by nature. To watch the development from the time of collecting the seed through the earliest stages of the seedlings, is a privilege that every one can enjoy.

The Porch Hen.

Stamford, Connecticut.

To the Editor:

The old hen has just sought the porch so that we shall not have to go far for our fresh eggs on these cool autumn mornings. That is from our viewpoint. She has more likely "reasoned" (do I



THE HEN ON THE NEWSPAPERS AMONG THE
TOYS.

use that term correctly, Dr. Bigelow?) that when the young chickens come they will be nicely protected from the bad weather and other perils. She has been so gentle in taking possession of our porch closet, although she resented our repeated intrusions after she began to set on the two eggs that I left for her. Every day for weeks, it seemed to me, as she walked the railing to her nest on the closet in the

to announce in tones of delighted discovery, "No, Mother Clara, they didn't kill the old hen at all."

CLARA HOYT LOCKWOOD.

Swimming in Great Salt Lake.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

This wonderful lake averages seven and one-half feet in depth, the greatest depth being thirty-three feet. The water is so saline that this lake is one of the



ALMOST GO TO SLEEP AND SWIM HERE.

corner, she braved the sound of the children's voices, and the noise of all kinds of newly invented locomotives. She was sometimes bothered because the baby's gate was closed. One morning I found her making a round of the porch, peeping into flower boxes and talking in her restless singsong. She followed me down for breakfast, but did not linger to eat with the chickens. All the way back to the house she was at my heels, and when I approached the closet she flew up before me, and actually scolded the truth: "Some one has taken my eggs and you know how to get them." She waited until I had found two more for her, and welcoming them as emotionally as a mother might a lost child, she rolled them under her and settled down to lay more. So much a part of the porch family has she become that my little boy, knowing that chicken frequently appears on his menu, often comes in

purest and most concentrated brines in the world, containing twenty-two per cent. of salt. It is refreshing to bathe in and singularly buoyant; but the swallowing of a mouthful causes strangulation, and a drop in the eye raises acute pain. The buoyancy of this body of water is seen by the position of the men bathing in it. They have nothing to sustain them but the density of the water. If one wishes to commit suicide by remaining under the water, Great Salt Lake is the last place he should seek.

The lower animals, points out Dr. Craig of the University of Maine, have almost no sense of rhythm. Horses driven in span make no attempt to step together. Two birds, however sweetly they sing solo, never sing in time with one another nor with any other music. Even the so-called dancing animals of the circus get their rhythm from the trainer, not from the tune.

The Eclipses of 1917.

The four eclipses of the sun will respectfully occur on the morning of Jan. 23, during the forenoon of June 19, during the late evening of July 18, and in the early morning of December 14. The first three are only partial eclipses, so that from no station on the earth will the sun be seen to be completely hidden by the moon, while the fourth is a so-called "Annular Eclipse," in which the round, intensely black, ball of the moon will be seen to move completely onto the bright disc of the sun. At this time, however, the apparent size of the moon will be slightly less than that of the sun, the disc of the latter will therefore at no time be completely hidden, but its edge will be visible as an intensely bright ring of light. The path of this annular eclipse will pass exactly across the South Pole of the earth.

Unfortunately, none of the four solar eclipses will be visible from any station within the United States. But two of the three eclipses of the moon will be completely visible to us and will furnish most interesting phenomena for observation. Each of these occurs after midnight; the first during the early morning hours of January 8, and the second before sunrise on December 28. Their observation will

cause the moon will at that time not have risen.

* * * * *

The Lunar Eclipse of January 8.

In Figure 2, the shaded circle represents a section of the great shadow of the earth, a shadow which always stretches out into space in a direction directly opposite to that of the sun. During the early morning of January 8, the center of the moon will be seen to move eastward along the path A B D E, and thus our satellite will plunge completely into the shadow.

The center of the moon will reach the point A and the eclipse begin at 0 hrs. 50.4 min., (Eastern Standard Time); it will reach B and the eclipse become total at 2 hrs. 0.4 min., and it will reach C and the moon be most completely immersed in the shadow at 2 hrs. 44.6 min. The total eclipse will end at 3 hrs. 28.8 min., the center of the moon then being at D, and the entire phenomenon will terminate, and the moon leave the shadow at E, at 4 hrs. 38.6 min. Thus the entire eclipse will occupy 3 hrs. 48.2 min., while the moon will remain completely immersed in the shadow 1 hr. 28.4 min.

The Solar eclipse of Jan. 23 will be visible throughout western Asia, northern Africa and eastern Europe, but from no region will more than three-

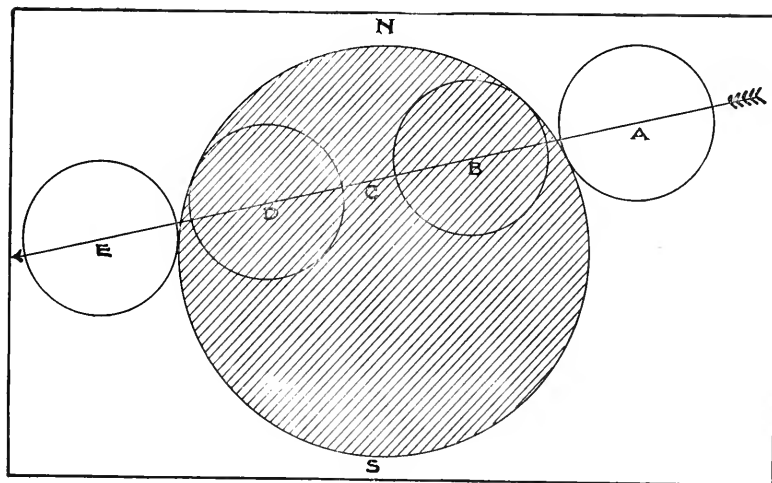


Figure 2. Passage of the moon through the Earth's shadow, on the early morning of January 8.

thus call for some resolution on the part of the amateur astronomer. The third lunar eclipse will occur during the afternoon of Independence Day (July 4) and will be invisible to us be-

fourths of the sun's diameter be seen covered by the moon.

* * * * *

The Planets in 1917.

Jupiter now shines very brightly in

the south-west in excellent position for observation. It will be very readily found from the position indicated in Figure 1, for it is by far the brightest object in this part of the heavens. As this planet occupies nearly twelve

date it will steadily climb upward in the western heavens, and toward the close of the year will become the most conspicuous object in the sky. It will attain its greatest distance east of the sun on Nov. 30.

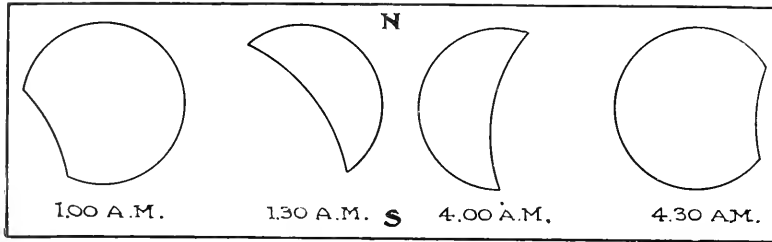


Figure 3. Appearance of the moon at different hours during the lunar eclipse of January 8.

years in moving once around the heavens among the stars, it will be found by the end of 1917 in the position directly between the Pleiades and Hyades indicated in the figure. This little region will then indeed be a most beautiful and interesting one.

Saturn is now high above the ground in the north-east, almost in a line with the Twin stars, Castor and Pollux. During 1917 this planet will move only across Cancer in its slow, 29-year journey around the Celestial Sphere. The sun, steadily pursuing its course along the path AVB, will overtake and pass Jupiter on May 9, and will similarly pass to the east of Saturn on July 27. On these dates the respective planets will change from evening to morning stars.

Mars, which is now too low in the south-west for observation, will not enter the borders of our evening maps during the present year. It will be passed by the sun and thus become a morning star on Feb. 28; by August 1, it will rise three hours before sunrise and this time will be increased to five hours by Nov. 1, and to seven hours by the end of the year. But the Red Planet will not attain its most favorable position for observation during the year 1917.

The very brilliant Venus now rises far in the south-east about two hours before sunrise, but this interval is rapidly lessening and becomes only one hour by the end of the month. The planet will, however, not enter the evening sky until April 26, after which

Thus from January until the middle of April, both Jupiter and Saturn will shine in our evening sky. On this date Jupiter will be lost in the sun's rays, but Saturn will remain until toward the end of July; before the Ringed Planet withdraws, the beautiful Venus will have become conspicuous in the west. Jupiter will again appear in the east toward the end of October, and Saturn toward the close of November. During these months, also, Venus will be growing nightly more conspicuous and mounting even higher in the heavens.

Mercury reaches its greatest distance east of the sun on the evening of Jan. 2, and may then be detected shining low in the twilight, almost directly above the west point of the horizon, until about one and one-half hours after sunset. Similar east elongations will occur in April, August and December; in February, June and October the planet will reach its greatest elongation in the morning sky.

On January 3, at 7 A. M. the earth will attain its least distance from the sun of the present year; it will reach the point of its yearly path which is most remote from the sun at 3 P. M. on July 3. The distance which separates the two bodies on the former date will be 91,344,000 miles. On the latter date this distance will be 3,108,000 miles greater.

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The January Stars.

The beautiful Capella is now almost directly overhead, the brilliant groups of Taurus and Orion are near the meri-

dian in the south, while the two Dog Stars, Sirius and Procyon, have mounted high in the heavens. The observer also notices that the beautiful Leo, the last of the bright Winter groups, has now well entered our evening heavens. The bright Star Regulus of this constellation, with its intensely blue companion three minutes away, is a beautiful object in a moderately large telescope.

The praesepe, at E, Fig. 1, and the wonderful spiral Nebula of Andromeda, at F, are both in excellent position for observation. Nor should the observer fail to note from time to time the variable star, Mira, at M, whose brightness during the present month should begin very rapidly to decrease.

For one who is familiar with the brighter constellations this will be found an excellent time to trace out the faint groups of the Camelopard, the Lynx, the Lesser Lion, the Unicorn, the Hare and the Dove. The entire Milky Way, from the Northern Cross, now half disappeared in the West, to the summit of Argo in the south, will also well repay prolonged exploration and study.

Percival Lowell.

BY GEORGE R. AGASSIZ, BOSTON.

The sudden death of Percival Lowell, at his observatory at Flagstaff, Ariz., deprives the world of one of the very few men of independent fortune whose inclination and ability enabled them to devote their lives and their resources to the advancement of pure science. A member of a brilliant family, well known in the history of New England, he was one of the men who gave the name, which he shared with the poet-statesman and the president of Harvard University, an international reputation.

Dr. Lowell was born in Boston on March 13, 1855. His father, Augustus Lowell, was closely identified with the education, art and science of Boston. His mother, Katharine Bigelow Lawrence, was the daughter of Abbott Lawrence, United States minister to Great Britain in 1851. The cities of Lawrence and Lowell attest that both families were prominent founders of the textile manufacturers of New England.

* * * * *

Dr. Lowell prepared for college at

"Noble's" School and graduated from Harvard in 1876. He was given the degree *cum laude*, and received second-year honors in mathematics. But the true distinction of his later career was foreshadowed by a remark of the elder Pierce, the mathematician of his day, who spoke of him as one of the most brilliant mathematicians of those who had come under his observation at Harvard.

After a year spent in travel in Europe and the East, Lowell returned to enter business in Boston. He was one of the few men who combined scientific abilities of the first order with a marked instinct and gift for matters of business. And when he later embraced the career of a man of science, he never abandoned his hold on the world of affairs. He became a force in the business world, where at various times he held the offices of treasurer of cotton mills and director of trust and electric companies.

From 1883 to 1893 his energies were chiefly devoted to literature and travel. In the spring of 1883 he settled in Tokio, where he was appointed counsellor and foreign secretary to the Special Mission from Korea, then on its way to the United States. This resulted in his return to this country in charge of the travels of the party through America. It was the first embassy ever sent by Korea to a Western Power. On the return of the mission to Korea, he remained in the country for a time as the guest of the government. An account of his travels there he published under the title, "Choson—The land of the Morning Calm." The volume is full of imagination and charm and gives evidence of a light touch and a true literary gift.

* * * * *

Until 1893 much of his time was spent in the far East, chiefly in Japan. In 1888 he published his "soul of the Far East," which Janet, the French psychologist, has characterized as a valuable contribution to the psychology of the Orient, and as showing a remarkable insight into the Eastern mind "Note," a delightful account of his rambles in an out-of-the-way corner of Japan, followed in 1891.

When wandering about with a friend in the interior of Japan in the

summer of 1891, chance took him up the sacred mountain of Ontaki. His interest in the curious rites of the Shinto pilgrims during their ascent of this Mecca led him to get in touch with the high priests on his return to Tokio. The result was a book on some hitherto but little known aspects of Shintoism.

All this illustrates the versatility of the man, for the real work of his life was the astronomical research of his later years. If there is any truth in the popular conception of an astronomer as a bearded and uncouth recluse, it was certainly not exemplified in Lowell. A man of the world, who was studying to be a man of many worlds, dressed with the greatest care, to whom a faint touch of other days gave a slight suggestion of a dandy of the past generation. Appreciative of the refinements of existence, enjoying a good dinner and telling a good story, he was the life of any gathering in which he chanced to find himself. Withal a charming and attentive host, as those who have been fortunate enough to enjoy his hospitality at Flagstaff will testify. With multitudes of friends in many lands, he had but a small number of intimates to whom he fully revealed the complete charm of his personality and his steadfast affection for a few people. Even to those chosen few it was only given by occasional glimpses to realize that deep under a somewhat uncompromising attitude of mind lay a real humility of spirit. Is it perhaps a paradox that the foremost believer in intelligent life on another planet shared with many of the scientific men of his days an attitude of robust scepticism on the future life of man? Although far too much in sympathy with the philosophy of the East to fear death in the usual sense, he resented deeply the idea of the termination of his personality, in a way characteristic of men of energy and intellectual force.

* * * * *

During all his early activities Lowell had kept a live interest in mathematics and astronomy. In 1877 the Italian astronomer Schiaparelli began a systematic study of the planet Mars, which led to his discovery of a remarkable series of markings which he called

canali, a word which has been incorrectly translated into canals, and has proved a source of much subsequent confusion. Lowell followed with deep interest the discoveries of the Italian savant, for the character of the work was calculated to fire the enthusiasm of a man of imagination of scientific proclivities. By the early nineties Schiaparelli's eyesight had so far failed that it was evident that his observing days were over. And Lowell determined to give his energies and his fortune to continuing the work. Before founding an observatory to be devoted chiefly to the study of the planets, with characteristic intelligence he and his assistants spent many months in a systematic series of explorations and tests to discover the most suitable spot. The site finally chosen was on a plateau above the town of Flagstaff, Arizona, at an elevation of over seven thousand feet. In order to obtain the best "seeing," it is necessary that the air should be quiet and rarefied. It is a singular fact that most observatories have been placed with a view of being seen rather than seeing, in the neighborhood of great cities or institutions of learning; while the few observatories that are more intelligently placed have not profited by Lowell's discovery that the currents of air swirling about a mountain top make it a far less ideal locality than a plateau.

* * * * *

Around the dome of the original superb twenty-four-inch refracting telescope, erected in 1894, has grown up a small village with quarters for his employees, and separate houses for his assistants, whom he treated with unflinching generosity, courtesy and consideration. Here, under a separate dome, a forty-inch reflecting telescope was also eventually installed, one of whose chief uses has been to establish the uselessness of that class of instrument in the study of planetary detail. Lowell's own house, a low picturesque structure, looks out on as magnificent a view as ever gladdened the eye of a roving man or soothed the spirit of a contemplative philosopher. Below a steep foreground of rugged pines stretches a broad forest-covered plain, broken with patches of natural park. Directly across rises the mighty mass of the

San Francisco peaks, their lower slopes clothed with huge pines, which melt into the stunted vegetation of the higher regions, till the last frost-like verdure is lost in a riotous mass of barren rocks capped with the jagged edges of their snowy summits.

He died looking out on this scene that he so dearly loved, and it is pleasant to think that he will lie there surrounded and honored by his assistants who are carrying on his work.

* * * * *

Here for many years Lowell and his staff have accomplished a mass of spectroscopic, photographic, visual and mathematical work of the highest class, which entitles him to a distinguished place in the history of astronomy. Just what that place will be undoubtedly depends on how time deals with his better known theories of the presence of intelligent life on Mars.

No one of good eyesight and open mind, who has enjoyed the privileges of a protracted study of the planet, under the unique advantages enjoyed at Flagstaff, can doubt the correctness of the essential facts; it is purely a question of their interpretation. The surface of Mars is covered with an extraordinary network of singularly artificial looking lines. The intensity of these lines waxes and wanes in periods that show remarkable relation to the melting of the winter polar snow caps. The atmosphere of Mars is rarefied, but we cannot say that it is insufficient to support some sort of intelligent life. The planet appears to have but little water on its surface. If we adopt Lowell's theory that the intelligent inhabitants of a dying Mars are struggling to keep alive by a planet wide system of irrigation, from the water of the melting polar snow caps, we shall find that the theory accounts for all the observed facts. He supposes that the so-called "canals" are bands of cultivated vegetation dependent on some system of irrigation forced down their centres. It is these bands of vegetation which we see, and not the water irrigating them. Just as an observer at a distance from our earth would see the fertile strip of the valley of the Nile stand out against the desert long before he could distinguish the river. Moreover, it is found that the intensifi-

cation of the markings on any part of the planet's surface takes place a sufficient time after the beginning of the melting of the adjacent polar snow cap to allow for the water to reach that point and the crops to grow

* * * * *

It is only human that such a startling theory should meet with determined opposition. But since none of the alternative theories offered by his opponents account for the observed facts at all, it would seem that Lowell's theory deserves the serious consideration of intelligent men. Schiaparelli himself called it "the best working hypothesis yet devised."

Ever since the earliest men of science endeavored to prove that the earth was round, humanity has bitterly resented any discovery that has tended to diminish the cosmic importance of the earth or belittle man's place in the universe. The objections that have been brought forward to smother Lowell's theory are of precisely the same character as those used in attempting to stifle the work of Copernicus, Galileo and Darwin.

Like most men who have brought the spark of genius to the correlation and interpretation of phenomena, Lowell's true title to fame will rest for decision with a future generation. But the ever-advancing hand of science is constantly pushing back the veil of the unknown. And some day she may place the plausible hypothesis that a neighboring planet is inhabited within the realm of ascertained fact. When that day comes, Percival Lowell will take his place, while the world lasts, in the foremost file of the learned men of all time.—The Boston Transcript.

Stanford University is to bring out a four volume illustrated flora of the Pacific Coast, to contain picture and description of every flowering plant and fern in the district.

A study at the New York State College of Forestry shows that although New York has one of the finest climates in the world for the growth of trees, yet the forests of the Adirondacks are producing only about a fifth or a sixth of the annual lumber crops of the properly managed state forests of Germany.

EDITORIAL

Giving Oneself to Life's Work.

Big-hearted Dr. David R. Lee of the university of Chattanooga recently wrote to me in regard to my lectures delivered at that university. The letter contained two sentences that perhaps pleased me more than anything in any other testimonial that I have ever received. . The writer says: "You captured our teachers because you did more than give them lectures. You gave yourself."

I have always felt a desire to put my personality and the throbbing of my own heart into my work of nature study.

Perhaps "I" is used too often in the editorial column, but not if the reader will accept my point of view. I believe that an editor, one lone man, has no right to use the word "we." The first person plural should be used only to express the opinion of a company, such as an association, an editorial board or a jury. In this magazine, when the word "we" is used, as it seldom is used by the editor, it may be accepted as an established opinion held by The Agassiz Association. In the editorial department it is not "we" but "I" and every member of the Association is at liberty to disagree with what I say if he so desires.

In this note I do not intend to write about myself, but to give a word of commendation to the various members of the Root Family at Medina, Ohio, who confine their journalistic endeavors to their ideal little magazine—"Gleanings in Bee Culture." I have heard some good beekeepers who value the apiarian knowledge displayed in that magazine, yet pretend to joke about the personality there shown. I have heard some weak attempts toward a little joke about "The Root Family Memoirs." But deeply entrenched within their heart is a love for the personality of A. I. Root and for his sons. Personally, I find extremely interesting the portrayal of that family, their thoughts and ambitions as

set forth in that journal. There are few families who would venture, every member of them, to record month after month, year after year, so many little facts, fancies and trivial conversations, and yet continue to rise higher and higher in the reader's estimation.

We know Grandpa Root and Herbert and Ernest as well as if we had been brought up with them since the days in which all of them were making mud pies. We are familiar with the venerable Mr. Root's boyhood. We know his hopes when he first met the girl who is now Grandma Root. We have been told when every baby was born and what was said about the baby when it came to ornament the home and make it happy. Recently I could not avoid smiling at the printing of two pictures of a great-granddaughter and her mother when the baby was only eighteen days old. The pictures are exceptionally good, but most editors would have been content to show either of the two, but such is the fondness of the family for one another that the editor could not decide whether the baby should be shown with her mouth open or with it partly closed. Isn't that charmingly delicious? After calm deliberation the family decided, "We cannot choose between the two. We will use both."

Here is the style in which Grandpapa writes. As a loving appreciation of his family, it should become classic.

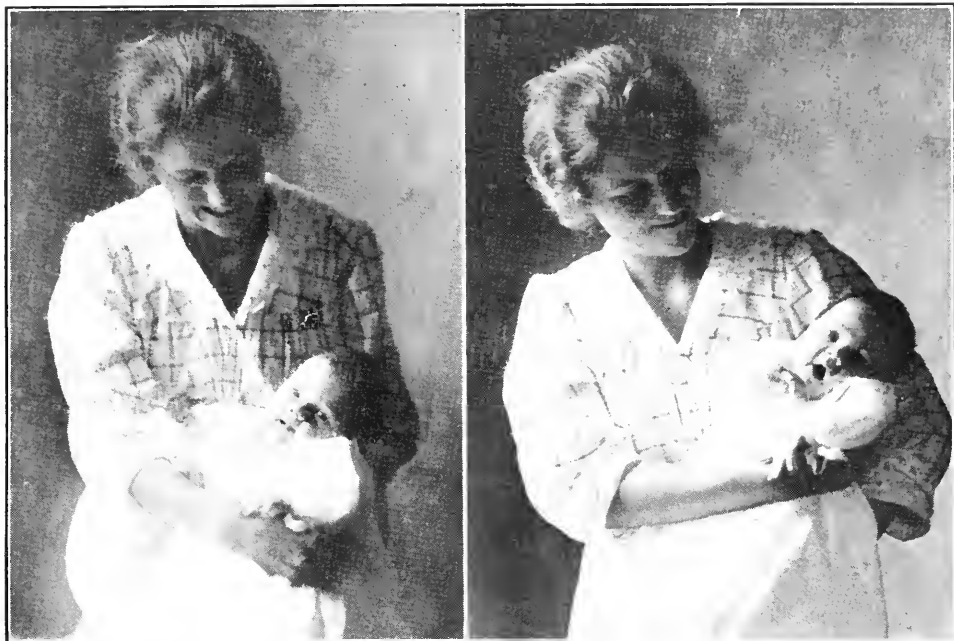
"Some years ago Mrs. Root made the remark, in speaking of Huber, our last-born boy, 'We shall probably not live long enough to see him married.'

"Well, through the mercies of a kind Providence we have lived not only to see him married, but to see him the father of a bright little girl who visits her grandmother almost every day when we are here in our northern home. And we have lived to see one of our grandchildren married, and who now has a little girl 'of his very own.' And it affords me wonderful pleasure—in fact, a thrill of joy and thanksgiving, to be able to present to the readers of

'gleanings' the happy mother and the bright little baby with that wonderous smile that she gave her friends when just eighteen days old. I think some good woman called that first smile that the baby gives her friends a 'three-cornered smile.' Just notice that sweet little mouth opened enough to indicate that she too is feeling happy and thankful to get just a brief glimpse of this

He gives us full data about his birth in 1839; and, with other charming family items, when he and Mrs. Root were married; when the first daughter, Mrs. Mand Calvert, was born, the day after Abraham Lincoln's death, and adds this astonishing announcement anent the multiplicity of children, grandchildren and great-grandchildren:

"Through a kind and merciful Provi-



The great-granddaughter and her mother when the baby was only 18 days old.

great and wonderful world and all the rest of the attendant vast universe. Oh! what is home without a baby? May I digress just a little right here?

"I once knew a beautiful woman. She married a bright and educated man; and as the years passed by he wanted a baby, one or more of them, in his household. Then there was a disagreement in the matter. If I am correct a divorce resulted. She gave her reasons, so far as I can recollect, something like this:

"My good sir, if you thought when you married me that I was going to be mother to a lot of babies, I want to tell you that you are greatly mistaken."

"She declined the office of motherhood, probably because of its cares and burdens. I have heard people talk about living for self, without care or regard or feeling of responsibility for anybody else or for coming generations after them."

dence I am able to say today, June 26, 1916, there has been no death among the children, grandchildren, or great-grandchildren up to date."

This personal literary gem merits careful inspection. Notice how Grandfather dotes upon the three-cornered smile of the baby and the sweetness of that little mouth, although he seems to feel that such revelations are hardly appropriate in a dignified journal, and to a certain extent apologizes. Go on, old Roots, and middle-aged Roots, and tiny Root-lets, and keep on telling us about your interests, not only in honey-bees but in everything that you talk about in the household, and especially about your hopes and ambitions. I, personally I, want to assure you that I believe you are setting a charming example, not only because you are giving yourself personally to the wide, wide world, but because you have a personality that will stand the strain.

When the great-grandpa shall be no more, I sincerely hope this rare but praiseworthy trait will be continued by every successive editor and writer in the family. I have learned much from "Gleanings in Bee Culture" in regard to the best method of selling honey, although I do little of that. I have learned many details about the management and care of hive bees, yet when I look introspectively into my own mind I find there an uplift and an inspiration to live a life as it should be lived, given to me not so much by "Gleanings in Bee Culture" as by "The Root Family Memoirs."

A Student Better Than a Reader.

The Agassiz Association does not exist as an incorporated publishing house to issue *THE GUIDE TO NATURE*, but the magazine exists as an aid in building up and making more efficient The AA, a company of students, and *ARCADIA*, its clearing house of information. A guide is to tell and to inspire to go forward, not to be read; to be a helper is the purpose of this magazine.

It is only one of the many methods of accomplishing Louis Agassiz's oft quoted principles, "Study nature not books." Yet everybody knows that that famous, scholarly scientist used books. By that clarion cry he means that nature should be first. Many books and some nature magazines seem to say, "Read me, then see if you can find what I am describing." But the exact converse is true of this magazine and of *The AA*. We say, "Study nature. Study her and interchange your observations with other observers. Give to others as you expect them to give to you." *THE GUIDE TO NATURE* is published not to make money, but to help the student. It will be continued even if it should cost more than we receive; but the more we receive the more useful we can make the magazine.

Frequently our well-intentioned friends think they are complimenting the work when they speak of "that interesting magazine. How I do love to read it." The compliment is pleasing as far as it goes and encouraging, but it does not attain to our highest ideal. We should like to hear an appreciator say, "I read that in your magazine and

I was encouraged to continue my studies."

Please note the emblematic heading of *THE GUIDE TO NATURE*. You will observe three sisters: a naturalist with a net; an artist, that also represents the camerist, and a guide leading toward the beauties and the treasures of nature's realms. According to some of our readers, the guide is wrong in beckoning to the others. She should be handing them *THE GUIDE TO NATURE* saying, "See what I have discovered. Sit still by your fireplace and enjoy it."

No, my dear naturalist friend, we are not trying to exempt you from the personal study of nature. We have failed, we have missed our calling, if our efforts end with you in an easy chair reading *THE GUIDE TO NATURE* and saying, "How interesting this is." We accomplish a part of our mission when you read only for a short time, then put on your overcoat and start for the out of doors, whether it be to see the stars or the leafless trees, or the ice crystals. Too many of our friends miss this essential point. They praise *THE GUIDE TO NATURE* and compare it with the strictly literary magazines. Although we appreciate that kindness, it is not what we are seeking. On any news stand or in any bookstore you will find books and periodicals in profusion. There are too many. The majority of these are the slang of the book trade known as "slush." The display is appalling. But there are not enough readers in nature's great out of doors, in the laboratories or at the examining table. Too few are investigating nature's details. We do not wish to save you from effort in going to nature but to urge that effort. Thousands can read, while few can observe. The pre-eminent value of the institution that we are creating is to supply this great need and to train careful observers who will generously stimulate and teach others to be observers.

Let us be specific, and classify the situation. Take our Christmas number. An article about Mr. McDermant, the proprietor of a restaurant who spends his leisure time among his plants. The intention of that article is not to classify Mr. McDermant among those that seek recreation along

unusual lines. It is to induce you to emulate his noble example. "What he has done I can do, on a smaller scale, perhaps, but I can do it, and I will. He shall be my guide."

On another page is an article by Mr. Faulkner about the astonishing performances of certain plants. We do not expect you to exclaim, "I can scarcely believe it, but it is interesting." No. That article is to suggest that you go and examine those plants, watch them and others for yourself. In others you may discover facts equally stimulating.

Miss Roe writes about song birds that sought a human audience. A well-known naturalist has severely criticised that article. He does not believe it. To be frank, I do not care whether he believes it or not and I suppose that his opinion will not worry the author. We should like that article to stimulate the critic's observations of birds so that he may ascertain for himself whether or not birds, in any circumstances, ever seek a human audience. We know that birds are shy and timid. Their tendency would be to stop singing when an intruder comes into the vicinity, but are there no exceptions?

Professor Doolittle has in that number, as he has had in every other, an interesting article on the aspect of the heavens for the month. A certain benefit may follow the reading of that article in a cozy chair in a well warmed room. Perhaps some one says, "I never before understood Mira. I am glad he makes that clear." But, my dear friends, that is not the article's intention and does not represent its value. If you did not take that map right out of doors with a little pocket electric light or some similar method and compare it with the stars themselves, or if you did not hunt up Mira to convince yourself that it does increase in brightness at this time, then, alas, what a loss to you!

Our readers, and especially the writers of the letters in reference to the use of the cat's tail, would be amused if they could see some of the criticisms. One man goes so far as to call another a fool for making such a statement, and another says, "I certainly thought he knew more than that." Others write to

express their thanks and their satisfaction. What we are trying to do is to stimulate observation of the cat or any other tail bearing animal. Since these articles were published I have taken a great interest in observing the squirrel's use of his tail in jumping and running, or when sitting hunched up in a cozy little crotch of a tree. The articles did the editor good. They should have a similar effect on you. If, since reading them, you have not seen a cat's tail or a squirrel's tail or a dog's tail, then these tales are in vain.

Ever since Mr. Walker sent us that photograph I have been wondering whether the South can exult over the North for using more rails in the fences. Wherever I have been I have noted the fences. A fence has meant more to me than ever before.

To some of our readers perhaps the least interesting part of the magazine was the lists of contributions in cash or specimens. You may have thought that it was merely to keep the management of ARCADIA from lying awake at night and to show that others are helping to pay the bills. But to every one that looks at The Agassiz Association and its work for nature, these lists are more valuable than anything else in the magazine. If you lived in a warring country and had friends in the trenches, would you not be delighted when the reinforcements and the loads of provisions passed by? You would know that these would increase the soldier's efficiency and the probability that your side would win. Every nature lover, especially every friend and Member of The AA, is interested in the outcome of this struggle of reality with frivolity, of enjoyment with pastime, of eyes with no eyes, of thought with thoughtlessness.

The AA knows its mission. To accomplish it is a struggle, as it is for every other organization engaged in an ideal, a philanthropic or a missionary work. What religious person does not read with delight of successful missionary endeavors? What politician does not shout hurrah, when his side forges ahead? What college graduate does not feel his blood tingle when his alma mater's football team wins the game? From a similar standpoint, in a similar light, the list of contributions

should be the most interesting part of the magazine. This is an age in which everybody believes that if a thing is worth doing at all it is worth doing well. *THE GUIDE TO NATURE* is therefore very, very far from an end, but one of many aids to a great Cause. This magazine might even be discontinued or it might be quadrupled in efficiency, and other aids may come in or other aids may go, yet The Agassiz Association will go on for all time for those who having eyes can see, having brains can think, and having a heart can love.

Wherein It Is Bad.

In a friendly letter, Mr. Frank B. Hopkins, of North Salem, Indiana, uses this expression, "As Dean Coulter of Purdue said to Dean Black of I. U. it is all very well to be a specialist, but it is bad to be nothing but a specialist." These words of wisdom and Dean Coulter's laconic and euphonious statement should be spread world-wide. It is a good thing to be a specialist but it is not well to be restricted within a shell. This magazine stands for sympathetic interest in all phases of nature. To the specialist it brings messages and news of the inspirations and interests in other departments.

To make sure that Mr. Hopkins had quoted Dean Coulter correctly I wrote to the Dean. He replies as follows:

"I think it is substantially correct and as nearly as I can remember any of my casual conversations is literally correct. The expression was used in discussion with Dean Black, of the Indiana University, School of Education, concerning the training of teachers, especially of teachers in universities. My contention was that the eagerness of the universities to secure specialists had led to the filling of faculties with a very unfit lot of men. My belief is, of course, that a teacher should have very many points of contact with life if he is sufficiently enriched intellectually to be a leader of the young. The expression was used in an informal discussion and not as a part of a regular address. I was combating, as I suggested, the tendencies of universities and even high schools in looking for specialists in some nar-

row field, instead of men who had intellectual vision enough and strength enough to make themselves more than specialists. From my standpoint true specialism is the result of *cumulative* processes and under no circumstances the result of *eliminative* processes."

This is worth reading again and again, especially that one sentence in which he says, "My contention was that the eagerness of the universities to secure specialists had led to the filling of faculties with a very unfit lot of men."

But a university is only a parallel of human life in other things. If the man in the store knows nothing but his goods, the minister nothing but his theology, the lawyer nothing but his sheepskin books, he exists within a very limited shell. Let your interests range from the infinitely great to the infinitely small, including every phase of mankind; if not, the result is, as Coulter says, an unfit lot of men, and Coulter is right. The result of intense specialization and the withdrawing of sympathies from other interests may produce a great specialist but it does not produce a man.

When Leaves Grow Old.

BY EGBERT T. BUSH, STOCKTON NEW JERSEY.
By permission of the publishers, Sherman, French & Company, Boston, Massachusetts.

When leaves grow old, a glorious change
From green to tints of flaming red,
Of gold and purple,—passing strange,
When all will soon be brown and dead.
They lend to earth and air and sky
A softer touch, a kindlier cheer,
And scatter joy as days go by,
Though death and nothingness are near.

'Tis written so, old men grow gray;
But why should age be dark or sad?
By the same law old leaves look gay,
And closing days are doubly glad.
Let man so learn; dispensing cheer
From gathered joys of days long past,
May he grow happier year by year,
Like theirs, his brightest days his last.

Devotion.

Alice—"Why are you taking up botany?"

Kitty—"Because my fiance is interested in a plant of some kind and I want to be able to converse intelligently with him about his business."—Brooklyn Citizen.



A Real Nature Study School.

I have observed nature study in a wide range of schools both public and private, and I find every gradation of interest in the subject and of efficiency in its presentation. It may be commendable to pin a butterfly on the wall or keep tadpoles in a fruit jar, provided the butterfly has been well chloroformed and the water kept well aerated. But in my opinion nature study of that type does not go quite far enough. I believe it is a good thing to correlate nature with the school studies and have nature study as an aid, but I believe that, especially with young children, it is better to correlate the school studies with nature study.

I have felt for many years that nature study is too often the tail of the kite, sometimes only a small part of the tip of the tail. But even that is commendable. Think of the loss if it were not for that tip found in so many schools. There are schools, in the country or near to the country and not a thousand miles from where I am dictating this article, that are, pitiful as it may seem, as barren of nature study as the sands of the Sahara are of garden vegetables, and one may travel among them for months and not find a cheering oasis. But turn from these dismal pictures of the pitifully small or the completely absent and contemplate a light that is set on a hill, on a high hill in unobstructed view from horizon to horizon, where the aim of the principal and the owners of the school is not merely to provide nature study for their own school but to show others how to provide it.

I believe that Mrs. Charles Tarbell Dudley of the Wabanaki School, Greenwich, Connecticut, is a pioneer that has blazed a trail that other private schools might well follow. She

has done for the private school what Dr. Elliot R. Downing of the Chicago Board of Education has been doing all his life for the public school. I once spent a week in Dr. Downing's Normal School when he was the nature and science man at Marquette, Michigan, and not a single thing was lacking to meet the ideal of perfect and complete nature study. He did what others talked about doing or longed to do, or what they talked about doing and perhaps did not really want to do. Their only wish, I sometimes think, is to hear the sound of their own words. But Dr. Downing has put nature study into the public schools in a thoroughly efficient manner, and he has taught teachers how to teach it. Unquestionably he is the great man in normal schools of this country and in this connection it should be understood that I must also speak of the remarkable work done by Dr. Liberty H. Bailey and Mrs. Anna Botsford Comstock at Cornell University. They have labored in season and out of season and successfully to show teachers how to put nature study into the public schools. Where the teachers that have been trained by Dr. Downing, by Dr. Bailey or by Mrs. Comstock have secured the active support of the school officers the work has progressed effectively. But, aye, there's the rub. Many a school likes to imagine that it has nature study and some of them do have it, but these are not so plentiful as those. Some clubs of Camp Fire Girls go into the woods and think they are then in nature, that because there is wild nature around them they are going to imbibe it with the air they breathe, as the Infusoria imbibe nourishment from the thin sap of a decaying infusion. It is not enough to be in nature or to talk about it, if one builds

around oneself a shell like that of a turtle. The turtle may all day be submerged but not a drop of water will penetrate his shell.

But to return to the Wabanaki School. Its location is ideal. It stands next to the ideal home of the naturalist, Ernest Thompson Seton, and Mr. Seton is inspiring these young people with the desire and the intention to get at nature with the heartfelt love of the Indian. He will show them how to make nature their real home. Too many of us treat the child as we treat the adult, but as Dr. Stanley Hall has said, "The child is in so different a world that it is almost impossible for us to imagine it." I think that he has somewhere used this illustration, "A reasoning electric light might well claim there are no shadows," for the simple reason that the light has never seen anything from the shadow's point of view. There is danger that we older ones will look at the young folks' world wholly from the illuminated point of the adult insight.

But Mr. Seton has the rare faculty of getting into the child world through the fancies, some of them fantastic and at times almost ludicrous, of the primitive Indian, and he seems to be convinced that this is what the child needs. We predict that the Ernest Thompson Seton Chapter of The Agassiz Association will take the lead, if our other private schools are not watchful, in the real heartfelt method, in the real educational efficiency of getting near to the heart of nature. The pupils and teachers study, play and sleep out of doors. It is really a school in nature.

Any parent desirous to place a child in that kind of environment should send to Mrs. Dudley of the Wabanaki School, Greenwich, Connecticut, for the catalogue of the school that has taken this totally new point of view. It is not that she is doing something a little better; it is that she has taken hold of the problem by an entirely different handle. Perhaps you would like to have your boy or girl get into the environment amid these beautiful surroundings, magnificent buildings and in the company of a thoroughly proficient corps of teachers.

Appreciation of the Commonplace.

BY WILLIAM J. BLACKBURN, JR., COLUMBUS, OHIO.

We are prone to overlook the fact that most of the beauty in this world is spread out before us daily, and needs only to be looked at, to be appreciated. In this way we are apt to lose much of the sunshine and happiness which the Creator intended each of his children to enjoy. Too often "having eyes, we see not, and having ears, we hear not."

Anyone possessing the least bit of an artistic nature can see the glory of a brilliant autumn sunset, and must enjoy the hazy skies, the passage of belated flocks of birds on their trip to the sunny southlands, or the changing tints of red and gold in any Indian Summer landscape. Few, however, notice the fresh green of lawn and the orchard, the rare beauty of scattered, golden dandelions springing up here and there, or the drifting showers of leaves that fall noiselessly at the touch of each passing zephyr.

We love the fleecy purity of the first fall of snow, as it blankets hill and valley in whitest ermine, but we forget to examine a few of the perfect snowflakes—those marvels of geometric design.

We gaze in awe at the fiery trail of a flashing meteor, but rarely think to go out under the crystal skies of winter and look up reverently into the infinite depths of heaven and notice the majesty of the great constellations, the marvelous mistiness of the Pleiades, or the mysterious glow of the Galaxy.

Each time we notice one of the beauties of Nature—and Solomon has said, "He hath made all things beautiful in their time."—we add a real treasure to our store, and make our lives a little richer. Let it be the innocent smile of an infant, the ringing laugh of a little child, the song of a bird, the rich color of a flower, the chirping of a cricket, or the twinkle of a distant star—it has drawn us a little closer to the warm, sympathetic heart of Nature, and has made us a little nobler, a little truer, and a little better child of God.

CORRESPONDENCE AND INFORMATION

Which Was Artistic?

Glen Ridge, N. J.

To the Editor:

Referring to your parable, "Which Was Artistic?" it seems to me not so much a question of art as of harmony. A little gem of a marble palace with all the modern luxuries would be a discordant note in the forest which the rugged boulders and field stones would resent. The trees, themselves, would protest against the gleaming marble and stain it brown, green, black; the vines, the lichens, the mosses would cover its nakedness and time would mellow it, but it would be the melancholy mellowness of sterile decay, a satire on man's vanity!

On the other hand, Brown's conception of a fitting home in the forest would be harmonious, therefore artistic, and I am sure the trees would agree because Brown would say to them: "You are beautiful because I love you!" and, as there is no real love without sacrifice, the sacrificial axe must fell a noble tree, the saw must shape it into slabs and planks to build the man's home, and, lo, the hidden beauties of the tree are revealed by the polished panels which adorn the inner walls of the man's house!

Cordially,

LOUIS CORTAMBERT.

The Passing of the Apple Turnover.

Boston, Massachusetts.

To the Editor:

"Backward, turn backward, O time in your flight,
Make me a child again just for tonight!

That is what I became while reading your article on the loss of the apple turnover, a child in a pinafore, with braided hair tied with brown ribbon, standing with clasped hands waiting for a turnover to cool.

I had not thought of turnovers for

forty years but now I will make some. I can make the edges "stiek." I know the sweet, spicy crust, but alas! the apples—where for filling can I find a string of sun dried apples, with their incomparable flavor, the rich, red brown sauce of dried apples, pared and quartered, strung on a string and dried in the sun? Such apples are no longer in the market. The last time I tried to get them to make "old-fashioned apple cake" the clerk looked at me pittingly, as if I were "the last leaf upon the tree," or so much belated that I cannot appreciate a good bleached apple. No fresh apple or pallid evaporated one can make the rich interior of the turnover to match the crisp outside. I will make some. I thank you for awakening the memory of that old-time dainty.

The old-fashioned dried apple is no more because the paring bee is no longer one of the social functions in the country, as it was when all the people for miles around were invited and came to help pare and string the apples for winter use.

When the late supper table was loaded with all the good things known to the expert cooks of those days, from baked beans to pumpkin pie and pound-cake never forgetting the lamented turnover, and after all had been disposed of and the apples were out of the way, the chairs were set back, the table pushed to a corner of the big old kitchen, with a chair on its top for the fiddler, then began the fun. The dance was on and "Money Musk" and "Fisher's Hornpipe," "Virginia Reel" and "Portland Fancy" held sway till the tall old-fashioned clock warned of the late hour and the miles of sleepy driving home.

Nowadays, "Pa" takes the apples and whisks them off to market in the "car." The apple bee is no more. The girls now dance the two-step and the tango. The fiddler no longer plays till he falls asleep in his chair. The good

times are gone, but why should there not be a renaissance of the turnover, commensurate with its merits, since its architectural construction is not a lost art as has been supposed? How could a mere turnover stand impregnable, and preserve its identity, after its very interior had been ruthlessly destroyed by the march of progress? Tell me that.

Very truly yours,

(MRS.) FRANCES E. SEANEY.

Why Potato Balls are Going.

To the Editor:

According to the current number of *THE GUIDE TO NATURE*, interest in the potato ball question continues. Let us look at the fundamentals of the question from the biologist's viewpoint. In the vegetable and animal world a basic fund of protoplasmic energy is vested by nature in a race. Species in the race have an allowance of protoplasmic energy which is less than that of the race. Varieties of a species have an allowance of protoplasmic energy which is less than that of the species. Cultivated potatoes represent varieties of a species belonging to a race, and we are therefore dealing with varietal groups which are short of stock in protoplasmic energy. What does that mean? It means that a cultivated variety will decline when it has reached cultural limitations. When a cultivated variety of potato, horse or man has reached cultural limitations it follows the laws which lead to senility of protoplasm. The first evidence of decline is manifested in the lessened functions of organs which are essential for purposes of procreation. In the case of man the desire for marriage is inhibited. Sociologists make a great fuss over sociologic factors in the question, and they overlook nature's little protoplasmic joke. In the case of the potato nature prevents development of seed but allows a variety to have a joy ride for some years longer with its tubers, before cultural limitations are reached. Finally nature calls her microbe agents to her aid and says, "Sic 'em! Go for those tubers!" Then the horticulturilists make a great fuss over cultural problems in the question,

and they fail to observe nature's little protoplasmic joke.

As a boy I often made thirty cents in a day for buying powder and shot by digging peachblows, Colebrook seedlings, Mercers, Prince Alberts and Cuzcoes. Where are these varieties of potatoes today? Gone; along with descendants of the signers of the Magna Charta and the Declaration of Independence, and for the same reason. Where today are the Morgan horses, Newfoundland dogs and Wilson strawberries? Going! Why? Because of the working of the law of cultural limitations. The logical end of culture is elimination of the race, with loss of varieties first. The more rapidly and thoroughly culture of an animal or vegetable variety is conducted by man, the sooner will that variety come to its protoplasmic end. A variety of potato goes to its long rest shortly after the ball is over. The reason why the birth rate is now falling in Aryan civilized countries is the reason why potato balls are disappearing. Nations will all go the way of varieties of potatoes and for the same reason. If any of your readers are really interested in the biologist's understanding of these questions they may step into a public library and call for a book entitled "Microbes and Men." In the index will be found various references to the subject of cultural limitations. Your readers will then cease to wonder why their blooded horses, cattle and fowls do not breed better, why their own families are dying out, and why their potatoes no longer have potent balls.

ROBERT T. MORRIS, M. D.

Concerning the Cat's Tail.

Stamford, Conn.

To the Editor:

You ask me confidently, "What is the use of a cat's tail?" Though flattered, my first answer must be that I don't know. I was not present at the creation.

If you had asked me about the kangaroo, now, I need not have confessed my ignorance. I might have told you how useful was the creature's tail as a thing to sit on, or perchance to maintain his balance when he comes down from a jump. Remembering the skele-

tons of prehistoric monsters in our museums. I might also have projected the theory (very reasonable in view of the kangaroo) that the nearer an animal is to primordial beasts, to dinosaurs, diplodoci and what the poet Spencer calls "mighty monosceroses with unmeasured tails," the more apt is he to have a huge and useful caudal appendix. But when you demand an answer to the cat, I am stumped; I am silent; I lay my hand upon my mouth lest I utter foolishness. I will patiently listen, however, to ten different evolutionists who give ten different explanations of the matter.

Thus I have been told on good authority that a cat's tail, like a dog's tail, is very useful in keeping the animal's eyes or nose from freezing when he curls him up to sleep in the bitter winter weather. This explanation pleased me greatly when I first heard it; for up to that time I had ignorantly supposed that a tail was a kind of emotional balance wheel, so to speak; that it was a primitive signal service, being used chiefly for wig-wagging the animal's feelings, and that it was quite as useful to me as to the creature that had it, since I could surely tell when a cat was angry or when a dog was pleased by observing how he wagged his tail. Then I was led to observe how foxes and husky dogs curl their bushy tails about their noses when they go to sleep in the cold, and that a few cats seem to make excellent use of their far extremities in the same way. The new theory seemed plausible, therefore, and based upon the facts; but the bottom fell out of it when I found that many cats which must sleep in the snow (wild cats or bay lynxes, for example) have no tails to speak of, while Persian kittens, which once lived in a warm climate and now sleep in a basket by the fire, grow tails of extraordinary and most useless proportions.

Again, I have been told that the cat's long and sensitive tail is useful for safety, giving instant warning when the creature is approached or touched from behind. But if I *had* been present at creation and been consulted in the matter, I might presumptuously have suggested that the cat's tail be given to the rabbit, who seems, in respect of

safety at least, to have the greater need of it.

All such explanations of the cat's tail move me to append a second answer to your interesting question; namely, that naturalists, like other people, are generally inclined to assume a fact before they explain it. For most of us are still unconsciously following the old deductive system of philosophy, which we thought was discarded long ago, but which still has a stranglehold upon our thinking.

This system, you remember, starts with a general principle or accepted truth, and explains a multitude of details in the light of it. In the present case it is assumed as a general principle that "everything in nature has its use." This is an accepted saying (I think I have seen it frequently quoted even in *THE GUIDE TO NATURE*) and is accepted so generally that it has become a truism, like "Two straight lines cannot enclose a space" and other fundamental propositions of geometry. In consequence, our logic runs somewhat as follows: "Everything in nature has its use; a cat's tail is a thing of nature; therefore it is useful." Whereupon your question follows as a matter of course, and we exercise our ingenuity or inventive faculty in answering it.

A more reasonable method, it seems to me, would be to ask, not "What is the use of a cat's tail?" but "Is the cat's tail of any use?" The former question blinds us by an assumption; the latter leaves the mind open for wisdom. Asking the former we proceed to invent reasons; asking the latter we open our eyes to discover what use the cat makes of her tail. Nor will our discovery be complete until we have a good look at the Manx cat, which is tailless.

This commonly accepted principle of ours, that everything in nature has its use, seems to me to rest on very shaky foundations. The sooner we forget it the sooner, I think, shall we begin to see things as they are, not as we would have them be in order to fit our various assumptions of a mechanically evolved or made-to-order or made-by-chance universe. Some things in nature are doubtless "useful" in the

ordinary or practical sense of the word; but quite as many other things seem to be happily ornamental, and a considerable number are apparently superfluous. Yet these superfluous things and creatures (superfluous, that is, from our modern or practical or evolutionary viewpoints) often seem to have in abundant measure what we mortals strive for, and commonly strive for in vain; namely, the joy of being. If there be any reason in this infinite variety, which includes the cloud with its rainbow and the humming bird with his jeweled throat, it may possibly be an object lesson to keep us, in our craze for efficiency, from becoming too practical and estimating the value of a thing solely by its usefulness.

So, whenever I meet a man who explains the use of everything in nature, or who starts with any other assumption and measures the life of animals by it, I am inclined to place him in that large and somewhat dogmatic class of naturalists who are theorists rather than observers. Also I quote Emerson's "Rhodora," and thank heaven for a nature which leaves us still with a few mysteries on our hands.

Very sincerely yours,

WILLIAM J. LONG.

A Penikese for the Country Lover.

I may also recall the great example of Agassiz at Penikese. In his last year, broken in health, feeling the message he still had for the people, he opened the school on the little island off the coast of Massachusetts. It was a short school in one summer only, yet it has made an indelible impression on American education. It stimulates one to know that the person who met the incoming students on the wharf was Agassiz himself, not an assistant or an instructor. Out of the great number of applicants, he chose fifty whom he would teach. He wanted to send forth these chosen persons with his message, apostles to carry the methods and the way of approach. (When are we to have the Penikese for the rural backgrounds?)—L. H. Bailey in "The Holy Earth."

We have it now, to a certain extent, here at ARCADIA. We will have it in all fullness when this is correspondingly developed.—E. F. B.

The Falling of the Leaves.

BY J. WARREN JACOBS, WAYNESBURG, PENNSYLVANIA.

How sadly sweet, how soft the sound,
Is the falling of the leaves;
How doth this aching heart abound
In grief and ever throbbing wound,
In the searing of the leaves!

When Nature, with a golden hand,
Bedecks the leaves with color,
And all the hills throughout the land
She touches with her magic wand,
My heart, with joy, grows fuller.

But soon the reaper, swiftly comes
To numb my rapture with pain,
Whilst from the trees, he deftly combs
The gaudy leaves, where'er he roams,
Over hillside, woodland, plain.

As Nature, to her own laws, bow,
I feel my heart's ebb flowing;
A something reigns in stillness, now,
From ev'ry naked, bleaching bough,
To keep my soul's work going!

In song of bird, and ev'ry tune,
The same low dirge is calling,
Beneath the sun, at rosy noon,
Or when the light of silv'ry moon
Is o'er the twilight falling.

I go into the forest, bare,
To dwell among Nature's dead;
Upon the ground, and everywhere,
They're strewn in sweetest fragrance
there,
Silent to my bended head.

In ev'ry dell I chance to wade
Through beds of leaves about me,
Of red and yellow, and a shade
Of brownish-golden, Nature made,
Their rustling sound doth haunt me;

For soon their rustling time will end,
And their faces sink to earth;
For dust they are, again to blend
In life, and on until the end
Of all time, and life and death.

And now, I see, I see my place!
'Tis but a leaf still swaying
Upon the tree, by God's own Grace,
To Nature, giv'n for all the race,
To His sweet will obeying.

And as each leaf has helped the tree,
And done its earthly mission,
So thus, my heart hath spoke to me,
Commanding that my life shall be
As one of calm submission!
Waynesburg, Pa., October 12, 1916.

The oldest turquoise mines of the world are in the Sinai Peninsula. They have been worked off and on since 4500 B. C. and their product was probably known to the ancient Hebrews.



THE AGASSIZ ASSOCIATION

Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

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- Mr. S. Paul Jones, Waukesha, Wisconsin.
- Mr. B. D. Miller, Schenectady, New York.
- Mr. W. A. Bentley, Jericho, Vermont.
- Mr. Louis Cortambert, Glen Ridge, New Jersey.
- Mr. Jesse G. Cockram, Woolwine, Virginia.
- Mr. Thomas Flint, Glen Ridge, New Jersey.

* * * * *

Sustaining:

- Mrs. S. O. Edmonds, Sound Beach, Connecticut.
- Mr. Charles Nevers Holmes, Newton, Massachusetts.
- Mr. Ernest Thompson Seton, Greenwich, Connecticut.
- Mr. Edward S. Wilson, Bridgewater, New Hampshire.

* * * * *

**Payment of the Remainder Due on the
Land of The Agassiz Association.**

For aid in clearing the debt on the land of The Agassiz Association we are more grateful to our friends than words can express. Not only the total of \$1,250 has been pledged but enough additional to cover the accrued interest of \$8.83 and the expenses of the printing and correspondence in obtaining this aid and to give a small surplus to the general expenses of the A.A.

- Cash, Stamford\$ 5.00
- Mr. Amos W. Avery, Greenwich 5.00
- Mr. Arthur F. Estabrook, Boston, Mass. 50.00
- Mrs. John Walker, Riverside, Conn. 5.00
- Mr. Russel A. Cowles, Greenwich 10.00
- A Friend, Sound Beach 10.00
- Mr. R. L. Agassiz, Boston, Mass. 25.00

- The Brunswick School, Greenwich 5.00
- Interested, Sound Beach 1.00
- Mr. Benjamin F. Palmer, Sound Beach 25.00
- Mrs. George Lauder, Jr., Greenwich 10.00
- Mr. William L. Marks, New York City 10.00
- Mr. Morton C. Nichols, Greenwich 10.00
- R. Hertzberg, M. D., Stamford 10.00
- Mr. Samuel P. Avery, Hartford 25.00
- Mr. W. H. Truesdale, Greenwich 10.00
- Mrs. Mortimer B. Foster, Sound Beach 29.00
- A Helper, Sound Beach 1.00
- Mr. John D. Chapman, Greenwich 10.00
- Mr. Charles H. Lounsbury, Stamford 5.00
- Dr. Ernest J. Lederle, Stamford 5.00
- Mrs. Belden B. Brown, Stamford 5.00
- Mr. Dwight F. Boyden, Greenwich 10.00

	\$ 281.00
Previously acknowledged ..	1,015.00
	\$1,296.00

* * * * *

For Growth and Efficiency.

Members and other friends who have aided in the general expenses of The Agassiz Association.

- Mr. Morton C. Nichols, Greenwich\$ 5.00
- Miss Dorothy A. Baldwin, Cambridge, Mass. 5.00
- Mr. James Maher, Greenwich .. 10.00
- Mrs. Benjamin F. Palmer, Sound Beach 10.00
- Mr. Frank J. Myres, Bethlehem, Pennsylvania 8.50
- Mr. P. W. Tuthill, Greenwich .. 10.00

Academy Pupils Visit ArcAdiA.

A party of twenty-six, including two Chapters of The Agassiz Association from the Greenwich Academy, visited ARCADIA yesterday afternoon from five to half-past seven. The party was first conducted through Little Japan, and thence to the Observatory, where they saw our moon and the planet Jupiter and his four moons. It was a perfectly clear night and the heavens were beautiful. The party afterwards repaired to the Welcome Reception Room where a bright fire in the spacious fireplace and a generous supply of hot chocolate and luncheon were awaiting them. Here the party was entertained with music and at the request of Dr Bigelow sang some of the songs with which they were familiar.

Dr. Bigelow then addressed the company, saying in part that The Agassiz Association was an association that had members all over the world, and that all the members were equal in power, for there was no chief. He impressed upon the children the beauty that they could find in the smallest, and apparently most commonplace objects, in nature that surrounds them on all sides. Then he added that in finding of such beauty there is a pleasure that leads to an increased joy in and that Science leads to, rather than from, religion.

Six new members were initiated into the Academy Chapters, with the usual ceremonies under the Swiss Cross.

The powerful electric lantern, with the aid of microscopes, revealed to the company some of the wonders of nature to be found in the study of plants, animals and insects.—The Greenwich News and Graphic.

A thousand times have I sat beside a rippling water-brook far from the haunts and contentions of men and felt every fibre of my system thrill with the unspeakable joy of God's kindly presence. The splendid impressive solitude, the luxuriant foliage, the happy birds, the caroling stream at my feet filled my soul with soothing peace, the peace that passeth understanding.—Kit Clarke, in "Forest and Stream."

We Boldly Let the Secret Out.

Occasionally the workers in ARCADIA bear in a roundabout way some such remark as this: "Look at the way those Bigelows work. There must be something in it for them. Look at the contributions of cash and other things that go to ARCADIA. Surely no people would work as they do unless they had a good fat job."

We hereby extend public thanks to all those that in any manner have expressed appreciation of our zeal. Perhaps there is no higher compliment, especially from some of those who have made the remark, than to say that we are working as if we were digging in a gold mine. My friend, we are. Pure gold and plenty of it. We are getting fat and rich with the joy of aiding. We are accumulating great things as we see it personally, and in our enormous correspondence from shut-ins at hospitals, from cripples, from professional people at their desks, from those kept bowed down to their daily tasks, whether it is in the kitchen, the office or the factory; from those who get their only contact with nature through our pages. We reach those who are bedridden and see the wild woods and fields and look at the birds only in the pages of THE GUIDE TO NATURE. Yes, we are working in a gold mine. Here is a sample of it. Read this letter.

LORA L. WALKER

DEALER IN

SHOES & FINDINGS

GENOA JUNCTION, WISCONSIN.

Genoa Junction, Wis.

Oct. 21st, 1916.

Mr. Edward F. Bigelow,
Sound Beach, Conn.

Dear Sir:—

Inclosed please find check for \$1.00 to renew my subscription to THE GUIDE TO NATURE which is now past due. I should have sent you the dollar sooner but just couldn't spare it until now. I enjoy your magazine so much that I can't give it up, though I know I ought not to afford it when we are having such a struggle to make a living. The love of nature is one of my chief joys, especially the birds and flowers, but I am interested in every phase of it. If I were only rich enough

I would go to Sound Beach and spend a long visit in ARCADIA learning and helping as I might. I should then get well fast. As it is I have to stay shut up in a small shoe store and manage the business for a living for myself and mother. Some of my spare time is spent in reading *THE GUIDE TO NATURE* (which is improving all the time) and in studying Gray's Botany.

I think you are doing a much needed work. Wish I could help you financially. May God bless you all, for even though we are strangers we are one in our interest in nature and in nature's God.

Sincerely yours,

MISS LORA L. WALKER.

There you have it, my friend. There is a good sample of the gold mine. Come and work here with the same zeal; come by your gifts, come by your good words, come by your contributed articles, and gather to yourself great heaps of riches from the hearts of devoted nature students all over this world. This is a sample. Yes, the Bigelows are working as if there must be "something in it for them." There is so much in it that this life will not be long enough and these energies not sufficient to exhaust this gold mine.

Another Devoted Student.

Woolwine, Virginia.

To the Editor:

I am almost a helpless cripple; can't walk at all, and haven't for forty years. I am paralyzed from waist down by infantile paralysis in 1876, when five years of age. My feet and legs are little and limber; I cross my feet and legs and crawl about by the use of arms and hands. I am a great lover of nature and from boyhood have greatly loved the little honeybees. I have crawled off into the mountains near here many times in search of wild bees. I am a stargazer too. Wish I had a glass to view them with. I could pass the time so much better at night looking at those wonderful things above. My thoughts on those things are too deep to express. I see a lonesome time here away off in the mountains. Seldom get out to church. Am most of the time by myself in a little log cabin on my father's old run down

mountain farm that was built thirty-two years ago for a shoe shop. As I could not walk, my father said I might learn to be a shoemaker, but I had a poor chance at this trade away off here in an out-of-the-way place, and no one to teach me. I never went to school but three days in my life, and that was before I got so I could not walk. I have studied hard at home and have learned to read and write. I now have worked hard and bought me some bees and have a little apairy around this little fourteen by twelve log cabin, but I have a hard way to live selling a little honey, and leather has got to be so high I cannot buy it and work it and sell my handmade shoes so I can live at it. I wish I could be where I could have a better way to live and have a little enjoyment while I live.

Yours truly,

JESSE G. COCKRAM.

This earnest student who carries on his studies under evident difficulties has been enrolled free as a member of The Agassiz Association. A microscope and some nature literature have been sent him.

I am deeply interested in the good work of our Association, and appreciate the sacrifice and effort of our president and others who have made this work possible. *THE GUIDE TO NATURE* brings added sunshine into the lives of many a nature lover over the length and breadth of our land, and helps to prove that we Americans are not so mercenary and unappreciative of art and culture, as some of our critics would make us out.—William J. Blackburn, Jr., Columbus, Ohio, Corresponding Member 2252.

The Witching Out-of-Doors.

Come, all, and get acquainted
With the witching out-of-doors,
'Tis appealing to your senses,
And besieging all your pores.

The freshness of the morning,
The glory of the night,
The radiance of the hours between,
Filled with sunshine bright.

They're better than a tonic,
They beat the M. D. quite,
They'll give you happiness and health,
The mantle of their might.

—Emma Peirce.

Dr. Hertzberg's Appreciation of The Agassiz Association.

Dr. G. R. R. Hertzberg of Stamford recently inspected the equipment and work of The Agassiz Association and as a result soon afterwards sent Dr. Bigelow the letter published herewith. This letter so preeminently has the right conception of ARCADIA as a nature institution of world-wide value as to be worth careful consideration. It not only well portrays the dignity of the ambitions and scope of The Agassiz Association as meriting the devotion of a lifetime and many thousands of dollars, but tends to correct popular error on the part of those who insist upon looking on nature study as a fad or hobby well enough to be given in moderate doses to the children or to be dabbled in by a fanatical few.

My dear Doctor Bigelow:

Permit me to contribute the enclosed small check of ten dollars toward releasing ARCADIA from the bondage of debt. Let us hope that in the very near future The Agassiz Association may start the collection of an endowment fund, the income from which shall serve to pay you and your able co-workers a living salary.

This work I am sure, would be carried much beyond even its present magnificent scope by you, were you able to give to it all your time, unharried by material care. I firmly believe that The Agassiz Association owes it to you and to itself, to finance the work in such a manner, as to enable you to devote all your splendid powers and energy to this task alone. The potential power of ARCADIA even at the present status is a thing of wonder. Its capacity and facility as arranged by you to reach every student, no matter of what age or what his bent, cannot be excelled with the equipment and material at hand.

It must be a revelation to the visitor to ARCADIA who has heard of it as a thing to amuse children to see the facilities given to not only children, but to any and all nature students of whatever age, to follow any line of "nature study," be it the unravelling of the mysteries of the starry heavens, or the community life of the busy bee, or the entrancing life metamorphosis of the lowly caterpillar, or to make the

acquaintance of our numerous beautifully garbed and flute-throated, feathered friends, or a knowledge of nature's very own carpet, woven in growths of wondrous beauty, by which she covers even the coldest and roughest places of the earth, plants and flowers, shrubs and vines—always something new, something more beautiful than seen before. All this you have opened up to any and all who may want to learn.

To bring to people a love of the great outdoors is to make them live fuller and richer lives. Every man or woman that loves the green fields, the woods and the creatures of the air and the wild places is a better man or woman for that love. For in attempting to solve the mysteries of the little lives around us, we are taken out of ourselves, away from the petty cares and vexations of daily life and our identity merges into the sublimity of the creation and we forget our troubles and tribulations.

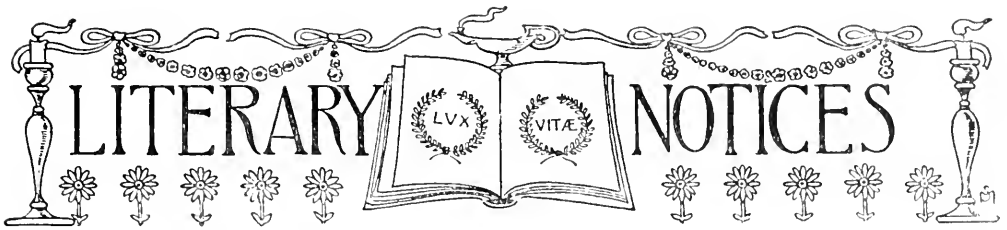
To afford to limitless numbers of all kinds and conditions of people, an opportunity to start where they wish and to go as far as they like in their study of nature, is certainly a great work and should receive recognition and encouragement. In your arrangement of ARCADIA, your unselfish and untiring devotion to your ideal, and in your desire to spread this love of nature, you have accomplished a task that any man may well be proud of, and I hope that many years may be given you to carry on this chosen work of yours on a larger and unhampered scale.

Yours sincerely,

(Signed) R. HERTZBERG.

Personal Expression for Public Good.

We begin to approach this time by the support, through semi-public agencies, of persons to accomplish certain results or to undertake special pieces of work, particularly of research; but we have not yet attained the higher aim of endowing individuals to express themselves personally. There are liberated personalities, rare and prophetic, who are consumed only in making a living but who should be given unreservedly to the people: the people are much in need. Never have we needed the separate soul so much as now.—L. H. Bailey in "The Holy Earth."



A GLOSSARY OF BOTANIC TERMS WITH THEIR DERIVATION AND ACCENT. By Benjamin Daydon Jackson. Philadelphia, Pennsylvania: J. B. Lippincott Company.

This is a revision of the author's well-known glossary and contains much new material with some slight changes. It is convenient for those who wish to have a neat little dictionary of botanical terms.

A TEXTBOOK OF BOTANY. By William F. Ganong, Ph. D. New York City: The Macmillan Company.

Although Professor Ganong is known the world over as a technical specialist in botany, he has not lost his sympathetic interest in the general reader and student. While this book is written especially for college students and is a masterpiece of its kind, it will be of great interest to all naturalists.

CONSERVATION OF OUR WILD BIRDS. By Bradford A. Scudder. Boston, Massachusetts. Massachusetts Fish and Game Protective Association.

This is a convenient handbook describing methods of attracting and increasing our useful birds and the establishment of bird sanctuaries. Particularly helpful are the tables of specifications for the building of nesting boxes for different kinds of birds. The book is convenient and inspiring.

A HANDBOOK OF AMERICAN PRIVATE SCHOOLS. By Porter E. Sargent. Boston, Massachusetts: Porter E. Sargent.

What this book fails to record in regard to private schools is not worth recording. It gives a complete description not only of schools but of camps, periodicals, teachers' agencies, publishers of books, magazines, printers of school catalogues, manufacturers of schoolroom equipment and uniforms. A third edition for 1917 is in preparation and school authorities are requested to send particulars.

HOW TO MAKE FRIENDS WITH BIRDS. By Niel Morrow Ladd. Garden City, New York: Doubleday, Page & Company.

This handbook tells in a simple and interesting manner the best methods for the conservation of bird life. It gives full descriptions of bird houses, baths and drinking fountains; discusses the question of bird enemies and the means of lessening their depredations; shows how trees and shrubs may be properly planted to attract

birds, and treats of winter feeding as well as the natural food of birds, touching upon their economic value in the destruction of insect pests. It is helpfully illustrated by many beautiful photographs and drawings.

TREE WOUNDS AND DISEASES. By A. D. Webster. Philadelphia: J. B. Lippincott Company.

It is now a well appreciated fact that shade and forest trees need the doctor as much as do human beings and live stock. Most of us who live in the country and those who enjoy their recreation in parks are devoted to certain trees as to real friends. This book is written with the distinct object of bringing home to those responsible for trees that at a small outlay of labor and expense the lifetime of old, historic, or accidentally damaged specimens may be greatly extended.

When left to themselves, cavities or hollows in trees gradually increase in size until the ascending sap is entirely cut off and the tree ruined. The same dire results follow from the neglect of injured bark, poor pruning, fungus growth, bad soil and atmosphere effects and diseased branches. The author in a lucid and thorough manner tells you how to go about their cure and how to take preventive precautions. It is a first-rate book and will be of real value.

THE FLOWER-FINDER. By George Lincoln Walton, M. D. Philadelphia, Pennsylvania: J. B. Lippincott Company.

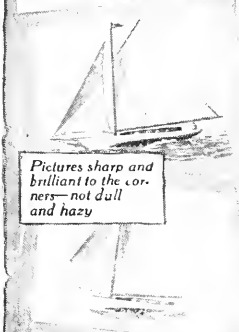
This is an identification handbook for the novice who must learn to recognize the wild flowers he would study. The author says:

"The study of wild flowers offers an unrivalled diversion for one who, on retirement from active work, feels the need of something to replace the interests which have hitherto absorbed him. It is also well for the plodder, in danger of going stale from too protracted toil, to improve such opportunities as offer for the broadening of his horizon before it is too late. It gives one a tangible interest in the open, and displaces the familiar worries by substituting a new and stimulating interest—an interest, too, that appeals always to our better side. Nor do I know of any pursuit in which so satisfactory progress can be made by the novice without such painstaking study as materially diminishes the value of the fad—that essential adjunct to every well-ordered life."



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The eighteenth volume of **Bird-Lore** begins February 1, 1916.

Volume I contained 206 pages and no colored plates; Volume XVII contained 560 pages and eleven colored plates.

The magazine has grown, but the price remains the same.

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The Guide To Nature



1917

FEBRUARY

VOL. IX, No. 9

EDWARD F. BIGELOW

MANAGING EDITOR

Published Monthly by

THE AGASSIZ ASSOCIATION

ARCADIA, SOUND BEACH, CONN.

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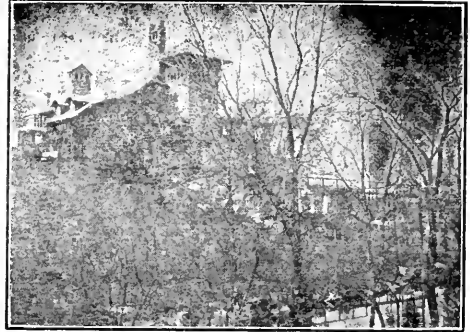
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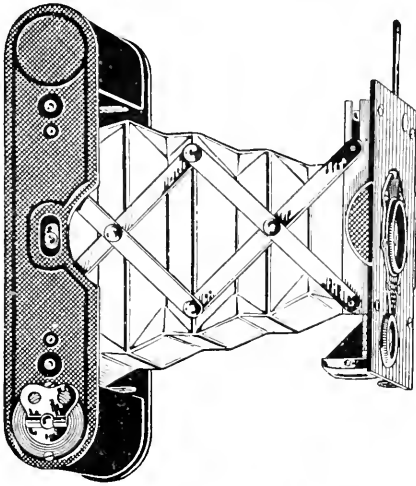
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Nature Responded too Much!

We were living in the Southwest. For weeks and months we had had no rain. Every day big, promising-looking clouds rolled up, broke apart and drifted away. Streams were dried up, vegetation was burning up and life was well-nigh unbearable to man and beast. From twelve to eighteen inches of sand and dust covered the highways; gnats made life hideous; heat parched our skin and throats. Rain was the only relief and rain we did not get. Every night at bedtime four-year-old Robert on bended knees by his little white bed asked God: "Please don't forget to send a nice, cool rain."

One day the big, black clouds rolled up as usual, but we noticed that they were all fringed with green. Pretty soon a big wind sprang up and leveled small houses and barns, broke down trees and scattered chickens, ducks, straw and haystacks all over the country. A big hail



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followed the wind and then came rain—a perfect deluge! Streams rose clear out of their banks and the water came creeping over the fields and toward the houses and cattle pens; pretty soon it had flooded the yard and was nearly to the door.

Small Robert, took a survey of the situation and then in a small, frightened voice said: "Daddy, don't blame it all on me. God had ought to knowed a small kid like me didn't need such a awful big rain."—Country Gentleman.



NO CHANCE FOR AN ARGUMENT.

When you and the "man next door" have those Sunday morning discussions, you differ on many points.

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Storm and Calm

By Don C. Fritz, Cos Cob, Conn.

I love the storm when great gales blow
And scudding mist in wrack lies low;
I love the storm when the waters roll
In breakers white across the shoal.

I love the storm when the oak trees tall
Bow to the winds, and brown leaves fall;
I love the storm when ripening grain
In wide waves ripples o'er the plain.

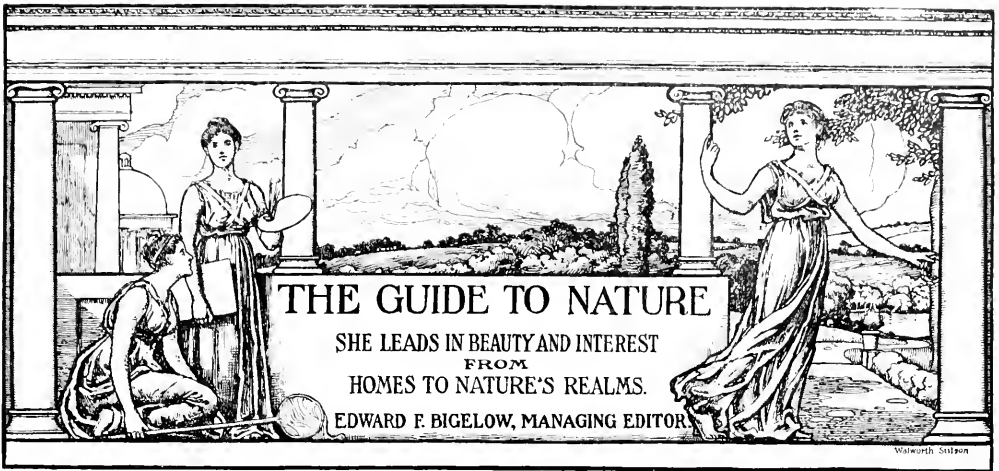
I love the storm when the thunders call
The gods to rise from their banquet hall;
I love the storm when lightnings play
And sullen cloud banks dim the day.

I love the calm, when the winds grow still
And sunshine brightens vale and hill;
I love the calm, and altogether
Whatever comes, I love the weather!



Photo taken near New Bedford, Massachusetts, by J. W. Jackson, of Belchertown, Massachusetts.

THE FOLIAGE OF WINTER.
Courtesy of "Tree Talk," Stamford, Connecticut



Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
 Subscription, \$1.00 a year
 Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

FEBRUARY, 1917

Number 9

The Friends and Enemies of an Oak Tree.

The words of the well-known fairy song, "Come to the old oak tree," have been used as a slogan invitation to the many parties that have gathered under the old oak tree at ARCADIA for demonstrations at the bee apiary. It seems a fitting place for the gathering of nature lovers and nothing could be more appropriate than this tree as an emblem of the AA and what it is doing in behalf of nature. It would be difficult to find anywhere another tree that suffered so long and so severely as this oak at the hands of its thoughtless enemies. In all the experience of the expert workmen connected with The F. A. Bartlett Company of Stamford, no other tree has had more extensive nor more skilled care than this tree has had.

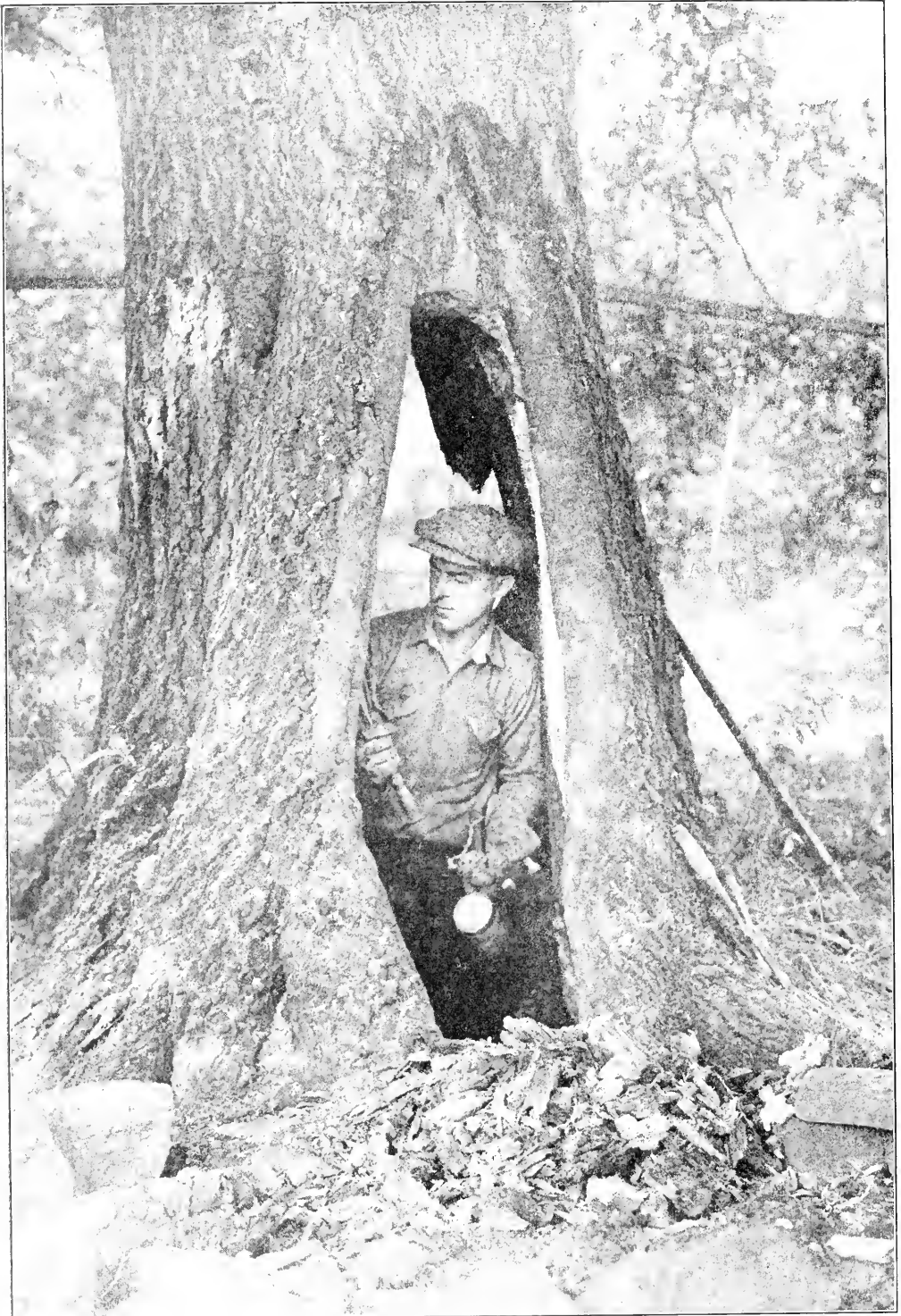
Its misfortune is that it stands near the skating pond and in the heart of a thicket where tramps and picnicking parties could have a rendezvous. The tree's good fortune is that it stands at the center of ARCADIA.

Some of the old residents of Sound Beach tell us that what is at present known as Nymphalia, a nature study park, was formerly a skating pond in frequent use every winter some thirty years ago, and known from the owner,

Archie Macaphee, who lived in a large house near-by, as "Archie's Pond" or "The Macaphee Pond." Mature men and women tell of their youthful experiences on this pond and recall that grandfather and grandmother said that from their earliest memory it had been a skating pond.

For many years, perhaps for a half century, winter after winter a bonfire was built against the tree until finally it was completely excavated with only a thin shell left on the side. What induced boys and girls for a half century to build a bonfire within a hollow tree would be hard to discover, but no greater evidence of the need of The Agassiz Association can be presented than this victim of thoughtlessness, this utter disregard of the dignity and the rights of a tree. Skaters were not the only offenders. The tree suffered in summer as well as in winter. With the approach of warm weather and the time for outdoor picnic parties, clam eaters gathered under the tree and there built their fires. When The Agassiz Association first took possession of the land it is no exaggeration to say that there was a cartload of clamshells in the vicinity of this tree and of one or two others that have suffered almost as badly and from similar causes.

It does not seem possible that the



CLEANING OUT THE DECAYING WOOD.

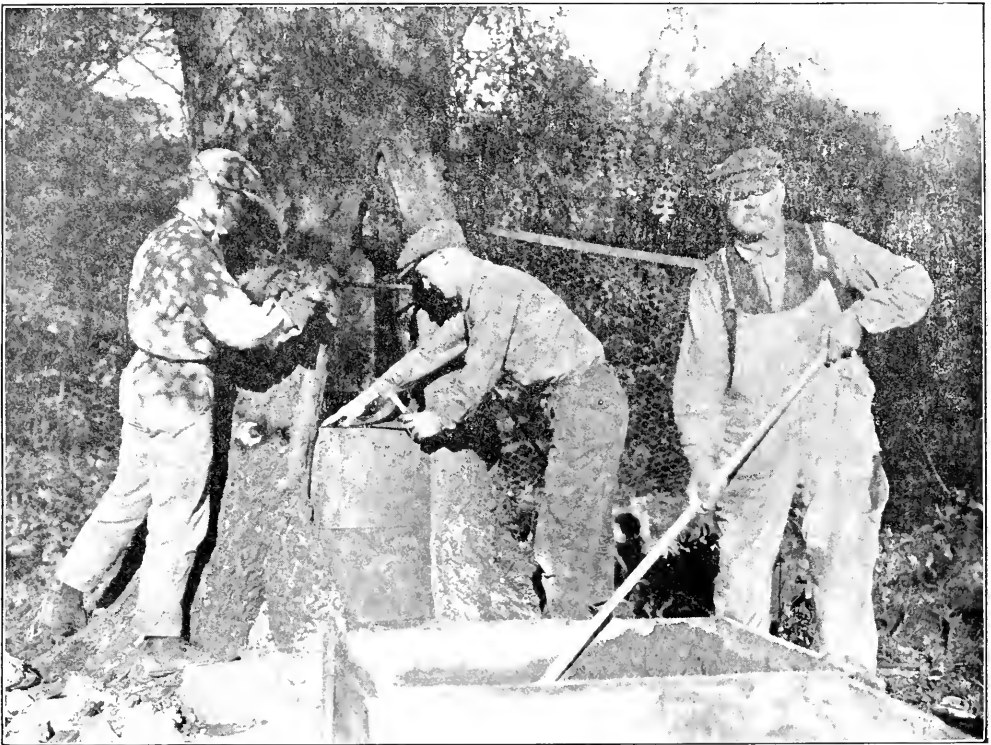
tree could have existed through another decade of such treatment. The supporting shell on each side of this monarch of trees was growing thinner and

thinner. The original circumference was eleven feet, lacking perhaps two or three inches.

Another of about the same size in

perfect beauty, symmetry and soundness of trunk is owned by Mr. Charles H. Knapp and stands on Park Avenue only a little way from ARCADIA. But Mr. Knapp's tree is fortunate in that it is in too public a place for the clam eaters and not near a skating pond. As soon as this tract of land came under the control of The Agassiz Association these depredations of course ceased. But in the expenses demanded in the development of our work and the time that had to be devoted to pressing work in the first few years, all that could be temporarily done to the tree

ARCADIA were put in the hands of The F. A. Bartlett Company of Stamford, especial attention was given to this monarch. First there was a thorough trimming. Huge limbs were cut off and the hollow interior was given a thorough overhauling. To remove every particle of decay with chisel and mallet was a long and laborious task of several days. The wood was then treated with an antiseptic liquid and the hollow filled with a series of layers of cement; between the layers a sheet of tar paper was placed to allow for the slight rocking of the entire pyramid of cement oc-



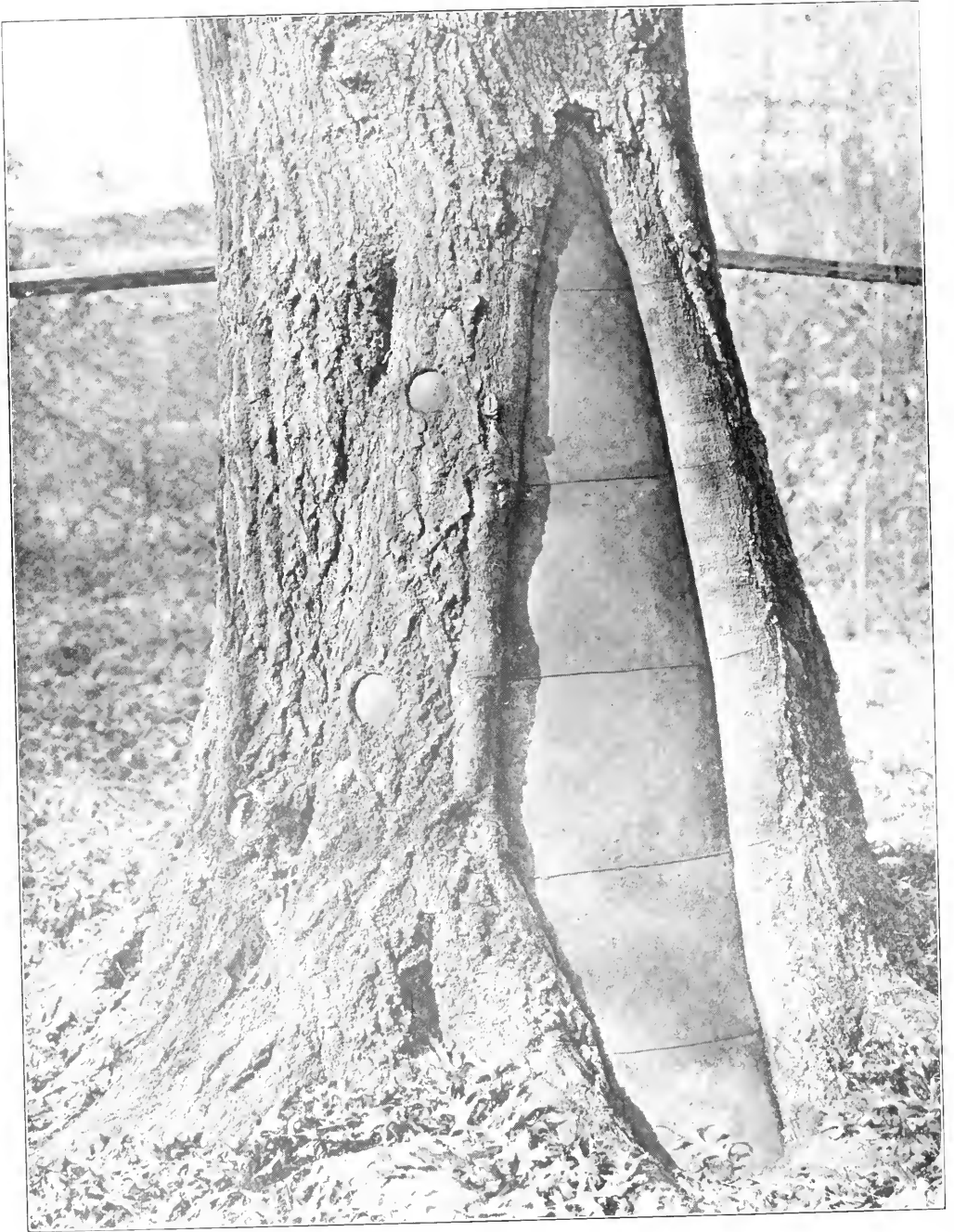
MIXING THE CEMENT AND PLACING IT IN SECTIONS IN THE TREE.

was done. The decaying of the limbs was due to the fact that the trunk could not carry enough nourishment to keep them in health. The tree was trimmed and the danger of the trunk's splitting completely apart was lessened by cables properly placed between the two main branches. The debris was removed from the ground and the trunk filled with cement and stone, but not according to the more advanced modern methods.

Recently when all the trees of AR-

casioned by the swaying of the tree in the wind.

From the extreme of depredation the tree has passed to the other extreme of the best possible care at the hands of these expert tree physicians. The accompanying illustrations show the progress of the work, and the completed picture conveys a good idea of the success that has attended the Company's skillful labor. Perhaps there is no other tree that can show to better advantage the triumphs of modern tree surgery.



THE COMPLETED GIGANTIC "TREE DENTISTRY."

It is a threefold masterpiece of nature, of its enemies and of its friends. In this renewed and rejuvenated form it extends its arms to every visitor and, grateful for what has been done for it, says, "Come to the old oak tree," for real nearness to nature.

"These spades are still the abode of gladness."

An Antidote.

Flee from the troubled street,
 Flee from the weary town,
 And with the eager wind go meet
 The shore and beaches brown,
 Walk off your "blues" in lonely miles,
 Wind-tossed, alone, and free,
 While still the wraith of summer smiles
 Beside the grayling sea.

—Grace E. Emerson.

Must Study Nature in the Open. Roosevelt Tells the Scientists.

TO WIN FIRST RANK, THEY MUST OBSERVE WILD THINGS IN THEIR NATIVE HAUNTS.

To obtain really great results the scientific naturalist must study nature out of doors. Theodore Roosevelt told scientists in a recent address at the formal opening of the New York State Museum. His theme was "Productive Scientific Scholarship."

"Let the scientific man realize that he must be a good first-hand observer of wild things in their native haunts if he is to stand in the first rank of his profession," the colonel said. "Let him strive to do original work, the work of original productive scholarship."

Col. Roosevelt did not belittle the value of research work in laboratories and studies, which was done by those whom he termed "closet men." Their contribution to science was invaluable, he held, but it must be rounded out and perfected by the observers in the field. He continued:

"There must be ample research in the laboratory in order even to present these problems, not to speak of solving them, and there can be no laboratory study without the accumulation of masses of dry facts and specimens.

"I do not for a moment mean that there should be any failure to recognize the need of such accumulation of facts, but I do mean that there should be an equally clear recognition that the accumulation of facts is only the beginning; that it is only laying the foundation on which the man of high ability must rear the superstructure.

"I also mean that from now on it is essential to recognize that the best scientific men must largely work in the great outdoors laboratory of nature. It is only such out-door work which will give us the chance to interpret aright the laboratory observations."

Col. Roosevelt said that the function of the museum should be to present to the people the knowledge of the natural objects of the countryside; it should aid in the study of nature from the utilitarian standpoint; it should aid the growing army of students who love nature without any set and immediate practical purpose, and it should give research facilities to the exceptional student, "the man who can supply that leadership without which it is so rare

for even the laborious and well directed work of multitudes of ordinary men to realize the ideal of large productive achievement."—N. Y. Evening Mail.

The Sweet Influences of the Plants.

BY MRS. FRANCES E. SEAVEY, BOSTON, MASSACHUSETTS.

THE GUIDE TO NATURE is beautiful—the flowers—the bees—your wonderful bees! It is interesting, especially the opening article. That is decidedly encouraging to one who timidly opens a book devoted to scientific research.

We all have more or less to do with "Plates, Puddings and Pies." If they can be lifted out of the commonplace to the realm of the beautiful, not to say scientific, we who spend a good part of our lives in the midst of them will feel a thrill of appreciation and gratitude too, for we know that there can be poems in puddings and psalms in pies, not to mention symphonies in salads. There is scope for artistic expression in the ensemble of Mr. McDermant's cuisine, and it is possible that his chef finds it hard to live up to, or cook up to, the concepts of his chief, for it is not the privilege of all to have the vision of the artist to whom food is not merely "something to eat," but the result of discriminating judgment in selection, skill and knowledge in construction, and the finished product a revelation of its author's character.

If one ate at the Stamford Lunch, one would expect to find geranium leaves in the apple jelly, pansies and the snow of whipped cream on the purple jelly and nasturtium leaves, buds and blossoms in the salad. The bees must have enjoyed his buckwheat fields (I have driven miles to see one in bloom). It is hard to say which is the more beautiful, that or a field of red clover. The buckwheat has however a charm that the other lacks inasmuch as the world calls to mind the ultimate manifestation of that purple field—in heaps of rich brown cakes smothered in honey. Nothing could excel that in poetical association I am sure.

Just can't get along without the little magazine.—Miss Anna L. Campbell, Lakewood, Ohio.

Not Wholly Lost but Getting Scarce.

The reader is familiar with the editor's lamentations over the things of the past that are disappearing. Life on the farm is rapidly changing, not only indoors but out, not only among men, but among the things of nature. We have lamented the disappearance of the potato's seed balls, and have noted the fact that after fourteen summers' search not one seed ball has been found in Connecticut, and nearly, if not quite, the same scarcity has been reported from some other states. Yet only a generation ago they were as plentiful as acorns under an oak tree. We have more recently deplored the loss from the kitchen of the old-fashioned hominy, or the coarser form known as samp so pleasingly described by John Greenleaf Whittier. We have also noted the disappearance of apple turnovers, and have incidentally referred to huckleberry hollow. A generation ago a variety of dishes made from hominy were common, and apple turnovers and huckleberry hollow at certain seasons of the year were made about as regularly as bread is now made.

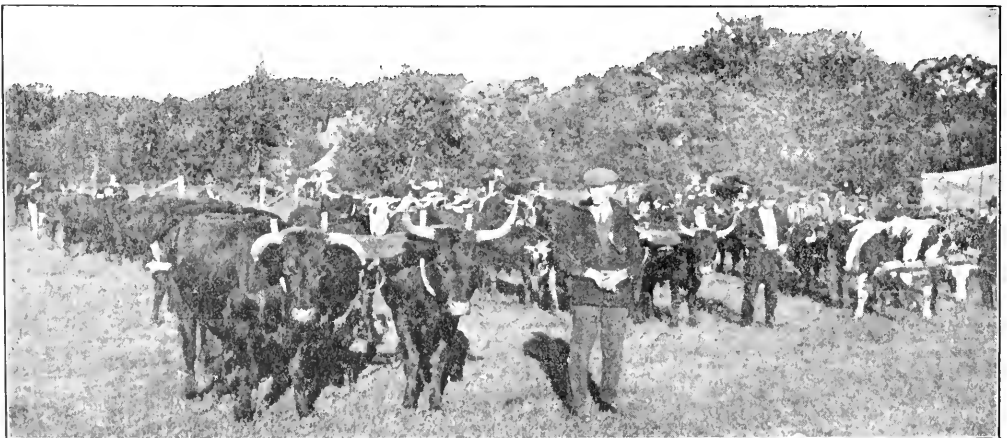
From the naturalist's point of view, we have lamented the passing of the passenger pigeon, until not one is left in all the United States, the death of the last one having taken place at the Cincinnati Zoological Park.

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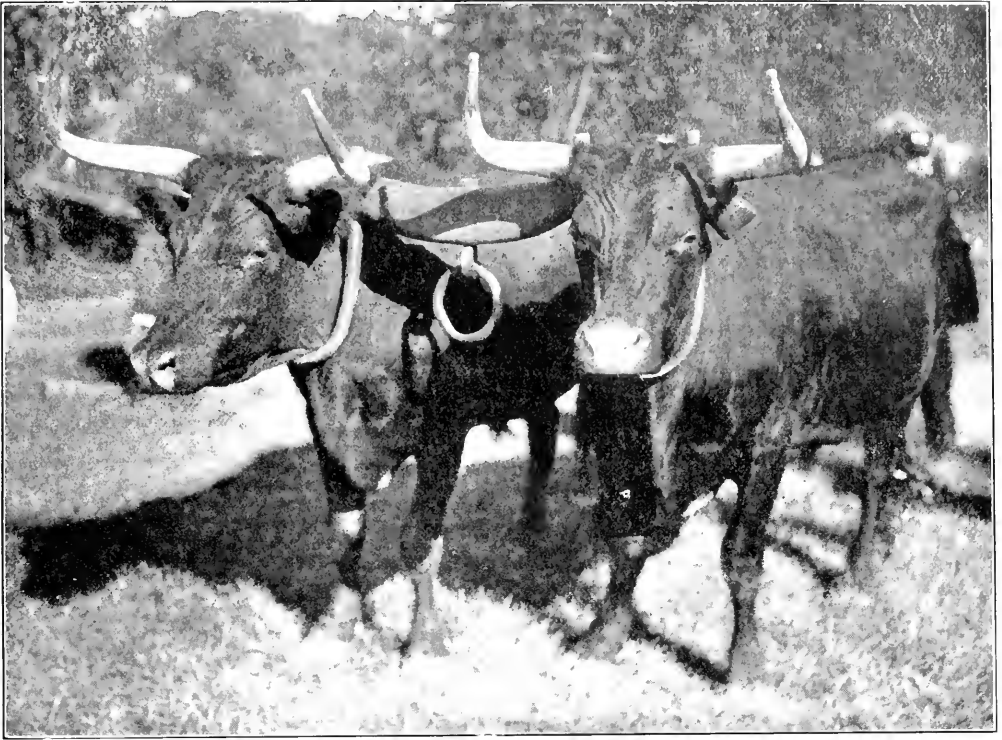
It is a curious fact that, within a lifetime, oxen were used on almost every farm but are now found only on a few in certain parts of the state. These

were supplanted by horses, and now the horse is fast being supplanted by the automobile. Beef cattle are also disappearing with the advance of such concerns as Swift & Company and Armour Company of Chicago. I have been told by several farmers that it is almost impossible to market beef cattle or to get them killed. The slaughterhouse is a thing of long ago. Forty years ago flocks of sheep might be seen in almost any pasture. Their enemy has been the dog. It seemed to be a plain, simple question, for at least the state of Connecticut, to decide whether we should have sheep or dogs. The decision seems to be in favor of dogs. Dogs are coming in, sheep are going out. Any one that doubts this should take a magazine like "Country Life in America," and note the increasing number of pages devoted to dog advertisements. Then take a drive through the country; not a sheep in any pasture. The human race does things queerly. The only meat producing animal thoroughly well adapted to the stony pastures of Connecticut is the sheep. But the people have said, "Sick 'em. Let's have dogs." They drove out the sheep, and then united in a unanimous howl at the high price of meat. Queer things, these human beings, aren't they?

The scarcity of oxen was emphasized emphatically at the seventy-fifth autumnal celebration of the town of Portland, Connecticut. Cattle for so many decades were there used so plentifully in the development of the



EXHIBITION OF OXEN AT PORTLAND, CONNECTICUT.



THE MAGNIFICENT YOKE OF PRIZE WINNERS.

Portland quarries, that they are remaining longer in that vicinity than anywhere else. There was a time when the entire work of the Freestone Quarries was done by the best oxen of the state. Those ponderous animals hauled the heavy loads of stone, and enterprising traders searched every nook and corner for the finest and heaviest, and for them paid a special price. At the recent celebration, some thirty oxen were brought in from the surrounding farms, and visitors were more greatly astonished by this display than by any other. Some visitors had never seen oxen in actual use on a farm. It is probable that a similar exhibition could not have been made in any other part of the state. The accompanying illustrations show this exhibit. Much as we may admire the oxen and love his patient, plodding ways, we know that he must be relegated to the museum in which we keep the warming pan and the candle lantern. It is incongruous to see a yoke of oxen in the fields, and a limousine dashing along the country road at the rate of a mile a minute. Things have become swifter since you and I were young.

Alas, and yet with joy we say it, we are in the era of the flying machine, and we have no occupation for an ox. Is it not curious, when we think of the sheep, that the very animals that have driven them out are the animals that took the best care of them? The sheep is proverbially associated with the shepherd dog. If you want to see a pretty, rural sight, go to the estate of John D. Rockefeller, Pocantico Hills, Tarrytown-on-Hudson, New York, and there see an old-time shepherd with his trained dogs. Those dogs seem to know as much as a human being. They care for the sheep. One might say with little exaggeration that they care for them as lovingly as would the shepherd himself. The sheep seem to realize that the dogs are their friends. The dog even tells them the best feeding ground, prevents them from going over the same ground twice, and guides them to the pasture in which grows the best and most succulent herbage. So here's to you, the friends of my boyhood. We recognize the fact that we must advance. Good-by, oxcart and oxen, and welcome, flying machine; good-by, Charles and

Kate, faithful horses, and welcome Ford and Packard; good-by, timid and mild eyed sheep, but it is not good-by, Don and Daisy. There are more dogs now than ever.

Sheep Breeding in Connecticut.

Since the foregoing item was put in type we have noticed an interesting article in "New England Farms and Connecticut Farmer" regarding the annual meeting of the sheep breeders of Connecticut. The members of that as-

Others made statements as follows: "Professor McNutt referred to the great number of sheep in New England a hundred years ago, and said there is no reason why the sheep industry cannot be as profitably conducted now, with the markets for mutton and wool so many times larger."

Angus Park, general manager of the Arlie Mills stated:

"The most serious obstacle today are the ravages of the flocks by dogs and he advocated adequate protection by



ON JOHN D. ROCKEFELLER'S LAWNS,
Pocantico Hills, Tarrytown-on-Hudson, New York.

sociation regard sheep breeding in Connecticut as profitable, more so than the breeding of any other animal, but they are unanimous in their assertion that the chief trouble is the dogs. In my own boyhood on a farm in eastern Connecticut, the dogs were then the chief obstacle, but evidently the difficulty has increased in recent years, so much so as to have almost completely annihilated the industry. President Charles L. Gold of Cornwall, said:

"At one time the farms in the state kept besides other stock more than 300,000 sheep more than are now carried. The number has shrunk to less than 20,000. The hills on every hand cry out for the sheep to come and redeem them. Brush and weeds and moss, have crowded out the white clover and grasses. Our pastures are gone, but sheep can reclaim them and our association is here to point the way."

the Legislature. 'If I had my way,' he said, 'no man should be allowed to keep a dog that had not had a college education. I do not desire the extermination of the dog but only that he be controlled.'

"Professor H. L. Garrigus of the Connecticut Agricultural College at Storrs said the reasons why farmers do not raise more sheep in the state is owing to the damage done by dogs and generally the too conservative appraisals made by the selectmen when the flocks are wounded and killed. The difficulty in getting breeding ewes was also cited in the discussion that followed. Others were in favor of keeping sheep, but the dog menace seemed to be the chief obstacle."

At a conference of the Philadelphia Wool and Textile Association recently held in Philadelphia, President A. C. Bigelow explained that the same trouble applied throughout the coun-

try. The dog was everywhere held responsible for the decline of the sheep industry.

No Abatement of Trespassing Evil.

Records of the New York, New Haven and Hartford Railroad Company for the fiscal year ending June 30, 1916, disclose no abatement of the trespassing evil, despite the earnest and extensive efforts of the Company to warn the public of the dangers incident to the use of the railway right of way as a public highway. During the past fiscal year, according to the New Haven records, 172 persons were killed while trespassing on New Haven property. This compares with 139 during the fiscal year ending June 30, 1915, and is an increase over that year of 33 persons. The total number killed and injured last year was 346, as compared with 270 the previous year, an increase of 76 persons.

During the year in which these accidents occurred the New Haven Railroad waged an active campaign against the trespassing evil. The Company tried in a most persistent way to bring to the attention of the public the perils of trespassing on railway property. In this campaign the co-operation of school superintendents has been enlisted and children have been warned to keep away from railroad property. Factories and mercantile houses have assisted by posting signs supplied by the Railroad pointing out the danger of trespassing. Efforts have been made to obtain the active co-operation of towns and municipalities, and particularly of magistrates and prosecuting officials.

In addition to its direct educational campaign, the New Haven has given as much publicity to the campaign as possible. In all 180,000 posters have been prepared. These have been posted where they may attract attention and the Company is continuing the distribution of them at regular intervals. The posters are placed in factories, schools, stations, freight houses, cabooses, crossing cabins, section houses, work trains, shops, car inspection cabins, interlocking towers, telegraph poles and various other places. These

posters are also being prepared in foreign languages in order that they may be read by the large foreign born population in southern New England. They are being printed in Italian, Greek, Polish and Hungarian. The newspapers throughout New England have also aided materially in bringing to the attention of the public the deadly peril of trespassing.

Despite this campaign and the publicity given to it, 33 more persons were killed last year than in the previous year.

It is the belief of experts who have made a special study of this problem that there can be no material lessening of the evil until stringent laws are passed and strictly enforced. This belief is based somewhat upon the experiences of other countries where trespassing is a serious offence and is punished accordingly. In the United States there are 35 states in which there are no laws regarding trespassing on railway property. In most of those states that have laws convictions are difficult to obtain and often after a conviction has been obtained sentence is suspended. Despite the fact that over 5,000 persons are needlessly killed each year in this country, it seems difficult to make any headway in the campaign the railways have carried on owing to the indifference of the public and to the lack of law or enforcement of existing laws about trespassing.

The Barometer in Diagnosis!

A Swedish farmer who lived on his wheat farm in Minnesota, was taken ill and his wife telephoned the doctor.

"If you have a thermometer," answered the physician, "take his temperature. I will be out and see him presently."

An hour or so later when the doctor drove up, the woman met him at the door.

"How is he?" asked the doctor.

"Vell," said she, "I bane put the barometer on him like you tell me, and it say 'Very dry,' so I give him a pitcher of water to drink, and now he bane gone back to vork."—Philadelphia Record.

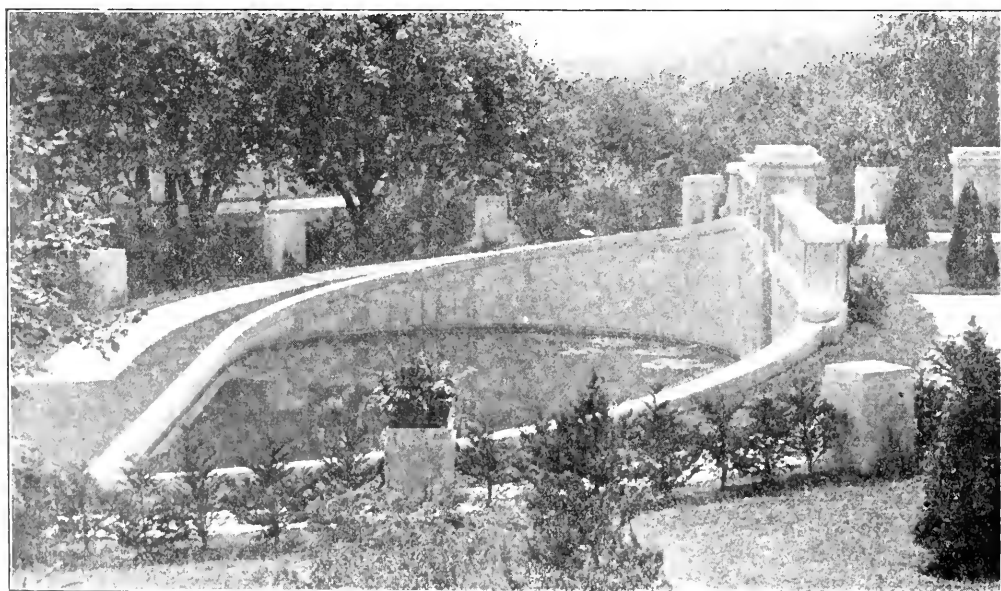


THE GARDEN POOL JUST THIS SIDE OF THE RESIDENCE.

A Magnificent Garden Pool.

Mrs. J. Langeloth of Riverside, Connecticut, has had placed in her garden a magnificent bird pool and in it has

planted various aquatic plants. The walls are made of cement moulded in graceful curves. The pool is seventy feet long by thirty wide, and is located



A NEAR VIEW OF THE POOL.

on a hillside, the water being supplied through what might be called a mural fountain. While there are a few estates with perhaps larger and more elaborate pools, yet this one is peculiarly attractive since it has been adapted to the irregularity of the location, and since it is placed directly in front of the residence, as shown in the accompanying illustration. Our readers will also be interested in the general view of the garden.

The pool was designed by John H. Duncan, Architect, 347 Fifth Avenue, New York City, and was built by Mr. C. W. Luyster, Jr., 35 Nassau Street, New York City.

Extensive Arctic Fauna.

The teacher asked the class to write down eleven arctic animals. Johnny Jones wrote his answer before the other children had started, and took his slate to the teacher's desk. She read:

"Six seals, four polar bears and one walrus."

Am so glad I sent for the magazine on trial. It is the most interesting and helpful nature magazine I have found. Miss Irma B. Armstrong, River Falls, Wisconsin.

A Vision of Eternity.

By Charles Nevers Holmes, Newton, Massachusetts

Like Time's vast dial open to the eye,
 Its jeweled hands revolving round and
 round,
 Yon Darkened Dome shrouds daylight's azure
 sky,
 An ebon roof above Earth's spheral ground;
 Like boundless threshold of eternal space
 Or mighty portal of a life unknown,
 The firmament reveals its starry face
 And countless sun-kings reigning on their
 throne;
 Like depthless gulf of deathless mystery
 Where silently the laws of God evolve,
 That sky will shine when human history
 And human life eternally dissolve;
 And suns shall blaze like beacons when man's
 home
 Drifts lifelessly beneath its Darkened
 Dome.

TO KNOW THE STARRY HEAVENS

The Heavens in February.

BY PROFESSOR ERIC DOOLITTLE, OF THE
UNIVERSITY OF PENNSYLVANIA.

Certainly no one who watches the sky at all can fail to be impressed with the extreme brilliancy of the February sky. Orion, the mighty Warrior, and the brightest of all star groups, rides high in the heavens, while Sirius, pro-

In the telescope this distant sun now shines with a deep red color. Above Mira there is the bright, golden Jupiter, which is to remain in a favorable position for observation but one month more, while the beautiful planet, Saturn, has attained almost its highest possible position in the heavens and shines out almost on the meridian in

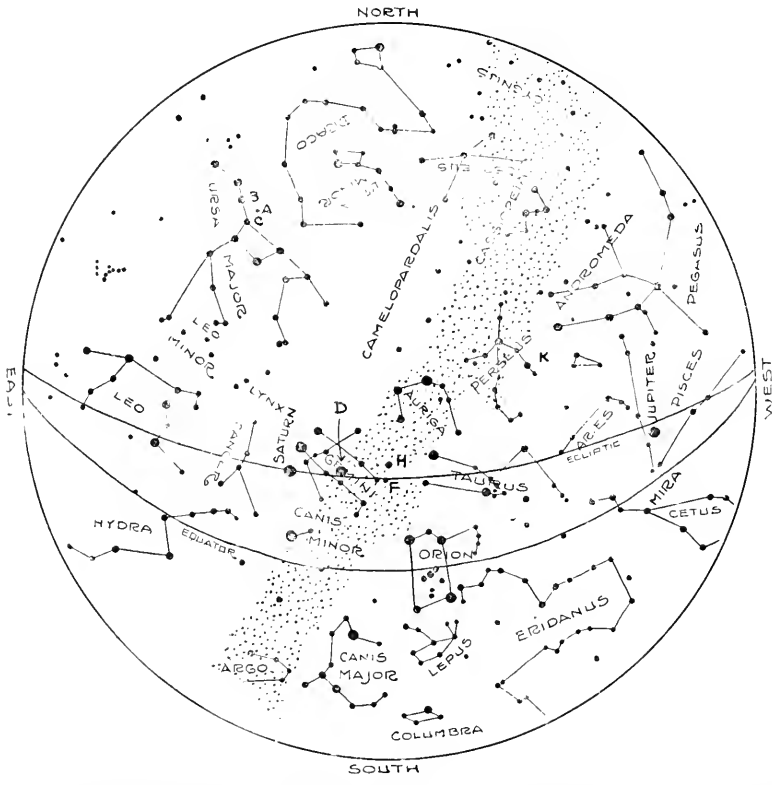


Figure 1. The Constellations at 9 P. M., February 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold map inverted.)

cyon, the Twin Stars, Taurus and Leo now cover the whole southern half of our evening heavens.

Slowly sinking in the west, there still shines the wonderful variable star, Mira, but this is now rapidly fading away, and by the end of the month will probably be quite invisible to the naked eye.

the south. Altogether, the February heavens of this year shine with an unusual beauty and splendor.

* * * * *

Variable Stars.

Of the many readers who have this year been watching the wonderful brightening and fading away of the

variable star, Mira, there will doubtless be several, at least, who will be surprised to learn what a great number of the stars in the sky are now known to be variable suns. More than five thousand have already been discovered, and this number is constantly being added to.

The modes of variation of these distant suns vary greatly, many brightening or growing dim in the course of a few days, or even hours, and others, like Mira, suffering their great outbursts of light and heat at much longer intervals. Of the latter class there are no less than ninety-three which during the present year will become sufficiently bright to be observed with a very small telescope, or even with an opera glass, and in many of them the range of variation is much more remarkable than in Mira itself.

For example, just above the handle of the Great Dipper, at the point A, Figure 1, almost equally distant from the stars B and C, the observer will find a variable star of this kind which when at its faintest is of but the thirteenth magnitude, and hence only visible in the largest telescopes, but which every 257 days becomes quite clearly visible to the naked eye. This star is now growing brighter and will attain its greatest brightness of 5.5 magnitude on March 13. Thus during the latter part of February it will be very easily visible in a small telescope.

An even more striking variable of this class is in the constellation Gemini, in the position D, Figure 1; but this is now wholly invisible in a small telescope and will not become bright until next October. The bright star at F more than doubles in brightness every eight months. This is now approaching a minimum; it will be at its greatest faintness next June. This remarkable variable is also a double star, but the presence of its companion sun has nothing to do with its remarkable variations.

While exploring this region with the telescope the observer should not omit to examine the remarkable star cluster at H, just above the variable at F. This is one of the finest objects of this kind in the heavens; though easily seen in the opera glass, it requires a larger telescope to reveal its multitude of streaming and intermingled stars. It

was near the star at F that Herschel discovered the planet Uranus on March 13, 1781. During the 135 years which have elapsed since that time this very distant and slow moving world has passed one and two-thirds times around the celestial sphere, and is now near Mars in the constellation Capricornus,

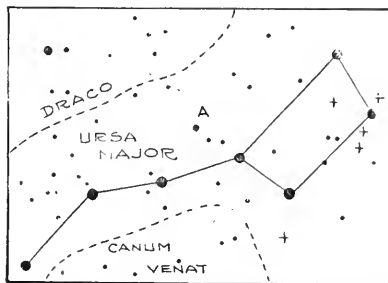


Figure 2. Showing the position of the variable star at A, Figure 1. The small crosses indicate the positions of nebulae or clusters.

where during these February evenings it is lost in the rays of the sun.

* * * * *

The Planets in February.

Mercury attains its greatest distance west of the sun on February 12; for a few days before and after this date it will rise in the extreme south-east, about one hour before sunrise, and may then be detected in the glow of the dawn.

This strange little world, whose radius is but four hundred miles greater than that of our moon, is revolving so close to the sun that the light and heat which it receives from that body are seven times as great as with us on the earth. The path which it follows around the sun is very far from being a perfect circle, so that at some times it is but 28,000,000 of miles from the sun and at others it is 48,000,000 of miles away. Its year is but 88 days long, so that when nearest the sun the heat poured down upon this little world is three times as great as when it attains its greatest distance 44 days later. We on the earth reached our least distance away from the sun on the third of last January. Mercury will reach its greatest distance on the 25th of the present month. But few on our earth ever hear the words Perihelion (nearest the sun), and Aphelion (farthest away), because our earth's path is so nearly a circle that its varying distance produces no appreciable effect. But upon a world situated as Mercury is

these two points of the path assume great importance. It cannot be doubted that the extreme heat, and still more the excessive variations in heat, would render existence there quite impossible, at least for such highly organized beings as ourselves.

The brilliant Venus is seen rising in the southeast 1 hr. 20 min. before the sun on February 1, and this time di-

minishes from a transit of the planet's disc at 7 hrs. 53 min. P. M. Similar phenomena occur on the evenings of February 3, 4, 7, 9, 13, 17, 19, 20, 23, 25, 27 and 28.

Recent studies of the excessively faint Ninth Moon of Jupiter have been made to discover if possible the true size of this minute body. It is found that the diameter is between eleven and seventeen miles, a striking contrast to

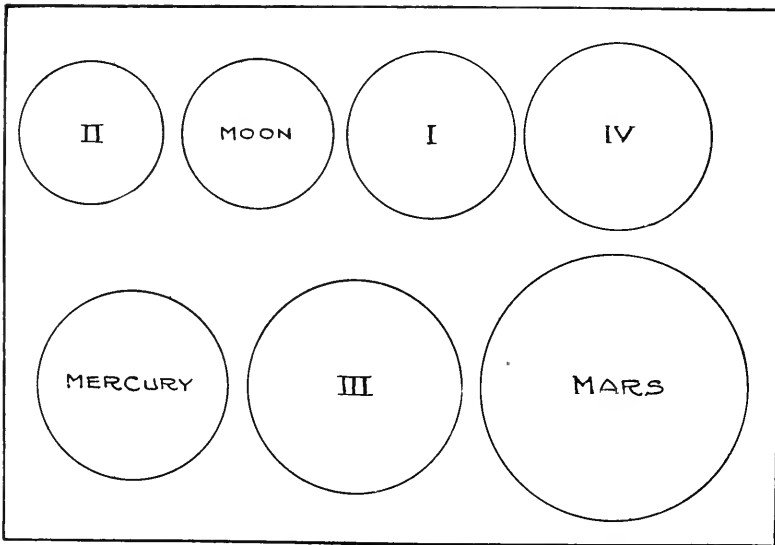


Figure 3. The comparative sizes of the four bright moons of Jupiter, our own moon, and the planets, Mercury and Mars.

minishes to but forty minutes by February 28. The planet is rapidly becoming lost in the sun's rays, though it will not enter the evening sky until next April 26.

Mars is also quite too near the sun to be observed, setting but thirty-four minutes after sunset on February 1 and passing to the west of the sun and so entering the morning sky at 5 P. M. on February 28.

Jupiter and Saturn remain, however, as our brilliant evening planets; the former with its four bright moons and the latter with its numerous fainter satellites and its beautiful system of rings furnish beautiful objects for examination and study with a small telescope.

The third moon of Jupiter will be seen to enter an eclipse on February 10 at 7 hrs. 45 min. P. M. (Eastern Standard Time), and to emerge from the planet's shadow at 9 hrs. 26 min. P. M. On February 11 the first moon will pass behind the planet at 8 hrs. 33 min. P. M. and on Feb. 12 this moon will emerge

the brighter attendants, for the largest of the four bright moons is no less than 3550 miles in diameter, considerably larger than the planet Mercury and but little smaller than the planet Mars.

The most interesting great comet which was discovered when almost as far away from us as the planet Jupiter is steadily approaching the earth. During the present month its distance away from us will diminish from 258 to 208 millions of miles, and it will nearly double in brightness. It is now passing through the summer constellation Ophiuchus, and is therefore in the morning sky. As yet it is only visible in the largest telescopes. Whether it will become a conspicuous object when it draws nearest to us, next summer, cannot as yet be foretold.

The variable star, Algol, in the constellation Perseus at the point K, Figure 1, will lose five-sixth of its light on February 7 at 7 hrs. 40 min. P. M. (Eastern Standard Time); on Feb. 10 at 10 hrs. 52 min P. M., on Feb. 25 at

12 hrs. 42 min. A. M. and on Feb. 27 at 9 hrs. 30 min. P. M. The remaining eclipses will occur in the early morning or during the daylight hours.

The Wonderful Sirius.

BY CHARLES NEVERS HOLMES, NEWTON,
MASSACHUSETTS.

The time has come, to look again for the spectacular sun Sirius, of the constellation Canis Major.

Its appearance is so brilliant and glittering that even an inexperienced stargazer should have no difficulty in finding it.

Its brilliant and glittering appearance is owing chiefly to two reasons:—first, its comparative nearness; secondly, its size. Respecting its nearness, Sirius is only approximately 50,000,000,000 miles distant from the earth—a mere cipher astronomically—and, as regards its size, the brilliance of Sirius exceeds that of the sun by about twenty times. In comparison the sun is at a mean or average distance of 93,000,000 miles and possesses a volume which is more than a million times that of the world. Therefore, were the sun at the same remoteness from us as Sirius, it would present a very dim and inconspicuous firmamental exhibition.

Sirius is, of course, the famous “dog-star” or Canicula—but how changed is the appearance of the landscape since we saw it rising during the morning hours of summer!

The New Haven Railroad Goes to the Moon Every Day.

In an interesting article in regard to hot boxes on the cars of the New York, New Haven & Hartford Railroad, the statement is made that 2,500 passenger cars travel 240,000 miles in twenty-four hours, or ten times the circumference of the earth. It is interesting to note that this distance is the same as that from the earth to the moon, and if such a thing were possible, it would help us make the immense distance somewhat realizable.

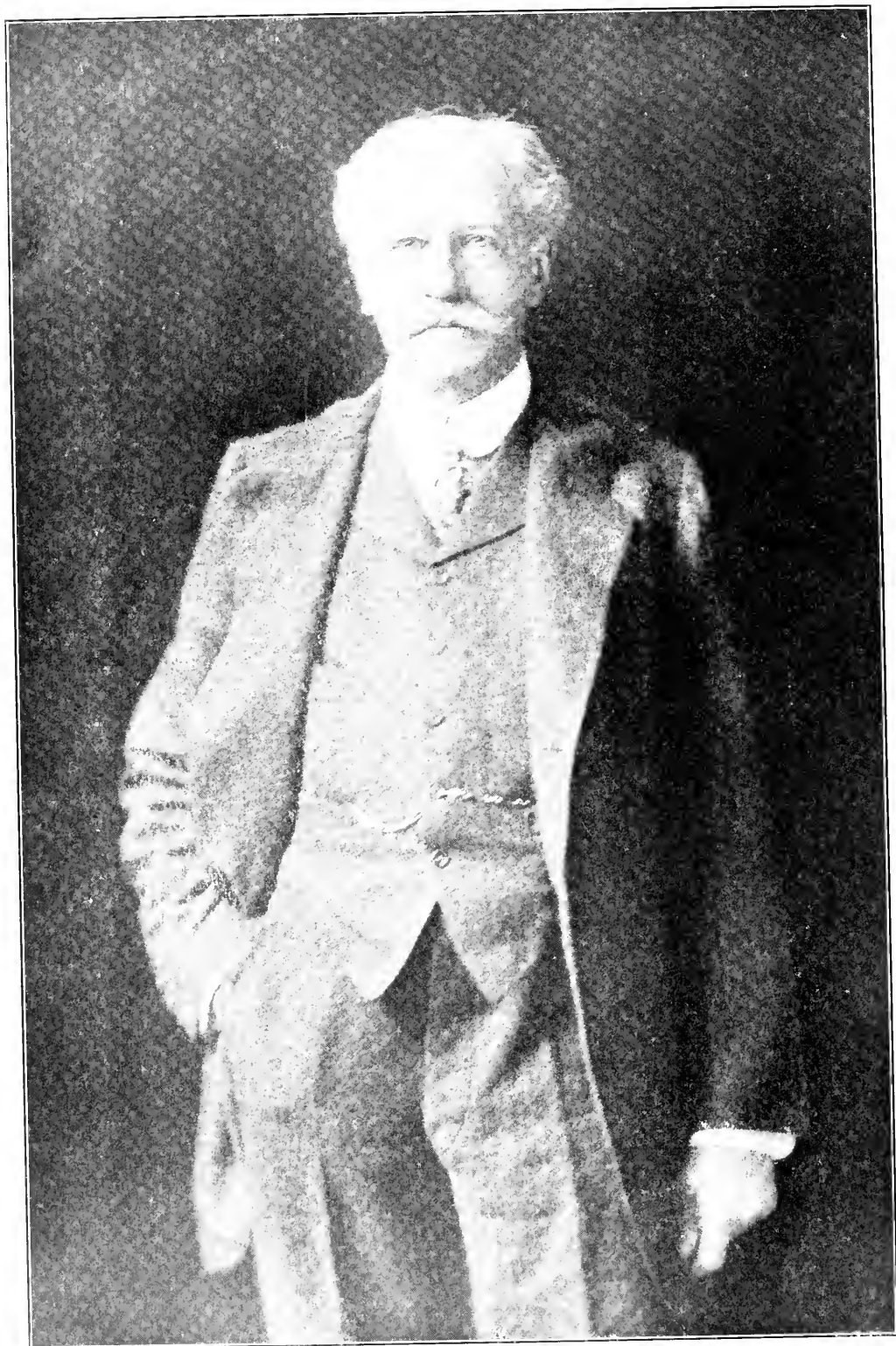
Yet occasionally when there is a hot box among the wheels of these cars how much impatience it too often oc-

casions on the part of the passengers! Is it not rather astonishing that in one week there were only eighteen hot boxes on all the passenger cars, about 2,500 of them, reported on the entire New Haven road. This speaks volumes for the rigid inspection of cars, journals and bearings. It may be of interest to our readers to know how these journal boxes are packed.

Within the journal box oil-soaked woolen waste is packed for the purpose of lubrication. This waste is soaked for forty-eight hours in specially prepared oil, and allowed to drain for forty-eight hours to remove all excess of oil, the waste retaining sufficient oil for the purpose but not enough to impair its own elasticity. It is packed in the journal box in three distinct parts. The first is a roll packed at the back to prevent dust from entering at the rear, and to keep the second or center packing in position. This second packing supplies the oil that continually flows between the journal and the bearing. It is placed in the box fairly loose and on the underside of the journal. The revolving journal draws the oil from the waste upwards but does not move the waste itself. The third and last packing is a roll placed in the front to keep the second packing in position and to prevent dust from reaching the journal.

According to Elihu Tompson, the familiar appearance of the aurora, the long streamers reaching toward the zenith, is merely an optical effect. In reality, he maintains, the streamers stand everywhere just about vertically and are arranged in bands which in a general way follow the parallels of latitude. Occasionally, it appears, the observer may be just under one of these sheets of light, and so see it directly overhead, while other sheets, farther north, add the appearance of a vast arch.

A private exploring party to the unknown interior of Australia reports five new species of birds and as many new plants. New species of insects proved still more numerous, including nineteen new species of ants.



PERCIVAL LOWELL.

(See obituary notice by George R. Agassiz on page 245 of our number for January, 1917.)
He told us of the heavens, especially of Mars, and by his life he showed the right kind of enthusiasm for the grandest of all thoughts that can enter the mind of man.

Astrology Is Superstition.

In an interesting article in the "New York Journal" Mr. Garrett P. Serviss, that popular writer on astronomy, tells how early mankind happened to believe not only in the signs presumably revealed by the entrails of animals slain before an altar, in the direction of a flight of birds, but also in the position and movements of the planets. It was, as he says, a strange dark world over which astrology and its cognates ruled, but the astonishing thing is that even at the present time there are some honest believers in astrology, and that false prophets catch fees from the unwary in this foolishness. Why can we not ring out the false and ring in the true? The study of the planets is helpful as a mental recreation, but when we think about and believe in their influence on human beings, we think and believe the rankest sort of nonsense. Before science was cultivated, and before men began to use their brains rather than their fears and fancies, the planets were regarded as celestial rulers. Mr. Serviss appropriately writes as follows:

"On the contrary those wonderful lights in the sky, some of which were seen to move about with slow and majestic motions, now advancing, now retreating, now drawing close together and shining for a while side by side, as if in fateful consultation, or conspiracy, and now glaring at one another from diametrically opposite quarters of the heavens, like spirits of celestial space watching and perhaps contending over the fates of the helpless beings on the earth beneath them; the menacing color of such a planet as Mars, always associated with blood and disaster; the golden glow of Jupiter, suggesting wealth and good fortune; the quick movements of Mercury, suddenly disappearing from the west only to reappear in the east, and seemed to dog the sun; the marvelous splendor to which Venus periodically attains, now in the evening and now in the morning sky, the "inconstant moon," continually changing her face like a mask, and sometimes eclipsed as by the shadow of a great hand, moving invisibly across the firmament—all these things, before they had been scientifically explained, lent themselves naturally to the notion that they were portents and powers appointed

to sway and fortell the fates of men.

"And this notion had nothing ridiculous about it in an age when the earth was thought to be the centre of the universe, and men were regarded as the constant playthings, pets or victims alternately, of a multitude of jealous, man-minded and woman-minded gods and goddesses.

"You should no more believe what an astrologer tells you the stars say than you believe what Mother Goose tells you the fairies say, for a soothsaying star or planet is as much a product of the imagination as a fairy."

* * * * *

Humanity is to be congratulated upon the fact that slowly and surely these nonsensical notions about the influence of the planets and stars are being banished into the garbage heap of superstition. But there is one phase of astrology that is still pretty generally accepted, namely the belief that the signs of zodiac represent certain parts of the human body.

Recently on a lecture tour in the West and South and also nearer home, I have inquired at drug stores and have found that patent medicine almanacs with these figures showing internal, human anatomy, with arrows pointing to various parts of the body are still in demand. At some of the stores I inquired, "Do you think the people care for these monstrosities?" "Yes," laughed the clerk. "If they could not get something to show how their insides looked and in what part of the body the constellations are, they would think the almanac is worthless. It is as Barnum said, the people like to be fooled, though I suppose they do not realize it."

Further inquiries, not only at the stores but of some of the members of my audiences, elicited this fact; there is still a widespread belief that this picture must be consulted to ascertain in what part of the body is the zodiacal sign of the time, especially the time for weaning pigs, calves and babies, and for surgical operations on animals. These signs are also consulted, or perhaps reference made to the phases of the moon, either separately or in connection with the signs of the zodiac, for horticultural and agricultural purposes. Potatoes, beans, peas, corn, etc., must be planted at a certain sign or phase of the moon.

Several people that I met argued thus:—"Well, do you think it does any harm to consult them? Don't you think that possibly there is something in it? I should not like to run the risk of operating on a valuable animal without some reference to these signs," remarked one farmer; "surely such reference can do no harm."

It would not harm the animal but *it does harm the human being who cherishes such foolish notions.*

"Don't you know that a board laid on grass in the light of the moon is held up more lightly and that the grass grows under it better than it will grow in the dark of the moon?" Several persons had tried it, notwithstanding the fact that the word "light" in this connection has two different meanings and is used as a pun. Light in reference to the moon and light in reference to gravitation are as distinct as if separate words were used. According to that point of view, dancers could not perform the "light fantastic" in darkness.

But when one investigates he finds that many minds are filled with this absurd belief about the moon's control of the weather. He also finds all sorts of other absurd things. One person was discovered who said that it is generally believed in the country that a swarm of bees must not be taken from a dead limb of a tree because, if it should be done, there would be a death in the beekeeper's family. How full is the human mind of the evil result of seeing the moon over the left shoulder, in looking in a mirror, in spilling salt, in the number thirteen, and in an unlimited number of other preposterous notions. When will the human mind be redeemed from error and obey the divine command:—"Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure,

whatsoever things are lovely, whatsoever things are of good report; if there be any virtue and if there be any praise, think on these things." It surely should be a large part of the work of those who search for truth to labor faithfully in ringing out the false and ringing in the true.

Life after Forty.

The best half of life is in front of the man of forty, if he be anything of a man.

The work he will do will be done with the hands of a master and not of a raw apprentice.

The trained intellect does not see "men as trees walking," but sees everything clearly and in just measure.

The trained temper does not rush at work like a blind bull at a haystack, but advances with the calm and ordered pace of conscious power and deliberate determination.

To no man is the world so new and the future so fresh as to him who has spent the early years of his manhood in striving to understand the deeper problems of science and life, and who has made some headway toward comprehending them.

To him the commonest things are rare and beautiful, both in themselves and as parts of a beautiful and intelligent whole. Such a thing as staleness in life and its duration he cannot understand.

Knowledge is always opening out before him in wider expanses and more commanding heights. The pleasure of growing knowledge and increasing power makes each year of his life happier and more hopeful than the last.—Standard Sunshine.

The American Museum now has a collecting party at work in China.

Please remember this educational uplifting work in making your will.

Form of Bequest to the Association

I hereby give and bequeath to The Agassiz Association, an incorporated association, having its principal executive office at ARCADIA, in Sound Beach, in the town of Greenwich, Connecticut, the sum of -----dollars.



EDITORIAL



Why I Live in the Country.

[This article was written in response to the request of the editor of "The Countryside Magazine" and part of it was published in the December number of that magazine together with brief expressions of opinion from a great variety of lovers of the country. We think our readers will be interested in the entire article.—E. F. B.]

"The Countryside Magazine" asks why I live in the country. Because, as a place of residence, the country is better than the city. I am not one of those countryites that decry the city because they have tried it and found it a disappointment or because they know nothing of its merits. I love the city in which I was a resident for thirteen years, but I do not count those years as the unlucky thirteen. They are not lost years. The city is in many respects an ideal place for human beings. It usually affords better home facilities, greater conveniences, better doctors, markets, schools, churches. These are powerful attractions; the conveniences are alluring. With all my enthusiasm for the country, I should need pretty carefully to search the field for arguments in favor of the country sufficiently strong to overbalance these in favor of the city. If I were compelled to live in the country, where I should be entirely deprived of civilization's facilities, as occasionally occurs to some unfortunate persons, then I would not live there. It is the city conveniences in the country that make the country comparable in desirability with the city. Even these are not enough. If I could carry the city facilities and the city's life into the back country, and could there establish a luxurious home, I would not. The city's spirit is best in the city. I have seen bits of the city planted in the remote country but they were out of place. I vividly recall a visit to a magnificent country home in the wild woods on the shore of a beautiful lake in Michigan. As I entered the house I said to my host, "What a delightful

life you must lead in this charming country place!" You may imagine my astonishment, if you can, when he replied, "Yes, we manage to endure it by having automobile parties come to us from the city, so that almost every evening we play cards and dance and have a fairly good time." Only courtesy prevented me from crying aloud in indignation. He seemed to be hypocritical and to be talking nonsense. I said, "You are not living in the country. You have not yet arrived. You are not acquainted with even the primordial elements of country life."

He led me to the rear of the house to show me the view. The house was on the top of a hill. My first exclamation of delight was: "How you must enjoy the evenings here as you look at the stars." He replied as if he were tired, "My wife and I have little time for such things. We leave them to you fellows." He directed my attention to the plants in the garden. Again I tried him with a burst of really sincere enthusiasm, "How you and your wife must admire and love these flowers." "No," he said, "we have no time for that. I employ a gardener and two assistants. They do all the work. I have not even been in this garden for more than a month."

I cite this particular example as a type of those people that travel for miles into the country but never get there. Such a home should be moved back to the city, not perhaps into the business center, but to the suburbs. Life in the country can be better than life in the city only on one basis: love for the things of the country. Among these I would place first the stars that there may be seen undimmed by electric street lights. City people never see the stars. They could not if they would. But, O ye gods, does man possess any gift diviner than the ability on a clear, frosty night, in an isolated country place, with a film of snow glistening on the ground, than the

ability to gaze at those glittering jewels of the sky? It is not a pastime. It is genuine joy. But what other things of the country make life worth living there? The trees, that one must love; the birds, with their entrancing melodies and marvelous actions; the joy of discovering new plants in a tangled thicket; the myriad insects with their graceful form, their beauty and their indescribable adaptation to the environment. There are the varying characters of soil; even the little stones scattered here and there merit careful examination. In the country our most valuable and enjoyable sense is the sense of sight. It sweeps from the stars to the microscopic denizens of the ditch. But to the eye should be added the telescope, the field-glass and the microscope. If you do not possess these things and have no desire to possess them, return to the city suburbs and get your enjoyment, if you can, with the tennis racket, or a pack of cards, or the latest "best seller" from the circulating library. If you would really live in the country, you must in some way get the key to the country door, open it and walk through it into the charms of the country. You cannot open the country door with a city key. Can you open the city door with a country key? Can you?

My Astonishing Potato Seed Year.

Distinct from everything else, potato seed stands out prominently in my literary experience for 1916. Astonishing letters, republications, cordial aid, kind words and vilification followed the publishing of a short illustrated article on "The Seeds of Potatoes" in *THE GUIDE TO NATURE* for January, 1916. That article, copied by "The Literary Digest" and by several other publications, has brought forth the most astonishing correspondence that has ever come to my desk.

As clearly stated in the original article, I was trying to show that potato seed balls no more grow in Connecticut, or at least have almost disappeared. I also suggested that we try to learn from what other parts of the country potato seed balls have disappeared or are disappearing. No offer was made of any high price for potato seeds. And I did not say that they no longer grow.

My interest was scientific, not commercial. In the presence of many audiences, I offered a year's subscription to this magazine for a small quantity of the potato seed balls, and I tried to make clear that the offer was intended not so much to obtain potato seed as to obtain information as to the thoroughness of the disappearance. I have been called upon to supply only six subscriptions. The cash value of six subscriptions is six dollars. But my innocent little statement has been twisted and distorted beyond recognition. It was said that I was offering six dollars for a thimbleful of seed. I have been called "nature faker" and "lunkhead" and what has been said in personal letters would stagger the wildest imagination and yet be no exaggeration of the facts.

Many letters have been helpful. Scientists have perceived that I wish to ascertain where potato seed balls are, where they are not, and whether or not they are disappearing. At least a hundred letters have been received to name seedsmen who will send a small package for fifteen cents. Others tell me that I am "nature faking" the country. None of this vituperation, none of the vilification, has anything to do with the original thesis, which was only to ascertain where the seed balls are and where they are not. I have never asserted that they cannot be obtained in this country, nor have I ever put a price upon the seed, and yet that thimbleful, costing me six dollars in subscriptions, has been distorted into all sorts of fantastic shapes.

Again it has been seriously said that formerly potatoes were grown from the seed, but that that is no longer possible. Both statements are partly true and partly false. Potatoes always have been propagated from seed to secure new varieties, but the new variety is cultivated from the tuber. Apple seeds will produce all sorts of apples, but when it is desired to perpetuate a particular variety it is done by grafting.

I cordially thank all who have seriously aided my scientific investigation, all those too who have supplied the amusement by their distorted notions, and those also who have been so lavish in sprinkling me with their favorite pet names. Many thanks for adding to the gaiety of my life. The explanation

that I believe to be correct was made by Dr. Robert T. Morris in the number for December, 1916. The absence of the balls is not due to potato bugs, Paris green, wet season, dry season, planting on Friday, on the thirteenth of the month, nor to dire influence of the moon, yet it is doubtful if a single ball can be found in the state of Connecticut. Some other states are equally vacant. It would be interesting to have reports from all parts of the United States. From the numerous packages received only a few full-grown balls have been obtained. Nearly all are vestigial. We have received, however, one large package of well grown, mature balls from an agent of the United States Government in Maine. From this we have obtained a supply for experimental purposes. We have no need for more. But what we should like to learn is—why in some places they grow and why in some places they do not?

There is another similar field for investigation. I have never seen a beechnut with a well developed kernel grown in Connecticut. The Connecticut nuts are shrivelled, vestigial and few in number. In some parts of the country the beech trees are laden with so many good, edible nuts that hogs feed and fatten on them as they fall to the ground. Can anybody tell from what parts of the country the beechnuts have disappeared, and from what they have not, and why? I am not offering six dollars for a thimbleful of beechnuts, nor should I be regarded as a "nature faker," but merely as one having a sincere desire to learn more of old Mother Nature's doings.

Congratulations to the Editorial Roots.

In our January number we paid our respects and expressed our appreciation to the Root family personally existent at Medina, Ohio. We wish now to say a few good words for their editorial skill, their wise judgment and their erudition in their specialty. "Gleanings in Bee Culture" was as a semi-monthly pleasing and acceptable. As a monthly it becomes larger and better than two semimonthlies combined. There is strength in combination as there is weakness in division. We are glad to see the Roots combining and growing stronger in the monthly mag-

azine. The new journal is a credit to them and to the industry. It is likewise a delight to every one who loves the wonderful insects of which it treats, whether for nature study or utility or both. That this big bee establishment can publish so big a magazine for so small a price as a dollar a year is astonishing.

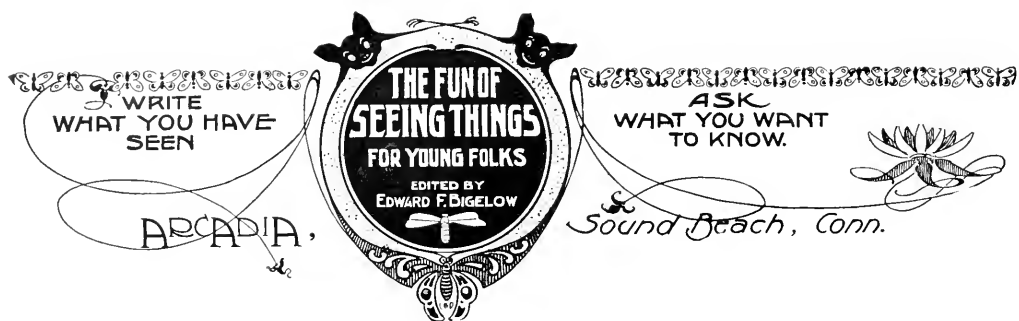
The Butterfly Farmer Married.

We take pleasure in recording the marriage of Miss Nimena McGlashan of Truckee, California, known to our readers and to readers of many other magazines as "the butterfly farmer." She is to spend the winter in Oakland, but beyond this her future plans are not yet decided.

She has done much to further an interest in the study of butterflies and moths. She has done good work in natural science. We sincerely hope that she will continue her missionary labors in science, and that her husband, if not already a naturalist, will be lured into those charming realms in which his youthful bride has been exploring for many years.

Dr. Bigelow, Scout Naturalist, under the Auspices of 2,500 Boy Scouts.

The public schools department of Pittsburg, through their director of special schools, has engaged Dr. Edward F. Bigelow of Sound Beach, Connecticut, to deliver a course of four lectures in different parts of the city, under the auspices of the Boy Scouts, of which there are about twenty-five hundred in Pittsburg. The local organizations and the Scout Masters are moving actively in the matter, and are making every effort to present the nature work as effectively as possible. The director states that the organizations are doing the preliminary labor "with the Boy Scout Spirit." Previously to this appointment, Dr. Bigelow will spend two days with the teachers of Wilkinsburg to instruct them in the principles and the best methods of teaching nature study in the public schools. Immediately following the appointment with the Boy Scouts of Pittsburg, he will spend two days with the city teachers of Meadville, Pennsylvania.



A Peculiar Tree Growth.

BY H. W. WEISGERBER, SALEM, OHIO.

There is not much to this picture and what there is is rather poorly taken, but it could not have been conveniently done otherwise. Nor does the pictured subject tell much. But after studying the tree in detail I found enough interesting material for this little sketch.

The tree is a soft maple, and in a



WHY DID THE TREE GROW IN THIS FORM?

moderately wet season stands on wet or spongy ground. Hence this story. Originally it was a large tree, for even now the old "half shell" that remains measures fully eighteen inches across and is about fifteen feet in length. How long since the tree was blown

over or the top broke off I am unable to say. But these facts are apparent, although the broke off top long ago returned to the earth as dust, and likewise all the trunk except the shell of bark with a thin layer of rotten wood.

Either the tree had three small branches before its top was broken or else they developed afterward; in any event, the three growing limbs must have been too much for the weak hulk and in time the wind broke the old trunk just at the surface of the ground. The two branches shown grew upward, while the third remained on the ground and developed into a root system for the new top growth. The twigs of the lower branch that reached above ground long since rotted away, but there remained one of the roots that has succeeded in keeping alive the old shell of the former trunk. Another peculiarity is that just within the crotch of the limbs a root system developed that may have had its start in the rotten wood of the old trunk, but now the roots and rootlets are entirely in the open. But this is not all, for the most interesting thing about the whole tree is the fact that there developed on the upper side of the limb that forms the root system a perfect specimen of natural bridge graft that measures about two inches in diameter by two feet in length, but too small to show in the picture. It is unsupported from end to end. How it was formed and how it was able to make so long a "jump" is, of course, a mystery.

The trunks of the two young trees plainly show the bending process that they underwent in reaching a vertical position. The whole shows to what extent nature will often go to overcome an injury.

Serpentine Growth in Cauliflower.

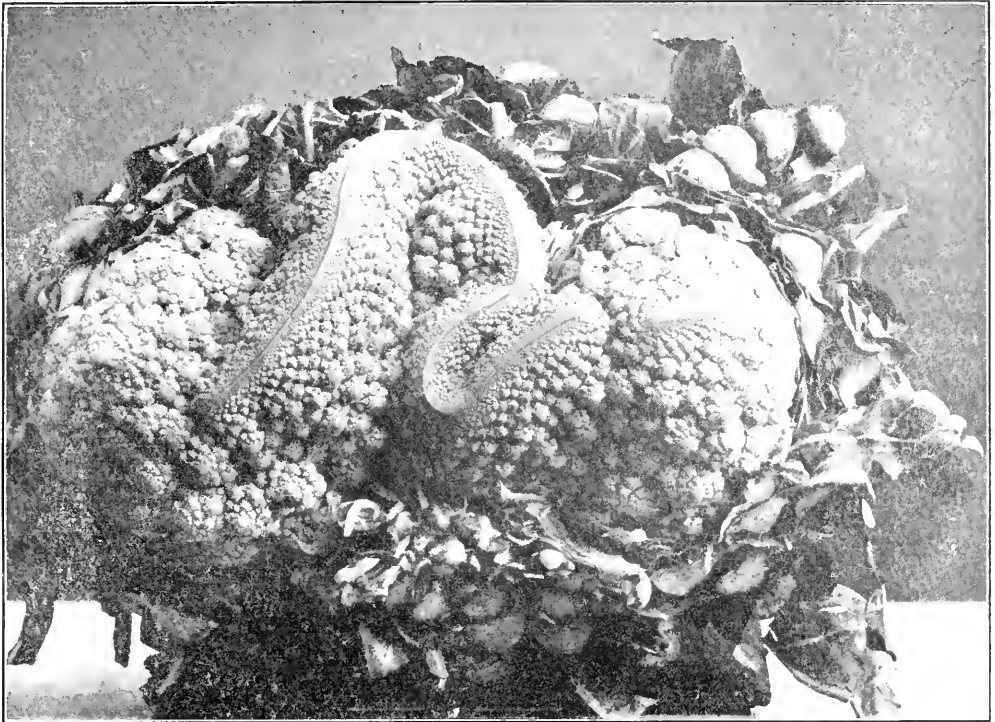
Norwood, Massachusetts.

To the Editor:

Herewith is a photograph of cauliflower which was sent to me from Jerusalem by Assad Khadder, a dragoman who led a camping party, of which I was a member, through the Holy Land. My interest in the wild flowers must have made so deep an impression upon him that he continues to send me interesting specimens for my pleasure.

The Closed Gentian.BY THE REVEREND MANLEY B. TOWNSEND,
NASHUA, NEW HAMPSHIRE.

The Nashua River is lined with closed or bottle gentians. I have examined the blossoms carefully for evidence of bees forcing their way in, but have not found a single instance. I know they do this occasionally, but believe it to be wholly exceptional and that the rule of the plant is self-fertilization.



SERPENTINE GROWTH IN CAULIFLOWER.

You will notice his comments upon the reverse side of the picture. Perhaps the readers of *THE GUIDE TO NATURE* may welcome the sight of the serpent that was greatly "admired by the people of Jerusalem."

Sincerely yours,
FRANCIS O. WINSLOW.

China is undertaking a geological survey, though at present on a rather small scale. Its head will be Dr. J. G. Anderson, formerly chief of the Swedish Geological Survey. Two other Swedes will accompany him and at least one Chinese geologist. Coal deposits will be studied especially.

How Turtle Shells Grow.

Does the shell of a common land or mud turtle increase in size by growth, as is the case with clams and oysters, or do they moult at regular intervals for a larger one?—B. D. Miller, Schenectady, New York.

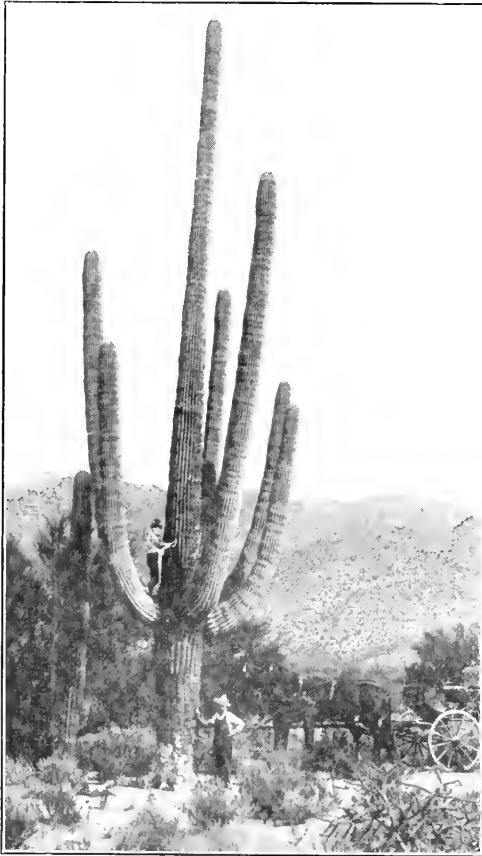
The shell of all turtles steadily increases in growth. They do not moult. Growth takes place between the sutures, thus expanding and enlarging the shell.—Raymond L. Ditmars, New York.

I regard it as the finest magazine of its class. The section devoted to astronomy is the best I know of in the class.—S. L. Boothroyd, Seattle, Washington.

Cactus Telephone Poles.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

In some parts of the Southwest, giant cacti are being used with success as telephone-poles. One kind of cactus thus used is the "giant" variety, a sturdy, non-edible, fruit-bearing plant which sometimes attains a height of forty feet. The



TELEPHONE WIRES ON A CACTUS.

sahuara, or cactus, is strong and tough, and when it became necessary to build a telephone line from the office of Supervisor of Forests to the Soldier's Camp Ranger Station, a distance of some thirty miles, economy dictated that some use should be made of the many sahuaras growing along the proposed route. From Tucson to the magnetic observatory, about eleven miles, the wires were strung on the poles of the Arizona Telephone and Telegraph Co.; to Lowell Ranger Station, redwood poles alternated with cacti, in the proportion of one cactus to two poles; to the Great Western power damsite, second-hand boiler tubes alter-

nated with sahuaras in the same proportion, and from there to Soldier's Camp the wires were strung on trees.

Another Tale of the Tail.

Glen Ridge, New Jersey.

To the Editor:

Nobody seems to have solved the problem, "Why is a cat's tail?" although a number of ingenious theories have been suggested. Br'er Fox's showy tail as a muffler for nose and toes seems to be well accounted for, but, reasoning from analogy, Dr. Long casts doubt on this plausible theory in its application to the Persian cat, whose fluffy tail is not needed for this purpose; the probabilities however are that primitive conditions were entirely different from those which now surround a highly prized pet.

The fact that the Manx has no tail eliminates him from this discussion.

The cat's stealthy nature probably derives valuable aid from the rhythmic, snake-like movements of the tail, by means of which the cat attracts the attention of its prey, especially birds, that are apparently hypnotized and thus fall easy victims under the spell.

I know of at least one well authenticated instance in which a bird, perched on a clothesline, was overcome by a cat's power of fascination, the swaying tail, the moving jaws and the intent gaze, all playing a part in paralyzing the bird, which was rescued just as it was toppling over. After being kept in a safe place for a few minutes, it recovered from the swoon and flew away.

It seems hardly probable that anything is ever created for purely ornamental purposes, but our sense of harmony being better developed than our faculty of analysis, we take things for granted without questioning their *raison d'être*. Whatever a cat's tail was made for, we can agree with Dr. Long, and consider it an ornament to this graceful animal that adds much to its power of expression. When his feline majesty is disturbed, how clearly he makes you understand his displeasure, or his haughty disdain, by the movements of his tail, just as his traditional enemy, the dog, our most emotional friend, expresses the opposite sentiment with a great variety of wags, the joyful, the questioning, the

wistful, the expectant or the cringing.

But, to return to *felis catus* and his tail, I would suggest that you refer the question to Miss Agnes Repplier, whose well-known affection for the "fireside sphinx" may enable her to solve the puzzle.

LOUIS CORTAMBERT.

The Chayote, a Little-Known Winter Vegetable.

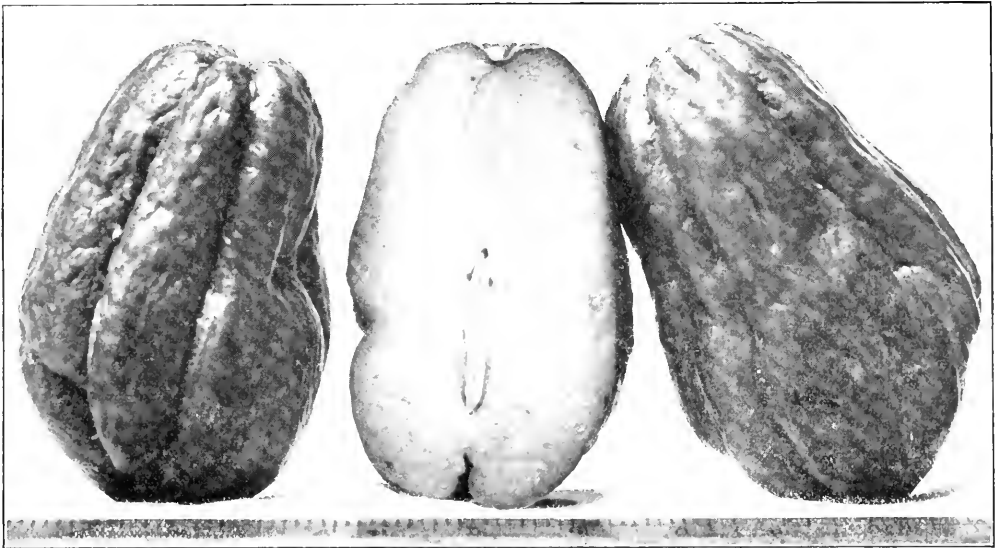
The chayote, like the summer squash, to which it is related, is a vegetable produced on climbing vines with perennial roots. The vines somewhat resemble those of the cucumber but are more prolific and vigorous in growth. In fact, it is such a rank grower and rampant climber that it can be used very successfully as a screen for fences or outbuildings.

Although it is native only in Mex-

icated soils in those sections of the southern states where the ground does not freeze. Experiments at the Plant Introduction Field Station at Brooksville, Florida, have shown that a good average yield is about 100 fruits per plant, although under favorable conditions, individual plants have been known to produce as many as 600 fruits, averaging from 8 ounces to a pound apiece in weight. The best yields of fruit are obtained when the vines are trained upon an arbor or trellis.

The fruits can be kept through the winter and may be shipped to the northern markets from September to March.

Chayotes somewhat resemble summer squash in taste but possess a firmer texture and more delicate flavor. The chefs of two of the most progres-



THE CHAYOTE.

They are good to eat. We enjoyed these at Arcadia.

ico and Central America, its cultivation has now spread over the West Indies and as far as Algeria. The governments of New South Wales and Ceylon, realizing its great possibilities as a wholesome and very prolific vegetable, have also endeavored to promote its culture.

During the last few years the United States Department of Agriculture has been encouraging the cultivation of chayotes as a new truck crop for the South. It can be grown successfully on any of the well drained and culti-

sive hotels in New York and Philadelphia have served this vegetable in many ways and have pronounced it an excellent addition to our small variety of winter vegetables. While there are many ways of serving chayotes, they are usually preferred creamed, used in salads, or baked with other vegetables or meats.

The fruits are best for eating when about two-thirds grown, as they are then more tender and of a more delicate flavor than when allowed to mature on the vines.



PUBLISHER'S NOTICES

Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT.
—Addison: Cato.

Shipping Room Necessities.

The finest collection of conveniences for the shipping room that probably is to be found anywhere is described in a four page circular issued by the Binney & Smith Company, 81-83 Fulton Street, New York City. They have struck the keynote of the needs in every shipping room and every receiving room. In fact most of the things mentioned would be useful in any office in which even a little receiving and shipping are done. Send to the address as given and obtain this circular. You will find that it contains a list of firstclass and convenient articles at reasonable prices.

A High Grade Piano.

It is with no little pleasure that we call attention to the advertisement of the Kroeger Piano Company of Stamford in this number of *THE GUIDE TO NATURE*. That company was so pleased with results of a previous advertisement that it now uses a full page space. Our first acquaintance with the Kroeger piano came about at the recommendation of an expert musician, who advised us to investigate its merits by placing one in the Welcome Reception Room. The contributions from local friends had made it possible for us to purchase a piano. We consulted several local musicians, and those familiar with the Kroeger expressed strong preference for it. It was almost exclusively on the personal recommendation of those friends that the Kroeger was selected after we had considered the merits of several other makes. It was with no little anxiety as to the outcome that the Kroeger was placed in the Welcome Reception Room nearly two years ago. We have waited until the verdict should be unanimous before saying much about the instrument. A great

number of musicians on a variety of occasions, all the way from a Sunday evening session of a local church to a dance party, have decided in favor of the Kroeger. We are sure that four hundred dollars could not be invested in a piano to better advantage. For that reason we believe the full page advertisement in this number is offering our readers a thoroughly good thing at a thoroughly moderate price.

Appreciation of Edison Phonograph.

The Edison Diamond Disc Phonograph in the Welcome Reception Room at ARCADIA has been used before a variety of audiences. At the meeting on Friday evening, January 12th, of the Stamford officials, including the Mayor, Selectmen, Assessors, City and Town Clerk, etc., with other guests, there was unbounded appreciation of the magnificent manner in which this machine re-created the songs and instrumental selections from the best musical talent of this country. Selections have been rendered at a special Sunday afternoon concert at which were present people from Sound Beach and Stamford. The phonograph has been used on several occasions at meetings of The Sound Beach Association, at special evenings of Chapters of The Agassiz Association, including one at which two Chapters from The Greenwich Academy were present. It has also afforded pleasure to single visitors and to companies of students and it has been used at the dances of our local young people. It has had a wide range of audiences and occasions, and has played with general appreciation selections ranging from "Pick-a-Chicken—One Step" to selections from Handel's "Messiah." The Edison Diamond Disc is a capable re-creator of any music that may be desired for any occasion

or by any audience. It has met the unanimous approval of all that have heard it. It seems not like a machine but like the living performer himself. It does efficiently all that it tries to do. The machine has been used in so wide a range of tests that we unhesitatingly endorse it as the best phonograph in existence. We give that as our unqualified and unstinted testimonial. Its merits demand nothing less.

Some of our friends may contemplate the purchase of a phonograph. Our unhesitating advice is, "Get the best, and the best is the Diamond Disc made by Thomas A. Edison, Incorporated, Orange, New Jersey."

That Marvelous Stump Puller.

It seems too good to be true, and some of our friends have felt that we are publishing a fraudulent advertisement, when we say that a little machine can pull forty-eight tons by hand power. I do not wonder that our friends are astonished when they learn that with a simple lever one man can pull a weight greater than sixteen horses can pull. But the editor assures his readers that he has personal knowledge of the machine's efficiency. He has seen it in operation on the premises of Ernest Thompson Seton at Greenwich. Mr. Seton is enthusiastic in regard to the efficiency of the machine. He told me, "You may safely praise it to any of the readers of *THE GUIDE TO NATURE*. It accomplishes all that is claimed for it." No other invention of equal simplicity has ever achieved such marvelous results in uprooting the biggest stumps as easily, the manufacturer claims, as rowing a boat. One movement of this machine oar pulls ninety-six thousand pounds. No wonder it has been adopted by the United States Government.

Right for the Zoo?

Dressed in the latest motor cycling costume, with goggles all complete, the motor cyclist gaily toot-tooted his way toward the Zoo. Suddenly he dismounted, and said to an urchin, "I say, my boy, am I right for the Zoo?" "You may be all right if they have a spare cage, but you'd ha' stood a far better chance if you'd had a tail."—Melbourne Leader.

Increase of Payroll.

The C. P. Goerz American Optical Company has just announced to their office and factory staff a general increase in salaries and wages to take effect about December 15th, 1916.

The reason given is the ever increasing cost of living which the management feels should be compensated for as far as the rather adverse conditions under which the Goerz Company has to work on account of the



AN INTERESTING PHOTOGRAPH WITH A GOERZ LENS.

war abroad will allow, by a suitable increase in the earnings of their loyal employees. The proposed increase will add more than ten per cent. to the present payroll of the Company.

Plants Proof against Chickens.

"Guess the neighbors' chickens won't bother my garden next spring."

"What are you going to raise?"

"Cactus, Spanish bayonet and prickly pear."

"I BELIEVE IN STAMFORD"

A Page of Stamford Interests

"Silver and Gold"

This is the title of a beautiful and interesting book giving a history of Stamford and of pecuniary interests, by Louise Willis Snead of Noroton, published by The Stamford Trust Company, Stamford, Connecticut, and printed by The Gillespie Brothers. It is a valuable book and a credit to all concerned in its publication. The author has had the skill and the rare good taste to select just the right things to make her work valuable and worth preserving. The printing is a credit to our local printing house; it is exquisite. The growth and prosperity of The Stamford Trust Company is viewed with pride by every one interested in this community. The institution is an index to the prosperity of this rapidly growing city of Stamford, which in many respects is rightly regarded as the most beautiful in the state. There is no other city in Connecticut so replete with the metropolitan spirit, with its own enterprising local spirit and, what is more important from our point of view, with such picturesque gifts from Mother Nature. No part of the Connecticut coast is more attractive. In no other place in the state are there country scenes,—brooks, meadows, forests—so picturesque. Here we have everything to add to the suburban and country charm.

Local Officials Visit ArcAdiA.

[DAILY ADVOCATE, STAMFORD, JAN. 13]

Eleven city and town officials visited ArcAdiA, at Sound Beach, last evening, guests of Dr. E. F. Bigelow. One of the officials expressed the sentiment of all when he said today:

"One has no comprehension of the work which is being done at ArcAdiA. Any one who hasn't been there does not know what he is missing. Dr. Bigelow is waking us up, ninety-nine out of every hundred of us, who have been asleep."

Mayor Treat, Selectman Moore and Chief Brennan were impressed, as well as greatly surprised, with ArcAdiA. Chief Brennan said he would take the

entire police force there next summer.

It was not a minute after the hour of 8 that the social evening started. It isn't always that city officers get together so promptly, but prompt to the minute they were last evening. Among those who enjoyed three hours were Mayor Treat, Selectmen Moore and Michaels, Town Clerk Close, Assistant Town Clerk Wisdom, Assessor Francis S. Tipper, Chief Brennan, Councilman M. R. Marquand, City Clerk Joseph H. Provost, Mr. Marquand's sister and Mrs. Brennan.

Pleasing entertainment was furnished by Miss Marjon De Vore, a violinist from Greenwich and Miss Viola Worrell, who played her accompaniments. Before the party broke up, remarks were heard from all present, and it was quite astonishing to all save Dr. Bigelow to hear the surprise that was expressed over ArcAdiA.

"Of course most of them had heard enough about it" as one of the officials said, "but we never half imagined it to be anything it really is.

A feature of the evening was a talk by Dr. Bigelow. "I Believe in Stamford," "ArcAdiA," and "General Views of Nature," were three subjects treated with the aid of the projection lantern and projection microscope. A fourth series of slides showed the embryo of a "chick," 36 hours old, with the backbone completely formed and showing every vertebrae.

"I Believe in Stamford" showed a very interesting group of slides, with which the party, of course, were much impressed. Pictures taken at the Town Hall, "making roads in Stamford," birds, insects, etc., in Stamford, and any number of things which were new to those who saw them, made up a series of interesting views. Dr. Bigelow spent 15 years in Stamford and was thus well able to show the results of his work here.

The members of the party even missed the 11 p. m. car home, to stay a half hour longer. Refreshments were served and a social time was enjoyed after the talks.

LITERARY NOTICES

WHEN LEAVES GROW OLD, AND OTHER POEMS.
By Egbert T. Bush. Boston, Massachusetts: Sherman, French & Company.

Here are the beautiful thoughts of a true lover of nature. The first poem, from which the book takes its name, is so pleasing that we have asked the author and the publishers for permission to use it here. Other poems that will interest our readers are, "Daydreaming," "The Song of the Frog," "Other Days" and especially "Hafez the Hermit." We are glad to introduce to our readers this delightful student and lover of nature.

FIRST OBSERVATIONS IN ASTRONOMY. By Mary E. Byrd, Ph. D. Concord, New Hampshire: The Rumford Press.

The opening paragraph of the preface is so true that we must pass it along:

"Real knowledge in science depends upon direct study of objects and phenomena. Astronomy is no exception. Literally to look up, to see with your own eyes and to find out by seeing,—these things are the beginnings of astronomy."

This book is a guide to such observations. The simple mechanical appliances suggested and needed may be made by a carpenter or by the student himself.

A HANDBOOK OF NEW ENGLAND. By Porter E. Sargent. Boston, Massachusetts: Porter E. Sargent.

A convenient handbook containing a wide range of information in regard to New England, its cities, their distinctive people, origin, history, their roads and highways, a typical New England village, the aborigines and slavery, famous New England poets, pessimists and philosophers, the flora and the biological environment, with road routes and much valuable information about highway construction. It is even now a valuable book, but to make it still more so the publishers invite suggestions for the new edition of 1917.

PRIMER OF BIRD-STUDY. By Ernest Ingersoll. 1974 Broadway, New York City: The National Association of Audubon Societies.

This book, as its name implies, teaches how to study the bird, not merely to know its name, song, environment and time of its migration, and in addition includes a wide range of subjects such as the anatomy of

the bird, the colors and the growth of feathers, musical methods, the bird's senses and the character of the nests. Mr. Ingersoll has conferred a favor upon bird lovers by preparing this type of book. It fills a place that was rather barren in the course of bird study, doing in a simple manner what has been previously done only in elaborate technical books.

THE BOOK OF FORESTRY. By Frederick Franklin Moon, B. A., M. F. New York City: D. Appleton and Company.

A practical book on forestry which is up-to-date and intelligible to junior readers, and which is neither too technical for immature minds nor too popularly written for grown-ups. It is not a text-book nor an instructive manual but rather a book of information on our original forests and the forestry movement in this country—its origin and present status. It will be of great assistance to boys who love the woods and wish to learn more about our trees and it will be especially helpful to Boy Scouts who are anxious to obtain merit badges on conservation, forest protection or fire prevention.

THE HOLY EARTH. By L. H. Bailey. New York City: Charles Scribner's Sons.

The author says that the earth is holy. I agree with him. But it took me several years to realize the fact. Apparently I am still ahead of some of my fellow men for they seem not yet to have realized it. This book bore me back to very youthful days. Scene: A country schoolroom. I was reading. Suddenly teacher and pupils burst into a gale of laughter. I had made a laughable mispronunciation. Later in life it dawned on me that the error, if an error at all, was so only in part. The sentence to be read was, "God made earth for man to delve in." I announced that "God made earth for man to devil in." The teacher assured me that I was wrong, but in later years I assured her I was right. But even if man does not devil in the earth, he too frequently looks on it as a prosaic, utilitarian object. He too frequently thinks of the heavens as far above the earth, but he should not forget that it is God who created the earth as well as the heavens and He pronounced the planet good. It is evidently to emphasize this thought that Professor Bailey has written this book. Every naturalist comes, in the later years of his life more and more to realize that thought. Extreme youth regards

the earth as a place for play. A little later he looks on it from the ambitious point of view; it is all hope to him. Still later there is the utilitarian or the sacrilegious. But when one gets into the Indian summer of life, there comes more and more a recognition of the holiness of everything. As David Grayson puts it, "One sees God in everything." We cordially recommend this book to those who can appreciate that point of view.

THE AMERICAN ANNUAL OF PHOTOGRAPHY, 1917. Edited by Percy Y. Howe. New York City: The American Annual of Photography, Inc. Sole Sales Agents: George Murphy, Inc., 57 East Ninth Street, New York City.

At the present time when photographic goods are manufactured in America more plentifully than ever before, so that we are now practically independent of the rest of the world for many kinds of photographic materials, we feel an increased pride and interest in everything pertaining to photography, and year after year this beautiful book increases that pride, for year after year it shows that we, as users of the camera, are becoming more and more skillful and artistic, and that our photographic literature, pleasing as it now is, is becoming still more alluring.

THE NEW STANDARD CYCLOPEDIA OF HORTICULTURE. Edited by L. H. Bailey. New York City: The Macmillan Company, Publishers.

This is a magnificent set of books, probably the finest on the subject in the English language. It contains twenty-four plates in color, ninety-six full page halftones and more than four thousand illustrations in the text. The set is to be completed in six volumes at six dollars each, or bound in leather at ten dollars each. Volume V has recently been published. We take especial pleasure in calling attention to this magnificent work. It should be dear to the heart of every nature lover. It is a sumptuous publication, and the authority on plants for garden and grounds, a *vade mecum* for the earnest student of horticulture.

On its publication we not only congratulate the publishers and the editor, but all who desire to see a love of plants steadily increase as well as love for other phases of nature. Only such increase could make possible the publication of this magnificent

work. To take this set of books in midwinter, and revel in the wealth within its pages, build air castles of what shall be done next summer, or to come down to earth and make definite plans, is to enjoy a summer day's outing in the garden and the fields while the snow is on the ground.

We commend the books unreservedly to the dreamer of such dreams, or to the planner of such plans. All that have a garden or intend to have a garden, and all that study the gardens of others, need those books. They are in the botanical department at ARCADIA, and may be consulted by any visitor or student. We are sure that the people of Stamford and Greenwich will welcome this announcement, and will consult the magnificent books, the use of which is here freely offered to them.

Bird-Lore for December is a 174-page number and contains in addition to the usual articles on birds and bird-life, teachers' department, colored plates, etc., the annual report of the National Association of Audubon Societies. This report shows that the year ending October 31, 1916, was the most active in the history of this organization. The total disbursements for the year exceeded \$120,000, the largest sum expended by the Association in any one year; a fact which, in view of the financial conditions which have prevailed during the past year, speaks volumes for the loyalty of those who are interested in the preservation of our birds.

The British Association for the Advancement of Science is taking much to heart the current lack of interest in popular lectures on scientific topics. Time was when men like Tyndall and Huxley talked to groups of working men. Today, according to a recent report of a committee of the Association, there is dire need of every agency that will extend an interest in science beyond the very small circle that now has the least concern for the study of nature. Here in the United States we have the same problem. We have also the same remedy, interesting popular lectures—and the AA.



The Guide to Nature

Vol. IX

March 1917

No. 10



EDWARD F. BIGELOW

Managing Editor

Published Monthly by THE AGASSIZ ASSOCIATION
ARCADIA: SOUND BEACH, CONN.

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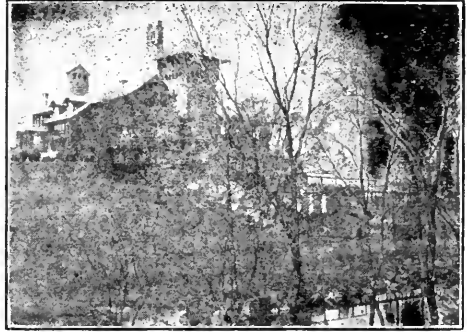
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TELEPHONE CONNECTION

An Honor Medal of the Massachusetts Horticultural Society has been given, for 1916, to an Englishman, William Robinson, in part in recognition of his labors in promoting the natural style of flower gardening as opposed to the formal beds once in fashion.

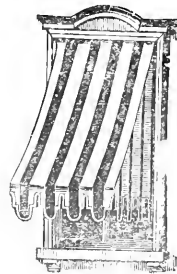
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Fleeing Homeward.

Two little fleas together sat,

And one to the other said:

"I have no place to hang my hat

Since my old dog is dead.

I've traveled the world from place to
 place,

And farther will I roam,

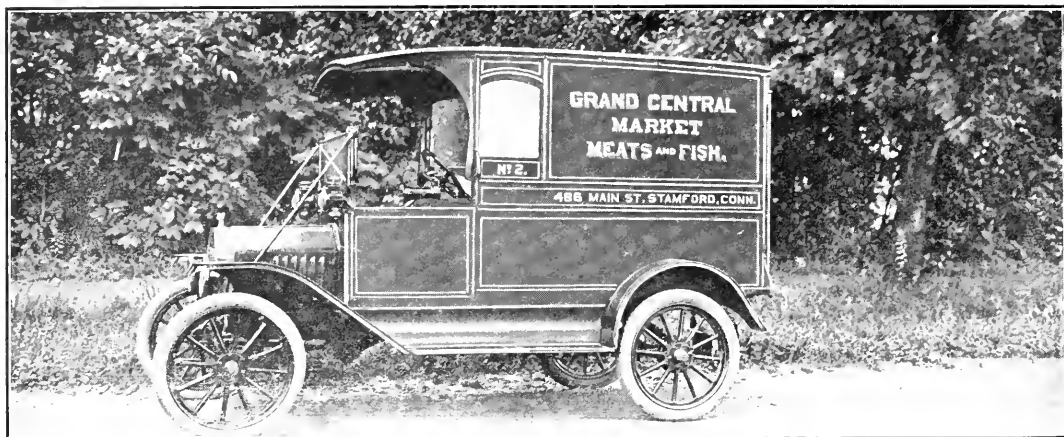
But the first darn dog that shows his
 face

Will be my home, sweet home!"

Celebrating the Calendar.

Apt.—"Why do they call the baby
 'Bill?'"

"He was born on the first of the
 month."—Awk.



Stamford Business Directory

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Use Velvet Cold Cream
It is the Best

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You Can Buy Flies Also.

Little June's father had just returned from the store and was opening some sheets of sticky fly paper.

"Oh, papa," she said, "down at the corner grocery you can get the paper with the flies already caught. They have lots of it in the window."

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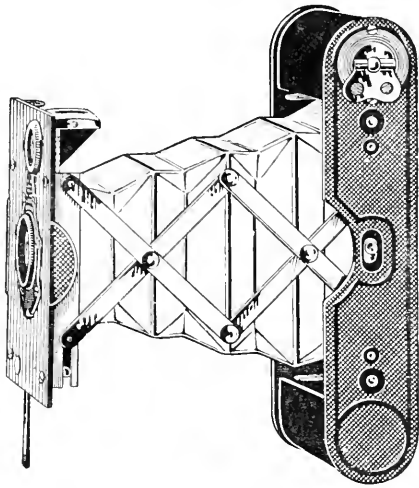
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The Baby as She Is Cared For.

Some strange rules for the care of the baby, gleaned by a Red-Cross nurse from essays by country school-children, are quoted in "The American Red-Cross Magazine." Sound advice mixed with bizarre reasoning is shown in the following excerpts:

"Don't let the baby suck its thumb, for there might be a fly on it and it would get the disease of the fly."

"Don't rock the baby, as it will toss its brains."

"If a baby gets beer every day, it won't grow very large and it won't be good in school."

"Rocking is not good for it; it makes them sick and stiff."

"Bad habits are easily made by the mothers, and the babies get wise to it."

"If you give the baby alcohol, he will lose one-half pound every year and will become drunk when he is old."

"Never lift it up by the arms, because it will place them out of place. Never, never, never pick up the baby by the arms whatever."



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"The public owes the baby as follows: Pure air and sunshine; pure, cool, fresh, free-flowing air at night; its own private, sufficient covering of fluffy, porous materials, and the chance to be a perfect man or woman."

How the Fish Can?

"These little sardines, Elizabeth, are sometimes eaten by the larger fish." Elizabeth gazed at the sardines in wonder and then asked:

"But, mother, how do the larger fish get the tins open?"



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9200 (With Basting Line and Added Seam Allowance).
Girl's One-Piece Dress, 8 to 14 years.

This is just a simple one-piece frock with body and skirt cut in one, but the pockets are exceedingly smart and attractive and together with the two belts that are arranged at the waist line, they serve to give it distinction. The material here is one of the pretty plaid wools and the collar and cuffs are made of taffeta, but mothers will find (chmodel) a good one for washable materials, such as linen, galatea, pique and the like, as well as for wool, while if something more dressy is wanted it could be made of taffeta. Taffeta with trimming of broadcloth or f serge would be pretty, and the taffeta could be either plain or plaid or striped as liked, and this season the stripes are exceedingly attractive.

For the 12 year size will be needed 5 3/4 yards of material 27 inches wide, 4 1/4 yards 36 or 4 yards 44 with 1/2 yard 36 inches wide for the collar and cuffs.

The pattern No. 9200 is cut in sizes for girl's from 8 to 14 years. It will be mailed to any address by the Fashion Department of this magazine, on receipt of fifteen cents.

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Mr. Hiram E. Deats, Flemington, N. J.: Supply of waste baskets.

Mr. R. L. Agassiz, Boston . . . \$25.00

Honorable Zenas Crane, Dalton, Mass. 50.00

Mr. William G. Rockefeller, Greenwich 50.00

Mr. Walter F. Mortimer, Sound Beach 5.00

Mr. W. A. Perry, New York City 1.00

Mr. Arthur A. Carey, Waltham, Mass. 25.00

Master Joseph Palmer, Sound Beach 2.00

Mr. C. E. Alling, Stamford, Conn. 1.00

Greenwich Educator 5.00

Friend Would Help, Sound Beach 1.00

Mr. A. B. Stanton, Sound Beach 1.00

Mrs. Linus Wood, Sound Beach 5.00

Mr. W. W. Lathrop, Warren, Ohio 1.00

The Sound Beach Association . . . 25.00

\$197.00

The Dentists Saw Gigantic Teeth.

The Dental Society of Stamford spent Wednesday evening at ARCADIA as the guests of Dr. J. D. Hertz, a Member of The Agassiz Association. Dr. Bigelow gave them a fireside talk on the work carried on at ARCADIA and then projected on a screen with a microscope gigantic views of the mouths of dragon flies, common house flies, horseflies, etc. Sections of plants were also shown under magnification but perhaps the leading feature of the projection was the recently prepared series of the embryology of the chick summer.

in which every detail of the beginning of the formation of the backbone, eyes, bill and heart, also the blood capillaries, was clearly shown, commencing with the egg that had been incubated only thirty-six hours.

At the close of the feast of good things provided by Dr. Hertz, he as toastmaster gave an interesting address, and there were also speeches by various dentists present. The most extended discussions were by Dr. Prior and Dr. Rule, but others participated. All spoke very highly of the work of The Agassiz Association and discussed many matters pertaining to nature including the theory of evolution.

Some half dozen high class selections were played upon the wonderful Diamond Disc Phonograph recently presented to the Association by Thomas A Edison. The dentists visited the office and laboratory.

At eleven o'clock the entire party spent some time in the observatory notwithstanding the zero temperature and thoroughly enjoyed telescopic views of Saturn. At half past eleven they departed for home expressing great appreciation of the entire work and equipment.

A Butterfly in Winter.

The beautiful yellow and black swallowtail butterfly, with its orange trimmings, is a rare and unusual sight in the middle of winter, but Gladys Jarvis of Sound Beach has succeeded in transforming a chrysalis of this butterfly, *papilio turnus*, into the imago or full-grown form. The swallowtail is a common sight in the summertime but there are not many, even butterfly specialists, who have had the pleasure of seeing one alive in midwinter. This one was fully formed, and waved its wings as naturally as in the warmest days of summer.

An Astonishing Thing about the Edison Phonograph.

A recent visitor at ARCADIA made this inquiry and the prefatory remark:

"You say that the Edison is superior to every other form of phonograph. Will you kindly tell me what is the most remarkable thing that you have discovered about it?"

The most remarkable thing is, primarily, its absolute superiority and, secondarily, that anybody should wish to purchase an instrument that is not the very best.

Neil Morrow Ladd and Morton C. Nichols Organize Company.

The fame of Greenwich bids fair to be advertised far and wide when the plans of the new firm of real estate brokers, Ladd and Nichols, are completed. As residents, who several years ago chose this town for their home, both Mr. Ladd and Mr. Nichols, are peculiarly fitted to emphasize its many attractive qualities to home seekers.

Everyone knows Mr. Neil Morrow Ladd, who as champion of our native birds has succeeded in enrolling hundreds of our residents as bird protectors. It has been estimated that the \$15,000 which has been spent upon Mr. Ladd's recommendations, has already saved the township \$100,000 due to the protection afforded our crops, gardens and trees by the increased bird life.

The knowledge of the country hereabouts, which Mr. Ladd has gained while on his tramps, in search of bird studies for his camera, will prove of inestimable value to prospective seekers of building sites.

Mr. Morton C. Nichols, formerly vice-president of the Colonial Trust

Company of New York city, brings to the firm his expert knowledge of values and rich real estate experience. Mr. Nichols could also qualify as a professional landscape architect. No other endorsement is needed after one has surveyed his beautiful home on the Post road, which, but a few years ago, was considered by many little less than a refuse heap.

Future clients of this firm are to be congratulated in being able to secure as advisor, one possessing his wonderful genius for creative landscape work.—Greenwich News and Graphic.

The Signature to the Letter.

At ARCADIA we have adopted the custom of signing most of our letters with the typewriter, even if also signed by pen, because nobody can read my writing. I myself am sometimes puzzled by it, although I can usually guess at the signature. We think that our custom would be a good one for others to adopt, especially where no name is printed on the letter. Curious, isn't it, when one receives a letter all nicely typewritten with an autograph signature that nobody on earth can read, when, as often occurs, the signature is the most important part, especially when it covers a remittance for a subscription? It would be an excellent idea for some special cases if our commercial schools would teach their pupils to have the employer, when he is a very bad writer, as most employers are, write the entire letter with his own pen and add the signature with the typewriter. That would be perfectly grand! It would save a lot of strain on the nerves, when the signature is the most important part of the communication.

The Best Scientific Work is Done in the Small Laboratory with Local Support.

(From an Editorial in "The Popular Science Monthly.")

"The most desirable institutions for scientific work would probably be comparatively small laboratories conducted by the scientific men who work in them. . . . It would be well if such institutions were endowed by the rich, still better if they were supported by a state or community."

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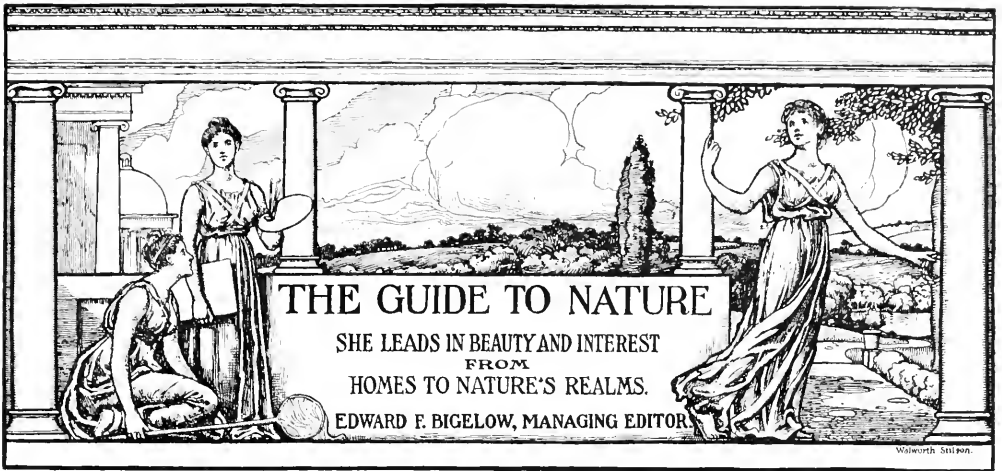
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STAMFORD - CONN

TELEPHONE CONNECTIONS



Published monthly by The Agassiz Association, ARCADIA: Sound Beach, Connecticut,
 Subscription, \$1.00 a year
 Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

MARCH, 1917

Number 10

Sea-Lions. Their Life and Relations.
 BY GAYNE T. K. NORTON, NEW YORK CITY.

With the thermometer registering twenty degrees above zero and the water in the tank freezing constantly—freezing so hard and rapidly that Keeper Keefer is kept busy breaking ice—the sea-lions of the New York Zoological Society in Bronx Park think the time and conditions ideal for swimming. Although accustomed to the less rigorous climate of California these animals have spent the entire winter in their tank with no ill effects; instead, they have grown and are in the best of condition. The outcome of the experiment which, by the way, is a very exceptional one, is all that can be desired, and the Society is justly proud of the animals.

Flopping about in the snow and on the ice, breaking through and vanishing in the freezing water, the sea-lions enjoy themselves to the fullest. Br-r-r! It makes us shiver to think of it. Early each morning and afternoon Mr. Keefer goes to the tank with a pail full of fish. The animals have been expecting him and at once bark their welcome. As they are fed, each receiving between ten and fifteen pounds of fish, they do all sorts of tricks, and perform some interesting and difficult catching and balancing feats. The fish are swallowed whole and the feeding is well worth watching.

It was this very fondness for fish that led the State legislatures of the extreme west and the fisherman to declare war on them a few years ago. The California fishermen claimed that salmon and other food-fishes were being eaten in such quantities by the sea-lions that the catches were being spoiled. Orders were finally issued to slaughter the animals by the wholesale. The killing began but some naturalists protested, and proved that the "Lions" fed chiefly on squids, shell-fish and devil-fishes, all enemies of the fisherman, and not upon the fishes valuable as food. The animals also include in their diet, for reasons known only to themselves, many round pebbles.

In captivity all seals and sea-lions live in fresh water, and a California sea-lion in New York City is valued at about \$150. This species are very intelligent though the pelts of short, coarse hair are of no value.

The Order Pinnipedia (pronounced Pin-ni-pé-di-a, meaning "fin-footed") contains three groups of sea-faring animals, distributed widely through the ocean waters of the world. They are the seals, sea-lions and walruses. The sea-lion has a long, supple neck, and long, triangular front flippers that have neither hair nor claws, but are simply living paddles. Their hind limbs are web-toed flippers. The ears are small and sharp pointed; and the heads are



FLIP SPEAKS FOR HIS FOOD AS NICELY AS ANY FOX TERRIER AND, LIKE THE TERRIER, EATS GREEDILY.

of the sea-lions, are a short-necked, fat-bodied, low-lying, clumsy set of animals, not nearly as interesting as the sea-lions. The front flippers are short and square ended, covered with hair and provided with claws. They have no external ears, and the hair is of no value save to the Eskimo.

The fur seal which yields the beautiful and costly fur is, in reality, not a true seal, but a sea-bear or sea-lion, quite like the California species. The ringed seal, harbor seal, harp seal, hooded seal and ribbon seal are the other members of this branch of the family. The little ringed seal is the smallest of the North American species and lives the farthest north. The common harbor seal is a good example of the family because it is seen oftenest. The harp seal is a handsome animal



WINTER OR SUMMER, SEA-LIONS ENJOY THE WATER.

The day this photograph was taken there was a keen wind and the thermometer registered ten degrees above zero.

The two photographs on this page were taken by G. T. K. Norton and are published in *THE GUIDE TO NATURE* by courtesy of the New York Zoological Society.

carried high. They are lively, active animals both in swimming and climbing rocks, and they have been seen to dive sixty feet into the ocean. The males of some species grow to enormous size, and have faces so lion-like that the resemblance has given them the popular name. Full grown males are about seven feet in length, weigh about four hundred and fifty pounds, and are of a uniform dark brown color. The Steller's sea-lion, the largest sea-lion in the world, inhabits a few isolated spots on the Pacific coast, from Santa Cruz to Bering Strait. An average male specimen is eleven feet long, stands six feet and weighs about fourteen hundred pounds, with a girth of nine feet, a lion-like head, coarse four inch hair and canine teeth like a grizzly bear, which are much used in fighting. Among themselves they fight much, but in the presence of man they are timid and easily frightened.

The seals, a sort of smaller cousin

and very valuable to man; upon reaching adult age—six years—it is strikingly marked by black or dark brown patches grouped together on the sides and back, on a white or yellowish ground color. This animal is also known as the saddleback and Greenland seal. The hooded seal is a large species. The older males have a flexible skin bag on top of the nose which they can inflate until it is ten inches high. The color is dark bluish gray with white dots. The ribbon or Harlequin seal, in pattern, is the most remarkable of all living Pinnipeds; on a smooth ground color of blackish brown or yellowish gray are several bands of yellowish white. One strip ties the neck, while others mark the body and flippers attractively.

The Pacific walrus, the sea-lions' cousin on the other side of the family, is a remarkable animal—big, slow, hairless and tusked. It can sleep floating bolt upright in the water, and often warns vessels from approaching dangerous rocks on which it rests with grunts and bellows, this is probably done simply to frighten away danger, with no idea of being of service to man. On land the walrus is helpless, but in the water it is at home—and dangerous. They are seldom seen in captivity; one young specimen in the Zoological Society's collection in Bronx Park recently died. This animal supplies the Eskimo with food, fuel, light, boats, dog-harness and leather. A full grown walrus is about twelve feet long and weighs almost a ton; it stands five feet and has a neck twelve feet around. The ivory tusks are sometimes two feet long. The chief food is shell fish and crustaceans, but aquatic plants are also eaten. The Atlantic walrus is much like the animal from the Pacific except that the neck is shorter and smaller, and not as heavily tusked. A specimen killed by Commander Peary measured nine feet and weighed more than fifteen hundred pounds; the skin alone being two hundred and twenty pounds.

The New York Zoological Society at present owns neither walrus or seal, but in sea-lions it is rich. Two specimens are particularly interesting: Flip and Jack. Jack is a California "Lion" lively, large and intelligent. Flip is a Steller's "Lion" and even more accomplished than Jack; his diving is wonderful and a habit confined to very few of

his species. He is probably the largest specimen in captivity and certainly one of the most intelligent. The females owned by the Society are small and do not care as much for the cold water as do the males.

The First Essential of Farm Life.

BY MRS. ELIZABETH P. BEMIS, EDITOR OF
NORMAL INSTRUCTOR—PRIMARY PLANS.

I look upon the work that you are doing as fundamental, universal, religious work, and eventually the Maker of all we want the children to see and love will open the eyes and heart of some one to see the need of strengthening this movement in a national way and of giving the money to promote it.

The money value of your work is its power to make people love the beauty of nature enough to be willing to live in the country.

I know that people can never learn to live happily on farms until women learn to live happily there, and while I believe with all my heart and soul in supplying women with all modern helps on the farm yet I know that the tendency of women is toward the life of the city and away from the loneliness of the farm. Not until women love nature and see its beauties will farming ever be as successful as it is capable of being. This is one of my hobbies. I am forced to think of all altruistic ideals in the terms of commercialism and I've come to respect commercialism; in its right place it is just as spiritual as the vigorous root and the rich soil of a fine tree, and the beautiful blossoms and fruit cannot be produced without it.

[From a later letter.]

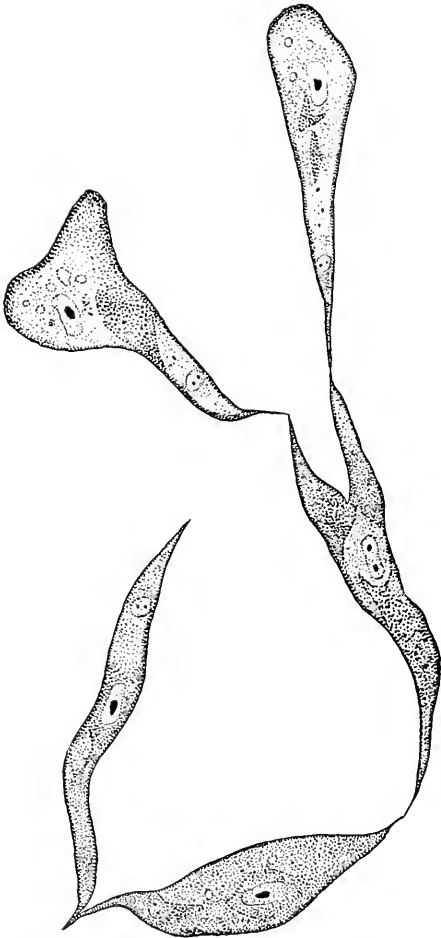
Your work is as hard for some people to understand as Jacob Riis's was, but it is none the less important because it's a new idea.

While all Europe is spending money by the shipload to promote destruction of human happiness some one ought to jump at the chance to give you a million for constructive work. I'd like to see you promote centers like ARCADIA all over the United States and if you had money enough to buy "seed corn" you could make a demonstration to be added to by local rich people. I'm never going to stop wishing for it anyhow.

Why Does the Heart Beat?

BY R. W. TOWER AND C. F. HERM.

Why does the heart beat? It is a question not altogether easy to answer. Perhaps there is no adult who has not counted his own or another's pulse and wondered at the regularity of the rhythm with which the phenomenon pro-



Series of single heart-muscle cells which have been observed to grow, beat separately, unite with one another, and finally beat in unison.

ceeds. Doubtless every one who has dressed his own catch after a successful fishing trip has observed how the heart of the animal beats for some time after it has been removed from the body, and has asked himself: Why this activity and how is it controlled? Is this rhythmic contraction of the heart muscles, continuing day after day, year after year, dependent upon factors outside of the heart, upon stimulations carried to it over nerves from other organs of the body, or is it of an auto-

matic nature, depending upon conditions and stimulations from within the organ—a function of the very heart cells themselves? The answers have been as many and varied as there have been questions.

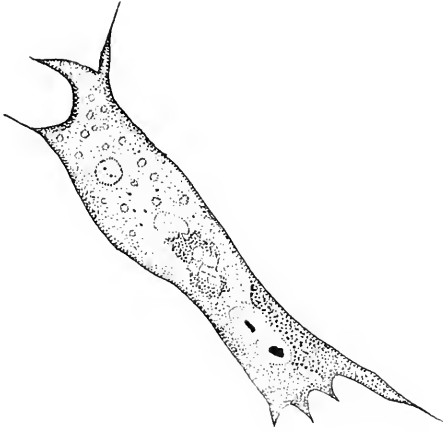
The problem is difficult and complicated. That the heart of a cold-blooded animal will continue to beat some time after being taken from the body has been observed by almost every one, but this proves nothing. That the activity of the heart is regulated by nerve centers outside of itself is undoubtedly true, but this in no way concerns the cause of the rhythmical contraction. It is well known however, that there are within the organ numerous nerve cells which, although cut off from their central office, yet through their natural properties might cause the systematic beating.

The cause may also be sought in the nature of the muscle itself, in which case it is assumed that the muscle cells possess the inherent quality of contraction. Many experiments have been performed to solve this interesting problem in a convincing manner. Very recently it has been found possible to grow heart muscles of a warm-blooded animal in an incubator, and during this growth, a single muscle cell has been observed to wander away from the mother tissue and by itself begin to beat. It would therefore seem that the individual isolated cell, having grown to a certain size and finding the necessary food, the necessary warmth, the necessary oxygen, or in other words the correct environment, will begin to beat—that is its business, it cannot help it.

Again, several cells, while growing, may attach themselves one to another forming clusters of various appearances, and these cells after a time begin to beat, not each one separately but all together, the rhythm persisting at perhaps one hundred times a minute for several days. In other cases, where several single heart-muscle cells are unconnected, they will be seen to contract, not synchronously but the one independent of the other. These interesting observations rather indicate that the heart cells have an inherent ability to contract and must so do when placed in a favorable environment. Rhythmic

contraction is their function.

In the developing embryo, these rhythmically contracting cells grow together, side by side, end by end, forming elongated muscle fibres, which placed layer upon layer, eventually form the contractile portion of the



Single muscle cell from heart of an eight-days-incubated chicken. When a section of the heart tissue is planted in the blood plasma and placed in an incubator, cells like above grow out from it, isolate themselves, and begin to contract rhythmically.

cone-shaped heart. Together with this growth there develop nerve terminals, or ganglia, and nerve fibres which connect the four-chambered heart with the central nervous system. This is essential for, although the heart is capable of automatic rhythmic movement due to the inherent property of the muscle cells as we have already explained, it is extremely important that this rhythmic contraction should properly serve the needs of its possessor. It is necessary that some control should be exerted over its activities, so that when the beat becomes slow, it should be accelerated, and when too rapid, it should be inhibited. These results are obtained by two sets of nerve fibres coming from the central nervous system. One set carries diminishing, or inhibiting, stimuli, the other augmenting, or accelerating, stimuli. Because the rate of the heartbeat changes quickly in response to variations of internal and external conditions, these regulatory nerves are of the greatest value, for through their agency, the motor power of the circulation is quickly adjusted to suit the changing needs of

the organism and is adapted to changes in the external environment.—The American Museum Journal.

An Intelligent Snake.

BY M. RUSSELL JAMES, CALIFORNIA.

Some time ago one of your correspondents made a plea for the common garden snake, and drew attention to its harmlessness and value. This Summer we had an interesting illustration of both the value and sagacity of these pretty little reptiles. On one of the mountain roads, attention was attracted to the queer antics of a garter snake that had been startled by the passers-by, and was making frantic efforts to get into a loose stone fence that extended along one side of the road. But it seemed to be trying to get in tail first! On closer inspection it was discovered that the snake was not "too scared to know which end he was standing on" but had good and sufficient reasons for "turning tail." It had a stranglehold on a mucilaginous slug of a girth greater than its own; consequently a forward entrance through the narrow interstices of the stones was out of the question and the snake was engineering a backward pull. The interested spectators remained quiet and watched the proceeding which was successfully accomplished; the exploring tail hitting an opening between the stones and the snake drawing itself and the slug backward into its home quarters.

Probably not many Eastern people are acquainted with our Pacific coast slugs. These are yellowish-brown slimy creatures that grow to prodigious size in damp localities where the cropping is good. They "sure-to-goodness" cut a swath in gardens, mowing down the succulent vegetation and leaving behind them nothing but a trail of white slime. As a check on these ravaging gastropods, this incident proves the harmless garden snake to be a public benefactor on the Pacific coast.—Rural New Yorker.

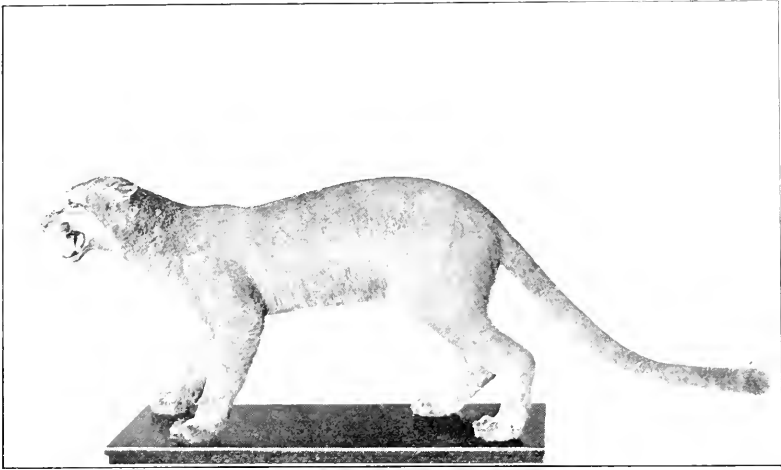
The geologists of Captain Scott's last party found the seaweed movement of the antarctic glaciers to vary from about twenty feet for the ten coldest months of the year to a yard a day during mid-summer.

Panthers in New England.

The famous "Wardsboro Panther," nicely stuffed and remounted, has lately come to rest in the collection of the Boston Society of Natural History. The animal was captured at Wardsboro, Vermont, in 1875. Later it was lost, and has only recently been found in Bennington.

Make Good Use of Forests.

In many places there are the forests. I think that we do not get the most out of them. Certainly they have two uses; one for the products, and one for the human relief and the inspiration. I should like to see a movement looking toward the better utilization of the forests humanly, as we use school build-



THE WARDSBORO PANTHER.

We are indebted to the Boston Society of Natural History for the cut of this Wardsboro panther, as remounted. In a letter dated September 20th, Mr. Glover M. Allen, the Secretary, writes as follows:

"This specimen is one of several New England panthers still extant, and was killed at Wardsboro, Vermont, November 20, 1875. It was mounted and kept for a long time in the town of Bennington, where it was erroneously supposed to have been the original of the famous panther statute there. It finally was lost sight of, and for some time was stored in a barn. Lately it was purchased by our Curator, and though poorly preserved and wretchedly mounted, was made over successfully and now forms a desirable addition to our collection. I am planning to write a history of the panther in New England and should be glad to receive any information of the species that the publicity attending the knowledge of this specimen may bring out."

Who has seen a panther, or, better still, who has killed one in New England? Please send to this magazine any information that you may have in the matter.

ings and church buildings and public halls. I wish that we might take our friends to the forests as we also take them to see the works of the masters. For this purpose, we should not go in large companies. We need sympathetic guidance. Parties of two and four may go separately to the forests to walk and to sit and to be silent. I would not forget the forest in the night, in the silence and the simplicity of the darkness. Strangely few are the people who know a real forest at dark. Few are those who know the forest when the rain is falling or when the snow covers the earth. Yet the forest is as real in all these moments as when the sun is at full and the weather is fair.

I wish that we might know the forest intimately and sensitively as a part of our background. I think it would do much to keep us close to the verities and the essentials.—L. H. Bailey in "The Holy Earth."

Lawyer—"Do you drink?"

Witness (a bit ruffled)—"That's my business."

Lawyer—"Have you any other business?"

Only Two Weeks a Year, but "Nature
KNOWS Her Own."

AN INTERESTING POINT OF VIEW FROM THE
CITY.

New York City.

To the Editor:

You know it isn't that we don't want to look at the clouds as they go sailing by, or watch the whirling snow, but we have to hustle to overtake the train! We New Yorkers are forever hurrying; hurrying in the morning, at noon and at night, and when we are on the train or the street car the time must be used for reading the papers to keep up with the topics of the day. What time have we to contemplate the stars!

Only two weeks out of the whole year (with perhaps a week end trip now and then) have I the pleasure of being out of the city, and, Oh, the city habit gets into the very blood, so that we city folk should be pitied because we cannot abandon ourselves to the country life—I mean become natural when we are near to nature's heart. The shriek of the locomotive's whistle still rings in our ears, the glare of the electric light still dazzles our eyes—pity us poor city-bred mortals.

I think that during all the rest of the months, I plan for those two weeks in the country, and the planning is almost the best of all; but, no, there is the re-counting of my adventures after my return. That too is a delight, for, Mr. Bigelow, I see things when I am out there. Every day, every hour is an experience to me, but not so for most folks. So when my friends ask, "Had a good time?" I say, "Oh yes, a splendid time," and perhaps relate as graphically as I can what splendid board and meals I had, speak of the golf course and the dances.

But would I tell every chance acquaintance my experience with nature? Those creatures would stare at me, or listen with ill concealed weariness, if I should become enthusiastic over an early morning walk in the woods or over a tramp for miles to find a covert-ed flower or to gain a fine view of the country, or should tell them of a bird's nest that I found, or that at last I saw the bluebirds (they do flash by so quickly), or that I know where the mountain laurel can be found!

Why, I am just starved here in the city; you have all the riches! I know so little, and you so much. But don't blame me. I cram into those two weeks all the outdoors that I can squeeze into them. Perhaps I do not go at nature "hunting" scientifically, but all the same I get out of it pleasure and happiness that last me till the next summer. No, you are right. We are not all fit to be farmers nor farmers' wives. A poor stenographer like me is not, I am sure of that. There the stenographer would woefully fail; she is too city-bred to succeed, although, of course, it has been done. Yet do you think that nature does not know her own? There is a revelation in every leaf and flower and insect and bird, if you look for it in love. Did not the dwellers of "The Heart of the Ancient Wood" (by G. D. Roberts) know their own kind? They knew the little girl was not to be feared but trusted. And look at "The Harvester" (Gene Stratton-Porter). Was nature not an open book to him? Some people fear the solemnity of a forest, shrink at the sighing of the wind, are frightened when the leaves rustle, and think it an ill omen when they hear an owl hooting. They do not understand the language of nature, nor that all is in accord and is planned as no man could plan it.

So then I come to the end where I want to thank you most deeply for your lecture of this evening in our Public School No. 46. I hope you have taken at some time in the spring a walk through our Botanical Gardens at 200th Street, and our famous Bronx Park. I remember the place when the old Lorillard tobacco mill was still standing there, and artists with their easels went there to sketch. We have some beautiful parks about here, with grand trees. What would this city be without its parks!

I am going next summer to see ARCADIA, if my plans can be carried out.

Sincerely,
(Miss) ANNIE F. MEYER.

[An important thought is in this city stenographer's letter. She goes to the country and there revels as a natural-

ist for two weeks every summer, but she confesses that when she returns to the city she does not dare be a nature missionary, because she fears that some of her friends will probably look upon her as an escaped lunatic. What is deepest within her heart, what she has most enjoyed, she does not mention, but she tries to make her friends think that she has been as foolish as they are. Yet possibly they practice a similar delicious hypocrisy and speak only of the good board, the dances and the social events.

Why are we all half ashamed of the things that form the fundamental parts of life? Time and again we hear as a sort of secret confession that the best asset in the heart of any human being is the love for good old Mother Nature, yet the speaker does not dare to speak aloud until he has felt his way and found that he has a sympathetic listener. At ARCADIA we had a summer school. Among the pupils was a boy, a good naturalist, who had been compelled to leave the school because, as his mother explained in confidence, he came home night after night crying as if his heart would break. He said in a burst of confidence, "Mother, I want to be a naturalist, but the boys make fun of me."

But, after all, is this repressed and reticent love of nature much different from our love for our religion, on which only the minister, and possibly now and then a deacon, is supposed ever to speak, and only on rare occasions?

Why are we usually so reluctant to speak among ourselves of the religion to which we are really devoted? Why are we usually so reluctant to admit that we are students of nature? I have noticed that when a scoffer at nature and at the student of nature finds himself in the attitude of "wanting to know," the student's doorbell begins to ring and his mail increases in volume. I have also observed that when the "funny man's" friend dies unexpectedly, and the "funny man" is seized by a pain in the region of his own heart, the clergyman's doorbell begins to ring.—E. F. B.]

"The stormy March is come at last,
With wind, and clouds, and changing
skies."

Do It Through Evolution rather than Revolution.

BY PROFESSOR THEODORE H. EATON, DEPARTMENT OF AGRICULTURAL EDUCATION AT THE CONNECTICUT AGRICULTURAL COLLEGE, STORRS, CONNECTICUT.

You ask our opinion concerning the offering of courses in agriculture and horticulture in the public schools of Connecticut. Without going into detail, as I hope to later in a bulletin, I may indicate my conclusions briefly:

1. It is not the function of the elementary school to give vocational training in agriculture. For pupils living in a village or rural environment the use of horticultural and agricultural projects and materials is of the very first importance as a means to teaching the "common elements" in terms of the pupils' own lives. In the seventh and eighth grades of elementary schools it is probable that agriculture on a meaningful rather than a textbook basis may have a prevocational as well as a liberalizing value. In city schools the prevocational and liberalizing aims may well justify the teaching of it. In the junior high school at South Norwalk you may note a beginning.

2. In the larger city high schools prevocational agriculture may well have a place. (The prevocational aim involves the election of occupation by the pupil rather than the attainment of skill and technology necessary to the pursuit of it.)

3. In many of the rural high schools it is probable that the whole course of study should be built up around a vocational course in agriculture for boys and a course in home economics for girls. Such a course may be developed in which the thought content is as great as that in the standardized old line studies, and the experience involved, even in the class room, far less vicarious and remote.

If such a course is to become the core of the rural high school, as I believe that it should, in most cases, then certain requirements must be fulfilled. Among them are these:

- a. The selection of subject matter in the light of community needs as revealed in survival types of agriculture, and variants in the line of progress.
- b. The problem adjustment in teach-

ing, whereby through the home project (or in possible rare instances the part time employment plan) the student finds motive, a foundation for technology and the beginning of type skills.

c. An extension of the vocational course to include the summer months.

d. The employment for the full year of a teacher of practical farm experience, agricultural college training, and training in pedagogy or of experience in teaching.

e. For most such schools a worth while course in agriculture is probably not possible without state aid. Algebra, geometry, Latin, can be taught at a less per capita cost than agriculture, domestic science or any other laboratory or "doing" subject.

4. Much as I believe in agriculture I should heartily oppose a compulsory requirement that it be taught in the public schools. The laws in Ohio, Missouri, Michigan and other middle-western states have been mistakes. We shall come to it through evolution rather than revolution, I hope.

Approves of Agriculture Instruction.

Colchester, Connecticut.

To the Editor:

I hope to live long enough to see more of this work done in all schools, and to see the course greatly extended in the Academy. This work must be the real stuff—actual work in pruning, grafting, spraying, knowledge of the value of the different spray mixtures, and how to make them, what kind of fertilizers the different soils need and what fertilizers meet this need, testing of cream, knowledge of poultry and how to judge it, ability to judge cattle, what crops to plant and how to get the best results, canning, cooking, sewing, Oh! everything that will train the boys and girls to get a living off the soil as the trade and the vocational schools try to train them to get their living in the shops.

We talk about keeping the country boys on the land but unless there is work of this sort done most of them will continue to drift to the town to earn their daily bread in the shop and the store. It seems to me that so-called nature study is all right but it does not seem to get the child anywhere any more than looking at the pictures of

engines and machinery and telling some of the wonders accomplished will make a boy able to do the first thing in machine work.

S. P. WILLARD.

Regarding the House Fly.

BY L. O. HOWARD, WASHINGTON, D. C.

The recent experiments at Washington have shown that the house fly flies at least a mile under suburban conditions. In Texas during the summer it was determined that under rural conditions the distance covered is frequently as much as five miles.

The most accurate observations on the influence of temperature on the adult fly seem to have been made by Donhoff, whose work is referred to in Hewitt's book on the house fly. In these experiments the flies recovered when exposed to a temperature of twenty degrees for three hours, but eighteen degrees for three hours they were destroyed. It therefore seems evident that a temperature of 15 degrees would destroy all adult flies.

Regarding the way in which the house fly passes the winter, it has been found that in the southern part of the United States there is a more or less continuous deposition of eggs and development of larvae through the winter. Of course the larval stage is greatly prolonged, being as much in some of the experiments as 115 days. In northern localities it is not known with certainty whether it is the adult stage, or the larval or pupal stages which pass the winter. Observations which are now under way will probably clear this matter up.

THE LENGTHENING DAYS.

BY CHARLES NEVERS HOLMES, NEWTON, MASS.
Unwarmingly the wan sun sets once more
And sudden shadows steal o'er vale and hill,

A crescent moon is shining out of door,
The wintry air becomes a bitter chill,
And now again we murmur words of yore:
When cold begins to strengthen then days begin to lengthen.

Yon thin moon gleams above the sunset's gold,
The gloaming comes and goes—the world is still,
Some star-gems sparkle over snow-clad wold,
The wintry air cuts with a keener chill,
And once again we murmur words of old:
When days begin to lengthen then cold begins to strengthen.

TO KNOW THE STARRY HEAVENS

The Starry Heavens in March.

BY PROFESSOR ERIC DOOLITTLE, OF THE
UNIVERSITY OF PENNSYLVANIA.

In March, the first of our spring months, the evening heavens show most clearly the contrast between the winter and the summer heavens. The whole western half of the sphere above us is

ged two-thirds of its length from below the ground, the western end of the great summer group Virgo is just beginning to appear, while above this we again see the reddish, brilliantly glowing summer star, Arcturus, to which the ancients ascribed a malign and stormy influence. Between Arcturus

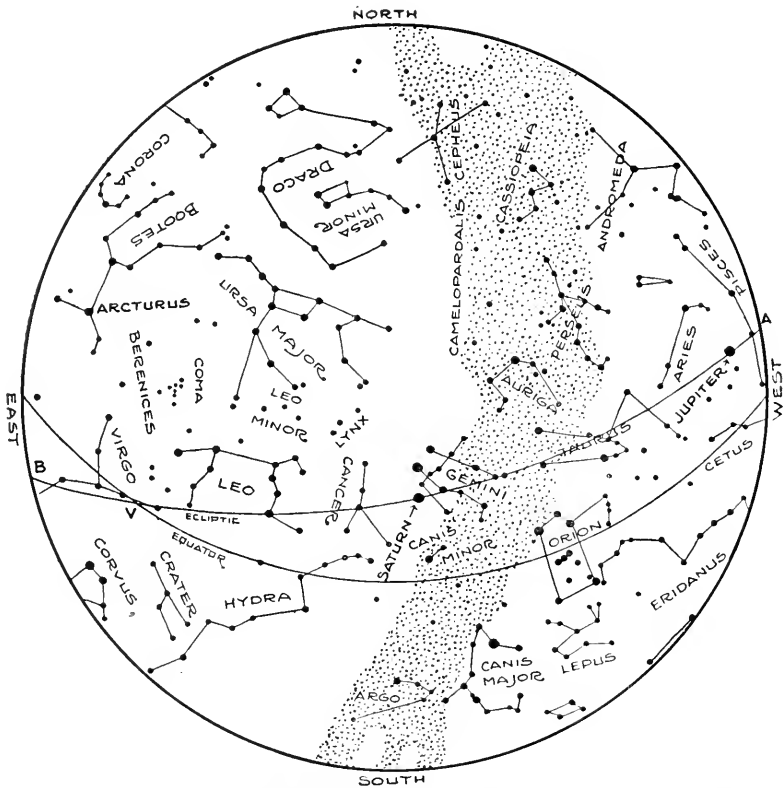


Fig. 1.—The Constellations at 9 P. M., March 1. (If facing south, hold the map upright. If facing west, hold West below. If facing east, hold East below. If facing north, hold map inverted.)

now covered with the bright winter groups, while the winter branch of the Milky Way is already west of the meridian and is just beginning its slow but steady withdrawal from our evening heavens.

In contrast, the whole eastern half of the heavens is far fainter. In the south the long Water Snake has drag-

and the Lesser Lion the observer may trace out the beautiful, filmy assemblage of stars known as the Maiden's Hair.

The interesting, but very faint, group Cancer is exactly on the meridian in the south; to the left of this is the bright Sickle, now apparently hanging perfectly upright, with its handle down-

ward in the heavens. Still higher in the heavens, the entire constellation of the Great Bear (of which the Great Dipper is but a small part) is now in excellent position for tracing out in its entirety. Now, too, is the best time of the year for the observer to become acquainted with the Lesser Lion and the Lynx, two faint little groups which, with Coma Berenices and the Hunting Dogs, inclose the whole southern border of the Greater Bear.

* * * * *

The Planets in March.

Mercury, Venus and Mars are all in the same region of the heavens, near the Vernal Equinox, and all are much too close to the sun to be observed during March. Mercury passes to the east of the sun on March 29, but will not attain its greatest distance until nearly a month later. Venus is still in the morning heavens, and though it will not pass to the east of the sun until April 26, it is already wholly lost in the sun's rays. Mars, the first of the three worlds to enter the evening heavens, passed from the west to the east of the sun on February 28, but it withdraws from the sun so very slowly that by March 31 it sets but twenty-three minutes after sunset.

The two great outer planets, Jupiter and Saturn, are still shining brightly, however, in the early evenings of March. The former glows low in the west, with a steady, golden radiance, but it is now too low in the heavens for the most satisfactory observations with the telescope. Toward the beginning of the month this planet sets about 9 hours 30 minutes P. M., but by March 31 it will sink below the horizon a few minutes before eight o'clock.

The beautiful Saturn shines high in the evening heavens, almost on the meridian. Ever since the beginning of the year this planet has been moving westward, or "retrograding," among the stars, so that although two months ago it was to the eastward of a straight line joining Castor and Pollux, it is now perceptibly to the right of this line. On March 25 this backward motion will cease and the planet will begin to run eastward again. Its motion is, however, always so slow that even by the end of the present year it will have only reached the eastern borders of the faint constellation Cancer.

Late on the night of March 3 the moon will be seen drawing quite close to the planet Saturn, and it will again pass the planet at about an hour before noon on March 31. Many observers in the southern hemisphere of the earth will see the planet hidden by the moon on these dates. To observers in northern latitudes, however, the two bright objects so near together will merely form an interesting figure in the heavens.

On March 20, 11 hours 38 minutes P. M. (Eastern Standard Time), the center of the sun will cross the equator in its motion from the south to the north, and at this instant spring will begin.

* * * * *

The Zodiacal Light.

It is at this time of the year that the strange, faint illumination of the western heaven known as the Zodiacal Light is best observed. It is very probable that the great majority of persons, even among those who are interested in astronomy, have never had the pleasure of tracing out this little-known object. Many imagine it to be so difficult that it requires an unusual eyesight or very special methods for observing it: when it is first pointed out to such persons and clearly seen by them their first expression is almost always one of surprise that they had never seen it before.

At this time of the year the Zodiacal Light is seen as a faint, wedge-shaped illumination in the western heavens, just after the twilight has fully disappeared. The center of the base of the wedge rests upon the horizon a few degrees north of the west point, its axis as seen from our latitudes not extending upward but inclining toward the south in the direction of the constellation of the Bull. The center line of the triangle of light lies very nearly along the Ecliptic, A V B, Fig. 1. It is because the seasonal change of the heavens brings this line so much more directly upward from the horizon during the month of March that the Zodiacal Light is best seen at this time.

To see this faint pyramid clearly the observer must occupy a station well removed from all sources of artificial light and the moon must also be below the horizon, so that the general background of the heavens is as dark as possible.

The second or third weeks of the present month will be especially favorable for the observation, especially the third week, when the moon changes from last quarter to new.

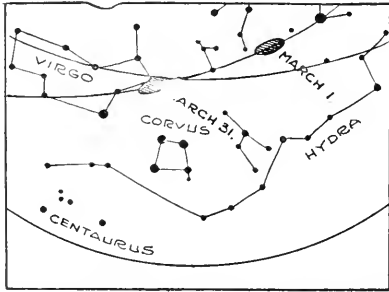


Fig. 2.—The southern heavens at midnight, showing the motion of the Counter-Glow during the month of March.

The observer will then clearly see the faint pyramid of light; it will be seen to be brightest nearest the sun and along its axis, and to fade away toward its edges. Its brightest portions may be nearly or quite as bright as the average area of the Milky Way. It may perhaps be traced at its apex up to, or even beyond, the Pleiades. At first the observer can best locate it by turning his eye to the right and left of the ecliptic and noting how much darker the sky appears in these adjacent regions. It may also be more clearly seen by what is called "Averted Vision," the eye not being directed exactly toward the object itself, but a little to one side of it. But when its position has been clearly ascertained by these methods it will bear more direct scrutiny.

It is practically certain that this illumination is caused by a great, flattened cloud of little particles which surround the sun and extend outward in all directions beyond the orbit of the earth. The earth and the two innermost planets are, in fact, immersed in the cloud. It is the sunlight reflected from each of the innumerable little particles of the cloud that causes the faint illumination that we see.

* * * * *

The Counter-Glow.

A very much more difficult object than the Zodiacal Light is a very faint little area of illumination which moves entirely around the heavens among the constellations in the course of the year, its center always being found in the ecliptic and exactly opposite the sun.

This is known as the Counter-Glow, an object so faint that it eluded detection until the year 1854, and which when again noticed many years later was thought to be a new discovery.

The Counter-Glow can only be seen when the general background of the heavens is very dark; when it is passing through the Milky Way, and even when it approaches the vicinity of a bright star or planet, its observation is rendered very difficult. During the present month its center will move over a comparatively vacant region of the heavens from Leo into Virgo. Since it is always opposite the sun, it will be found highest in the heavens at midnight. During the last week or ten days of the present month, while the moon is absent from the midnight heavens, the observer by using proper precautions in regard to getting away from all artificial light and employing averted vision, may very possibly detect this exceedingly interesting but little known object. He will then have the satisfaction of knowing that he has accomplished what is regarded as one of the most difficult of naked eye observations.

* * * * *

Is There a "Tail" to the Earth?

We do not definitely know what the source of the Counter-Glow is. It is one view that the innumerable particles of matter forming the cloud of the Zodiacal Light are crowded together most closely in a region exactly opposite the sun so that here the great cloud has an unusual density. Each particle in this position must turn its illuminated half directly toward us and indeed shine as a full moon, so that from this region we should receive an unusual amount of light. A profound and beautiful mathematical research shows, in fact, that under the combined pulls of the sun and earth the particles of the zodiacal cloud will tend to accumulate in a region which is exactly opposite the sun as viewed from the earth. The analysis shows that particles which would normally revolve regularly in their orbits about the sun, as the earth does, will upon reaching this region be arrested. Here their motion will become very irregular; they will oscillate backward and forward for a greater or less length of time, finally escaping to pursue their paths about the sun, their places being taken by other newly ar-

rived particles. If this is the true explanation of the Counter-Glow its distance from the earth must be 930,000 miles—four times the distance of the moon.

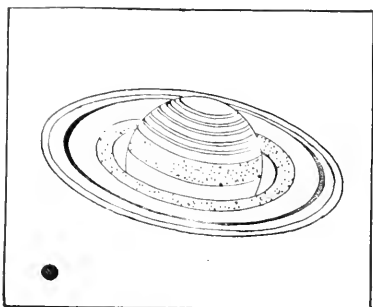


Fig. 3—The planet Saturn. The small black circle shows the earth drawn to the same scale.

Another, wholly different, theory supposes that these particles directly opposite the sun are molecules of the lighter gases of the earth's upper atmosphere which are continually driven away by the sun's action. If this is the true explanation, the earth as it passes about its orbit is, like many of the comets, ever accompanied by a great but very tenuous "Tail," which stretches out into space in a direction exactly opposite to that of the sun.

* * * * *

Amateur Observations.

The Zodiacal Light and the Counter-Glow are two excellent examples of celestial objects which seem especially designed for the observation of amateur astronomers. In this work even the largest telescope is not of the slightest use, and though the latter object has been photographed, yet for their continual observation reliance must be placed wholly upon naked eye work. One observer has recently completed a long series of zodiacal light observations, having special reference to its brightness, which latter is determined by comparing it with selected regions of the Milky Way. These observations may in the future throw much light on its irregular fluctuations in brightness, which phenomena are as yet unexplained.

Again, it is of much importance to determine whether its axis lies exactly along the ecliptic, for one theory of its origin supposes that its particles are

expelled from the poles of the sun's equator. If this theory is correct, the axis must be inclined to the line of the ecliptic no less than seven degrees, for this is the amount of the inclination of the sun's equator. It has not yet been determined from observation whether this is the case.

Like a Rainbow in the Frosty Air.

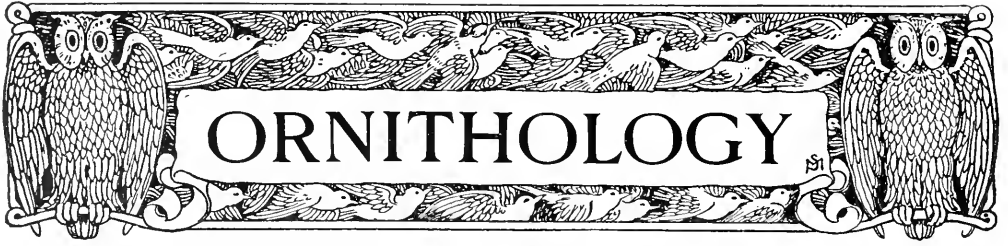
BY H. A. BADGER, D.D.S., TICONDEROGA,
NEW YORK.

As I sat at my breakfast table this morning, Old Sol was just showing his face over that historical Mount Defiance. There was a good bit of frost in the air, and as the sun shined on it an almost perfect spectrum was formed. I say almost perfect for the blue and violet were missing. This remained for almost half an hour when the fall of frozen particles of moisture ceased. My first thought was to write you of it. My mother said that she has never heard of nor seen anything of the sort before.

* * * * *

[The presence of ice crystals in the air frequently gives rise to beautifully colored figures in the vicinity of the sun and of the moon,—haloes, so-called "Parhelic Circles," mock suns, and coronae,—and sometimes to a combination of several of these, making a striking sky figure. Many will remember the striking solar corona of about a year ago, and on the evening of the last eclipse of the moon, (January 8), there was a fine lunar halo visible from eastern Pennsylvania. (A very satisfactory account of these various appearances may be found in Loomis' *Meteorology*, Pages 214 to 225.)

Your correspondent does not state the position of the colored appearance with reference to the sun, but it may perhaps be assumed that it appeared between him and the rising sun, and that it had the form of an arc of which the sun was the center. If this is the case it was the regular Primary Halo; if there were two principal regions above the sun, these were probably parts of the so-called "Contact Arches." A small sketch of any unusual appearance like this, will almost always enable its exact nature and explanation to be told.—E. D.]



ORNITHOLOGY

All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

An Enterprising Robin.

BY IRMA B. ARMSTRONG, RIVER FALLS,
WISCONSIN.

Much has been written about the various phases of bird life but the following incident may be of interest. It occurred in a little town in Saskatchewan where I was visiting. There, as in most other young western settlements, trees are scarce. The few birds which find their way to the place frequently

tigated. On the following Sunday the congregation saw on the ledge at the top of one of the pillars behind the pulpit a regulation robin's nest, built according to all the plans and specifications of robin's nest architecture and ready for occupancy. Not only was the nest allowed to remain but the window was left open so that the happy pair continued their home making undisturbed.

When the time came for the mother to devote herself to the care of the eggs, the church services did not drive her from her post of duty, but she remained quietly on the nest. Occasionally during the service her mate brought her some dainty morsel of food.

Interest in this portion of the Sunday services increased with the arrival of the young birds; the busy parents flying in and out with food, and the calls of the hungry little ones, were a considerable test for both minister and congregation.



THE ROBIN AND HER NEST IN THE CHURCH.

have difficulty in securing suitable nesting sites.

One spring Sunday, when the janitor of the little stone church closed it for the week, he accidentally left one of the windows open for a few inches at the top. Not long after an enterprising robin in search of a good location for her nest espied this opening and inves-

Mocking Birds in Connecticut.

West Haven, Connecticut.

To the Editor:

It may interest you to know that I have enjoyed the unusual pleasure of seeing a mocking bird in my yard nearly every day since October. He alights softly as thistle-down, apparently, upon my bitter-sweet vines, eats two or three berries, and flies away. In the autumn he ran about with tail raised and wings drooping. The only sounds I have heard from him resemble those of the English sparrow. It was some time before I could ascertain his identity, but the Reverend Mr. Job and Mr. Nelson Willmot, both of whom are well informed on the subject, say he is a mocking bird. A pair, I am told, nested in Greenfield last year. This may be one of the young.

Sincerely yours,
MRS. CHARLES H. LYMAN.

A Dove's Nest in a Cactus Thicket.

BY DR. R. MENGER, SAN ANTONIO, TEXAS.

I am sending a photograph of two young doves in and out of the ordinary nesting haunt inside of a blooming



TWO YOUNG DOVES IN NEST IN CACTUS THICKET.

cactus thicket. In this location these young Texas wild doves had ample security from marauding animals of the jungle, including snakes, the prairie rat and various rodents. An additional interesting fact is that it is remodeled from an old abandoned nest of the cactus wren. The old dove, in this instance, as it is occasionally accustomed to do in other birds' nests, built a new nest with only a few dry grasses placed directly on that of the wren. I have often during the breeding time of our prairie birds encountered similar nests of the wild dove inside a cactus jungle. One showing the eggs was, a few years ago, published in your magazine; I am glad to add this which shows the young doves so well.

Do Birds Sing for a Human Audience?

Nashua, New Hampshire.

To the Editor:

In regard to your recent letter, asking if I have ever known birds to sing especially for a human being, or in any way respond to a human being's song,

whistle or call, I gladly give you my experience and my opinion. I have had responses from many birds, after imitating their call, from a loon on a lone wilderness lake to a chickadee about my home. But it is clear to me that the birds mistook my calls for those of kindred birds. The chickadees acted as if greatly puzzled, peering at me as if to discover where the concealed bird may be. Loons are full of curiosity and may be lured close to shore by imitating their wild cries. Owls are prone to answer when imitated.

Many birds sing about our homes, but they sing just as joyously when far removed from human beings. It is easy to imagine that they sing for our pleasure, but I have never known a bird to do so, and I believe they never do. Still I am not dogmatic on the subject. I have learned to maintain an open mind. But I want strong evidence. Male birds (the males do practically all the singing) perform for the benefit of their mates, or sing for the very necessity of singing that is laid upon them. It is as natural for a bird to sing at nesting time as for a lamb to play; play and song are in their blood. Cage birds appear to sing for human beings. But they are in a class by themselves, artificial living having changed their habits.

Yours sincerely,

MANLEY B. TOWNSEND.

Birds and Human Audience.

Watertown, New York.

To The Editor:

THE GUIDE TO NATURE came today. I was much amused by the criticism on my song bird sketch. The naturalist that wrote it knows infinitely more about the structure of birds and about their proper scientific label than I do, but I doubt if he has been more intimately associated with the song birds that build close to human dwellings than I have been for more than seventy years in country homes, north and south, east and west.

I gave those instances as unusual, but in accordance with what I have seen and heard. I could give others. While most birds are timid and cease to sing when one or more persons come near them, there are exceptions. I would not on any account have missed

the pleasure that I have had in taming wild birds. Some will never trust you, but those that do trust become perfectly fearless and when in trouble will come for help.

My most remarkable experience of that kind I told to my brother who used the incident in his "Nature's Serial." I knew where most of the birds around my old home on the Hudson had their nests. One day, while I was planting flowers near the house, a pair of robins came close over my head with cries of distress. As I sprang up from the ground, the birds flew to a lilac bush not far away. Two catbirds also flew in that direction, giving their call of alarm. I ran to the bush, opened the thick clump and saw a black snake crawling up the main trunk to the nest, where were four little nearly fledged birds. I called to my brother John telling him to hurry to the rescue. He seized an old-fashioned gun that we kept to scare away crows from a corn-field, shot the snake through the head before it reached the little birds, and carried it away.

I returned to my flower bed near which were many trees and shrubs. Soon several birds, including the robins, perched on those trees and shrubs close to me and sang as long as I remained. If they were not saying, "Thank you," in their way, what were they doing? I suppose my critic will not believe this story but there are other members of my family who saw the whole episode.

Edward used the incident as he wished for his story in "Nature's Serial," on page 276. That was written some years after the event and when I referred to the gratitude the birds had expressed by their songs he said, "I am sorry I forgot that part for I would have used it."

Yours sincerely,

MARY A. ROE.

Birds Responding in Song to Human Audiences.

New York City.

To the Editor:

In reply to yours as to whether birds sing especially for a human audience, all I can say is that when birds are in the humor for song they are very easily stimulated to it by noises which do not

alarm them. For example, a turkey gobbler will gobble when you whistle to him; canary birds are often made to sing by whistling to them; and I have seen a canary stimulated to song each time a sewing machine began to run. I have frequently induced the chickadee to come and sing by whistling its spring notes, and, in England, I have aroused the nightingale to music by going to its thicket and whistling shrilly. I might add that I have also started the nightingale by throwing a brickbat into its copse. This is a well-known trick among boys in the south of England.

Yours sincerely,

ERNEST THOMPSON SETON.

An Idiosyncratic Rooster.

You are right in regard to the individuality of birds. Recently I have been interested in a rooster that we have, a Rhode Island Red. Among thirty or forty other roosters, he is the only one that pays the slightest attention to me when I go into the yard. But if he sees me anywhere on the premises, he runs to me with a curious sidewise gait and a curious clucking noise which I translate as "goo-goo." He immediately begins to scratch diligently at my feet, as if to show off one of his accomplishments, at the same time making the clucking sounds that he uses to attract the attention of the hens when he has found something good to eat. He is an idiosyncratic rooster, and I am inclined to think that if he keeps on at this rate he will never be served up in a potpie, but will die of old age.

Why Do Hens Act in This Way?

The tangles of nature are frequently hard to disentangle, and the methods hard to explain. In the home, Birchen Bower, at ARCADIA we have for some two weeks past been accustomed to have oranges for breakfast and to use a spoon to hollow out each half sphere. These empty, hollow skins have been thrown into the garbage pail, and from it the contents transferred to the so-called sun parlor of the chicken house where the hens enjoy the warmth of the sun during the cold winter days. Nearly all of these hollow hemispheres are carried by the hens into the dark-

ened section where the nests are located. Several of the nests have been partly filled with them. No one has seen a hen in the act of carrying one, but there seems no other possible explanation of their presence in this strange location. The place is rat proof. Now the question is, Why? That they do it is a fact. We are prepared by past experience to be called a nature faker, but that will not explain the fact.

The Christmas Bird Census.

The Christmas Bird Census, conducted annually by "Bird-Lore," has revealed many interesting facts and much valuable information in regard to the winter movements of the birds. Would not a census from widely separated localities, especially from those along known migration routes, during the periods of migration in both spring and fall be of even greater value? We have known to a certain extent the winter ranges of most of the species recorded in the Christmas census, but when we search for definite dates of arrival and departure of many of our common birds in well-known localities, they are surprisingly hard to find. To know where the various species are at the most interesting time of their movements, when really the least is known about them, would add to our sum total of ornithological knowledge, and should prove valuable to the somewhat meagre information on this subject at present available to the student. We should like to see something definite and systematic undertaken along these lines.

During a recent campaign in the interest of bird study and bird protection at St. Paul, Minnesota, over four thousand bird houses were constructed by boys of the public schools, these being brought together under one large exhibit, and later erected in the parks and private property about the city. This should do much toward conserving the bird life of the city, which in turn will greatly reduce the number of injurious insects preying upon the trees, thereby helping to make St. Paul a more comfortable, healthful and beautiful place in which to live.

TIME'S SYMPHONY.

BY MISS ORA SINGER, HARVARD, ILLINOIS.

The sad, sweet chords of Autumn
Lend a weird pathetic part
In the strains of Time's soft music
Played upon the year's mute harp.

Then the deeper tones of Winter
Add a rich and minor strain
When in solemn meditation
Nature's heart feels thrills of pain.

But the clear bright notes of Springtime
Wake her from her Winter sleep
And our dear old Mother Nature
Rainy tears of joy doth weep.

And the blithe sweet tones of Summer follow these
And gently blend
In the year's full deep Sonata
And in richest measures end.

Then there follow quickly onward—many years
'Til there remains
One glad symphony of Nature
Let us all take heart again.

For from even darkest memories
When our hearts were filled with fears,
Come there—richest harmonies
In this symphony of years.

The Sequence.

The Spring is knocking at our gates,
But Winter's bolts hold fast:
Of weary weeks of snow and ice
May March contain the last.

For April, bonny April's near,
With palette and with brush,
To paint anew the brown old earth,
And make it green and lush;

And ready for the Queen of May,
With all her flowery train,
Her miracles renewed each year,
With sunshine after rain.

Then June, the bride, comes tripping in,
A-blush with blossoms sweet,
And all the world, in merry mood,
In homage at her feet.

Midsummer brings vacation days,
When her work, too, seems done;
Though Nature takes no respite now,
But works from sun to sun.

Fruition needs her every care,
And, though of hours shorn,
A treasure-trove are Autumn days,
Their signet, plenty's horn.

And then must follow well-earned rest,
When, under blanket white,
With all the stars as sentinels,
The earth sleeps through her night.
—Emma Peirce.

EDITORIAL

Is Amplifying the Ideals of The Agassiz Association.

The General Education Board of New York City, founded by John D. Rockefeller, has recently been making extended announcements as to the need of the Modern School. This need was first expressed by the Board in a paper entitled "Changes Needed in American Secondary Education" by President Charles W. Eliot.

The gist of that paper is the ideals of The Agassiz Association that have been promulgated into thousands of schools throughout the land for nearly half a century or to be more exact since 1875 at which time The Agassiz Association was established.

Let us hear what President Eliot says. I quote as follows:

"The best part of all human knowledge has come by exact and studied observation made through the senses of sight, hearing, taste, smell and touch. The most important part of education has always been the training of the senses through which that best part of knowledge comes. This training has two precious results in the individual besides the faculty of accurate observation—one the acquisition of some sort of skill, the other the habit of careful reflection and measured reasoning which results in precise statement and record.

* * * * *

"The boy on a farm has admirable opportunities to train eye, ear, and hand; because he can always be looking at the sky and the soils, the woods, the crops, and the forests, having familiar intercourse with many domestic animals, using various tools, listening to the innumerable sweet sounds which wind, water, birds, and insects make on the countryside, and in his holidays hunting, fishing, and roaming.

* * * * *

"From remotest times the successful physician has been by nature a naturalist. He saw and heard straight, and his touch gave him trustworthy infor-

mation. He has still, and must always have, the naturalist's temperament, and he must possess the naturalist's trained senses.

* * * * *

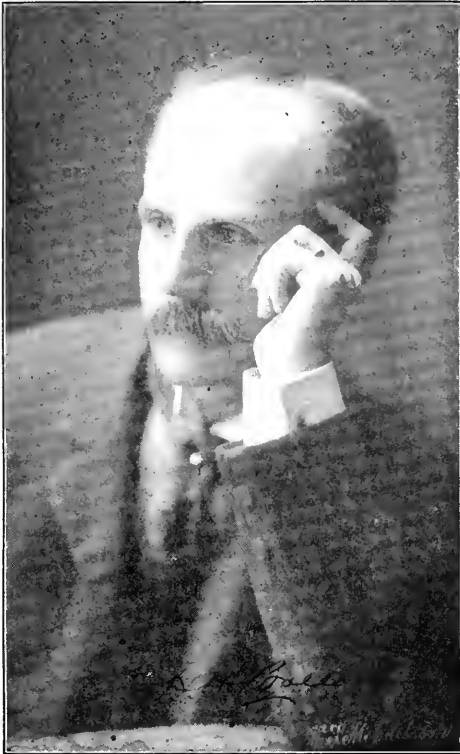
"What has already been done in medical education needs to be done in all other forms of education, whether for trades or for professions, whether for occupations chiefly manual or for those chiefly mental.

* * * * *

"The devotees of natural and physical science during the last hundred and fifty years have not shown themselves inferior to any other class of men in their power to reason and to will, and have shown themselves superior to any other class of men in respect to the value or worth to society of the product of those powers. The men who, since the nineteenth century began, have done most for the human race through the right use of their reasons, imaginations, and wills are the men of science, the artists, and the skilled craftsmen, not the metaphysicians, the orators, the historians, or the rulers. In modern times the most beneficent of the rulers have been men who shared in some degree the new scientific spirit; and the same is true of the metaphysicians. As to the real poets, teachers of religion, and other men of genius, their best work has the scientific quality of precision and truthfulness; and their rhetorical or oratorical work is only their second best."

President Eliot is right. The Agassiz Association has been faithfully working along this route for several decades. Think, Oh, think for a moment, you who are interested in the welfare of the young, how much more could be accomplished along all these lines with a reasonable amount of financing. Mr. Harlan H. Ballard, of Pittsfield, Massachusetts, who established The Agassiz Association, in 1875, and worked faithfully in its behalf for one-third of a century, accomplished the Herculean task of modifying the thought and the point

of view in many a school. All over the land he established missionary centers in the form of Chapters and Members of this grand organization. Suppose he had had even a small fraction of what is to be lavished upon general educational interests by this Board. Suppose



HARLAN H. BALLARD, PITTSFIELD, MASSACHUSETTS.

Originator of The Agassiz Association in 1875.

his work in behalf of the teachers and children had had even one-tenth of the financial support that has been given wisely and well for the protection of birds or to the stopping of cruelty to horses, dogs and other animals. What could he not have done?

It is a curious fact that the arguments coming from President Eliot, who is primarily not a naturalist but a literary man, are practically the same that came from Mr. Ballard, who is primarily not a naturalist, but a learned classical scholar, thoroughly imbued with the spirit of literature in general, and of Latin poetry in particular. He is the author of a scholarly translation of Virgil's Aeneid. The only trouble has been that Mr. Ballard's ideals of education through natural science have

not had as direct and powerful an effect upon the bank accounts of great philanthropists as they have had upon educational thought and practice.

Professor Alpheus Hyatt, Curator of the Boston Society of Natural History, in 1888 wrote as follows of The AA:

"That it is worthy of the support already received from its thousands of members cannot be questioned, and this is a sufficient guarantee that it would be a proper and useful trustee and administrator of a part of the large sums annually distributed by public-spirited persons to institutions having not a title of its claims to their favorable consideration.

* * * * *

"The originator of this enterprise has done something permanent toward developing and spreading a taste for self-culture in an almost new sense, so far as the majority of the people are concerned. He has shown that there is a practicable method by which the average intelligence and self-reliant character of the people outside of the school-room, as well as in it, can be effectively increased. He has taught thousands how to work with whatever means were at hand, not only for their own intellectual improvement, but for that of their children and neighbors. This must also eventually effect the curriculum of the public schools in many places, through the creation of a demand for better and more natural methods of instruction. If he devote the remainder of his life to carrying on and perfecting the system he has originated, he can do nothing more desirable for the interests of science in this country, or more likely to secure future happiness and personal satisfaction for himself, as well as for many thousands of his country-people of all ages and both sexes."

President Eliot's plea has been accepted by this wealthy General Education Board, and here is what Dr. Abraham Flexner, President of the Board, proposes to do by way of experiment. His suggestions have attracted column after column of notice in the educational and the secular papers throughout the country and nearly all, with only a few slight modifications of what he and President Eliot have said, and additions to it, are amplifications of the

ideals of The Agassiz Association. We have claimed before, and we claim again, that no other educational movement has accomplished nearly so much in proportion to the money that has been invested in it, in the last half century, as has The Agassiz Association.

Note what Dr. Abraham Flexner says:

"The work in science would be the central and dominating feature of the school—a departure that is sound from the standpoint of psychology and necessary from the standpoint of our main purpose. Children would begin by getting acquainted with objects—animate and inanimate; they would learn to know trees, plants, animals, hills, streams, rocks, and to care for animals and plants. At the next stage, they would follow the life cycles of plants and animals and study the processes to be observed in inanimate things. They would also begin experimentation—physical, chemical, and biological. In the upper grades, science would gradually assume more systematic form."

He places these statements at the beginning, as the foundation of an announcement in regard to a curriculum. It would be well if the General Education Board would invest liberal sums of money in such an experiment in the Modern School.

It has been worth while, and is still worth while, for every one inclined toward educational philanthropy, to invest liberally in this assured fact that has been demonstrated through decades and vouched for by hosts of educators. I say this assured fact or the work of The Agassiz Association.

In the final analysis the ideals and ideas of not only this Modern School but of other so-called modern educational propaganda are but one or more of those of this long established organization in a little different wording or with a special emphasis.

Read again what President Flexner says:

"The work in science would be the central and dominating feature of the school."

It has been worth our while to work faithfully and with much self-sacrifice. Every worker in The Agassiz Association, from Mr. Ballard to the young-

est member, has for nearly half a century seen the value of the kind of work that, at last, is advocated by this great Educational Board. It was The Agassiz Association and its founder that Prince Kropotkin wrote to the Nineteenth Century for December, 1885:

"Another feature to be introduced in our schools ought to be mentioned here. I mean the exchange, between schools, of correspondence on geographical subjects and of their natural science collections. This feature, already introduced in several schools of the United States by The Agassiz Association, cannot be too warmly advocated. It is not enough to collect specimens of rocks, plants, and animals, from its own limited regions. Each village school ought to have collections from everywhere: not only from all parts of its own country, but from Australia and Java, from Siberia and the Argentine Republic. It cannot purchase them: but it may have, it can have, them in exchange for its own collections, from schools scattered everywhere on the surface of the globe. Such is the great idea which presided at the creation of The Agassiz Association—an association of schools which has already seven thousand members and six hundred Chapters or sections. The children of this Association are accustomed to study natural sciences in the field, amidst nature itself; but they do not keep their treasures to themselves. They write to other branches of the Association: they exchange with them their observations, their ideas, their specimens of minerals, plants and animals. They write about the scenery of Canada to friends in Texas. Their Swiss friends (for something similar exists also in Switzerland) send them the Edelweiss of the Alps, and their English friends instruct them in the geology of England. Shall I add that in proportion as the existence of the Association becomes known, specialists, professors and amateur-naturalists hasten to offer their services to their young friends for lecturing before them, for determining their specimens, or for climbing with them on the hills in geological and botanical excursions? No need to say that: there is plenty of good-will among those who have instruction in anything; it is only the

spirit of initiative which is wanting for utilizing their services.

Is it necessary to insist on the benefits of The Agassiz Association, or to show how it ought to be extended? The greatness of the idea of establishing a lively connection between all schools of the Earth is too clear. Everybody knows that it is sufficient to have a friend in a foreign country—be it Moscow or Java—to begin to take some interest in that country. A newspaper paragraph entitled 'Moscow' or 'Java' will henceforth attract his attention. The more so if he is in a lively intercourse with his friend, if both pursue the same work and communicate to one another the results of their explorations. More than that. Let English children be in a continuous exchange of correspondence, collections, and thoughts with Russian children; and be sure that after some time neither English nor Russians will so readily grasp at guns for settling their misunderstandings. The Agassiz Association has a brilliant future; similar ones will surely extend all over the world."

What Eliot and Elliott Say.

There is an Eliot and an Elliott, with even more difference in their occupations than in the spelling of their names, although from two different standpoints they are working practically for the same end. There is President Emeritus Charles W. Eliot of Harvard University, well-known the world over as an educator and a thoroughly scholarly and literary man. It is he who has become an authority in reference to the best standard literature of the world. From his long experience as President of Harvard University he probably knows better than any other man in New England the condition of our schools, yet he says that the prime object of our educational work is not right and has not been right. He proposes to apply the remedy. Hear his own words on the subject.

"The new teachers would be good mechanics, well-trained laboratory assistants, and naturalists competent to teach botany, zoology, and geology on walks and excursions with the pupils. To provide these teachers in sufficient numbers, the programmes of normal schools would need to be considerably

modified; so that it would probably be necessary to wait for the production of an adequate number of teachers competent to give the new kinds of instruction. The prime object being to give all pupils a correct conception of the modern scientific method, and sound practice in using it, the teachers themselves must understand that method, and be bred to its constant use."

Is it not the strangest thing in the world that a professedly literary man should say that the new teachers should be mechanics and naturalists? Yet this is exactly what he correctly claims. Again hear his words:

"The training of the senses should always have been a prime object in human education at every stage from primary to professional. That prime object it has never been, and is not today. The kind of education the modern world has inherited from ancient times was based chiefly on literature."

Another President by the name of Elliott has been telling us that we are on the wrong track, a practical railroad man, Howard W. Elliott, regarded as one of the most efficient railroad managers in this country. Perhaps the most difficult of all railroad problems has been assigned to him. With it he is accomplishing wonders. The task is yet far from completion, but he is reorganizing and rejuvenating and putting into a higher grade of efficiency the New York, New Haven and Hartford Railroad. But what is one of the first things of which he sees the need on his arrival in New England? That we are not living up to our privileges as an agricultural state. He marshals together a vast number of photographs to show what crops we produce, and from them he concludes:

"If the actual figures were obtainable we would undoubtedly find the amount produced is actually less than 30 per cent. of the consumption. New England must raise more farm products, cattle, fruit, vegetables, etc."

He notes our extensive facilities for agricultural labor and emphasizes the important fact that New England has advanced her manufacturing interests so far ahead of her agricultural output that it is now needful to make a strong plea for the more active development of these neglected interests for the fur-

thering of community welfare. He cites our possibilities and tells us that we should produce far more milk, sheep, alfalfa and even beef, which we have been thinking is hopelessly relegated to the west. Let us hear his words:

"He (the farmer in New England) can, however, supply, I believe, profitably a much larger part of its beef, mutton, pork and poultry. There is no logical reason why New England should not produce all the fruits and vegetables adapted to its climate that it requires, and have a goodly supply left for its neighbors—New York, Philadelphia and other cities."

But the Eliot and the Elliott are, in the final analysis, practically pleading for the same thing. They are asking for the abandonment of traditional formalism and antiquated methods. Both are pleading for the fundamental products of nature, the one Eliot as a factor in education, the other Elliott as a factor in food supply. These men have, in two distinct fields and within a few months, aided in the great work of promulgating and of putting into practice the ideals of The Agassiz Association. For decades we have stood for the training of the child in a knowledge of the things around him, as being more important than the traditional school methods of the past. Howard Elliott sees that defect as we have seen it. He pleads in pamphlet after pamphlet, and in newspaper article after article, for the development of a greater agricultural interest in New England. We Members of The Agassiz Association, hail with delight the cooperation of President Eliot and of President Elliott.

When may we have the cooperation of the public schools of New England? Only here and there do we see that a knowledge of the woods and fields is taught to the young people. We venture to state that a large part of the schools, even those of the country, are cityed and with city ideals; that there is even in the rural districts far more manual training and far more training for a position in the city store than there is for the holding of the plow handles or the making of an ideal country home. We appeal to our New England educators to put into practice

in the schoolroom these thoroughly practical methods of President Eliot and of President Elliott.

We Supply All Three.

It is encouraging to note how the authorities are advocating and advancing the principles of The Agassiz Association, sometimes even when they do not realize what they are doing in that direction, nor how much. There is Superintendent Frederick S. Camp of the Stamford, Connecticut, schools. He recently sent a series of questions to the leading business men and manufacturers of Stamford. These questions were discussed at a meeting of the Department of Education of the Stamford Chamber of Commerce. Superintendent Camp thus appeals for information:

"Please number the following in the order of their importance to you, filling in any omitted general qualifications that you deem important.

- "() Powers of concentration—absolute attention to the job till it is done.
- "() Power of observation.
- "() Resourcefulness: 'gumption'—must not run to the boss for help for every problem."

These points, which are supposed to sum up all that business men require from the boys and girls sent out from the schools, are for the doing of something with things rather than to the saying of something correctly in words. This is exactly the fundamental ideal of The AA. We believe in going to the concrete and not to the abstract. From that to see the thing and make the correct statement and so finish the job.

"Absolute attention." That is one of the essential qualities of a good naturalist.

"Power of observation." That means to see the things that are around you. But what is around you? The greatest thing is the world of nature, and toward it is best directed our observation.

"Resourcefulness." That is only another name for good, old-fashioned "gumption." The very ideal of The AA is that the youngest child should be a learner and may become a teacher by

making discoveries for himself. He does not loiter in the realm of nature until he is told something, but he himself takes up the fact. That needs gumption.

There, my friend, you have the great triumvirate of education, as needed by the business world, according to Superintendent Camp of Stamford, Gumption, power of observation, absolute attention. These are The AA's threefold points of view as applied to the study of nature. Things are coming our way in the hearty approval of the master educators, and though they do not always mention our name when they accept our principles and give them hearty approval, still we are pleased by their cooperation.

Good Work and Rural Nature Study.

Here is a man well fitted for his task or, as the colloquialism puts it, "He is right on to his job." I refer to Edward M. Tuttle, of Ithaca, New York, the Editor of the "Cornell Rural School Leaflet." Several good people are associated with him in his interest in rural localities, and in genuine love with Mother Nature in her simplicity. The "Cornell Rural School Leaflet" savors of nature as she is, beautiful and impressive in her commonplace interests. The Leaflet is entirely free from everything sensational and from the abnormal in observation or development. It is sane, quiet, weighty. I have become so weary of some editors who demand the unattainable or the nonexistent that I am charmed, I am delighted with a publication for boys and girls that regards nature as she is and tries to make her a delight and a charming companion. That is what boys and girls need and should desire. I believe that the average boy or girl is not interested in the latest discoveries of science. There are many things that have been known for at least a year or two that may readily come within the scope of their intellect. I am sure that the average boy or girl who wants to know about nature, and who enjoys her marvelous ways, cares not an iota for the duck-billed platypus of Australia or a Rocky Mountain cony or how asphalt is mined in Trinidad; but I do believe that a bright boy or girl does want to know about the life that ex-

ists nearby on the farm or at the side of the road to the schoolhouse. I shake hands with Mr. Tuttle, and tell him cordially: You are a man after my own heart and the hearts too of boys and girls. You know what they like and you know how to give things that are really worth while. You speak to them about the everyday things that are near them."

In a recent number are illustrations of a bird at a feeding station, a hornet's nest, a cottontail rabbit, the common chickweed that grows and blooms in the winter; attention is directed to the beauty of trees in winter, to corn contests, to school entertainments, to pleasing work with feathers, to bird houses, to a combination apron that will gratify the girl with nimble fingers, to weed seed collections, and fire-side talks on many an alluring topic, although these are only some of the good things in this particular number. I welcome these Leaflets as the traveler across a desert hails the oasis. The average magazine unintentionally presents a distorted view of nature, it is teaching the young to think that only recent discoveries are worth while, that only the things from a distant country merit consideration. Mr. Tuttle has the right idea. In his salutatory for the year he makes the following stimulating appeal in the first two paragraphs:

"Wide-awake boys and girls know that the number of interesting things that may be studied in the out-of-doors, on the farm and in the home, is endless. You know that the more you study, the more new things open up, and that the whole subject of nature study is full of life and joy and worthy accomplishment. It puts you in touch with your surroundings in a way that makes you understand them better and appreciate them more.

"Of course you should always be ready to learn about any new thing that comes to your attention—an unfamiliar bird that sits outside the window and calls, a strange weed by the wayside, a tree that you have not seen before an unknown insect. And you should constantly be on the alert to learn new facts about the things you already know. No opportunity should pass by unheeded. In this way you will grow in knowledge and in power."

The Action of "Efficiency Experts."

On Staten Island is a natural history museum of which Arthur Hollick is Curator-in-Chief, and Howard J. Cleaves Curator. There are other workers in the museum that have been efficient, but most of us that know anything about it know the remarkably efficient part that Howard H. Cleaves has taken in the upbuilding of the institution. He is known world-wide as a first-class, able young man with a life devotion for natural history. But recently the "efficiency experts" of the Board of Estimates of New York thought to save some dollars, so they looked over the museum, spending as much as a half hour there, and in that they assumed to learn of all that Mr. Cleaves had done in many years. They decided to remove him from the payroll.

The public emphatically disagreed with these conservators of public funds, and immediately a host of appreciators put their hands into their pocketbooks and contributed the amount needed for the salary. It is hard to understand how the "efficiency experts" could have thought that the museum could get along without Mr. Cleaves, and it is also difficult to understand why a coterie of appreciators should be obliged to bear the expenses of Mr. Cleaves's public service. A Staten Island newspaper, "The Richmond County Advance," says:

"From the way they acted about the work they might have been a lot of plumbers before they became efficiency experts. They are the kind of men who would go to the capitol and look over the president's record for the past year and then have nerve enough to go in the senate and tell them the president ought to be fired."

All know that Mr. Cleaves had made his influence felt everywhere in behalf of the highest kind of nature study work. He has influenced wealthy Staten Islanders to provide for the birds by erecting bird houses, bird baths and feed places on their estates. He has a powerful influence among the Boy Scouts and other young persons that have proved themselves friends of the birds.

The museum is to have a new build-

ing. It is to be hoped that the powers that be will come to their senses and will recognize the reprehensible thing they did when they tried to dispense with the services of this thoroughly efficient and hard working young man.



HOWARD J. CLEAVES.

"A good naturalist and a royal good fellow, which nobody can deny."

New York City has reason to be proud of Mr. Cleaves, and will have greater reason for pride as the years go by. He is the right man for the place or for a place a good deal bigger.

Truth through Error.

"These spades are still the abode of gladness."

Every lover of the forest and of Bryant's beautiful poem knew that this funny statement is a typographical error, and that we meant not spades but shades. Yet perhaps the printer, through an error, spoke another important truth, if he used the word spades as emblematic of labor. Blessed is the man who has found his work! To him a spade is the symbol of gladness.



A Lapful of Caterpillars.

North Salem, Indiana.

To the Editor:

I am enclosing a little picture of my five year old niece. She was playing alone one day, and seemed to be having such an unusually good time that her mother was led to investigate. She found Esther with a lapful of fever worms or woolly hairs, *isia isabella*. The



UNUSUAL PLAYMATES.

baby was posed as you see, and photographed in an unself-conscious moment. Ten of the caterpillars can be seen. A sort of shrinking because of that one near her neck shows that, baby though she is and very roly-poly, yet she possesses much of the eternal feminine. Esther, like our own two girls, is developing a wholesome fearlessness of lowly things. She has done this partly in emulation of a brother that loves birds and bugs, and partly under the sympathetic explanations of an understanding mother. All hail the day

when the questions of childhood regarding living things and life shall no longer be rebuffed!

Harriet wants to send you her bugs, and a letter that she wrote more than a month ago. She amuses herself by writing to people that she hears us mention, and wonderful creations she sometimes produces. The letter is absolutely uncensored and does pretty well for a baby.

Yours very sincerely,
FRANK B. HOPKINS.

She Sent Ink-made Bugs.

North Salem, Indiana.

Dear Dr. Bigelow:

I have been making bugs with ink. I sat down at the desk and I began to write and I made nine bugs and these was the best. This summer when we were gone our feed box that we fed the birds with fell down. And every year two blue jays comes and eat whatever we had in it. This morning we saw our blue jays but we did not have anything for him.

I must stop.

HARRIET HOPKINS. (Age 5 Years)

Why the Cat Has a Tail.

New York City.

To the Editor:

To judge from the fact that the Manx cats get on exceedingly well without a tail, one might be tempted to believe that the appendage is useless to the cats that have it, but when we consider that tailless cats are scarce, and that in many cases their kittens (of which they produce very few) are more likely to have tails than not, it would seem that the tailless are only freaks and that the tailed are the real thing.

I believe that the tails of all animals have one very definite reason for existing, and that is for the protection of

a sensitive part of the body. The kitten plays with his and the mature cat carries his erect in ordinary circumstances or lashes his sides with it when hunting. Whether this forms part of a signal code that exists between himself and other cats, I do not know, but it is certainly possible—indeed probable.

I wish you would start a campaign against the desertion of cats by their owners in both city and country. While I admit that in many instances the tramp cat is a nuisance, I also claim that it is an unnecessary condition brought about by cat owners themselves.

Sincerely yours,
(Miss) J. R. CATHCART.

Chipmunks as Pets.

BY F. H. VAN HISE, SUMMERLAND, BRITISH COLUMBIA, CANADA.

Several years ago I caught two chipmunks in a box trap. In removing them from the trap, I was careful not to let them bite me, and after placing them in a cage I put my hand on them and found that I could pick them up without being bitten. Since then I have caught fifteen or sixteen, some in the trap and some by chasing into a hole with a dog, and taking them from the hole with my hands. Of all these only two bit me. If I gave them a nut they would sit in my hand and eat it.

We named one "Major," the other "Colonel."

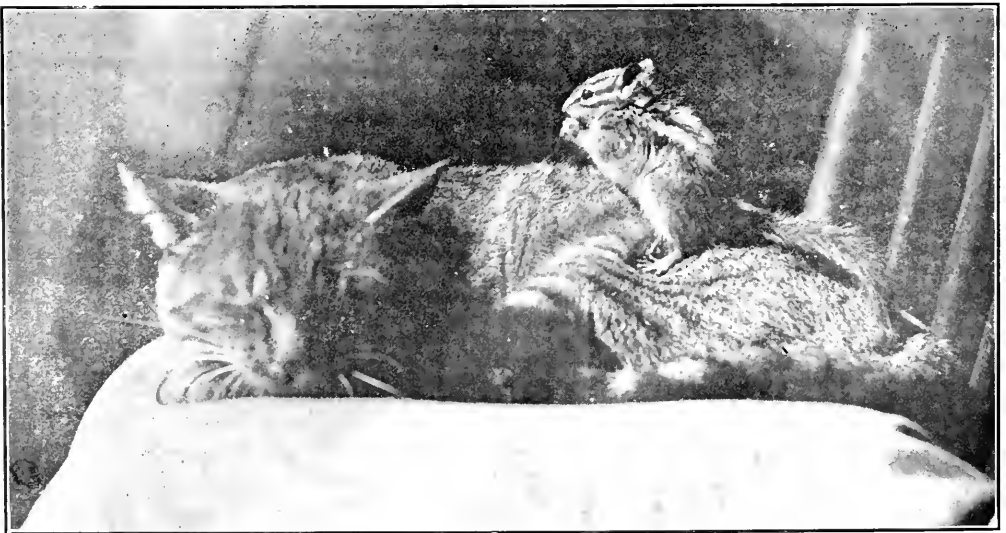
Major took exercise by running and jumping in the cage, while Colonel would sit all day in a corner, but as soon as I made a wheel for them Colonel took possession and would not allow Major to run it. If Major did manage to get in, Colonel would catch hold of him and pull and scold until he ran out. If Colonel wanted to take a nap in the daytime, he would curl up in the opening between the cage and the wheel so that Major could not go in.

In the morning, as it began to get light, Colonel would start to run the wheel and keep it going almost all the time until afternoon, when he would run it only occasionally. In the summer he would get up and take a few turns in the night.

We had them for only a short time before they would run all over us and the dog, jumping from one to the other. They did not like to stay out for any great length of time; they soon would try to return to the cage. If anything frightened them, they went into the cage, as they felt safer there.

I had a box, with a hole in one side and partly filled with strips of white rags, for their bed. When winter came I put in more rags, some of which were black. By morning they had pulled out all the black rags!

Every fall they would save part of their food to store in their bed. As we took the box out of doors in the day and brought it back at night, they



TED LIKED TO HAVE COLONEL RUN OVER HIM.

would bury the food in the gravel on the bottom of the cage until night.

They ate shelled nuts, sunflower seeds, apples, peaches and apple seeds. In the spring they liked to eat the maple blossoms and the new leaf buds as they began to burst.

One morning Major tried to go into the wheel while Colonel was running it and received a blow in his nose that killed him.

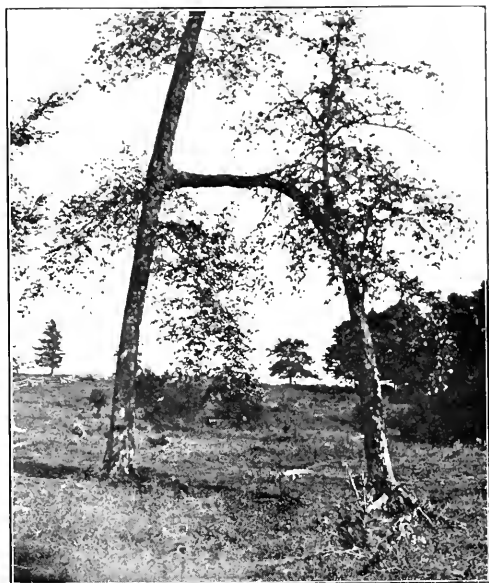
We had an old cat, Ted, that liked to have Colonel run over him. If Ted were lying on the couch when we had Colonel out, he would beg us to put Colonel on him, and would then roll over on his side and lift his foot like an old mother cat with kittens, and Colonel ran over him and pulled fur for his nest. Ted did not exactly like to lose his fur, as the depilation was often painful, but he would only mew and turn over.

We had Colonel for five years, when he met with an accident.

Twin Trees.

An unusual example of grafting is seen in two elms, *Ulmus americanus*, growing near Cortland in central New York. They stand upon a bluff overlooking Brown's gorge and are far from any dwelling. The trees are twenty feet apart at their base and unite at a height of twenty-five feet above the ground. That the union of the trees is physiologic as well as superficial is shown by the enlargement of the combined trunk immediately beyond the point where they met. The smaller tree is fourteen inches in diameter at its base, the larger eighteen inches, both normally decrease in diameter to the point of union, immediately above which the trunk enlarges to a diameter considerably greater than immediately beneath, from which it again tapers normally. This tree reaches a height of about seventy feet. The roots of the smaller tree are partially uprooted on the side farthest from the larger one and the uppermost of these roots have been rotted away leaving mere stumps. This early uprooting, and hence probably also the grafting, was evidently the work of a wind storm, though it is a common belief of the countryside

that the grafting was the work of the former Indian Inhabitants.—H. W. S. in "Science Conspectus."



AN UNUSUAL EXAMPLE OF GRAFTING.

Grading from Bad Boy's Point of View.

On the eighteenth of January I lectured at Public School Forty-six, the Edgar Allan Poe School, of New York City. While I was talking with the superintendent of that center, a judge of a local court came in, or perhaps he was a lawyer, who said that a bad boy had been taken into court that day, and his mother had complained that she could not induce him to attend school, yet the boy tried to prove to her that his markings were correct. He was rated, it appeared, at D, and he explained to his mother that the significance of the ratings, A, B, C, D, etc., is: "A, awful; B, bad; C, corking; D, dandy."

A man at a horticultural meeting quoted the adage "An apple a day keeps the doctor away." A physician arose and said "I question somewhat the statement just made, but if the gentleman will make it two apples I will withdraw my objection. Apples are healthy food."

Less, it is said, is now known about the natural history of the Malayan Islands than of any equal area anywhere else on the globe.

Fishes That Hatch Eggs In Their Mouths.

BY C. H. TOWNSEND.

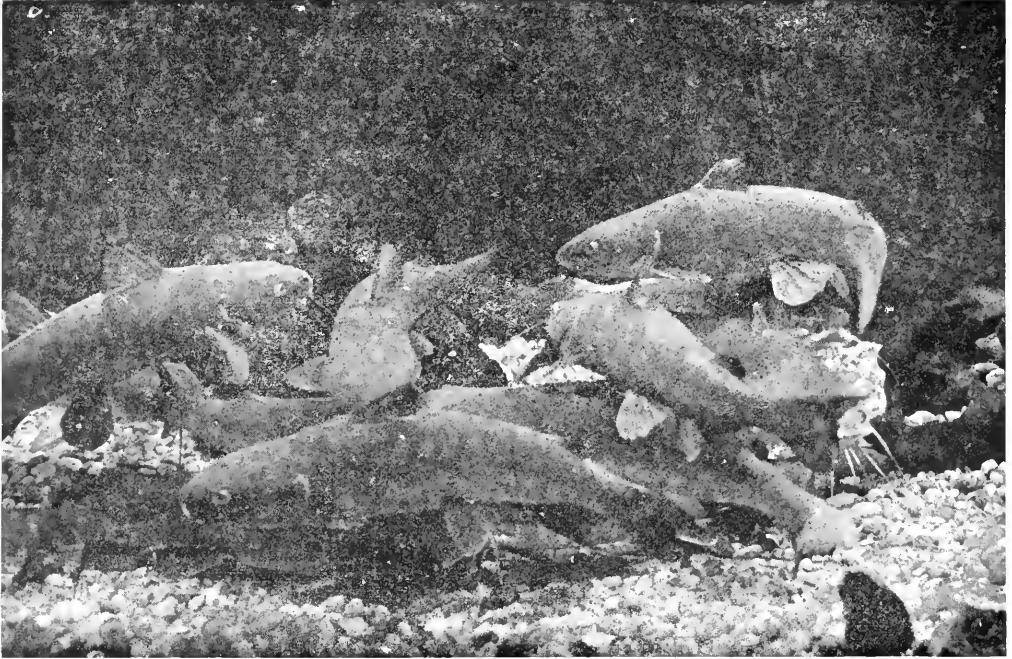
There are two species of salt water catfishes to be found on the New York coast, the gaff-topsail catfish (*Felichthys marinus*) and the sea catfish (*Hexanematichthys felis*). Both species have about the same range along the Atlantic coast, being found from Massachusetts to the Gulf of Mexico.

They are interesting to naturalists

fishes, and are described as resembling white grapes.

The male fish must of course cease feeding while the eggs are in process of incubation, as the mouth becomes quite distended with its load of eggs.

The gaff-topsail catfish is so called on account of the height of its dorsal spine. The sea catfishes are smooth-skinned fishes, reaching a length of two feet and a weight of five or six pounds, but the specimens so far received at



Photograph by Edwin R. Sanborn.

SEA CATFISH THAT HATCH EGGS IN THEIR MOUTHS.

on account of the peculiar manner in which they care for their eggs, which after being deposited are carried in the mouth of the male fish until hatched.

This habit is practiced by marine fishes of several genera inhabiting other regions. It is definitely known that the gaff-topsail catfish carries the eggs in this way, and it is in all probability the same with the sea catfish.

Prof. E. W. Gudger has taken as many as fifty-five of the eggs from the mouth of a single male of the gaff-topsail catfish and has also found the newly hatched young in the mouth of the fish. He determined by dissection that the eggs are cared for by the male parent. The eggs are among the largest in size produced by any of the bony

the Aquarium have been of less than half that size. Both species live well in captivity and have been taken at Gravesend Beach, New York Bay, on several occasions, but they do not seem to appear in our waters every year.

The New York Aquarium has at present twelve specimens of the sea catfish (*H. felis*), the largest of which is fourteen inches in length. They have lived in the Aquarium for three years.

These fishes have been found to feed largely on small crustacea, mollusks, worms, sea anemones and algae, together with some small fishes.

The sea catfishes are but little esteemed as food fishes, but according to Mitchell are really good eating.

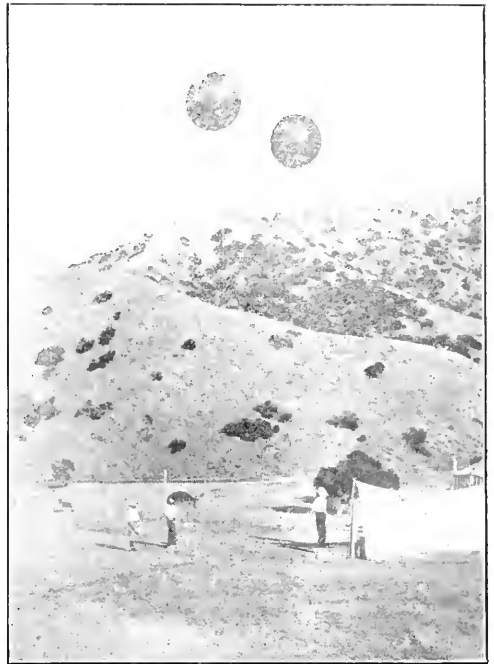
When the spawning season arrives, efforts will be made at the Aquarium to determine whether the eggs of the sea catfish are actually cared for in the same way as in the gaff-topsail catfish.—N. Y. Zoological Society Bulletin.

Testing the Atmosphere.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

In order to observe the humidity, temperature and air currents in the upper strata of the atmosphere, an arrangement such as that shown in the illustration is used by the United States Weather Bureau. Two balloons of pure rubber, equal in size and equally inflated, are attached to a common cord, at the lower end of which is fastened the delicate apparatus. When these reach a stratum of air sufficiently rarified, one of them bursts, and the basket slowly descends, as it is still partly sustained by the other. So gently do these instruments generally fall that they are seldom broken, and as the government remunerates the finder for packing and shipping them "express collect," they are generally returned to the proper officials.

The other illustration shows the delicately adjusted instrument with the needles that make the record on a smoke-blackened cylinder. To the left is the basket in which the instrument is placed for protection during the ascension. The notice to the finder is printed on an envelope attached to the basket and containing an addressed

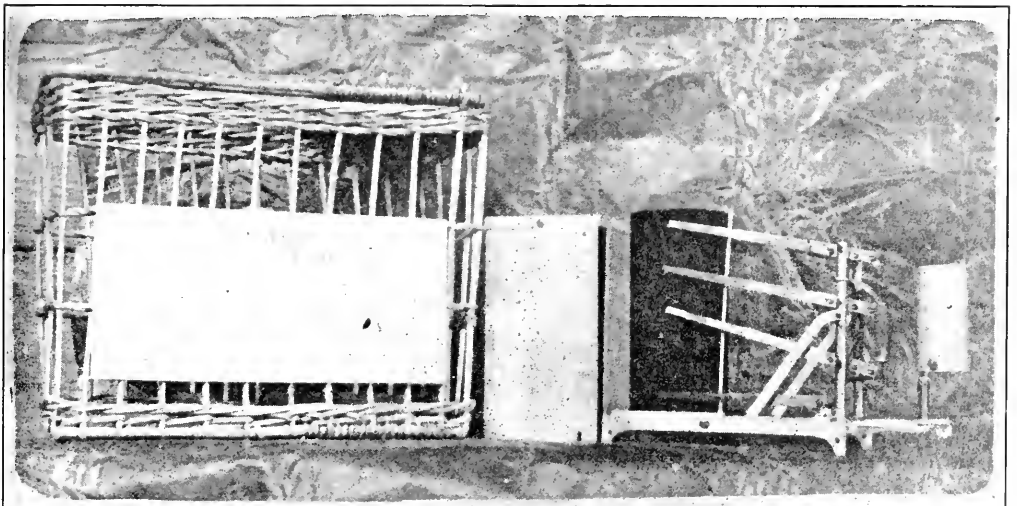


THE WEATHER BALLOONS.

shipping tag and a postal card for the finder's report.

Balloons are as a rule used in pairs only when there is a chance of their falling in the ocean or other large body of water.

Ordinarily, when the balloon is likely to fall on land, we use only one. The meteorograph is then attached to a parachute. When the balloon bursts the parachute takes care of the meteorograph during its descent.

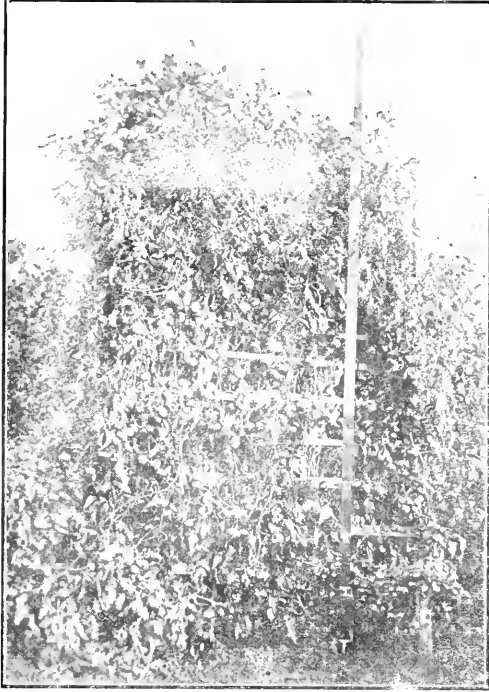


THE BASKET AND THE RECORD CYLINDER.

Mammoth Tomato Vine.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

Santa Ana, California, boasts of what was probably the largest and most productive tomato vine in the world. It came up spontaneously on the premises



A TOMATO VINE WHICH GREW TO A HEIGHT OF MORE THAN FIFTEEN FEET.

of J. M. Feighner during the spring of 1916. It grew to a height of twelve feet, and spread till it was eighteen feet across. Had Mr. Feighner's bungalow not interfered with its growth, it is hard to tell just how far this vine would have gone. Expecting that it would produce unusual results, Mr. Feighner asked the Chamber of Commerce to take charge of it, see to having the fruit gathered and the vine officially photographed. Before the vine died six hundred and eleven perfect tomatoes were picked from it, or more than six bushels, worth about twelve dollars.

The foregoing was referred to Mr. Feighner. He replied as follows:

"I can verify the statements as to the mammoth tomato vine. At the time the picture was taken the vine was not at its best. It grew to a height of more than fifteen feet.

"We gathered one thousand good

sized and perfect tomatoes; not a decayed one was ever found on the vine, and at the time it was taken down (a necessity that we much regretted) for the purpose of building an addition to the bungalow, many blossoms and small tomatoes still remained. We neglected to get another picture of it after the Chamber of Commerce photographed it.

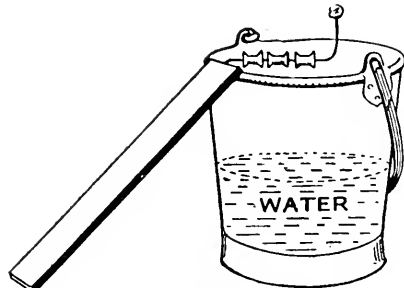
"People that had never seen anything of its kind came from some distance to view it."

He Had Studied Sheep.

Teacher: "Tommy, if there are ten sheep in a field and one jumps over the fence, how many will be left"? Tommy: "None." Teacher: "Why, Tommy! I've been teaching you subtraction a whole year. Try again. How many would be left"? Tommy: "None, Teacher, you may know subtraction, but you don't know sheep."—Credit Lost.

An Australian Mouse or Rat Trap.

The Gardeners' Chronicle (London) reprints from the Queensland (Australia) Agricultural Journal a sketch and description of an ingenious trap for rats and mice, reproduced herewith. A small board is placed with one end resting on the rim of an ordinary pail nearly half full of water, and the other end on the ground. A piece of wire is stuck into the end of the board, three cotton spools strung on the wire, and its end turned up, with the bait fastened on the top. The best bait is a piece of cooked bacon or toasted cheese. The trap has been found very successful, the



AN EASILY MADE TRAP.

mice standing on the spools in an attempt to obtain the bait, and overbalancing into the water.—Rural New Yorker.

LITERARY NOTICES

LVX VITÆ

TWENTY-FIVE BIRD SONGS FOR CHILDREN.
Words and Music by W. B. Olds, with
an Introduction by Henry Oldys. New
York City: G. Schirmer.

Here is a good idea well worked out. The bits of melody that fill the solitudes of nature offer a fascinating field of discovery to musicians as well as to poets and prose writers. It is a curious fact that we go to the woods to hear the music of the birds, as well as to think about them, yet there have been published a thousand words for one note of the music. It is the musician above all others that can find or should find keen enjoyment and actual inspiration in such study. Mr. Olds has supplied the words and music, and Mr. Oldys has told us inspiringly what those words and music should mean to every naturalist. The publisher has done his part well. The entire creditable performance we cordially recommend to our readers.

THE DIATOMACEÆ OF PHILADELPHIA AND VICINITY. By Charles S. Boyer, A. M., F. R. M. S. Supplied by Edward Pennock, 3609 Woodland Avenue, Philadelphia, Pennsylvania.

When one thinks of microscopical material there comes simultaneously to mind the thought of Edward Pennock, 3609 Woodland Avenue, Philadelphia, Pennsylvania. He has one of the best collections of all kinds of bargains in the way of second-hand microscopes, accessories, books, cameras, lenses and other instruments. When you cannot find it anywhere else or when you want to make a little money go a long way, consult Pennock. He has been a spoke in the microscopical wheel for many a year. He knows and appreciates the enthusiasms of the amateur in microscopy, and he knows what the amateur will like in the way of a volume on the diatomaceæ. This book is a sumptuous volume, with magnificent plates that will delight any student of these marvelously beautiful microscopic forms of plant life. We older workers with the microscope look back longingly to those days when the study of diatoms was at fever heat, but it is coming in again. Utility is bringing back much of it in the publication of interesting monographs regarding public water supplies, the algae and the tiny animals found in all the fresh waters, but there are many people who love the diatoms for their own sake, as they love the desmids, rotifers, Entomostraca, and thousands of other delightful forms. Happy is the man who has found his microscope and a ditch of water. He is in the Elysian fields.

MORNING FACE. By Gene Stratton-Porter.
Garden City, New York: Doubleday,
Page & Company.

A few years ago, a tiny girl-child came into the home of Gene Stratton-Porter, with heart full of joy and sunshiny smile that continually recalled to Mrs. Porter, Stevenson's line in "The Prayer": "Call us up with morning faces." So "Morning Face" the child was called.

From the hour of this little girl's birth, Mrs. Porter improvised for her amusement endless sing-song chants, rhymes, jingles, and told stories about the flowers, birds and



MORNING FACE AND HER MOTHER.

animals surrounding the Cabin in Wildflower Woods, and made funny pictures to illustrate them.

Then came the inevitable day when "Morning Face" demanded that her stories and pictures be made into a book, and a little later the further request that her book be "made like the other books," so that she could give copies of it to her little relatives and playmates. So here it is, reproduced for all children, exactly as Mrs. Porter made it for the one child of her heart.


Duty is so obvious that nobody, mentally unperverted, need fail to see it—duty to those we love, duty to employers, duty to one's native land, duty to one's God, whose existence cannot be doubted on a clear night, when the stars and other worlds are on parade—Julius Chambers in the "Brooklyn Eagle."

Dreer's 1917 Garden Book

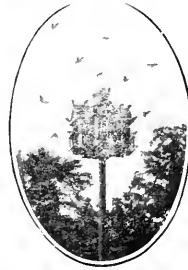
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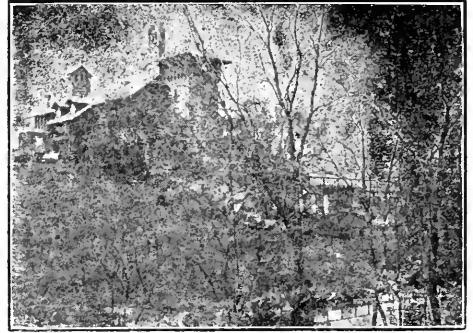
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9369

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The May Manton pattern No. 9369 is cut in sizes from 10 to 14 years. The braiding design 848 gives three yards. They will be mailed to any address by the Fashion Department of this magazine, on receipt of fifteen cents for the dress, ten cents for the braiding design.

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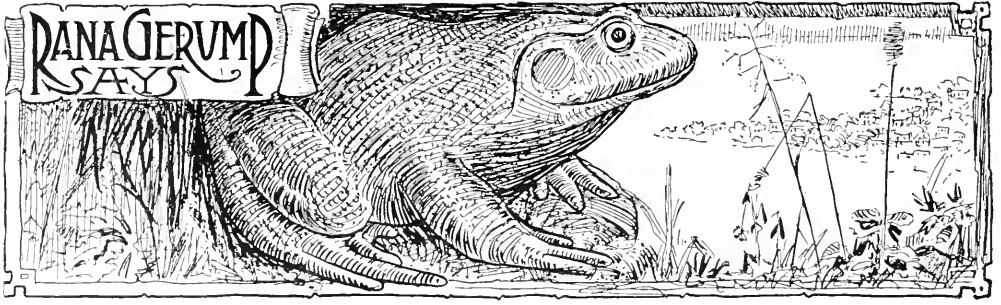
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Dreer's Garden Book Suggests Spring.

In the zero weather of the early part of February, Dreer's Garden Book for 1917, together with some other seed catalogues, was placed on our desk, where and elsewhere it easily holds the supremacy. It is a magnificent production, not only from the horticultural point of view, but from that of the printer and the illustrator. It is a horticultural encyclopaedia, in which one may find illustrated and fully described all the plants best suited to the garden, both for utility and beauty, and their beauty is not less useful than their other good qualities. It would be well if this catalogue could be used as a textbook in every school in the land. With it the children and the teachers could together discuss the common plants of the field, and the special of the garden. The knowledge thus acquired would be really common sense knowledge. But it will be a long, long time before one may dream with any show of probability of such Pestalozzian ideals. The reader will remember that the schoolmaster of his day believed in training the child to know the objects of his environment, and to do the things that were worth while. That kind of vocational training might be directly derived from a study of Dreer's catalogue. Because a thing is done as a matter of business and well done, it should on that account be not the less but the more highly prized. We are writing this notice partly because Dreer is an advertiser in *THE GUIDE TO NATURE*, but chiefly for the benefit of our readers. Therefore we say without the slightest hesitation or mental reservation that the best and most commendable illustrated catalogue that has thus far reached our desk, best in every respect, is the one sent out by Henry A. Dreer, 714-716 Chestnut Street, Phila-

delphia, Pennsylvania. The firm of Dreer has in the past few years furnished a large part of the seeds used at ARCADIA, especially those that were needed for very special experimenting. They were absolutely satisfactory.

The Experimental Method!

"You mustn't go near the open windows, dear," said a mother during house cleaning time to her three-year-old daughter. "If you should fall out on the ground, you would surely break your neck."

Betty followed her mother upstairs and played happily with her doll for an hour. Suddenly her mother missed her from the bed and, noticing that the door was closed, thought she was hiding somewhere in the room. After a playful search of a minute or two she heard a patter of small feet in the hall, and hastened to open the door.

"It *didn't* break my neck, mother," remarked the child as she resumed her play with the doll.—Youth's Companion

Meehan's Marrow Marvels are Marvelous.

Some two years ago we ordered about one dozen of these famous marrow marvels for ARCADIA. They have been admired, perhaps more than any other flower that has been grown in ARCADIA and encouraged by this we last autumn put in one hundred. We are sure that these in a year or two will attract great attention and will please our visitors.

But we do not want them merely in ARCADIA. What we do here we like to see done elsewhere, as the very purpose of our Institution is to suggest, stimulate and inspire in the observation of nature. We cordially recommend the reader to see the advertisement of Meehan's Marrow Marvels, and to send for a liberal supply.

A Good Whack at Myths.

For the benefit of those who still believe the atrocious and fantastical tales and superstitions told of snakes, please observe that: the "hoop" snake is a myth; snakes bite, not sting; snakes do not protrude their "legs" when thrown in fire; the "puff adder" (hog-nosed snake) is not poisonous but is the most harmless snake in this country as it feigns death when approached and nothing can induce it to bite, and above all things, milk snakes do not drink milk.—Rural New Yorker.

The eminent animal psychologist, Professor Jerkes of Harvard, finds that the apes are much more intelligent than the monkeys, who in their turn, are strikingly superior to dogs and cats.

The United States National Museum at Washington has the largest collection in the world of brains of anthropoid apes. In fact, barring only the chimpanzee, it has more such specimens than all the other museums of the world combined.

Removal Notice

On or before April 1st, the Diamond Disc Shop, 372 Atlantic Street,

Will Be Located at the Store of A. S. Kellogg, 46-48 ATLANTIC STREET.

Newly furnished Record Parlors and Salesroom on Second floor.

You are invited to attend our opening recital, April 7th, at 2:30 P. M.

"The Diamond Disc Shop" to Move.

Amburt A. Kellogg, a Stamford boy, graduate of the S. H. S. class of 1915, and son of A. S. Kellogg, whose long-established and popular news and notion store has extended itself from the basement to the roof of the building, corner of Luther and Atlantic Streets, in recent years has been for some time connected with "The Diamond Disc Shop" at 372 Atlantic Street. Something of a musical connoisseur himself, the conviction that "the diamond disc" is the great Edison's last word in exactly and perfectly reproducing the tones of voice or instrument by mechanical means, made a strong appeal to him. He has arranged to buy out the business of the present "shop" and transfer it to new quarters on the first of April. A liberal section of the second floor in the Atlantic and Luther Street building will be devoted to the purpose. The "parlor" atmosphere will be emphasized there, in a skillful and tasteful way. It will become, no doubt, one of the most attractive and comfortable places in the town, or perhaps in the State, for the purpose intended. The furnishings will include, of course, specimens of the cabinets—themselves works of high art—which enclose the "diamond disc" mechanism, and which are all designed and furnished in a style worthy of latest and greatest invention in this line—not a "talking machine" merely, but a device which re-creates the music in exactly the same tonal quality with which it is originally delivered from voice or instrument.—The Stamford Advocate.

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(From an Editorial in "The Popular Science Monthly.")

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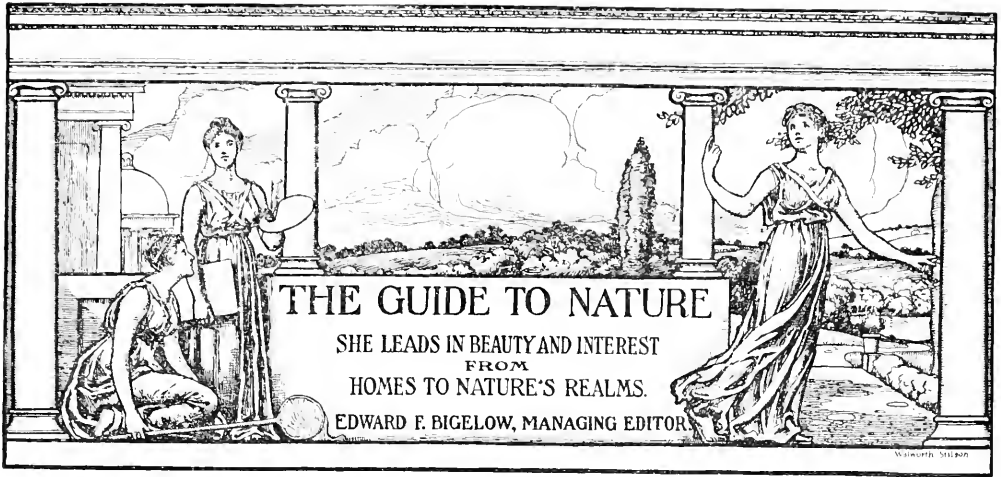
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Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897

APRIL, 1917

Number 11

Venomous Snakes of the Eastern United States.

BY GAYNE T. K. NORTON, NEW YORK CITY.

Several things have transpired recently that prompt the writing of this paper on the venomous snakes of the eastern United States. The writer had a thrilling experience—I'll not dignify it by calling it an escape—with a copperhead in New York City. A friend, while exhibiting a copperhead, was poisoned by a drop of the venom coming in contact with an unknown scratch so that the loss of his arm was narrowly escaped and his life saved only by prompt action. A recent article in a magazine belittling the danger of the moccasin, and the tragic experience of a keeper in the New York Zoological Society's Reptile House, and other incidents, are my excuse for writing. Mr. R. L. Ditmars, Reptile Curator of the New York Zoological Society and the Rockefeller Institute says: "It is not generally appreciated that inhabiting the United States are some of the most deadly known species of snakes, and these fairly teem in some parts of the country. Even in the East—in the immediate vicinity of well-known summer resorts, within city and town limits—poisonous snakes are abundant. It is well—nay imperative—for all who visit the country to know how to distinguish

these from the many harmless and really beneficial reptiles."

Of the one hundred and eleven species of snakes found in this country, seventeen are poisonous. There is hardly a portion of the country that is not inhabited by poisonous snakes. The majority are found in southern latitudes, though the few northern species are so abundant that venomous snakes are more common in some sections of the East than in the South.

The two species of Elapine snakes, the common coral (*Elaps fulvius*), and the Sonoran coral (*Elaps curyxanthus*), need hardly be mentioned as their habitat is restricted to the South. A few words will suffice for the rattlesnakes, because all species are readily distinguished by the rattle. The timber rattlesnake (*Crotalus horridus*) is the only one found in the East though the Massasauga (*Sistrurus catenatus*) and the pigmy rattlesnake (*Sistrurus miliarius*) are found in the central and southeastern regions, the other ten species appearing only in the South. This leaves but two species of the Crotaline snakes to be described: the copperhead (*Ancistrodon contortrix*) of the East, and the water moccasin (*Ancistrodon piscivorus*) of the Southeast.

These two species belong, with the rattlesnakes, to the sub-family of Pit

Vipers—Crotalinae. On each side of the head, between the eye and the nostril, is a deep pit—a distinguishing characteristic. They also have but a single row of plates for the greater length of the tail, whereas our harmless snakes have two rows on the under surface of the tail. The harmless snakes have the pupil of the eye round, while the copperhead and moccasin have an elliptical pupil. The moccasin is dull olive, with wide, black, transverse bands. It abounds in the swamps and sluggish waterways of the southern states; the mouth, when open, is gray white, thus the popular name of cottonmouth. The copperhead is pale, hazel brown. Crossing this ground color are rich, reddish brown bands, narrow on the back and wide on the sides, appearing, from above, to have the outlines of an hourglass. The top of the head may show a coppery tinge, hence the name. In the north, the colors are dulled, but the markings remain the same.

In the New England and Middle Atlantic states there are but two species of poisonous snakes, the timber rattlesnake and the copperhead.

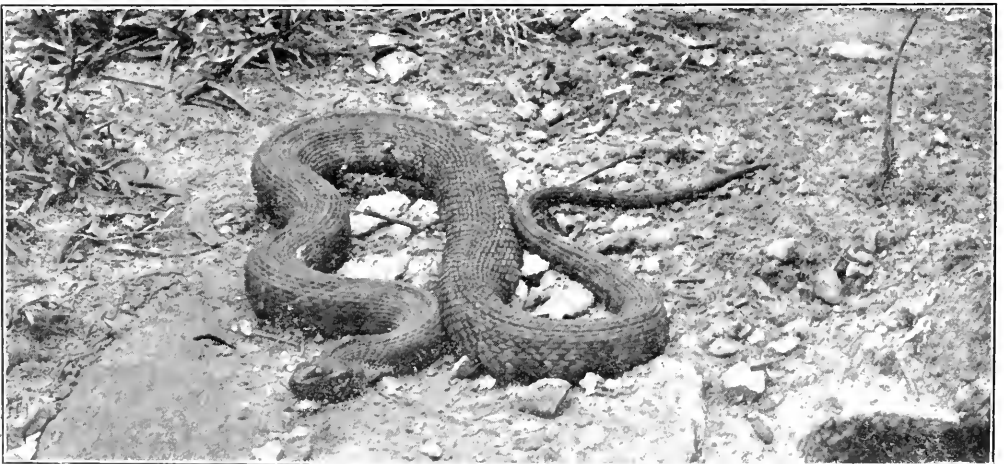
A poisonous snake does not spring from the ground; it seldom strikes more than a third of its length, and never chases an enemy. The attitude toward man is merely that of self-defence. It need not coil before striking, providing the neck can be doubled into an S-shaped loop to lurch the head forward. It is impossible to render a poisonous snake permanently harmless by

extracting the fangs, as a number of auxiliary fangs are ready within two weeks to take the place of the functional pair.

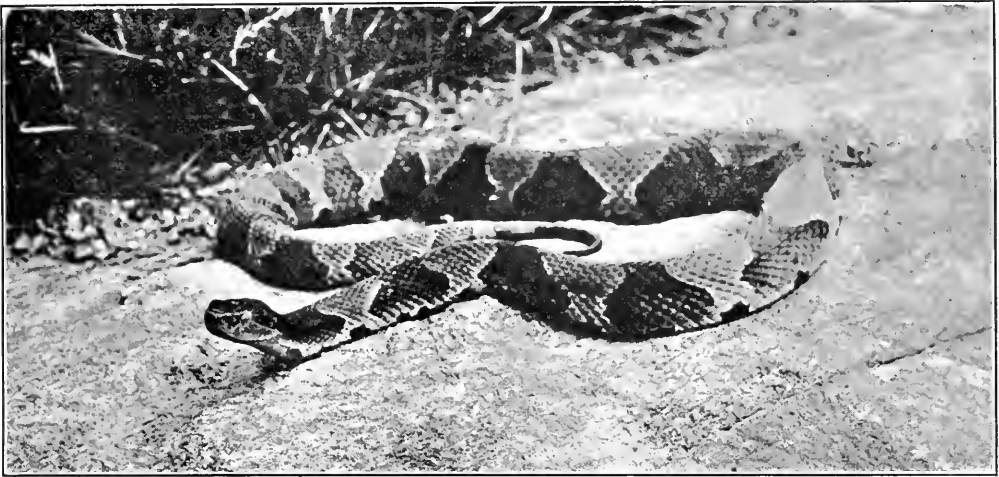
Snakes do not sting. The injury is a bite, dealt by a pair of hollow teeth in the upper jaw. These teeth have an opening at their tip for the ejection of the venom. Each fang works independently and is connected with a poison gland behind the eye. When the mouth is closed they fold back against the upper jaw and are covered by a membrane. The snake can strike without ejecting its poison, the entire poison apparatus being under perfect control at all times. The darting, velvety, forked tongue is in no way connected with the poison apparatus; it is used only for the purpose of feeling. The snake, to strike, goes through a number of operations; the head is raised slightly, lunched forward, and the mouth opens; the fangs strike, often only one effectually, and are pushed deeper.

The venom of *Ancistrodon* affects in about equal proportions the blood and the nerves; the venom of *Sistrurus* and of *Crotalus* is practically destructive of the blood. Bites from these snakes are dangerous but not fatal if prompt and proper action is taken.

Venom is a glutinous, yellowish substance resembling a thick solution of gum Arabic. The peculiar odor comes from the snake. In fresh venom are floating granular particles that soon settle. These particles are whitish and



THE WATER MOCCASIN (*ANCISTRODON PISCIVORUS*).
Habitat: southeastern United States.



THE COPPERHEAD SNAKE (*ANCISTRODON CONTORTRIX*).

Habitat: eastern United States.

This photograph and the one on the previous page are by Elwin R. Saaborn, New York Zoological Society.

are innocuous when freed for the soluble constituents of the venom. No color is peculiar to any definite species. One specimen will furnish deep colored venom, another pale colored. Venom dries quickly and retains its poisonous properties in unaltered strength.

It is harmless when swallowed. The cause of death in acute poisoning of warm-blooded animals is the cessation of respiration from paralysis of the nerve centers. The heart is enfeebled but not paralyzed. In chronic or secondary poisoning, the rapid decomposition of the blood and of the tissues locally acted upon leaves no doubt that serpent venom is a septic or putrefacient poison. From two to four drops are usually discharged at one bite.

The bite of *piscivorus* is more dangerous to other venomous snakes than to itself; it is fierce toward other snakes; its length averages from four to five feet. *Contortrix* is more slender, about three feet in length, and like all Crotaline snakes produces living young from seven to nine in number. The bite of a pit viper will send a rat, rabbit or any other small mammal immediately into convulsions and cause death in a minute. A king snake will kill a copperhead, moccasin or rattlesnake within five minutes by constriction and show no ill effects from the poison. *Elaps*, though killed, will cause the king snake to appear sleepy for a few hours. A snake is not poisoned by its own venom, and its

fangs which it sheds periodically, usually in its food, are the only things which the stomach juices cannot digest. The feathers, teeth and claws of the prey are all digested.

Studying Buds and Twigs.

BY HERBERT W. FAULKNER, WASHINGTON, CONNECTICUT.

Sometimes when a warm day comes in late winter we hear from casual observers the news that "The buds are forming and spring is near!" As an actual fact, the buds were formed last autumn, and have all along been visible but unobserved.

We must not take a long vacation from our nature study because it is winter. Many things are now easier to find. The trees have gone to sleep, their leaves are wrapped in warm "sleeping bags" or buds distinctly recognizable one from another.

For several reasons we want to know our friends, the trees and shrubs, in winter.

We may want to feel certain of them and leave others for the good of our forest. This is true forestry.

We may need certain kinds of wood for our bows, canoes, traps or for other purposes.

We may plan to start a maple sugar refinery, and must know the sugar maples from other maples.

Again, we may desire to transplant young trees or choice flowering shrubs from the wilderness to our own home

grounds. We should do this while they are in the dormant state. Thus we need to recognize our trees and shrubs in their winter undress, as we can generally do by the leaf buds.

The beech and the birches may be differentiated thus: Most of them have



A REVELRY OF BUDS READY FOR "THE BURST."

pointed buds, but the buds of the beech are longest and sharpest, and are brownish at the base, becoming almost yellow at the tip. The smooth gray bark is another indication, as also are the dried leaves of a pale yellow color which often cling to the twigs and flutter softly in the wind.

The black birch has pointed buds of medium length, and with much the same color as those of the beech; but they are often mounted on little woody necks, as shown in the sketch. The glossy black bark and its delicious "birchy" flavor, even in winter, are sure guides to this tree.

The yellow birch has pointed buds, more yellow in color and much shorter than those previously mentioned. The yellow twigs and the shiny trunk, which peels in a shabby, ragged fashion, will assure us that we have found a yellow birch.

You might expect no trouble in immediately recognizing the lovely white birch, but in early youth it has a way of disguising itself under a dark brown bark, which turns white as the tree advances toward maturity. We must therefore learn to know it by its oblong, subspherical buds, with sometimes a slight point, and with scales long and dark. A catkin too sometimes dangles from the tip of a twig.

The hard and useful ironwood has somewhat pointed buds, but the oddly fluted trunk and fine twigs, twisted into strange, decorative forms, will help us to know it out of season.

The sugar maple bears small, sharp buds in opposite pairs, as shown in the sketch. In the first warm days its sweet sap is a sure guide to it.

The swamp maple produces round, red buds in close clusters at short intervals on the young twigs. Early in the spring they burst into bloom; in the autumn this tree is the most resplendent of all.

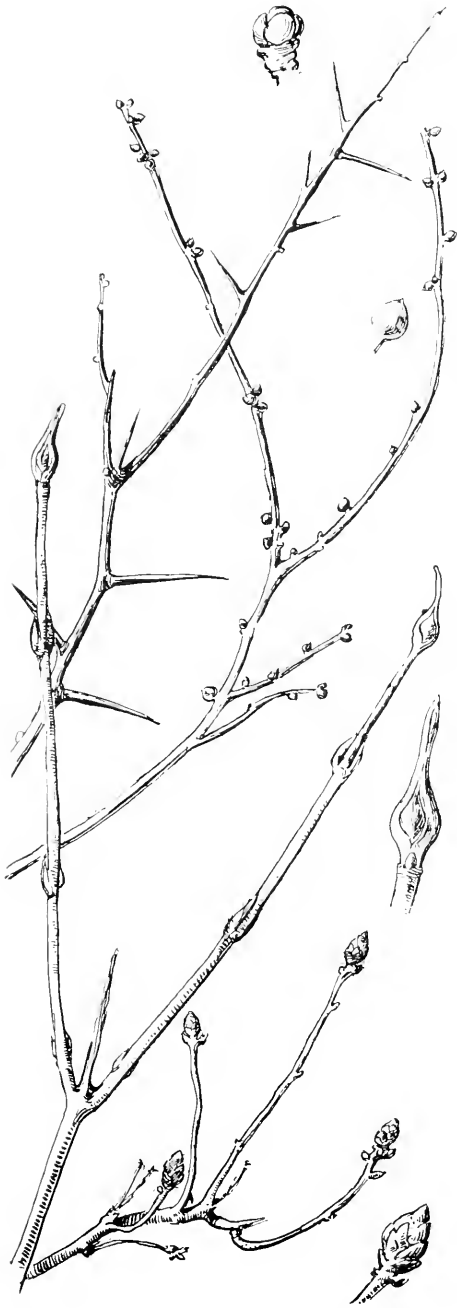
We are fortunate in having a large number of native shrubs that bear beautiful flowers in quantity and in close succession.

The hawthorn buds are so minute as to be scarcely visible, but there is no mistaking their thorns.

The spicebush is covered with numerous spherical buds, which look like a host of little yellow-green beads.

These open into flowers before the leaves and fill the wood with their perfume.

The hobblebush bears buds in opposite pairs along its smooth gray stem, and a curious terminal bud sometimes described as a "minaret." The flowers develop into flat, white clusters, followed by grape-like fruit, dark purple



PROPHECIES OF SUMMER.

and luscious to look upon but not edible.

The pink azalea is, perhaps, our showiest shrub in May and June. Its buds are large, terminal, and look like pineapples. The plant may be made to flourish in our garden, provided it has plenty of sunshine.

In this season there is some fun to be had with dormant buds, if we gather the twigs and keep them in the warm house with their tips in water. The buds will swell and open and burst into bloom like Aaron's rod.

The best and surest is the garden Forsythia, although many others such as the apple, the dogwood and many early bloomers will act as miraculously. In this way we can set the clock ahead and waken the flowers before their time.

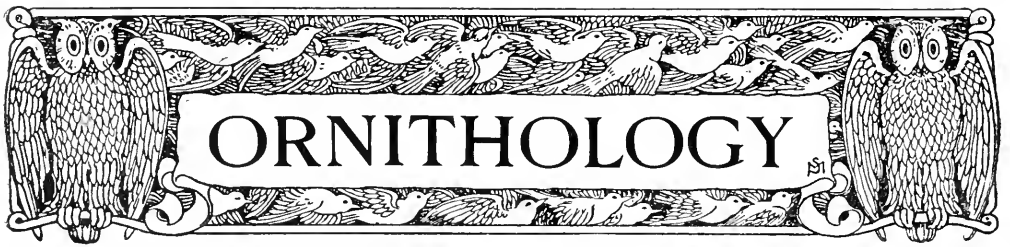
Shot a Panther.

Lynchburg, Virginia.

To the Editor:

I have just been reading your account of the panther killed in 1875 in Wardsboro, Vermont. You ask if others have been killed in Vermont. About 1885, as nearly as I can recollect, a beautiful specimen was shot in the township of Barnard, about nine miles from Woodstock. In November, at Thanksgiving time, a party of boys, roving around out of doors in Barnard, observed in the light, recently fallen snow the footprints of an animal like those of a huge cat. They followed the trail till it ended in a dense spruce thicket. Being unarmed they went to a farmhouse near-by and called out its owner, who came with a shotgun with which he presently dispatched the animal. It was brought to Woodstock and placed on exhibition. I saw it there. It was a handsome beast, the coat of an auburn tinge, and the muscles of its paws like twisted steel. It must have been a powerful creature. Its claws were like little crescents, and sharp as a razor. I shuddered to think how the animal could have rent asunder its prey, whether man or beast, with weapons of offense so formidable. The man that shot the panther claimed it for his own, refusing to recognize the fact that the boys were instrumental in tracking it. The boys protested but, I think, without avail.

Laura Fay Smith.



ORNITHOLOGY

All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

A Study of the Brewster's Warbler.

An unusual opportunity of closely observing the home life of the Brewster's warbler was offered to a few fortunate bird students when a pair of these birds chose for their nesting site a slope of ground near the main driveway in the Arnold Arboretum at Boston, Massachusetts, several years ago.

This being the first instance of their nesting within the state, and but the third of their reported occurrence within its limits, a somewhat widespread

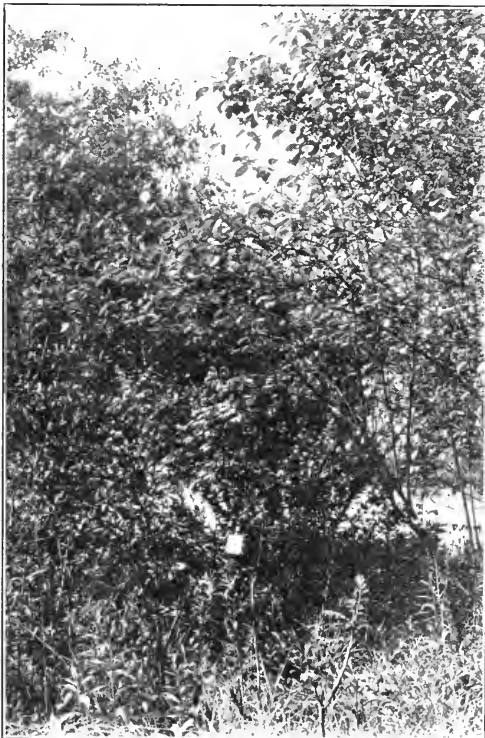
interest has been created in regard to it; as there has been so much discussion in regard to the status of this bird,—which is generally supposed to be a hybrid between the golden-winged and blue-winged warblers.

While photographing this nest, which was on the ground at the base of a small elm among somewhat scrubby growth as indicated in the first picture, giving an excellent opportunity for a close study of their plumage and actions.

The small white card showing near the lower right-hand part of this picture was hung directly over the nest to show its exact location, and the female was on the nest when the picture was taken. A careful study of the birds was made here and the colors of their plumage noted down, as there has been such a wide variation in the reported descriptions of the few specimens of this warbler which have been taken.

The female, in this instance, appeared to be about as brightly colored as the male, excepting that the black stripe through the eye was not as decided as in the male, and did not continue *beyond* the eye. It seemed also to have more ashy on the throat than the male, and was greenish-yellow on the back, though not bright. I did not observe any greenish-yellow on the back of the male, and no yellowish tinge on the breast of either the male or female. Both birds were marked similar to the female golden-wing, but a little lighter; though both showed ashy on the throat, and the black through the eye was simply a line, rather than a patch as in the male golden-wing. The yellow patch on the wings was quite broad and in two slightly separated bars, rather than in one,—a fact which varies somewhat in the markings of the typical golden-wing.

The nest itself,—a close view of which is shown in our second illustration,—was a beautifully-made affair,



NEST LOCATION OF BREWSTER'S WARBLER.
White card hangs directly over the nest.

placed upon the ground almost completely hidden among the surrounding growth. It was composed of dead leaves, thickly lined with grapevine bark and dried grasses, and was very compactly woven together. Within this deep, soft cup were five beautiful eggs; creamy-white, with a thin wreath of very dark brown, or black, spots encircling the larger ends. These eggs, which were quite rounded, more closely resembled the type of the blue-winged than those of the golden-winged warbler. In shrubs within six feet of this nest were also the nests of a yellow warbler and a rose-breasted grosbeak.

After studying the nest and its surroundings, we spent some time in watching the male, who appeared to make his haunts about a group of oaks some two hundred yards distant. Here, as he perched for ten minutes in one position in the top of one of the oak trees, I listened to his weak, lisping song, which was frequently uttered and seemed identical with the song of the golden-wing;—being a wheezy “Zee—zee—zee” in a grasshopper-like note, sometimes in three syllables and sometimes in four; the first note being high-pitched and the others low. Each time the bird repeated this song he would open his bill and throw back his head, as if to give more force to the utterance.

What seemed to be a rather curious coincidence with the study of these birds as noted here, was the finding on the following day of another Brewster's warbler (the fourth record for the state) in a scrubby tract of growth in Hyde Park, within a few miles of the nest just described. This bird,—a male,—was discovered by its almost constant singing, while it remained in the low scrub oak and birch growth, flitting about under the bushes and feeding upon the worms and insects.

This bird proved to be decidedly different in its markings from those noted at the Arboretum, and was altogether an unusual specimen. Its crown was yellow with a few dark feathers. The entire back and wings were greenish-yellow; some of the wing feathers being bluish-gray edged with greenish; the tail was bluish-gray above, with the three outer feathers on either side partially white,



NEST AND EGGS OF BREWSTER'S WARBLER.

and the under sides of both wings and tail were light gray. There were two yellow bars on each wing, these being not so broad as in the typical golden-wing. There was a black line through the eye, and a little whitish on the sides of the neck. The throat, breast, sides and belly were decidedly yellow, this color being strongest on the breast. A few bluish-gray feathers were scattered through those of the back and wings. The hazel eye, black bill and greenish-black tarsi and feet were typical.

According to the second annual report of the “Preliminary Census of Birds of the United States” under the auspices of the U. S. Department of Agriculture, there are 124 pairs of nesting birds on an average on each farm of 108 acres in our northeastern states. Many individual instances have been reported where the bird population has been enormously increased on such areas by protection and methods of attracting them: One hundred and ninety-two pairs on 44 acres at Indianapolis, Ind.; 180 pairs on 23 acres at Chevy Chase, Md., and 70 pairs on eight acres at Olney, Ill., being among the most prominent instances of this nature.

Feeding Stations for Game Birds.

The lean-to shelter and feeding station here illustrated is a practical type of station for pheasants, grouse and quail, and a number of such have been constructed throughout the reservations by the Metropolitan Park Commission in Massachusetts,—the one pictured here being in the Blue Hills reservation.

Such a shelter is simple and easily constructed. It is about four feet high and five or six feet wide. After driving two upright forked sticks or poles into

ground is thickly covered with snow, though if well fed they will be able to withstand almost any weather conditions. It has been very gratifying to note that many of these birds have been saved, which would otherwise doubtless have perished, by putting out food for them in suburban localities. The handsome ring-necked pheasants are easily tolled to the edges of the woods and reservations and will come regularly into yards near such places, where grain is supplied for them. One party whom we know has from a dozen



BIRD SHELTER AND FEEDING STATION.

the ground the required distance apart, a pole is laid across the top, supported in the crotches of the uprights. Longer poles for the roof are then laid in a slanting manner from the ground against this ridge-pole, and the closer these are laid together, the tighter will be the roof. It remains only to thatch the roof and sides with pine boughs, or other branches, in such a manner as to keep out snow and give a reasonably dry shelter from storms, where food placed within will be kept in good condition. The open part of such a shelter should, of course, face in the direction which is least exposed to storms.

Food is more essential than shelter during severe winter weather, as the ground-feeding birds often have difficulty in finding the former when the

to two dozen of these fine birds come to feed under his window every morning, where they are sure to find a plentiful supply of corn. Beavies of quail, and ruffed grouse, have also been reported under similar conditions, sometimes coming even into the dooryards for food. If we make these birds our friends they will come more than half way to meet us.

Bird Clubs of any nature are invited to affiliate themselves with The Agassiz Association, and by thus cooperating may find it greatly to their advantage, as many things may thus be accomplished, not only in bird protection, but in general bird study as well, that would not be possible with the individual society.

Planting Fruit Trees for Robins.

BY ARMSTRONG PERRY, NEW YORK CITY.

The movement for the protection of song birds has been so effective in Allegheny County, Pennsylvania, that the robins have multiplied and become a nuisance.

They feed on cherries and other small fruits. As they often take a bite out of a cherry without eating the whole of it, they destroy much more than they devour.

However, no one in Allegheny County wants the robins killed. After a careful study of the situation a method was discovered which it is believed will save the fruit and also the robins.

Of all the small fruits, the robin likes the mulberry best, it is said. The mulberry is as large and as luscious as the blackberry, it grows on a tree as large as a cherry tree, and the mulberry tree bears fruit continuously all through the summer season, so there you are!

The boys and girls of Allegheny County have been given young mulberry trees to plant and have been told where and how to plant them. Next year six thousand of these trees will be bearing, if all goes well, and robin red-breast can fill his tummy without incurring the wrath of the fruit growers.

Educational Bird Leaflets.

The list of Educational Leaflets issued by the National Association of Audubon Societies now contains eighty-nine species of birds. Each of these is a four-page leaflet, fully describing the bird in question, together with its habits, range and general usefulness. Each leaflet is accompanied by a beautiful colored plate of the species described, and many of them also contain half-tone illustrations from actual photographs.

Through the benevolence of persons interested in this work, these leaflets are sold at practically the cost of issuing, and may be obtained in lots five or over at the normal price of two cents each, single copies being sold for ten cents. This is an exceptional opportunity for anyone interested in birds to obtain accurate and reliable descriptions and information of species contained in this list. New leaflets are constantly being added and complete

lists may be obtained by addressing the National Association of Audubon Soc., 1974 Broadway, New York, where copies may be purchased at prices mentioned, postpaid. A large variety of books, bird-boxes and feeding devices may also be purchased at these headquarters. This will all help the cause of bird conservation, as well as to bring joy and delight to those who participate in this work and study.

Further Telescopic Observations of Migrating Birds.

The Harrold Observatory,
Leetonia, Ohio.

To the Editor:

I was much interested in the article in regard to the telescopic observation of migrating birds at Paterson, N. J.

I have often watched the migrating birds fly across the moon, and find the best conditions for these observations to be on a cool night, with a light wind blowing from the direction towards which the birds are flying; as it is easier to fly against the wind than from it. On full-moon-light nights in the migrating season, it is the rule for me to count from ten to fifty birds a minute passing across this field of view, this rate continuing throughout the night.

Nearly all birds migrate in the night, and I often hear them on moon-less nights in the same large numbers as on a moon-light night. I often get large lists of species on these nights, just from their notes, as I am able to identify nearly two hundred species by their calls alone.

Frequently I have made these observations in company with a friend. We would then have two telescopes, setting them up from ten to thirty feet apart, and thus getting the altitude and distance of the birds. From several hundred such comparisons I find that the rails fly about the lowest of all,—about 1200 feet. The sparrows, flycatchers, warblers, thrushes, ducks and a lot of other species fly from a thousand to two thousand feet high. The terns fly the highest of all birds,—nearly a mile high on the average. Plover fly from 1500 to 2000 feet high, while the other shore birds fly at a height averaging from two thousand to three thousand feet.

The enormous number of birds migrating on a single night would surprise a person who had never listened for them in the country. They can be heard in numbers on all sides throughout the night. Averaging ten birds a minute, which is a small count in our field of view, there would be three hundred and sixty times that number stretching across the sky. This would make three thousand, six hundred birds a minute, passing overhead, or two hundred thousand every hour, while the flight lasted.

ELMER HARROLD.

Birds and Human Audiences.

Shirley Centre, Massachusetts.

To the Editor:

No, I have never observed that *wild* birds ever consciously sing *for* a human audience, but parrots, canaries and other domesticated birds seem by the presence of human beings to be influenced to talk or to sing. I know of an authentic case of a canary which *talked* whenever its owner swept the floor. It finally became the property of Mr. John E. Thayer of Lancaster, Massachusetts.

Many birds, both wild and tame, respond to human calls and songs.

Sincerely yours,

ERNEST HAROLD BAYNES.

Birds' Singing for Human Auditors.

Caryville, Massachusetts

To the Editor:

I am interested in the letters about birds that sing for a human auditor. My canary, a fine singer, was trained by the repeated playing of one or two simple airs on the piano. He would sing as soon as I began to play. But any noise will start him off, and the louder the noise the better he seems to like it. Gene Stratton-Porter mentioned a similar fact in an article in "The Youth's Companion" a year or two ago. The coffee grinder, the egg beater, the sewing machine, my typewriter, animated conversation or even the singing of the tea kettle will start Sunny Jim. But he keeps his choicest song and a dance, in which he flutters more than halfway up the window, when he performs before his own reflection in my mirror, or when the house is quiet and he has forgotten that I am about.

Yesterday he desired me to stay in the room where his cage is while weariness compelled me to lie on the couch. He screamed like the spoiled baby that he is, but when I sang a lively tune he too sang. The concert was in progress when company arrived.

Years ago, in Connecticut, for weeks in the spring and the early summer, if I began to play on the organ about four in the afternoon, a catbird would come into a shrub not far from the open window and sing beautifully. He seemed to do his best to drown out my music, and his patience often lasted longer than mine. I never before nor have I since heard such singing from a catbird. He made no attempt to discover the source of the music, but he did seem to be trying to out sing his supposed rival. He could not see me on account of the drapery curtains between us.

Yours truly,

EDNA S. KNAPP.

The Mocking Bird in Connecticut.

The letter (page 308 of our March issue) regarding the mocking bird was submitted to Herbert K. Job who reports as follows:

"In regard to the letter about the mocking bird, I will say that I think this is correct. I have not been to hunt it up myself owing to almost constant absence, but Mr. Wilmot has been to my house and described it so accurately that I think there can be no question about identification. Mocking birds are certainly scarce in Connecticut, but I understand they are occasionally met with. It is my impression, for instance, that members of our New Haven Bird Club have occasionally seen one in winter in Edgewood Park, New Haven."

Strange Death of a Cuckoo.

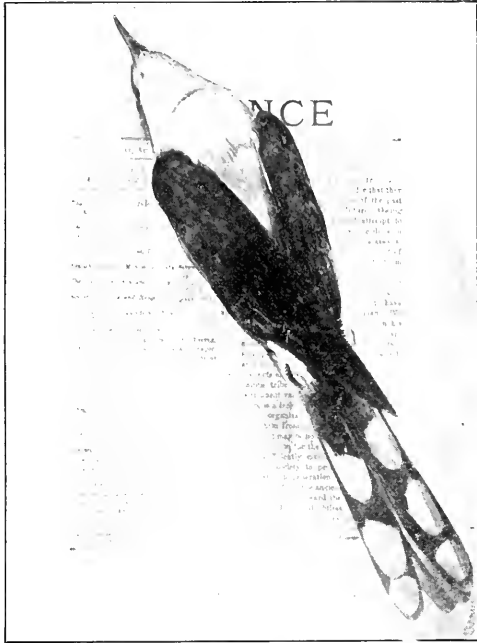
North Salem, Indiana.

To the Editor:

I enclose a photograph of a yellow-billed cuckoo that was picked up on our front step in Bloomington last July. Its feathers were unruffled, and nowhere on its body was there a mark of violence. Its crop was empty. Its eyes were still full rounded but glazed; its feet and wings composed as you see. There had been no storm the night before: there was no dangerous network of wires near—only thick overhanging

trees. Evidently the bird had dropped from a low hanging limb to the porch roof and thence rolled to the ground.

I have had several cuckoos in my hands, but seldom has it been my fortune to see one with fuller, richer plu-



THE CUCKOO.

mage. It had been handled by several people before the picture was made, which accounts for the roughness of the neck. This bird by the way had a distinct yellowish tinge to the throat and upper breast.

Sincerely yours,
FRANK B. HOPKINS.

Bird Notes.

A Barrows golden-eye was shot, in company with other ducks off the Massachusetts coast in the early winter.

A single specimen of the mountain plover (*Podasocys montanus*) has lately been taken on the beach at Chatham, Massachusetts, on Cape Cod, the first record of the bird for New England. Its proper breeding place is in the dry plains from northern New Mexico to Montana, and its wintering place is in the region from northern California to central Mexico. What series of accidents, one wonders, could have brought this solitary wanderer so far from its usual haunts!

A mockingbird has been reported throughout the fall from Manchester, N. H., and without doubt has wintered in that locality, as wherever these birds have been found they have become resident.

An unusually large migration of the northern birds have been reported as visiting New England the past winter. Pine grosbeaks, red-polls, pine siskins, juncos, tree sparrows, American, and white-winged crossbills, and our handsome visitors from the Canadian Northwest—the evening grosbeaks—have all been reported in good numbers from various and scattered localities. An unusual invasion of “northern chickadees” has also been reported from several towns in Massachusetts.

A Blue Jay Eats a Mouse.

BY MILO LEON NORTON, BRISTOL, CONN.

The other day a curious event occurred in my yard. During a cold spell my wife threw out a dead mouse, thinking that a stray cat might carry it off. But a blue jay picked it up, and with it flew into the fork of an apple tree where it held the mouse with one foot and struck the body constantly, like a woodpecker hammering at a tree trunk. As the branch of the tree did not seem entirely to please the jay, the bird carried the mouse to the top flat rail of a grapevine trellis, where it continued to peck industriously at the frozen rodent, evidently intending to penetrate the skin to the flesh beneath. Some moments later I saw the bird eating the mouse with apparent relish. I wonder if any reader of *THE GUIDE TO NATURE* has ever noticed a similar performance.

Fossils brought back from within four hundred miles of the south pole include a fern-like plant of about the age of our coal measures; a creature intermediate between sponge and coral, of Cambrian age, and armor plate from a primitive fish, probably Devonian.

Mrs. Richard A. Proctor has lately been created a Fellow of the Royal Astronomical Society, just fifty years after the same honor came to her famous husband.



TO KNOW THE STARRY HEAVENS

The Heavens in April.

BY PROFESSOR ERIC DOOLITTLE, OF THE
UNIVERSITY OF PENNSYLVANIA.

In the early evenings of April we see the striking star groups of the Great Bear and the Lion, both lying exactly on the meridian and both high in the heavens very near the zenith. In the

may also be seen in its entirety, while below this the great Water Snake stretches its great length from the southeastern horizon to well past the meridian in the west. The extreme western sky is still crowded with the brilliant groups of winter, but these are very evidently disappearing; both Tau-

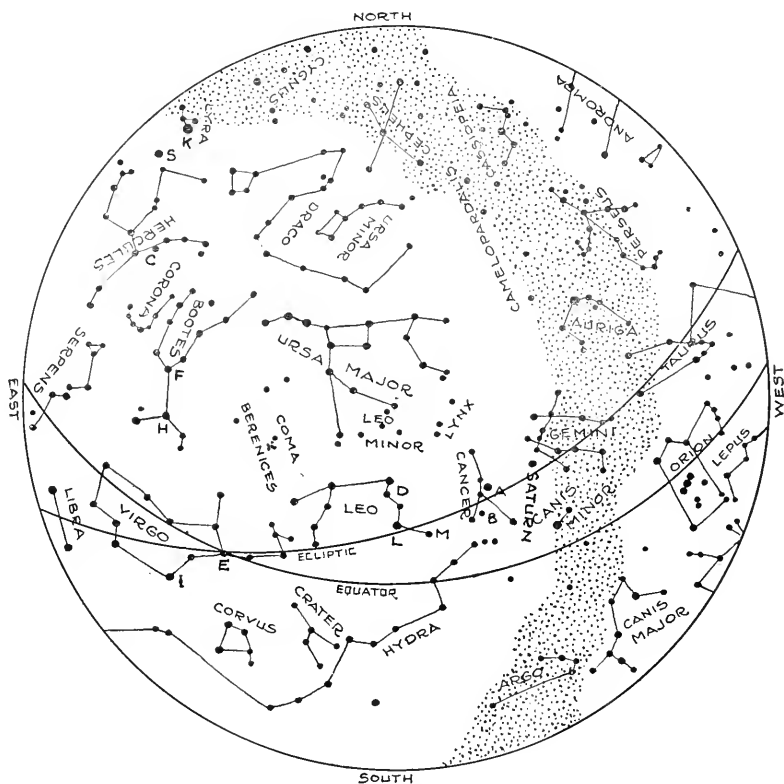


Fig. 1.—The Constellation at 9 P. M., April 1. (If facing south, hold the map upright. If facing west, hold West below. If facing east, hold East below. If facing north, hold map inverted.)

east is the wonderful Bootes with its great reddish-yellow sun, Arcturus, while the beautiful and delicate Northern Crown and even the greatly extended and interesting Hercules have now completely emerged from below the ground.

The very large constellation Virgo

rus and Orion have partly sunk below the ground, and though Gemini is still high in the heavens, the most brilliant midwinter star, Sirius, is now very close to the southwestern horizon.

To one who studies and observes the wonderful heavens throughout the entire year, the various brighter stars can-

not help but suggest the various seasons. The very brilliant, bluish Sirius recalls at once to his mind the long, cold nights of winter, while the beautiful Scorpio, with its surrounding groups of Ophiuchus, the Eagle and the Archer, bring to his memory many long and pleasant summer evenings of observation. Especially does he welcome the very first appearance of the beautiful autumn star, Vega, and the entrance into the evening heavens of

ies indicate that it is of an overwhelming and inconceivable magnitude, hitherto wholly unsuspected. It is estimated that its distance from us is so great that the light by which we may view it to-night must have started on its journey toward us no less than one thousand centuries ago. This distant cloud is made up of more than sixty thousands suns. If the recent conclusions are correct, so vast a portion of space does it occupy that light would

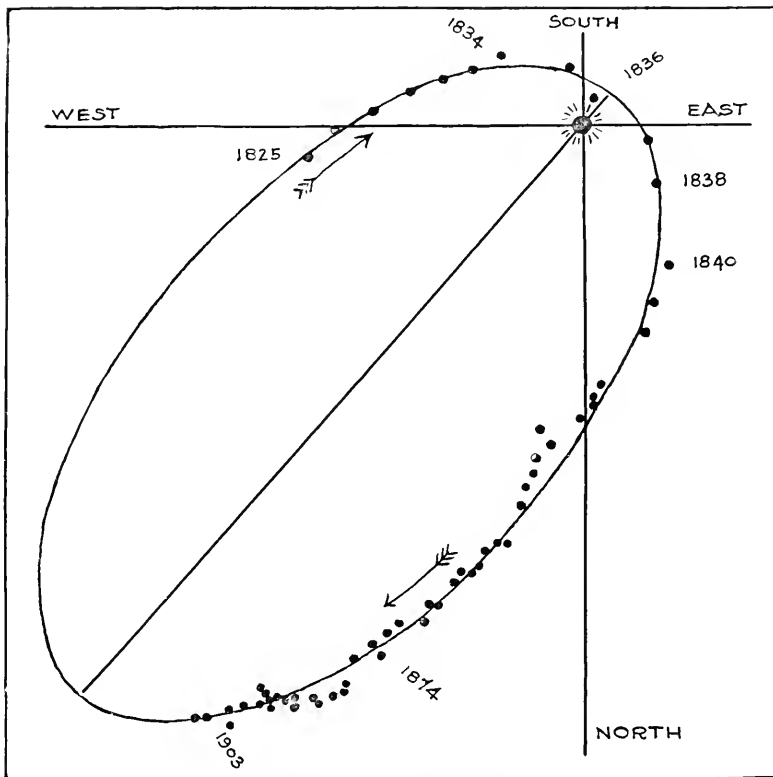


Fig. 2—Orbit of the Double Star at E. Fig. 1.

the head of the Serpent, for when, as now, these both emerge from below the eastern horizon they tell him that the end of winter has come and that many months of mild summer evenings are to follow.

* * * * *

The April Stars.

The possessor of a small telescope should not fail to examine the diffused cluster of stars at A, Fig. 1, nor the more difficult cloud at B, nor, above all, the very brilliant cloud of suns at C, which last is the most wonderful star cluster visible to northern observers. Of this last object, recent detailed stud-

require ten centuries to pass through the cloud from one side to the other. Thus the radius of this great assemblage of suns (which seems to have a nearly spherical form) is more than two million times as great as the distance from our sun to the planet Neptune, which lies at the outermost boundary of the Solar System.

The possessor of a small telescope will find beautiful double stars (among others) at the points D, E and F, Fig. 1. The colors of the first are described as yellow and green, of the second as both yellow, and of the third as orange and green. The second double (that in

Virgo) is of special interest, not only because the orbit or path of one of the stars about the other is well determined, but also because each of them varies in brightness. The period of a complete revolution about the orbit is about 193 years, but each star diminishes about half a magnitude in brightness and recovers again in the course of but a few days.

The observers should also examine the most brilliant stars of the heavens, noting their distinctive colors and their comparative brightness. Thus the great Arcturus, at H, many thousands of times brighter than our sun, is of a reddish-yellow color; the fainter Spica, at I, that wonderful sun which is ceaselessly revolving about a dark and invisible companion with a speed of fifty-six miles a second, is a white star, while Vega, at K, the brightest star of the northern heavens is of a decided blue. The beautiful Regulus, at L, is a white star but due east of it at a distance of three minutes it will be found to have a faint little companion which is of an intense blue.

* * * * *

The Planets in April.

The bright, but difficult little planet Mercury will attain its greatest distance east of the sun on April 24, and may be seen for a few evenings before and after this date shining well toward the northwestern part of the horizon but low in the twilight glow. On the evening of elongation it will not set until one and one-half hours after sunset.

On April 16 the planet Jupiter, which is now drawing so close to the sun, will be passed by Mercury in its eastward motion, the two worlds then being three degrees apart in the sky and Mercury being north of Jupiter. This interesting conjunction may be viewed without much difficulty, especially if the telescope of the observer is furnished with setting circles, but especial care must be used as on this evening both of the planets set less than one hour after sunset.

Venus during the first part of the month is in the morning sky, but it will change to an evening star on April 26 at 3 A. M. During the entire month, however, it is too completely lost in the sun's rays to be observed.

Mars is very slowly withdrawing from the sun into the morning sky. Since on April 1 it rises but twenty-two minutes before sunrise and on April 30 but forty minutes before the sun it is, however, too wholly lost in the sun's rays for satisfactory observation.

The planet Jupiter, although during the first part of the month it may be seen in the northwest for a short while after sunset, is rapidly leaving the evening heavens and toward the close of the month will be too close to the sun to be observed. This planet will pass to the west of the sun and become a morning star on May 9.

Saturn still remains in excellent position for observation and will be seen shining high in the western heavens in the southern borders of the constellation Gemini. The rings of this planet are now widely opened out, and it furnishes a beautiful object for observation in the telescope.

* * * * *

The Occultation of Omicron Leonis.

In the course of its monthly journey around the celestial sphere among the stars the moon is continually passing over the fainter stars in its path and hiding them from our view. During the first months of the present year it happens that very few bright stars are thus occulted as seen from the eastern United States; on April 2, however, an occultation of the quite bright star at M. Fig. 1, may be witnessed and the phenomenon will furnish a very interesting subject for observation.

At this time the moon is three days past the first quarter, of approximately the form shown in Fig. 3, so that it is its dark portion that is to the east or advancing edge. As seen from Washington this edge will reach the star and cause it to disappear at 10 hrs. 35 min. P. M.; the reappearance will occur at 11 hrs. 39 min. (Eastern Standard Time) so that the star will be hidden for one hour four minutes. These times will vary greatly however, as the phenomenon is viewed from different stations; observers further north on the earth will see the moon pushed further downward among the stars, while to those south of Washington the position of the moon in the sky will be higher. The observer should therefore

notice the relative positions of the star and the moon some little time before that given above for the immersion, when by considering that the moon

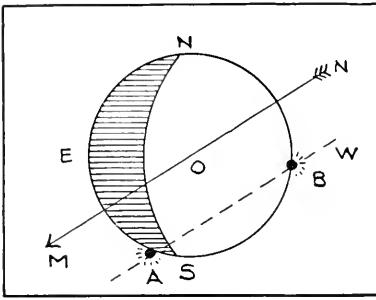


Fig. 3—Occultation of the star Omicron Leonis. The center of the moon is moving in the direction of the arrow, which causes the star to disappear at A and to reappear at B.

moves eastward an amount equal to its own diameter in one hour, the approximate time when the occultation will begin can be estimated.

Omicron Leonis is attended by a ninth magnitude star, northeast of itself and eighty-four seconds distant, which was discovered by Herschel in 1783. In a large telescope this will be seen to be also occulted, its disappearance occurring about two minutes after that of the principal star. The brighter star is also a close double-star system, the revolution of one star about the other occurring in about fourteen days. This was discovered with the spectroscope in 1898, but the two stars are far too close together to be separately seen in any existing telescope.

* * * * *

The April Shooting Stars.

These occur in the greatest number on April 20, but may be looked for several evenings before and after this date. They are called the Lyrids, and dart outward in all directions across the sky from the point S, Fig. 1, in the constellation Lyra. As this star group is not high in the heavens until toward midnight, it is from this time until sunrise that the observations are best made. The Lyrids are bluish, swiftly moving shooting stars, the brighter ones frequently leaving a trail behind them. The swarm is pursuing the path of the first comet of the year 1861.

Infinite Variety.

Charles Nevers Holmes, of Newton, Massachusetts, calls our attention to an interesting paragraph in "L'Astronomie" by the famous astronomer, M. Camille Flammarion.

"This immense world (Jupiter) is in its primordial stage and is preparing itself for the future. Spectral analysis shows that the substances which predominate there are different from terrestrial substances. We can imagine that the living beings who will develop there will be chemically different from terrestrial beings, composed not of oxygen, hydrogen, carbon and nitrogen, but of other combinations. It is a world differing in kind from us."

Here is an idea based upon fact and upon logic that is too often lost sight of. There is on this earth an infinite variety whether we study the smallest or the largest things. I vividly recall making the acquaintance of a professor in a laboratory, who had been spending months in measuring a tiny extension point at the rear of a microscopic animal known as the *Daphnia*. He not only measured the length but the angles at the sides of that point and told of the incredible number of measurements that he had taken. He found almost infinite variety.

It is a trite statement that in this world there are no two things alike. Surely there are no two people alike and even the corresponding parts of the body are not alike; our thumbs are not alike, and the wrinkles on the inside of the two hands are not alike. How widely different are voices. Even though the voice come a hundred miles over the telephone, you at once recognize the speaker if he is one with whom you are familiar.

Most people, when they question whether there is life on another planet, picture human beings there, in the same occupations as ourselves, with the same hopes and ambitions, going to the same sort of markets and stores, and running the same styles of automobiles, thinking the same thoughts, writing the same style of books, attending same trashy moving picture shows, playing bridge whist as we do, and in general participating in all the occupations of

human beings. But it takes only a minute of thought to show that this cannot possibly be correct. Not only is there infinite variety in the things of this earth, but in those of the different planets not only around our sun, but around other suns. Even on our planet, how vastly different are our present methods of doing things from what they were even a hundred years ago. It is difficult to think away from our own point of view. This infinite variety undoubtedly extends to planets and why not to universes. We believe that there is a universe beyond this, and another beyond that, and so on *ad infinitum*. But why do we always think of the others as being the same as ours? There is after all nothing more tiresome in this world than monotony and an infinite Creator has steered the course of events away from that, not only in our own lives but in the possibilities of other lives. In no one fact are religion and science more strongly united than in this. Science tells us that there are no two things alike, no two lives that are in the same environment, no two days in one's life the same, and so it is going to be for all time. There are "diversities of gifts." "But every man hath his proper gift of God, one after this manner, and another after that." Other planets and other worlds and other lives are so remote and so different from these that we are plainly told that "Eye hath not seen, nor ear heard neither have entered into the heart of man, the things which God hath prepared for them that love him."

I have stood and looked at a horse or a cow in the field, and have wondered if I had not been familiar with them from childhood if it would be possible for me to imagine such an animal. The same thoughts come to mind when I look at the skeletons and restorations of the huge animals of remote eons of the past. It seems unthinkable that such an animal as the *Diplodocus* ever existed. Can there be anything more astonishing than the denizens of a drop of water? One who has studied them for years becomes accustomed to them so as to take them as a matter of fact. But stop for a minute, and think how these might appeal to the intelligent adult who has never seen them. Ex-

istence is endless but there will be no tiresome monotony in our surroundings. It is evident, on good authority, that we are always going to occupy a place. We are plainly told, "I go to prepare a place for you," and a place is unthinkable without surroundings and, according to all we know or can logically reason out, that place will be surrounded by infinite variety and by wonderfully interesting things, just as is the place that we now occupy.

Better start in at once if you have not already done so, to find pleasure in studying infinite variety.

The remarkable auroral displays of last summer, especially that of August 26, have stimulated an uncommon interest in this mysterious phenomenon. Reports still continue to come in, so that at last accounts, the streamers were seen almost simultaneously at points so wide apart as Nova Scotia, Washington, D. C., Nebraska, Oregon and Alaska. In general, the southern stations report the usual bright greenish glow, observers farther north saw more vivid colors mostly red.

That an outdoor life and an interest in nature tends to length of days as well as health and happiness, witness the career of the late John Finlayson, the explorer, for whom are named Finlayson River and Finlayson Lake in Yukon Territory. He prospected and mined gold in California and Oregon till he was eighty-six. Then he retired from active business, and went to mapping new country in British Columbia and the Yukon region where no white man had ever penetrated. Early in the present year, he died at the age of one hundred and five!

* * * * *

Worth recalling in this connection is the fact that the earlier studies of Chinese geology, about the middle of the last century, were made largely by Americans—Newberry and Raphael Pumpelly—while even Baron von Richthofen, who did some of the best pioneer work, though a German, was trained under J. D. Whitney on the California State Survey.



EDITORIAL



The Agassiz Association an Important Factor in America's Popular Education.

THE GUIDE TO NATURE recently published an editorial on the proposed Modern School to be established by the John D. Rockefeller Foundation, New York. The need of that school was first expressed in a paper entitled "Changes Needed in American Secondary Education" by President Charles W. Eliot. It was claimed in the editorial:

"The gist of that paper is the ideals of The Agassiz Association that have been promulgated into thousands of schools throughout the land for nearly half a century or to be more exact since 1875 at which time The Agassiz Association was established."

It was further claimed:

"In the final analysis the ideals of not only this Modern School but of other so-called modern educational propoganda are but one or more of those of this long established organization in a little different wording or with a special emphasis."

President Eliot, under date of March 7, writes an extended letter of personal explanation and approval. Upon request to publish a part of that letter, he writes (March 9): "You are welcome to publish the extract," which is as follows:

"The efforts you have made in The Agassiz Association, and in publishing 'The Guide to Nature' have been parts of the pioneering work in a long, slow campaign on behalf of wiser and better school programmes, and a more natural, effective, and enjoyable method in America's popular education.

"It looks now as if something large and happy were about to result from that long campaign. The early labor-

ers in it are all dead. It will be the second or third generation that will sing the songs of victory."

Not the System but the Teacher.

Newspapers and magazines are discussing the Modern School and our school systems. Here are words of wisdom from an extended article on the subject in "The Outlook" for February 7th:

"One reason, perhaps, why our schools are not any more successful than they are is that any system, traditional or modern, tends to make those in charge of it impersonal. The cure for that is not by substituting still another system, but in getting some humanity into those who are dealing with human material."

These two sentences go straight to the pith of the matter. It is curious that every little while along comes some skilled and enthusiastic teacher who is not content, neither are her friends, with her skill and enthusiasm but who asserts that everything that has ever been done must be undone. The sad part is that frequently, when modern teaching is along the lines which have been established since the days of Socrates, many will hold up their hands and shout in joy of the ideal, new system, when there is nothing new except the *rara avis*, the new enthusiasm of the skilled teacher.

"The Outlook" goes further:

"In the defense of this experiment the chief emphasis has been laid on developing the powers of the pupils. In carrying this out we hope that more emphasis will be laid on training the pupil in the use of his powers, in the will to use them, and in the desire to have them contribute to a life of service."

"Developing the powers of the pupils." Why, certainly; that is what The Agassiz Association has been doing for forty-two years.

A Good Example of Bad Teaching.

Miss Sara Arnold, while supervising the primary schools of Boston, came one morning into a room where one of the teachers under her charge was heard in a class in geography recite a lesson on Newfoundland. "John," said the teacher, "what is fishing?" Now John had been sitting listlessly before he heard this question. The teacher had thus far failed to win him. But at this he wakened. This was the first sensible question he had heard since he got into that school. With light in his eye he started, "You get a hook——" "Next," said the teacher; "Willie, what is fishing?" Now Willie had also wakened. He thought John had not started early enough in the process to suit the teacher. "You git a worm——" "Next," said the teacher, and the amazed Willie sat down dumbfounded beside the equally non-plussed John. The next was Mary to whom a hook was a fearful thing and a worm an impossibility. "Fishing," said Mary, "is the chief industry of the Province." "Right," said the teacher.

The moral of this story lies in its

pathos. If this teacher had known the things that made for her peace, she could have gripped those boys to her with hooks of steel. She would have stood John up to talk on what he really knew. Lapses in grammar and in pronunciation might have gone unchecked for the time, and he would have proudly learned that he knew things the others did not. And Willie would have joined in the game. Newfoundland could wait until tomorrow, for two souls were finding themselves, and a teacher was entering into two lives. But the door into paradise, swung open for a while, closed and the teacher "never could know" what she missed. She had been over-standardized.—S. C. Schmucker in "Nature-Study Review."

Life Is Ever Young.

My friend, Luther Burbank, will never grow old. He deals too much with plants that are perpetually renewing their youth to ever become fossilized. At the age of sixty-eight he has taken to himself a bride who will not



THOMAS A. EDISON, LUTHER BURBANK AND HENRY FORD.



MRS. LUTHER BURBANK.

only assist in home-keeping but in plant study.

Papers throughout the country have heralded his intellectual activity as an astonishing fact, yet why should it be? We often read of wonderful achievements by men long after they are fifty years of age. I once knew a microscopist who became famous and added much to microscopical science yet never saw a microscope until he was fifty-six years of age. So here are words of congratulation to this enthusiastic plant lover and best wishes for his life's partnership to be long, happy and prosperous in all things that make life worth living.

The accompanying illustration shows Mr. Burbank with two other happy boys who also can well afford to smile a smile of satisfaction at what they have achieved. Can one find in all the country three happier boys than Thomas A. Edison, Luther Burbank and Henry Ford? Think what this world would have been if these three had not existed. To them all we may assign the term plant lovers. When I was lecturing in the Cincinnati schools, I asked the pupils of a high school,

"What is the most famous plant in Cincinnati?" Imagine my surprise at the general shout, "The Ford automobile plant." Had I asked the same thing in West Orange, the answer would have been, "The Edison plant."

"Gosh—That Stuff!"

One of our subscribers in Long Island sends us the following letter:

"For Christmas we sent *THE GUIDE TO NATURE* to a small cousin in the west, and we think you would like to hear what his mother wrote us about it:

"We had quite a joke on Keith when your magazine came. It opened to Ornithology. Keith's face fell, and he said, 'Gosh—that stuff! I thought it was going to be about birds!' However, the reaction when he learned that ornithology would help him was worth the shock. And he isn't the only one who is looking forward to it. I'm quite as eager."

The dismay of our young friend is typical of that of many another and even older nature student when confronted by a scientific term. However, if there is some one at hand to explain that the term is only another word to designate some well-known and beloved phase of nature, the reaction is, as with Keith, "worth the shock."

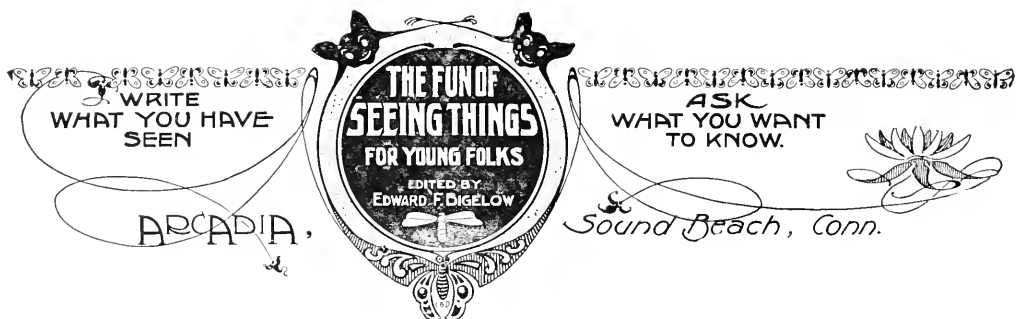
To the great mineral collection at Harvard University has lately been added some two thousand pieces native to the State of New Jersey. The collection was the work of the late Elwood P. Hancock, a resident of the state. Many of the finest specimens come from the region of Franklin Furnace.

A famous scientist was present at a dinner at which one of the guests began to deride philosophy. He went on rudely to express the opinion that the word "philosopher" was but another way of spelling "fool."

"What is your opinion, professor?" he asked, smiling. "Is there much distance between them?"

The professor surveyed his vis-a-vis keenly for a moment, then, with a polite bow, responded:

"Sometimes only the width of a table."—Tit-Bits.

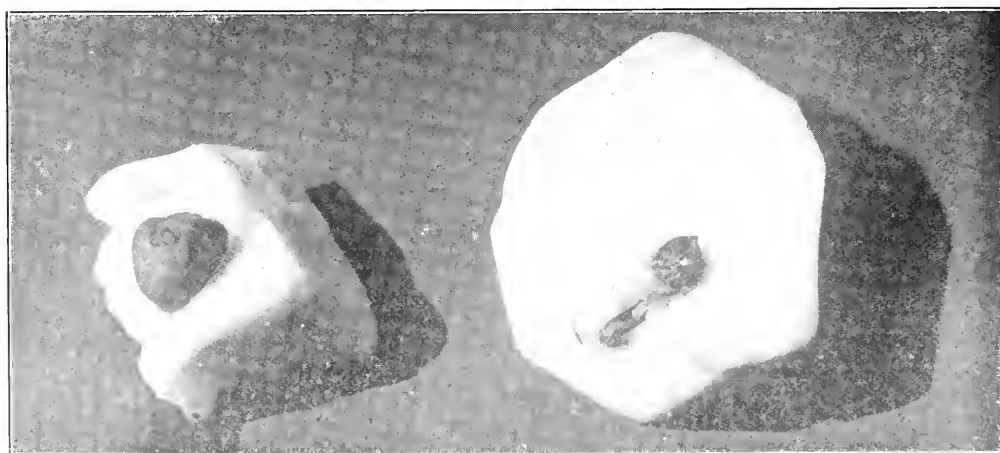


Beech Nut Embedded in a Potato.

BY O. A. FARWELL, DETROIT, MICHIGAN.

On returning from my vacation trip to the Pacific Coast last October, I was very much surprised in being presented by an aunt, Dr. Anna M. B. Gray, of this city, with what turned out to be a very unusual freak of nature. Nothing more or less than beechnuts embedded in the starchy substance of a potato! The potato was procured in the usual way from the food markets of Detroit, Mich., but whether it is a product of Michigan, Kentucky, or some other state is unknown. The potato had no unusual appearance, externally, the skin being perfectly even and unbroken; the beech nuts, however, were discovered, more or less deep in the potatoes, after they had been peeled and were being sliced. Several potatoes contained these seeds some of which were eaten by my aunt who says that they had lost none of their flavor through being made prisoners by such a common staple of our daily diet. Some of the potatoes contained hazel

nuts, i.e., the seed. The accompanying photographs show the potatoes with the embedded seeds, and with the seeds removed. How the seeds came to be in their unique homes is a mystery. Perhaps they formed part of the winter storage of some squirrel or chipmunk, what had been left over from the preceding winter's supply, the busy little provider having stored up more than was necessary for its simple wants; the plough of the farmer, perhaps, passed through the store house of food scattering its wealth broadcast; some may have lodged against stones, roots of stumps, or other unmovable substance; in time, the small potato tuber began to take shape in the near vicinity of the scattered seeds; as the tuber grew and became larger it, perchance, caught the seed between itself and the unmovable stone, or other obstruction; as the pressure of the growing tuber became greater, the potato skin was ruptured in a more or less wavy but circular line around the seed; the substance of the tuber finally surrounded



THE BEECHNUT IN THE POTATO.

and completely over-covered the seeds and the wound thus made in the potato was in due time healed by again being covered over with a new skin. The process outlined above is based on the fact that the *lower half* of the cavities made by the seeds are covered by a *very pale* but normal *epidermis* while the *upper* parts of the cavities are not. My thanks are due to Mr. Buell, of the Electrical Department, for the photographs.

The Wheel of Honey in the Comb.

Of all the novel forms in which bees have built their honeycomb, it would seem that that secured by Mr. Edward

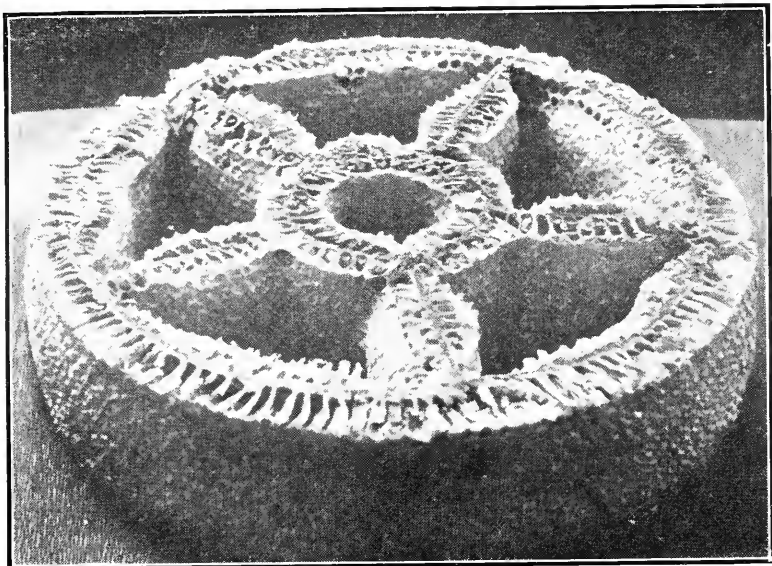
An Essay on Bones.

Bones is the framework of the body.

If I had no bones in me, I would not have so much shape as I have now. If I had no bones in me, I should not have so much motion, and teacher would be pleased, but I like to have motion.

Bones give me motion, because they are something hard for motion to cling to. If I had no bones, my brains, lungs, heart, and larger blood-vessels would be lying around in me, and would get hurt; but now my bones get hurt, but not much unless it is hard hit.

If my bones were burned, I should be brittle, because it would take the animal out of me. If I was soaked in acid,



COMB HONEY DESIGN BY EDWARD WILLBRIGHT.
This took first prize in its class at the Minnesota State Fair.

Willbright was justly entitled to the first prize at the Minnesota State Fair. It is evident that this ingenious bee-keeper arranged comb foundation in the form of a wheel, as a hint to the bees that they accepted. We are indebted to the "American Bee Journal" for the accompanying illustration. Do any of our readers know of anything equally novel in comb formation? Here is a good suggestion to some of our bee-keepers to try this or other designs this coming season.

A census of the mollusks in a New York lake shows nearly eight million individuals on an area of bottom three hundred by five hundred feet.

I should be limber. Teacher showed me a bone that had been soaked; I could easily bend it. I should rather be soaked than burned.

Some of my bones don't grow close to my others snug, like the branches to the trunk of a tree, and I am glad they don't, for if they did, I could not play leap-frog and other good games I know.

The reason they don't grow that way is because they have joints. Joints is good things to have in bones. They are two kinds. The ball and socket joint, like my shoulder is the best. Teacher showed me, only it was the thigh of a cow. One end was round and smooth and white. That is the ball

end. The other was hollowed in deep. That is the socket and it oils itself.

Another joint is the hinge joint, like my elbow. It swings back and forth, and it oils itself. It never creaks like the school door.

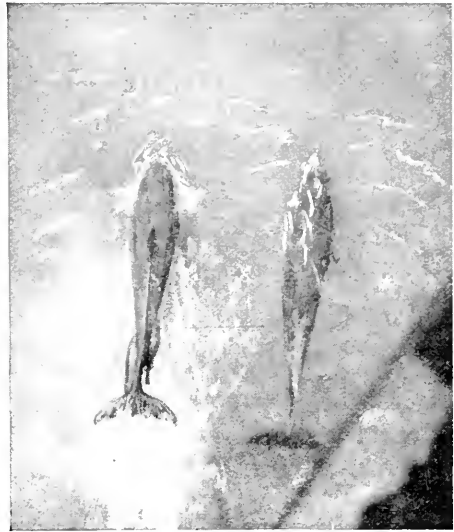
There is another joint that don't seem much like a joint; that is the skull. It don't have no motion.

All my bones put together in their right places make a skeleton. If I leave out any or put any in the wrong place, it ain't no skeleton. Some animals, have their skeletons on the outside. I am glad I ain't them animals, for my skeleton like it is on the chart wouldn't look well on my outside.—Clipping from a New York newspaper, sent by a member of The A.A.

Porpoises at Sea.

BY C. H. TOWNSEND.

The two small photographs reproduced in this "Bulletin," showing porpoises racing under the bows of steamers are interesting in spite of their imperfections. The one made by Mr. Greenlee shows a porpoise with a shark sucker (*Remora*) attached to each side of its tail, while the one by Mr. Chapman Grant shows, although very dimly, a small baby porpoise racing close beside its mother. Mr. Grant observed that the little fellow managed to main-



Photograph by E. S. Greenlee.

PORPOISES RACING UNDER THE BOW OF A STEAMSHIP.

The porpoise at the left has a shark-sucker (*Remora*) attached on each side.

tain the pace set by its parent. It is difficult to make photographs of porpoises under such conditions, because they keep just below the surface, merely protruding the tops of their heads to breathe. Their speed at such times is of course equal to that of the vessel.

Mr. J. K. Nye, of New Bedford, Mass., informs me that he "timed" a school of porpoises off the coast of South Carolina, when the vessel was steaming at the rate of twelve miles an hour. The porpoises remained with the vessel about one hour. On another occasion when the steamer was running at the rate of fifteen miles per hour, a school of porpoises remained near the bow for nearly two hours.

I have seen a school of porpoises in the inland passage to Alaska, remain near the bow of the United States Fisheries Steamer *Albatross* for nearly three hours, while the vessel was maintaining a speed of nine miles an hour. This happened at night, and as the sea was smooth and phosphorescent, the movements of the rapidly swimming porpoises made a rarely beautiful sight.

Porpoises could no doubt swim much faster than fifteen miles an hour, but would not be likely to remain long with a very swiftly moving steamer.



Photograph by C. Grant.

PORPOISES RACING UNDER THE BOW OF A STEAMSHIP.

In this photograph the porpoises are entirely under water, the female in advance having a baby porpoise swimming beside her.

Careful observations made on board some very fast steamers would furnish interesting information on the speed attained by porpoises. Steamship passengers are always interested in these lively animals, but not one person in a thousand, perhaps, thinks of ascertaining the actual speed of the vessel and the length of time a school of porpoises may accompany it.—N. Y. Zoological Society Bulletin.

Good Technical Nature Photography.

We are indebted to "American Photography" or the accompanying illustration that that magazine com-

and the distinctness of the details is all that can be desired. But beyond and above these we, as naturalists, especially applaud the artist because he shows the beauty of the birches as nature prefers to have them shown, and not after some vandal has torn off their bark. Mr. B. H. Spencer, who took the photograph, says this is one of his favorite walks which gives it an interest to him although to others this interest will depend on their admiration for woodland scenes. We are pleased with the picture, for one reason, because it does not contain any human or other animal life. Here nature



AN IDEAL STUDY OF A PATH.

mends. We heartily endorse that commendation. The picture is an ideal study of a path through the white birches. The path is well displayed

stands in her simplicity and beauty with nothing extraneous to distract the observer's attention. There is enough in this photograph to fill many a half

hour with profitable study. Try it. If you are country born and bred thoughts will arise that words cannot express, and you will see effects in the photograph that light has not produce and cannot produce.

Photograph of a March Thaw.

BY ZELLA SCOTT, BROCKPORT, NEW YORK.

This picture of trees was taken about one mile west of Churchville, Monroe

to a nucleus you watch for the virgin to hatch. When it is time for this you look at the cell, it is open at the end and the lid hangs down attached by a hinge. You know the queen is there all right but still you want to have a look at her; you find her large and long and you think; isn't she a beauty? After a few days you look again to see if she is laying; there are no eggs so you look for the queen; there she is with a more



A PHOTOGRAPH WORTH CAREFUL STUDY.

County, New York, along Black Creek, during a March thaw.

At that time I was studying "Design and Composition" at Mechanics Institute, Rochester, New York, and I thought the scene would make a fitting illustration for my notebook on "Shape Harmony." An enlargement was exhibited at the Rochester Camera Club Exhibition and I received honorable mention in Boston for composition, my picture being too small to enter the regular contest.

Queen Rearing Is Fascinating.

BY F. L. BARBER, LOWVILLE, NEW YORK.

All phases of bee-keeping are fascinating, but to me queen rearing is particularly so. How interesting to watch the cells accepted, then grow large, long, white and beautiful; to see, just before they are sealed, the big fat larva curled up on a hump of royal jelly, three times as much as it can possibly use. Then after being sealed and given

matronly and dignified appearance; you know she has mated and will be laying in a few hours. Next day when you look again there are eggs all pointing in one direction; you put her in the mailing cage and envy the fellow who buys her.

It has been said that there are two kinds of work in the world, that which men do strenuously for their daily bread, and that which they do joyously for their recreation. In bee-keeping the two are combined; people are sometimes forced by circumstances into uncongenial employments, but I cannot imagine any one taking up bee-keeping under compulsion. With me it is first a labor of love before it is a business. After I had been the happy possessor of bees for several years I felt myself quite learned in the subject, being in some degree like one of Tennyson's characters, crammed with theories out of books. That pleasant feeling departed long ago, crowded out by a growth

of unsolved problems and the realization of my mistakes. This perhaps is the great charm of bee-keeping: a study that could be mastered in a year or two might be flung aside like an out-grown garment, but one which rewards us with an ever widening prospect of new truths and beauties is a splendid pursuit for which a lifetime is all too short.

An Octopus Tree.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

Near Markleton, Penna., is a tree which has cleverly overcome an obstacle to its growth. When the roots



HOW ONE TREE OVERCAME AN OBSTACLE TO ITS GROWTH.

of this birch tree found that they could not remove or pierce the rock which lay in their way, they concluded, it seems, that the only thing to do was to go over the obstruction. Slowly but surely they pushed their way over this rock, and down on the other side, there reentering the ground, thus holding in their arms, octopus-like, the large rock. Some old residents who have lived near this tree for many years assert that this rock was never covered with soil, as one might suppose. The size of the rock is about 4x6x8 feet, and the diameter of the largest root is six inches, this size indicating what time it has taken to accomplish this feat. Strange to say, there are other trees nearby whose roots have also acted in this manner, though this is the largest tree of them all.

Marine Biological Laboratory.

We are reminded that another summer is coming by receiving the annual announcement of the Marine Biological Laboratory, at Woods Hole, Massachusetts. This laboratory is regarded as very efficient for the study of all forms of marine biology. The announcement will be mailed to any one who is interested. It is attractive reading.

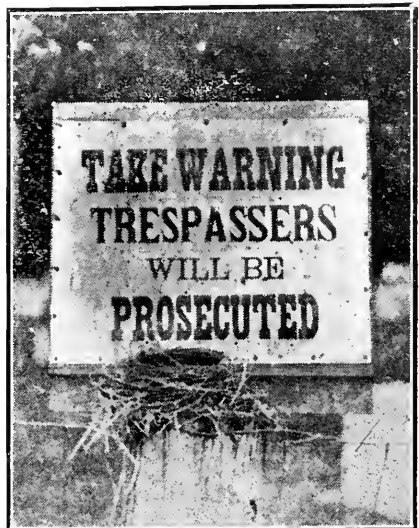
Who Can Answer This?

Donald was holding his new cat and his mother told him to let it go whenever it wagged its tail so hard, as that showed it was unhappy. Donald said: "Well, mother, why is it that a cat wags its tail because it is unhappy and a dog wags its tail because it is happy?"

The food and game fishes of north eastern United States get nearly a third of their sustenance from mullusks. More than sixty different species are eaten by at least one sort of fish.

Did Not Heed the Trespass Sign.

We acknowledge the courtesy of the "American Bee Journal" in lending us the accompanying cut of a nest made by a robin. The bird undoubtedly thought, if it thought at all, that the sign would be a good protection against the north winds. Robins, as well as other birds, are instinctively wise enough to select a sheltered location for the nest, and not rarely take advantage of such places.



DOUBLY PROTECTED.

CORRESPONDENCE

AND INFORMATION

The Cat Question Discussed by an Authority.

New York City.

To the Editor:

I am, as you know, a lover of cats, dogs, horses and all other animals, but I am also a believer in the responsibility assumed by those who take possession of any animal whatsoever for a pet. Owners of cats seem to be particularly devoid of any sense of responsibility, and there lies the main cause of the "cat nuisance." For there certainly is a cat nuisance. People keep cats for all sorts of reasons—some as a source of amusement for the children or for themselves—because cats are the cheapest pets and require the least care, or are so supposed. Some keep them to kill or to frighten rats and mice. Some like them because they are pleased to see the playful kittens, but only while they are kittens. After that, anything may happen to them, although some of us are too "humane" to put to sleep painlessly at birth those we are sure that no one will provide for when they are grown. We abandon them, for instance, because it is "cruel" to keep them indoors in the city; because we desire to avoid the trouble of caring for them; because it is "unlucky" to move a cat; and because (one of the greatest of all fallacies) cats have no affection for human beings, they like only the *place where they feel at home!* Most people will laugh at you and call you a "nature faker," if you suggest that cats have any sense of affection for human beings or attachment to them. They will tell you that the cat is self-sufficient and, above all, treacherous, all of which is absolutely false. The cat can be and is most affectionate, provided it senses affection and sympathy in the attitude of its master or mistress. But sympathy is as necessary as affection, and humans give puss even less sympathy than affection.

Cats are gentle, timid and nervous. They misunderstand and dislike teasing and the game of "rough house," and they resent a blow. You cannot abuse them as you would your dog, but love them and treat them according to the peculiarities of the nature and the physique that the Creator has given them, and you will find them as devoted in their way and as responsive as any pet need be.

With regard to a license, I see no reason why it should not be. Cats can with perfect safety wear properly adjusted collars, and since apartment house cats are successfully confined and do not come under this ban, there is no reason why country cats, at least the pets, cannot also be confined, especially since a small, wired-in runway can easily and cheaply be constructed in the rear of any country house. This would give them ample opportunity to air themselves on pleasant days like cattery cats. When I spoke of "at least the pets," I was thinking of the farmer's cats which are expected to hunt field mice, grasshoppers and other vermin out of doors, and rats and mice in the barns. Possibly they should enjoy a special dispensation! Personally, I would also, temporarily at least, exact a kennel license from breeders and make it unlawful for any other persons to own breeding cats. Such, it seems to me, is the only way in which the matter can be properly handled. A campaign of extermination such as certain people are trying to put on foot is cruel and unjust, both to the cats and their owners. When we exterminate the cat, we shall find a void that would hardly be filled by toads and salamanders—or perhaps it was lizzards and chameleons—which some learned gentleman a short time ago suggested as substitutes.

Sincerely yours,
(Miss) JANE R. CATHCART.

[This letter from one of the best authorities in this country on cats is timely, sound and practical. It seems to the editor that it is one of the most sensible statements of the real status of a cat that he has yet seen. Some apparently good friends of the cat are unconsciously the cat's enemies because they overstate the case and claim everything for the cat, and fail to recognize the cruelty occasioned by lack of proper care. There is also the other point of view. Many have become so fanatical in their dislike of the cat, and have been so impressed by the cat's havoc in the bird world, that they are unable to see any good in the cat. It is like many other questions. It has two sides. We believe that Miss Cathcart has fairly stated both sides. One of her sensible statements is that not only should the cats be licensed but the cat breeders. We restrict the running of an automobile to those who are licensed to run it, because no one

should be permitted to do anything that may injure or annoy others. The suggestion, therefore, that only licensed breeders should be permitted to breed cats is timely and good. The indiscriminate breeding of cats is an injury to the cats, to all the people and especially to the birds. We pay a heavy tax for the privilege of breeding dogs. Can any one suggest any reason why that same principle should not apply to cats?—E. F. B.]

Early in the war a volunteer organization in England took up the task of borrowing from naturalists, astronomers, and others, for use at the front, every sort of optical instrument that could be put to any sort of use. Their latest report shows that they have thus far supplied to the army no fewer than twenty-six thousand field glasses and portable telescopes. Opera glasses, however, are not used.

The Traveller

By Dou C. Fritz, Cos Cob, Conn.

I like to travel over the desert
 Coming at sunset to the green oasis
 With flowers, grass, and high plumed
 date trees
 And fountains whose cool flowing
 rivulets
 Lose themselves soon in the hot
 desolation
 Whither I go again in the dawning!



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Miscellaneous Contributions.

- Mr. Alden L. McMurty, Sound Beach: Apparatus for experiments in optical projection of sound from vibrating diaphragm.
- Mr. J. A. Kearful, Ada, Montana: Samples of special development of potatoes from seed.
- Miss Viola Worrell, Sound Beach: Variety of pudding stones.
- Mr. Clyde T. Ford, Sound Beach: Beautiful specimen of amethyst, shell from Avalon, sea bean and specimens of gold and copper ore.
- Mr. E. W. Graves, Long Island, Alabama: Mounted ferns from Alabama.
- Mr. Hiram E. Deats, Flemington, N. J.: Three waste-baskets.
- Miss Edna S. Knapp, Caryville, Mass.: Puzzle whittled from wood.
- Mr. George Shackleton, Greenwich: Two enlarged photographs in sepia, taken on Conyers Farm, Greenwich.

Please remember this educational uplifting work in making your will.

Form of Bequest to the Association

I hereby give and bequeath to The Agassiz Association, an incorporated association, having its principal executive office at ARCADIA, in Sound Beach, in the town of Greenwich, Connecticut, the sum of-----dollars.

From The Farmer Poet of Stamford.

So advantageously perched is Mr. Crandall's little fruit farm on a crest of Cedar Heights, near the old Wire Mills canon, that we do not wonder that he continues to write poetry. We should wonder if he did not write. He is sure of an attentive and friendly audience when he contributes a lyric to the Stamford Historical Society's monthly program as "At Dawning" was thus recently presented. The poem has so direct an appeal to nature lovers that we gladly give it room in *THE GUIDE TO NATURE*. An amusing fact in connection with the verses is that the author rose before daybreak to shoot the crows that were stealing his neighbor's sweet corn. To his great surprise he actually brought down two of the black thieves at one shot. Then he felt remorseful as he had not shot a bird of any sort in a decade or two. To assuage his grief and to distract his thoughts from the death of the crows, he sketched in verse the beauty of the sunrise, and here it is.—E. F. B.

AT DAWNING.

BY C. H. CRANDALL, STAMFORD, CONNECTICUT.

To see the dawn suffuse the sky,
 And roll the pink across the blue;
 To see the woodland shadows fly
 Before the light rays charging through;
 To see the nymphs of morning steal
 Along the stream-side and surprise
 The hillside naiads where they kneel
 With dewy wonder in their eyes.

To see the argosies of gold
 Spread canvas in the waking east
 With gleaming prows and sails unrolled,
 So dumbly dazzling, bird and beast,
 While scarce a leaf dare fright the air
 Before that miracle of light
 That, smiling, fair, and still more fair,
 Halts the admiring gaze of night.

Till, as the scene is fully spread,
 With saffron curtains, opal deeps,
 And servitors in gold and red
 Around the throne where glory sweeps,
 Out steps the flaming King of Day
 In crimson grandeur, sweeping wide
 His gaze across his destined way
 To greet the fair earth like a bride.

And then to hear the silver throats
 Of winged life, that faintly holed
 The light's first advent o'er the moats
 And hedges where the radiance trailed,
 Now burst into a choral song
 As if the Day King swung his rod
 And led the joyous notes along
 In million-throated praise to God.

Or, on the sea, to watch the lids
 Of that great sky that spans the world
 Part slowly, as the Maker bids;
 "Let there be light," and so, imperaled
 With bands of lavender and rose
 And wondrous tints that change and grow,
 The trembling ocean thrills and glows
 And wandering winds forget to blow.

This is to greet life face to face,
 In Eden beauty, new-arrayed,
 Where all her forms of maiden grace
 Play o'er the landscape, unafraid,
 So, Early faring, we shall reap
 The sweetest joys of nature's sway
 And know, while luckless laggards sleep,
 The virgin beauty of the Day.

A Man Asks, "What Is Your Favorite Book?"

BY BRUCE BARTON, EDITOR "EVERY WEEK,"
 NEW YORK.

[Reprinted by Permission.]

Of course, no man wants the same book for every mood, any more than he wants the same food for every meal or the same medicine for every disease.

But the book to which I come back again and again was written several hundred years ago.

It is called *Ecclesiastes*; you will find it about the middle of the Bible. Frederick the Great called it the "Book of Kings," and said every monarch should re-read it constantly.

He should have said *every man*; for every man is the monarch of his own life. And this is the book of life, written by a king who had everything that life can give. It is the answer to the eternal question: "What's the use?"

What profit hath a man of all his labor
 Which he taketh under the sun?
 One generation passeth away,
 And another generation cometh;
 But the earth abideth for ever. . . .
 All the rivers run into the sea;
 Yet the sea is not full;
 Unto the place from whence the rivers
 come,
 Thither they return again. . . .
 The eye is not satisfied with seeing,
 Nor the ear filled with hearing.
 The thing that hath been,
 It is that which shall be;
 And that which is done
 Is that which shall be done:
 And there is no new thing under the sun.

In other words, life is not just one thing after another. It is the same

thing again and again. Get up, worry and work; eat, lie down, sleep. What's the use of it all?

The man who is never tempted to ask that question has no imagination.

Solomon, the writer, determined to find out what is worth while in life.

Is wisdom the thing greatly to be desired? He made himself the wisest man in the world, and discovered—what?

In much wisdom is much grief;
And he that increaseth knowledge
Increaseth sorrow.

From wisdom he turned to mirth, only to find, as an end of living, that "this also is vanity."

He sought to give his heart unto wine, and "to lay hold on folly": and in this also there was no satisfaction.

Perhaps, then, he said to himself, perhaps work is the one thing worth while. To achieve something great—to leave a monument for posterity to wonder at.

I made me great works; I builded me houses; I planted me vineyards: . . .

Then I looked on all the works that my hands had wrought, and on the labor that I had labored to do: and, behold, all was vanity and vexation of spirit, and there was no profit under the sun.

Wisdom, mirth, wine, women, work, fame—

The man who has not at some time sought each one as a solution of the puzzle of life has in him no spirit of adventure.

But none of them satisfied Solomon.

What, then, is the answer to the riddle? What will satisfy the soul of man? What will make his life seem to have been worth while when he comes to give it up?

The answer is in the great last chapter, which begins:

Remember now thy Creator
In the days of thy youth,
While the evil days come not,
Nor the years draw nigh,
When thou shalt say,
I have no pleasure in them.

To live straight and simply; to do a little kindness as one moves along; to

love useful work; to raise a worthy family, and to leave the world a little better than you found it—to do one's daily duty in simple reverence—this is the final answer.

And the man who, having passed through his periods of questioning, and made his false excursions into the varied by-paths, does not come finally to this true road, has missed real greatness.

Justice Our Hope.

In "The Sun," New York, a somewhat extended discussion has been published in regard to the belief in conscious immortality. The discussion was started by a communication said to have come from Sir Oliver Lodge's son, who was last year killed in battle. Some of the ideas pro and con are hardly worth putting into type, but Louis Cortambert, one of the esteemed Members of The Agassiz Association, recently published a letter in which he argues in behalf of justice as the solution.

"When we consider," he says, "the limitations of the human mind, which depends upon the five senses for its impressions, and possibly a vague, more subtle sixth sense, it is doubtful whether we shall ever arrive at any solution of the eternal question which will satisfy everybody, so we shall continue to lean upon dogmas and theories, influenced by thought and circumstances.

"But the one fundamental principle that is intelligible to all minds is the principle of justice, and as the short space of human life and conditions which govern it are inadequate, we depend upon a future existence and a Supreme Justice to square the account. This seems the simplest explanation of the hope for conscious immortality."

The finest results of nature-study consist in an absorbing fondness for nature, in finding in her a solace and a refreshment from the worry and care of life, in gaining from her a culture without cost to those for whom costly culture is out of the question, best of all, in feeling in her the throbbing indwelling of a power not ourselves that works for, not only righteousness, but for eternal uplift in all things.—S. C. Schumucker, in "Nature-Study Review."

The Rattlesnake Does Not Jump Forward.

BY RAYMOND L. DITMARS, NEW YORK CITY.

A rattlesnake never springs at his victim. If it strikes hard while on smooth ground, it may involuntarily slide forward a foot or so, but the strike is usually made by the straightening of the snake's body. I have never heard, from any reliable source, of a rattler's springing at its victim.

A naturalist in the Philippine Islands reports that, even after fifteen years of American occupation, it is still possible to enter almost anywhere one of the larger forests and there stumble upon magnificent trees that are wholly unknown to science.

Appreciation of Lectures.

It is a pleasure to be able to say to you that your lecture was enjoyed most thoroughly by all the faculty. It was like a breath of the out of doors and has done a great deal to stimulate the interest in nature at large and in the school-room.—Edward Sargent, Superintendent of Meadville Public Schools, Meadville, Pennsylvania.

Dr. Bigelow, the noted Scout Naturalist, last week led the Boy Scouts of Pittsburgh and their friends in a most instructive and interesting "hike" by means of his illustrated lecture—"Journeys About Home—Roadsides, Fields and Forest." The lecture was given before four evening audiences in connection with our Evening Extension Work. Everybody was pleased and the Boy Scouts were simply *de-lighted*.

Dr. Bigelow's lectures are distinctly worth while and are especially valuable to all students and lovers of nature.—J. M. Berkey, Director of Special Schools, Pittsburgh, Pa.

Just a few lines to say that we, teachers and all, pupils included, very much appreciated your illustrated lecture on "Journeys about Home—Roadsides, Fields and Forests," given to us on the evening of February 2nd. The illustrations were the best I had ever seen, but the majority of the teachers liked your morning lecture on "The Child or

You" much better than the illustrated lecture. It was full of sound pedagogical truths and yet was fair from both angles. I have heard many expressions of appreciation and requests that you be asked to return to our Institute at some future date.—James L. Allison, Superintendent of Public Schools, Wilkensburg, Pennsylvania.

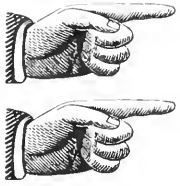
It is generally agreed that Edward F. Bigelow, of ARCADIA: Sound Beach, Connecticut, is one of the most interesting instructors of any who have addressed the institute in recent years. His talks are not only intertaining but are based along lines that will prepare teachers for the new vocational work that will be expected of them this spring, and his subjects cover a wide range. Mr. Bigelow's lectures have attracted considerable attention locally and there have been many in attendance who are not connected with the teaching staff of the county. These visitors are cordially welcomed by the pedagogues.—"The Danville Gazette," Danville, Indiana.

Good Words for This Magazine.

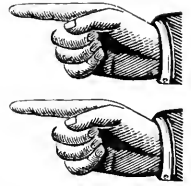
I thought I could do without your delightful little magazine this year but I cannot. Will save some other way.—Mrs. J. W. Hughs, Ellisburg, New York.

I am enjoying every number and am intending to delve more deeply into Nature when some household burdens are lifted. Truly one cannot become dreary when THE GUIDE TO NATURE enters the home.—Miss May M. Michel, Osage City, Kansas.

It gives me great pleasure to renew my subscription to THE GUIDE TO NATURE. The idealistic spirit of its articles, the superb photographs and its intimate presentation of all fields in nature make it the most interesting magazine open to our students in biology.—Paul B. Mann, Head of Biology Department, The Evander Childs High School, New York City.



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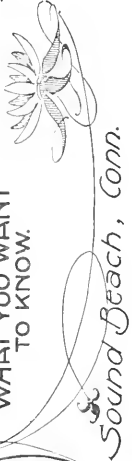
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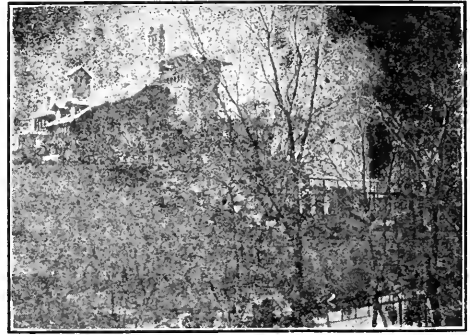
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The May Manton pattern No. 9369 is cut in sizes from 10 to 14 years. The braiding design 848 gives three yards. They will be mailed to any address by the Fashion Department of this magazine, on receipt of fifteen cents for the dress, ten cents for the braiding design.

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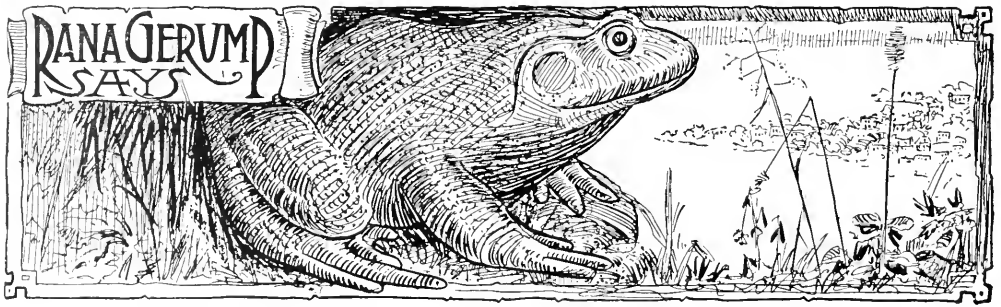
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The Ansco camera is a good one, and Embree's Drug Store, next to the Stamford Theatre, has an ample supply. Every one in this vicinity that contemplates the purchase of a camera will be interested in examining these.

An Ideal Hotel for This Vicinity.

Stamford now has a first-class hotel. This will be pleasing news for automobile parties and for others. We are especially glad to call attention to the hotel as it will benefit the visitors that come to ARCADIA from a distance, either by automobiles or in any other manner.

Forging Ahead in Developing and Printing.

The developing and printing done in McClelland's store, Stamford, is meeting with favor. The recently enlarged photographing department is thoroughly well equipped, with a good man in charge of the work. The store is well stocked with cameras and supplies. This is the time to get a camera and to use one if you have it. You will find this store a good place in which to have your work developed.

Age with Greater Enthusiasm than Youth.

One of the drug stores the longest established in Stamford is that of A. L. Embree. It dates back in the historical past of that rapidly growing city. The store has recently removed from Park Row to the building next to the Stamford Theatre, a locality that is becoming more and more conspicuously the center of things in that city. In many respects this new location is ideal, especially for theatre goers. It is also of convenient access to the trolley lines.

For many years the store has been generally known as "the family drug store," as is only natural since it dates back for so many generations. Now it has added to its other good qualities dignity and convenience in a magnificent new equipment. Without going into architectural details, it is sufficient to state that the floor, the cases and the ceiling are all of the most modern material and the latest design and produce the beautiful effect of a tasty, well organized drug store. A large stock of new material has been put in and tastefully arranged. Mr. Embree has always been fortunate in having skilled and courteous assistants. We predict for the new store increased popularity.

Steadily Progressive for the Quarter of a Century.

"The Daily Advocate," of Stamford, Connecticut, on the 4th of April completed the twenty-fifth year of what it terms a "joyous existence." That must correctly describe the situation. "The Daily Advocate" has been not only "joyous," but enthusiastic, persistent, faithful in all its duties as a daily newspaper.

The editor of this magazine has for a long time regarded "The Daily Advocate" as one of the most enterprising, best edited, and best printed daily newspapers to be found anywhere in the United States. This assertion is made with an extended knowledge of journalism for more than a quarter of a century.

Once an editor, always an editor, the editor of this magazine takes delight in the fact that he is an editor as well as a naturalist, and he too is joyous when he sees these achievements in good journalism, as well as in good studies and proficiency in the realms of nature.

Not only personally, but in behalf of The Agassiz Association as a scientific organization, should good words at this time be spoken in behalf of this progressive daily newspaper. Our beloved Association has in a few recent years passed through a great variety of trying vicissitudes. Good fortune and bad fortune have followed each other so rapidly that it has been diffi-

tion." When a surprising change in the course of events came, necessitating our removal from old Arcadia to our present location, "The Daily Advocate" published five columns that fully explained the situation. More than five hundred copies were sent out, and before our magazine could appear, there had come to us \$1,144.25.

But, aside from our personal gratitude, we can truthfully say that "The



cult at times to manage the capricious developments. In all these, "The Daily Advocate" has been a loyal journalistic friend. We acknowledge with gratitude the truth of a remark that has several times been made by another good journalistic acquaintance, "The Daily Advocate" has been a mighty good friend to you and the Associa-

Daily Advocate" is a good newspaper. Every one that knows the situation knows this fact. Probably the most convincing proof of this is that no other daily newspaper has been able to stay long in the same field. "The Daily Advocate" furnishes all the people of this part of the county require in a newspaper.

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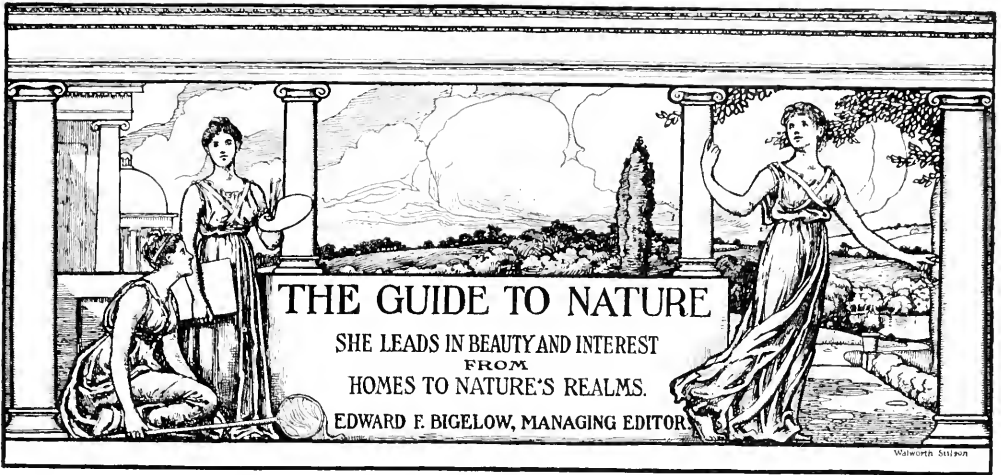
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 Subscription, \$1.00 a year
 Single copy, 10 cents

Entered as Second-Class Matter June 12, 1909, at Sound Beach Post Office, under Act of March 3, 1897.

Volume IX

MAY, 1917

Number 12

Afield in the Month of May.

BY HERBERT W. FAULKNER, WASHINGTON,
 CONNECTICUT.

A story is told of a young girl who, while reading to her grandmother, stopped and exclaimed, "Grandma! Here is a typographical error."

"Never mind," the old lady replied. "Kill it, and go on."

This little incident illustrates the view held by a number of people concerning every living thing that walks or swims or flies. But a part of the work of this Association is to study the lives of these little creatures and to find what they do toward the weaving of the great fabric of Nature's mantle.

American bees and ants have not yet been thoroughly and systematically investigated. Much is still to be learned about their life history. Scientists do not agree as to whether or not bees are attracted by certain colors. Gardeners assume that all ants are harmful to vegetation and slay whole colonies, not knowing that most ants are flesh eaters and that they spend their little lives in killing off small pests.

Insects perform a great service in the cross-fertilizing of flowers. Our cover design shows a butterfly approaching the flowers of the pink

azalea, whose pistils, protruding far beyond the stamens, will receive the pollen it is bringing, and on its nearer approach the stamens will give it a fresh load to carry to other flowers.

This is but one of the many schemes by which insects are compelled to act as couriers to the flowers.

Another system for accomplishing similar results consists in shedding pollen before the stigma is ripe and ready to receive it, so that the flower cannot be fertilized by its own pollen but some insect must carry it over to an older flower, where the stamens are withered and the pollen has been shed but where the stigma is ripe and ready to receive and hold it. The wild geranium, in bloom about this time, will be found to exhibit this interesting method of cross-fertilization. But the most interesting methods are those found in the orchids. In May we should be on the lookout for the *Orchis spectabilis*, described in these pages a year ago, and we should search for the *Andromeda ligustrina*, a shrub growing in moist places and bearing small flowers that shoot clouds of sulphur-like pollen upon the insects that visit them.

There are many of these sly trick flowers at work around us, but it takes sharp eyes to discover their legerdemain.

South Australian Explorations.

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

Recently I have been much interested in the splendid scientific and exploratory work carried on in Australia and Tasmania—the war notwithstanding, and in all of these enterprises no one is more active and energetic than my friend, Captain S. A. White, of Fulham, a city in southern Australia, situated not far from Adelaide. Captain White owns a beautiful estate at Fulham, to which he has given the name “Wetunga,” and by the last Australian mail he sent me some very interesting photographs of his home (Fig. 1) and the beautiful gardens surrounding it. Among these photographs I find one of the nest of a very interesting Australian bird, namely the Black-breasted Plover (*Zonifer tricolor*), which contained three eggs. The photograph had been made by Captain White, and is reproduced as one of the illustrations

the bird in Doctor Leach's excellent little volume on Australian Ornithology—I refer to his recent book entitled “An Australian Bird Book.” It has many colored plates, and nearly 400 text-cuts of Australian land and water birds. Figure 81 of the latter presents this plover, and through its assistance I was enabled to make a drawing of the species, which is here reproduced in Figure 3.

The bird lives upon insects, and is rather an abundant species in the plains districts of Australia and Tasmania. Doctor Leach says it occurs in flocks in the stubble, and can be easily recognized by its markings, its upper parts being brown, with the crown, line on the face down to a broad band on the chest, with the wing-quills black. The throat and abdomen are white, as is also a line through the eye on either side. Black bars cross the tail-feathers, while a spot at the base of the upper mandible



FIG. 1. CAPTAIN WHITE'S RESIDENCE ON HIS ESTATE "WETUNGA," AT FULHAM, SOUTH AUSTRALIA.

to the present article. This plover is not very distantly related to some of our own birds of the same family, as for example our Common Kildear Plover. There are two very good cuts of

is brilliant red in the male, lighter in the female. The Black-bellied or Gray Plover they have in Australia is the same as our bird here in the United States; but this is also true of other

Australian and Tasmanian birds, especially the marine and other water species.

Doctor Leach has written a great deal about the ornithology of that part

used as pack animals on these expeditions, led by native drivers. Nearly twenty of these have now been successfully conducted through untold dangers, back to Adelaide, laden with



FIG. 2. EGGS AND "NEST" OF BLACK-BREASTED PLOVER (*ZONIFER TRICOLOR*). Photograph by Captain White on his own estate Considerably reduced.

of the world; he is editor of *The Emu*, which is the official organ of the Australasian Ornithologists' Union, an organization that corresponds to our American Ornithologists' Union. Some of the members of the former are Honorary or Corresponding members of the latter. As a matter of fact, the ornithologists of Australia take the greatest interest in all the publications and doings of our Union; and, personally, I am just as much interested in the ornithology of that far-off country as I am in that of my own. In Australia there are nearly forty parrots and their near allies, to our single and nearly extinct Carolina parrot.

To return to Captain White's work, I may say that he has described quite a number of new Australian birds of recent years not to mention a good many other forms new to science, and to that great Continent. Nearly every year he is the senior naturalist and ethnologist connected with the splendid scientific expeditions that are formed in Adelaide, moving from there northward and westward for miles and miles into the almost entirely unknown country beyond. Some twenty camels are

quantities of new material of all descriptions. Captain White publishes accounts of these expeditions in the transactions of the Royal Society of Adelaide, and subsequently in extensive and popular booklets for the people. Three of these intensely interesting publications are before me, and any one of them fills me with the desire to join the next party going out to the "Ranges."

Not only are all sorts of new creatures and plants discovered, but entirely new races of people, heretofore not known to the world at all. I wish I could give some of the remarkable habits and customs of these strange men and women; but that I can not well do at present. It is my intention to do so later on, for then I shall have the photographs of many of them, which Captain White posted me by the last mail leaving Adelaide. Not long ago I published quite a full account of these expeditions (*Science*, Dec. 1, 1916, p. 793), and that account might be read with profit, in connection with what I have set forth here. To tell the truth, I was much surprised to note the great interest taken in the subject in this country

—a fact I judged from the number of letters sent to me by readers of my aforesaid story in *Science*.

The new tribe of people described by Captain White stand among the lowest

Wm. L. Finley of Oregon, Clinton G. Abbott, of New York, and Dr. Arthur A. Allen, Professor of Ornithology at Cornell University are the speakers engaged. Mr. Charles C. Gorst, the well

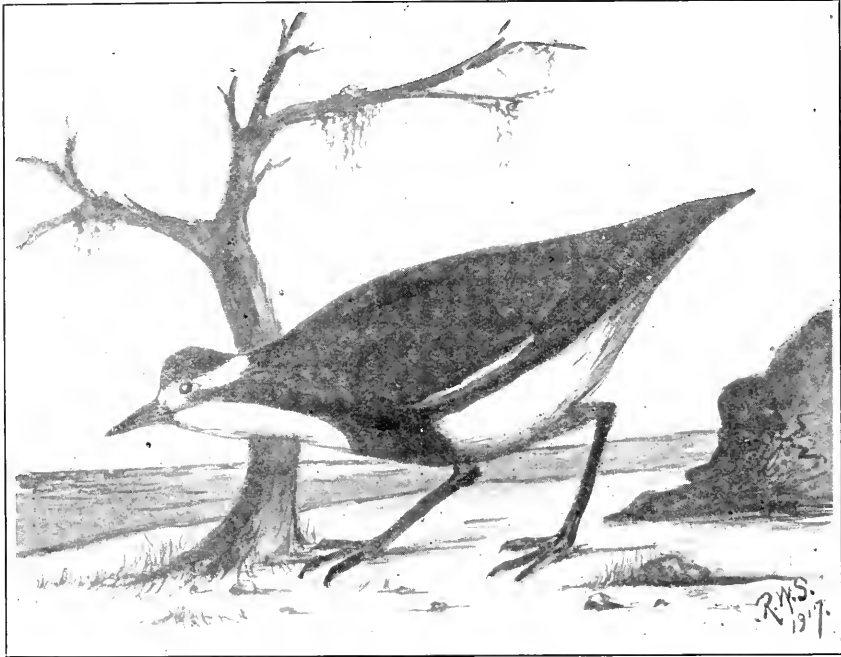


FIG. 3. BLACK-BREASTED PLOVER (*ZONIFER TRICOLOR*) MALE.
Drawn by the author after Dr. Leach's figure.

of the races now known to us. The women of it wear no clothing whatever, and the men are not much better clad; and, while not cannibals, they do not hesitate to eat their own relatives when the latter pass away.

I have written the osteology of a number of Australian birds, as the Cape Barren Goose, the big Southern Stone Curlew, the Red-Wattle Bird, and other species, and I hope to live long enough to describe the skeleton of many another species in the avifauna of that wonderful land.

The Massachusetts Audubon Society is aiming to outdo all past efforts in its presenting its annual course of bird lectures to the public this season, in a course of four Saturday afternoon lectures beginning March 3rd. The finest bird pictures obtainable—both stereopticon and motion pictures—will be shown at these lectures, and such well known authorities as T. Gilbert Pearson, Sec. National Assoc. of Aud. Soc.,

known imitator of bird songs, will also give exhibitions in this art at each meeting. This series will doubtless attract bird students from many other towns and cities to Tremont Temple in Boston, where the lectures are to be given.

The Audubon Society of New Hampshire is working hard through their legislators to secure the passage of a bill to provide for the better protection of birds, by the licensing of cats. This important legislation, which we think must come to pass in the near future, has been too long looked upon as a joke by legislators of some of our other states, who have been either ignorant and unprincipled in the matter, or have been duped by parties opposing such bills for selfish interests. The status of the wandering, homeless cat as a menace to public welfare and an enemy of useful birds is now a matter of common knowledge for anyone who is sufficiently interested in the matter to know the truth.

TO KNOW THE STARRY HEAVENS

The Starry Heavens in May.

BY PROFESSOR ERIC DOOLITTLE, OF THE
UNIVERSITY OF PENNSYLVANIA.

During this month we note the practically complete withdrawal of Taurus and Orion; Leo is well past the meridian, Virgo is high in the south and the remarkable and striking group, Scorpio, is just entering our evening sky. The entire length of the great Water Snake is above the horizon in

high in the heavens, almost in the zenith. Almost exactly overhead, too, are the delicate little groups of the Maiden's Hair and the Hunting Dogs, while lower down are the many brighter constellations, which, from the great Bootes to the beautiful Northern Cross, now fill the whole northwestern part of the evening heavens.

At this time but little of the Milky Way is visible, for the winter branch

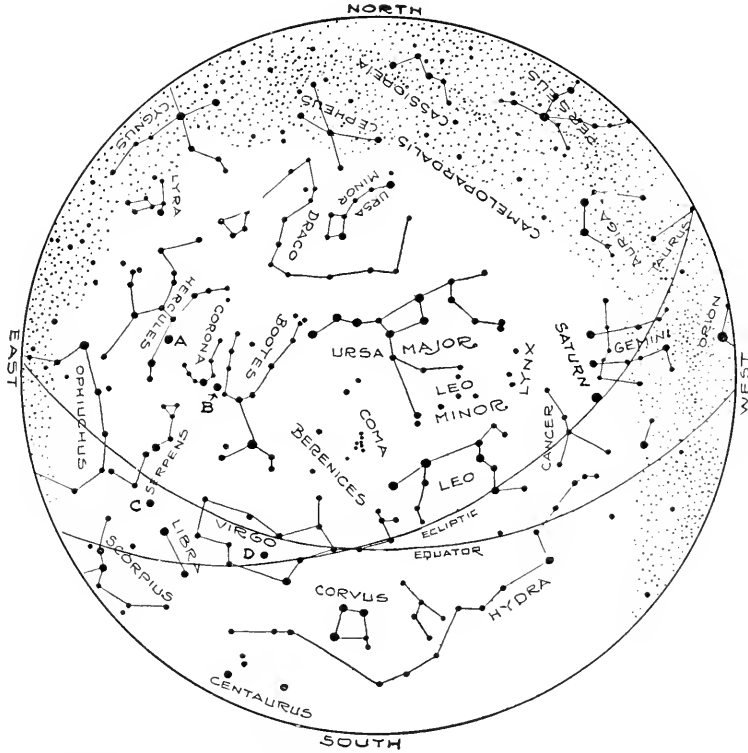


Figure 1.—The constellations at 9 P. M., May 1. (If facing south, hold map upright. If facing west, hold West below. If facing east, hold East below. If facing north, hold map inverted.)

the south, so that the present time affords the most favorable opportunity of the entire year for tracing out this interesting constellation.

The bright Cassiopeia is now at its greatest distance below the Pole, while opposite to it the Great Dipper rides

is setting in the west, while the summer branch is rising in the east, so that the whole extends completely along the ground through the north, inclosing two-thirds of the horizon.

The only planet which shines conspicuously in our evening heavens is

the beautiful Saturn. During the month this world will move steadily eastward among the stars, emerging from Gemini and crossing into the borders of Cancer on May 27. The observer will easily note that Saturn is now far more nearly to the east of a straight line joining the twin stars, Castor and Pollux, than it was a few

with the discovery of the great planet Uranus in the year 1781. When Herschel saw this new object he believed it to be a peculiar kind of comet; it was not until its motion had been studied for nearly a year that the presence of a new world in the Solar System was revealed.

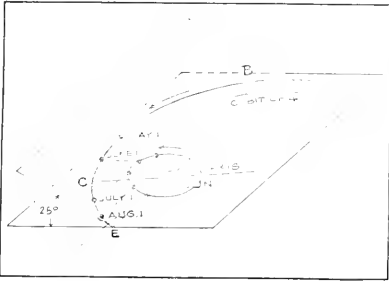


Figure 2.—The path of the new comet in space.

weeks ago. When, during next November, the planet again enters our evening sky we will see that it has entirely crossed the latter constellation and entered the borders of Leo.

* * * * *

The New Comet.

This object, which has been attracting the attention of astronomers for many months, was discovered a full year ago, but since throughout all of 1916 it was so far away that it was only visible in large telescopes, and since it will shine in the heavens throughout all of the present year, it may well be thought of as the comet of 1917.

The comet was first seen on April 27, 1916, when it appeared as an excessively faint (12.8 magnitude) star-like object having a nebulous envelope. It was thought probable that it was one of the numerous little bodies called asteroids, which revolve about the sun between the orbits of Mars and of Jupiter, and it was given the provisional asteroid designation ZK. The nature of its motion soon showed, however, that it could only be a comet, but a comet so far away that it must have been nearly five hundred millions of miles distant when it was first discovered.

The first uncertainty as to the nature of this new body recalls to an astronomer the similar uncertainty connected

with the discovery of the great planet Uranus in the year 1781. When Herschel saw this new object he believed it to be a peculiar kind of comet; it was not until its motion had been studied for nearly a year that the presence of a new world in the Solar System was revealed.

Figure 2 shows the situation of the path of the new comet with reference to the position of the earth's orbit and to that of the sun. The comet is moving about the sun in the same direction as the earth is, but its path lies in a different plane, the comet plane being inclined twenty-five degrees to the plane in which the earth moves. The comet passed above the latter plane at the point A, but it was not discovered until it had reached the position B. It will pass the point of its orbit which is nearest the sun on June 16, and will be at its least distance from the earth on August 21. At this time it will be 91,700,000 miles away from us.

As the great cloud moves along its orbit, it should appear to us to grow constantly brighter, both because it is drawing nearer to us and because it is drawing nearer to the sun. The latter source of increase acts in two ways, both by increasing the illumination by sunlight of its opaque matter and by intensifying the excitation of its self-luminous material, either through electrical disturbance or otherwise. It is easy to show that if the comet thus brightens in a normal manner it should during the next summer become fully two hundred times as bright as when first discovered and hence should be easily visible to the naked eye.

Unfortunately, however, these bodies frequently grow inherently brighter or fainter in a quite capricious manner, and we cannot therefore at all predict how conspicuous the present comet will grow. Observations made toward the end of March indicated that the comet is not brightening so rapidly as it normally should.

If the reader will imagine himself standing on the moving earth of Fig. 2 and continuously watching the comet as it moves along the path ACE he can readily picture roughly to himself what its apparent motion among the stars will be. Evidently it will mount con-

tinually higher in the heavens and also run quite rapidly westward among the constellations until it has come to the neighborhood of the position C, when it will begin to move downward and its westward motion will become very slow, or cease altogether. The true path is shown in Figure 3, which represents the southeastern heavens as viewed on May 1 at 5 A. M., or on May 31 at 3 A. M. As this region will be well up from the ground by 11 P. M. during the month of August (which is the time of the comet's greatest brightness), it will then be in very favorable position for observation.

* * * * *

The Planets in May.

Mercury, which reached its greatest elongation east of the sun on April 24, may still be seen, though with some difficulty, during the first few days of May. It should be looked for in the northwest and very near the horizon until about three-quarters of an hour after sunset. It is in the constellation Taurus, near the Pleiades, and shines with two and one-half times the brightness of a first magnitude star. Mercury will enter the morning sky on May 16 and will afterward attain its greatest distance west of the sun on June 11.

Venus entered the evening sky on April 26, and though it is steadily emerging from the sun's rays, it sets but about fifty minutes after the sunset by the end of the month. Toward this time it should be looked for very far

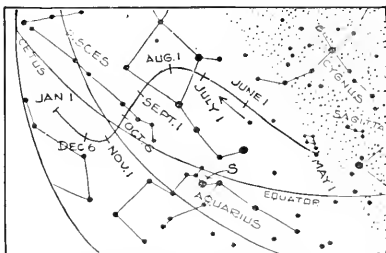


Figure 3.—The path pursued by the new comet among the stars during the present year.

to the northwest and low in the twilight glow. Notwithstanding its proximity to the sun, it can readily be found, for it now shines with sixty times the brightness of a first magnitude star.

Mars rises about fifty minutes before sunrise on May 1, and though this time is increased to seventy minutes by May 31, the planet is still far too close to the sun for satisfactory observations.

Jupiter, which has shown so brilliantly in our evening heavens throughout the entire winter, will definitely withdraw from the evening sky on May 9. By the end of the month it may be seen rising in the northeast, nearly an hour before sunrise.

Saturn is now conspicuous in the early evening. It is moving eastward and southward in the eastern borders of Gemini and will readily be found from the position shown in Figure 1. The rings are now widely opened out, and the system forms a beautiful telescopic object for study.

* * * * *

Shooting Star Showers in May.

The several readers who have observed the shooting stars referred to in the present articles will be interested to know that many lesser showers will occur during the present month. On the evening of May 9 an occasional shooting star may be seen to dart outward from almost the exact center of the constellation Virgo (at D, Fig. 1), while on this evening, and especially on May 10, similar shooting stars will occasionally draw away from a radiant at C. On May 24 a minor shower will occur from a radiant at A, while five days later, on May 29, a second, even lesser, shower will occur from this same point.

The above are all, however, but small showers, quite long waits being usually necessary before a single shooting star which belongs to one of them is seen. A much more interesting one occurs from the 3d to the 6th of the month, but this must be looked for during the few hours just before sunrise, since in this shower the shooting stars (called "Aquarids") dart outward in all directions from near the point S of Figure 3. Prior observations have indicated that this radiant point shifts about one degree toward the eastward during each twenty-four hours, the change being caused by the different way in which we view the particles as

the earth ploughs through the great stream.

Though these fainter showers are of far less spectacular interest than some of the well-known ones, their careful observation is of much greater value, for of many of them we have still to determine with accuracy the true path of their meteor stream about the sun. And when one has become experienced in this kind of naked-eye work, it is found to possess an interest and fascination all its own.

How to Use the Sound Beach Observatory.

No observatory with only one telescope can accommodate a large party to good advantage. We have discovered by experience that, until we have at least one more telescope, it is not satisfactory to receive a party of more than ten. Preferably there should be fewer. An observatory can easily be overpopularized in large groups. Such a place is not like a large hall that can accommodate a large company, yet the Sound Beach Astronomical Observatory receives a dozen requests for large parties to one from a single student or a family. We prefer the small number.

Our observatory will hold from thirty to forty persons, but even then it is overcrowded. If we had room for thirty people, so that each one might look through the telescope for only a minute, which is far too brief a time for proper seeing, that would keep every other member of the party waiting for half an hour, and if each one had only four minutes at the telescope, that would keep the others waiting for two hours. This is unsatisfactory, both for giving information and for receiving it.

During the cold weather several persons had their astronomical enthusiasm so completely chilled that it was not considered advisable to receive large parties in the winter, as was done to a limited extent in the autumn. It is pleasing to have a large social party in the Welcome Reception Room, around a roaring fire in the fireplace, and then to visit the observatory, but practically that has not proved to be the best way, because of the cold and the delay in seeing. The best time for observation is in the winter nights, as the most beautiful and impressive constellations are visible then, but the disad-

vantages are many. It takes real enthusiasm to keep the observer in the observatory for two or three hours, with the thermometer down to zero, but on a clear night, with the mercurial at zero, there is no more delightful sight than that of the sharply glittering stars.

But spring is here, and summer soon will be. The observatory freely offers its aid to any who really want to study the stars, but it cannot be used to good advantage for the gala time of a large party. It is a fact, proved by experience, that many people prefer to visit the observatory in a large party. It seems sometimes almost as if some persons are afraid to explore the infinite unless they have a crowd with them for company. It would be a simple matter to extend one invitation and get twenty-five or thirty boys in the observatory, but it would be difficult to extend thirty invitations and get one boy for an entire evening.

If we were after record making figures we could secure them by inviting schools, clubs and other societies to visit the observatory, and we are willing to receive such large companies and to show them the building and the telescope, but such visits are disappointing to all concerned. Instruction can neither be given nor received.

We therefore extend this invitation to the individual, to the family and to small groups. Come and seriously study the stars. The observatory, even on a warm night in spring or summer, is not the place for laughing, gossiping and loud talking. Neither is it a place for curiosity seekers. To such visitors the observatory is always a disappointment. The management desires to help the earnest student, not the mere seeker after amusement. Several teachers have come and brought their classes, and others have wondered why they have not received an invitation. We are now telling them.

Far better would it be for the teacher to come alone and get a knowledge of the constellations and then tell her pupils. It requires considerable preliminary knowledge to use an astronomical observatory to advantage. There is danger of wasting time when the telescope is made merely the dessert at the end of a social party, or a means of entertainment for an invited company of more than three or four.

One point more. It is impossible to make an appointment far ahead. There

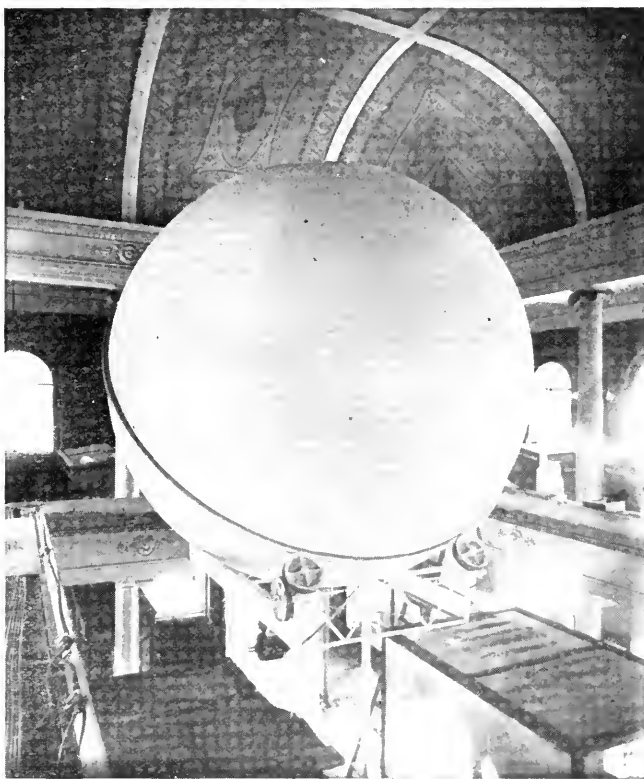
are but few good observing nights in the whole year. When a really bright night appears, that is the time for serious work. Place your name on our waiting list and we will notify you by telephone when a propitious time arrives. We shall then be glad to have you accept the invitation and we shall be happy to do all in our *power to make your visit profitable to you*, but come only one or two at a time if you please.

The Heavens Brought Within Doors.

There are some disadvantages in studying the heavens. The most important is the fact that in the entire year there are but few ideal starry nights. The second is that of these few favorable nights the best are in the win-

In Chicago all these difficulties have been overcome so far as they can be overcome by any artificial device. At The Chicago Academy of Sciences has been placed the Atwood Celestial Sphere that gives a miniature reproduction of the heavens and the stars as they are there located. The student or the casual visitor can walk inside of the heavens and see the stars under comfortable conditions of situation and temperature. It is to be presumed that this arrangement prevents visitors from stamping during the first minute and saying, "Oh, my feet are freezing," and shivering the next and saying, "I can't stand this. It is too cold."

But to be within this celestial sphere is like following the showman around



AN ATWOOD CELESTIAL SPHERE.

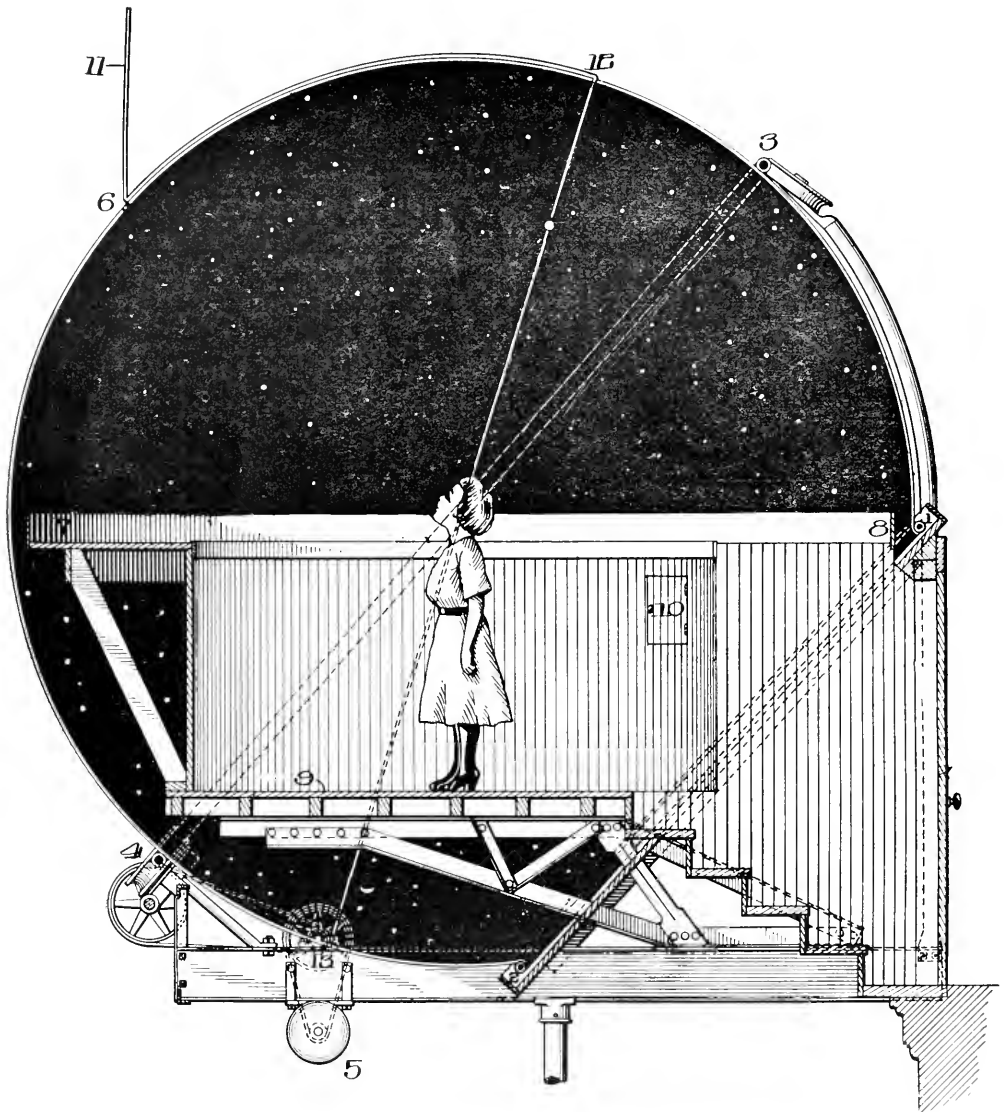
ter when the constellations shine at their brightest. There is another disadvantage. People in the cities cannot study the heavens on account of the electric lights, the smoke and the lack of proper localities from which the heavens may be seen from horizon to horizon.

the menagerie of a traveling circus. The exhibitor carries a small electric light at the end of a rod and with it easily points out the stars. Mr. Atwood, the inventor, writes as follows:

"When the sphere was first opened to the public, the popular demand for admission was so great that a profes-

sional demonstrator was kept on duty day and night. Visitors in groups of twenty or thirty were taken into the sphere and after the demonstration, which took about twenty minutes, an-

came with an instructor or by special arrangement with the secretary of the Academy. This has resulted in a thoughtful, educational use of the sphere, and today many of the teachers



NORTH-SOUTH SECTION OF SPHERE.

- 1-2. South Polar Ring at entrance.
3. Upper Wheel supporting sphere.
4. One of two lower wheels which support the sphere and are propelled by motor.
5. Electric Motor.
6. North Pole of the heavens.

- 7-8. Horizontal Table.
9. Observers' Platform.
10. Switch Board.
11. Electric Wire.
- 12-13. Ecliptic or apparent path of the Sun.

other group was admitted. This popular, general demand was however, not what the Academy desired to encourage. Therefore, the use of the sphere was limited to student parties that

in Chicago make regular pilgrimages to the Academy, and with the help of the sphere demonstrate to their children their simple lessons in descriptive astronomy.

"Children may readily become acquainted with the constellations, and may learn to know them so well that recognizing them is easy when they are seen in the open sky. As the sphere rotates, the apparent motion of the stars is reproduced with perfect accuracy. They appear to rise, move westward, set, and to follow precisely those courses which they seem to follow during the night. With the pointer, which has a tiny flashlight at the farther end, the instructor may point out accurately one star after another or one constellation after another.

"The sphere is under electrical control, and may be set so that the stars will appear just as they would appear to an observer at any desired hour on any night of the year. Similar spheres could well be constructed for other latitudes. The immediate practical value in connection with the training of men in the Navy has been appreciated by the British Government, and a request has been received for the construction of such a sphere at their naval training station. Other museums and educational institutions in this country are considering the installation of a celestial sphere."

It is a brilliant idea to bring the heavens within doors and good especially in crowded cities. When all the earth is carried into the house in moving pictures, when the best instrumental and vocal music is supplied in the phonograph, when all kinds of food from all parts of the earth are preserved in cans, what else would one expect then to have the heavens spread out within an artificial sphere? I hope that this plan will be adopted in other places. Its educational merit is real, and if it led to the actual observation of the heavens themselves, then it is really worth while.

But, ay, there's the rub; yet I believe that people will in greater numbers become acquainted especially with the winter constellations since that may be done in a comfortable, well warmed sphere.

At the Sound Beach Observatory, from which the entire roof rolls off, we wear our greatcoat and our mittens. This sphere is commendable, but one of my weak points is that I prefer a bit of beefsteak, although it may be

tough, to a cube of condensed, "predigested" essence of cow; and I actually prefer to eat my soup with a spoon rather than to receive it in the form of a pill. Another of my weaknesses is that I prefer to take my science "straight," not diluted, not made easy, not predigested, not in the form of a patent tablet. I prefer to wear mittens and "arctics," and see the real Saturn, rather than to be seated in a steam heated sphere to see a picture and to wipe the perspiration from my "noble brow" while Saturn is handed to me in a silver spoon and sugar-coated. May I be forgiven for my honest confession of weak points! Alas! I have several. Pictures of foreign countries are useful. Not all of us can travel in foreign countries. But are warmed, comfortably furnished, hollow spheres needed to show the heavens above us? Perhaps they are. If you want a good thing of the kind, you will find it in Chicago.

There is a feeling that there is a secret which we have lost, and that it is to be refound in nature. This feeling points in the right direction. The artificiality of our lives has deadened us to a true appreciation of nature and of the health of body and of mind which nature fosters. . . . We need to recover a sense of our kinship with nature, and draw more life from her bosom. We need to find again the lost secret.—Abram Linwood Urban in "My Garden of Dreams."

Fairyland.

Fairyland comes to us once every year,
 But just for a very brief stay;
 Close watch we must keep on the mystical
 signs,
 For it might be in April, or May.
 Light gossamer wreaths, all of rainbow
 hues,
 That seem as if floating in air,
 Are captured and held by each branchlet
 and twig,
 Iridescence is everywhere.
 Such wonder is only for fairy folk,
 Rare beauty their right of dower;
 But we ne'er can surprise them at revels
 bright,
 Unless we will watch every hour!
 —Emma Peirce.



Nature Study at the Connecticut Agricultural College.

BY GLENN H. CAMPBELL, STORRS, CONNECTICUT.

The process of farming, or of learning to farm through work at an agricultural college, is more or less a study of nature. Practically all agricultural

partment, to determine, if possible, how cattle lice live and develop.

His method of procedure is as follows: He selects a calf that has been removed from its mother before there is possible chance for lice to have been transmitted to it. The calf is isolated in a clean, lice-free pen.



STUDYING INSECTS ON A CALF.

work is based upon nature's laws, and our experiment stations exist to a large extent simply for the sake of discovering these laws and the best methods of applying them. One interesting study recently made at the Connecticut Agricultural College was made by Professor Lamson, of the Entomology De-

A white patch is selected on the shoulder and fifteen of a certain species of the parasite are released. They immediately begin their operations of eating, growing and reproducing. After a few days careful inspection will show that the lice have deposited eggs. These are carefully watched until they hatch. A

few of the tiny, young lice are taken to another part of the calf and there "planted." They are watched every day until eggs again appear. This indicates that the lice have arrived at maturity.

By carefully tracing this life cycle for a few times, Professor Lamson is able to determine just how long it takes the eggs to hatch, how long it takes the young to mature, and how soon they may be expected to lay eggs. The object of this work is primarily to learn about lice, and, secondarily, to determine some method of killing them.

A careful study of the lice and the mites of the hen has also been made by Professors Lamson and Manter, and the results have been published by the Experiment Station at Storrs.

An interesting fact brought out in that Bulletin is that the mite with which we are familiar is not a louse but a member of the spider family. Another interesting fact is that a hen louse does not suck the blood of the hen but lives among the feathers and eats the scurf and the skin scales, while the mite sucks the blood through the skin.

Such investigations combine work and pleasure. Some people might not consider the watching of lice eggs to be of any great fun, but it is. A young louse, seen through a lens, is as interesting as a young chicken. Because we do not see the louse in our daily routine of life, we do not realize that it is possible for it to have qualities that are both interesting and beautiful.

I must extend my sincerest greetings of cheer for your great and wonderful work for the advancement of nature study in our public schools. Some day your work will bear fruit that will awaken and strike off these humdrum shackles of ancient hero worship of dead languages and things a child needs not, leaving out the everyday common sense and the study of the geography and natural history that surrounds him. We need a nature teacher in every school as well as we need music and drawing. The sooner we get back to nature the better it will be for the people.—Henry A. Link, Waterloo, Indiana.

Death of the Oldest Beekeeper.

John Cline, of Darlington, Wisconsin, recently died at the ripe old age of ninety-eight years, seven months and four days. For ninety years he was a beekeeper, a noble example that few can expect to equal; a remarkable example not only at the beginning but at the end. Comparatively few persons own and care for bees at the age of eight years, as Mr. Cline owned and cared for them, and few indeed live in the active work for nearly a century, as he lived.

Bees Tried by Fire.

BY E. R. ROOT, MEDINA, OHIO.

At our recent lumberyard fire a little backlot apiary belonging to A. L. Boyden's boys was located within 100 feet of the piles that were burned. The heat was so great that it looked at one time as if the lumber, including all our manufacturing plant, would be reduced to ashes. During the general excitement the little beeyard was forgotten. After the fire was over, a hive located nearest the fire stood out as a remarkable instance of the power of the bees to keep the internal temperature of the colony down in spite of a \$25,000 lumber fire near by. The engraving below, when it is understood that there was a nice colony in the hive "after it was all over," tells its own story, and a wonderful story it is.

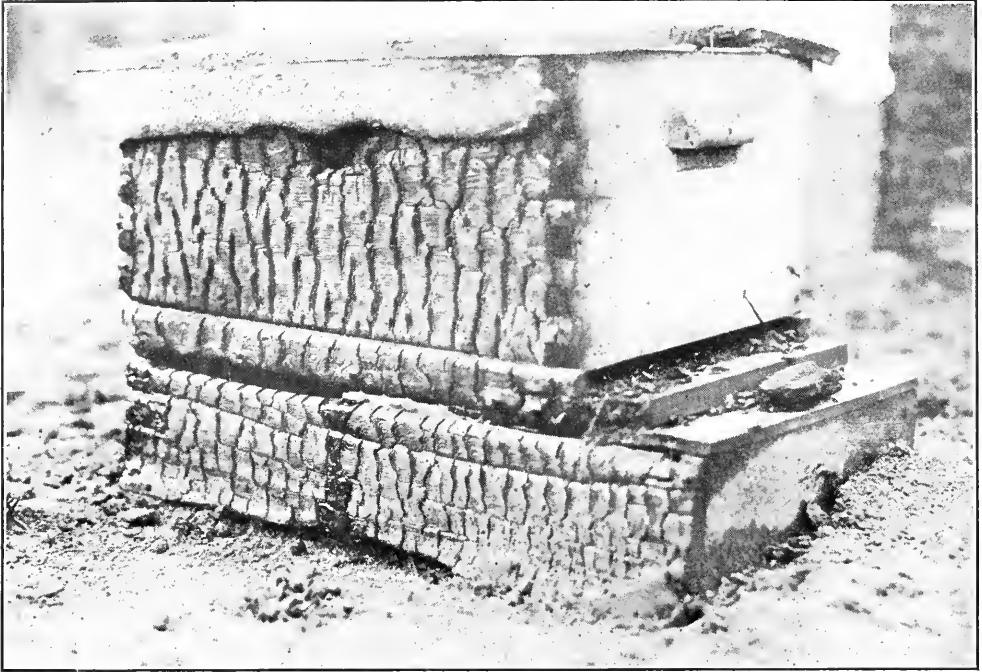
The heat was so intense that all the woodwork under the metal cover was burned away, even the front rail. A piece of it is shown where it dropped down at the entrance. The fire not only burned deep on the side but actually burned a hole through the center. The comb next to it was melted down, as will be seen by the black stain where the wax ran on to the side board of the hive-stand. Not only was the wood burned out from under the tin roof, but the top-bars of the brood-frames were charred half way down. That a colony could survive under such conditions is unbelievable.

Any one would have supposed that they would have been driven out of the hive, and that all the combs would have melted down, and that the wax would have ignited, leaving nothing but a pile of ashes. But, remarkable to relate, at the time the photograph was

taken there was a nice colony of bees, and all the combs were intact except the one next to the hive, which had been melted down.

These bees, as soon as the hive became scorching hot, must have gone into the business of ventilating with the

to keep down the internal temperature of the colony, even though the outside of the hive was afire. It will be noticed that the entrance is $\frac{7}{8}$ by the width of the hive, and that would afford ample ventilation. If it had been contracted down to the usual space, in all probab-



THE BEES THAT KEPT THE INSIDE OF THE HIVE COOL IN SPITE OF THE FIRE.

knowledge that the flames of hades were after them. The men who fought heroically to keep down the big lumber fire could not have worked harder, and every bee must have gone into the business of fanning, blowing a current of cold air into the hive and the warm air out. It surely was a life-and-death struggle.

We have heard of instances where colonies left out in the hot sun have had their combs melted down; but evidently they had a restricted entrance, or too many bees in the fields, to keep up the necessary ventilation.

Why the hive here shown did not burn up entirely will remain an unsolved mystery, unless we admit that a good colony can do more in ventilating than we usually give it credit for. It is possible and even probable that some fireman, seeing the plight of the hive, dashed a pail of water on it and thus saved for us a relic that is exceedingly valuable in showing the power of bees

ity the combs would have melted down and the bees been destroyed.—Gleanings in Bee Culture.

Griffith Taylor, who was one of the scientific staff of Captain Scott's final polar trip, calls attention to the fact that microscopic life swarms in the south polar seas "to an infinitely greater extent than in the warmer waters of the tropics, "so that" there is almost as much protoplasm per acre of ocean as there is in a well-cultivated crop on land.,—(Science, Dec 15, 1916, p. 860)

Wild Azalea.

When dogwood, like the drifted snow,
Makes all the woodlands white,
Tis then the wild azalia bloom
First bursts upon the sight.

Aglow, like Diana from her bath,
All rosy she is seen:
First Maid of Honor she becomes
To Cornel Woodland Queen.

—Emma Peirce.



EDITORIAL

The Value of Boy Scout Training.

I have recently been vividly impressed by the improvement that Boy Scout training makes in boys. The Scout like other persons, is not perfect, but I have been for a long time convinced that the boy as a Scout is a far better boy than he would be if he were not a Scout. There is surely much in the standards and ideals of Scouting that develops the manliness that a boy possesses, even if that is not much. When I see a Scout that does not live up to my highest ideals, I try to imagine what he would be if he were not a Scout.

But to make my lesson more impressive, more specific, let me relate this experience. I have just returned from Pittsburgh, where I was engaged by the City Education Department to give four lectures in different parts of the city, under the auspices of the Boy Scouts organizations. At the first three of these lectures, I was amazed at the perfect order. Never before in my life have I been in the presence of a company of young people who entered the hall in such perfect order, nor where the attention was so absolutely undivided. I was so encouraged by this, and by the fact that some of the Scouts had walked five miles to hear the lecture, some even coming from a distance of sixteen miles, that I was tempted by this evidence of interest to make the lecture longer than I would otherwise have done. In three of the centers, I lectured until ten o'clock, speaking in each place for about one and a half or one and three-quarters hours.

But at the fourth center, I received a severe shock. My good opinion of Boy Scouts was impaired. In trooped a noisy mob of at least five hundred boys with a few girls and fewer adults. It was with difficulty that the superintendent of the school was able to secure order so that he could make himself heard when he introduced me. But I consoled myself with the thought, "Alas, it is not Scouting; it is the crude,

rude and uncultivated boy himself. At the three previous lectures, I must have had a remarkable set of manly young fellows, but here I met the exception that proves the rule."

As I began to speak, my voice was drowned by noise. It was with difficulty that I pleaded and begged for quiet. After several vain attempts to deliver the lecture under more pleasing conditions, I said: "To the Boy Scouts of Pittsburgh I appeal, by all the fundamental principles of Scouting, to keep order in this large audience of boys, some of whom I assume to be gentlemen." Then a happy thought occurred to me: I will have a showing of hands, and that will appeal to each individual boy's responsibility as a Scout. Imagine my surprise when after making the request I saw only about a dozen hands raised and those from boys near the platform and in one corner of the room where there had been no disorder. They were the hands of the only Scouts in the hall. At the close of the lecture, the Scoutmaster who accompanied them told me that they had come from a distance, and that I was speaking in a part of the city where Scouting had not yet been introduced. This was to me an overwhelmingly convincing argument that Boy Scouts differ in better ways from other boys, far better than if they were not Scouts. While in other places, I had been encouraged to lengthen my lecture on account of the absolute silence in the hall and the perfect attention, here I was forced to curtail it to about thirty minutes. Then ensued and ignoble scramble for the front door. The only ones left to shake hands with me were the Scoutmaster and his little group.

Recent tests show that in spite of the dog's marvelous scent for certain animal substances, his nose for such things as ether, oil of rose, vanilla, which do not concern his natural life, is not so good as a man's.

Resisting Knowledge vs. Correcting Error.

I have a lecture entitled, "Garden Interests versus Utility," that has been delivered in many parts of the country, on several occasions before strictly scientific audiences. I believe the lecture contains new material, the result of original investigation. At any rate it has been delivered so many times and before so many critical audiences that even if it had been originally erroneous all errors would by this time have been eliminated. I was recently engaged to deliver this lecture with some others in a rural community in Indiana. On leaving the platform I remarked to the superintendent who had engaged me, "That seems to contain some good new material that your teachers can use." The astonishing reply was, "Yes, I liked the lecture in a measure. Some of the things I knew but the others I did not know. I have a garden but the plants there have never shown me any of the things you describe." I said, "You surely have received something new and valuable?" The man shook his head dubiously. I suspect he disapproved of the lecture because it told him something that he did not already know, the very point for which he should have most valued it.

The same spirit is occasionally the characteristic of a nature student. In a recent number of *THE GUIDE TO NATURE* we published the statement of a thoroughly trustworthy observer, more than seventy years of age, Miss Mary A. Roe, who said that she had observed that birds at times may sing especially for a human audience. That appealed to me as an original observation and I believe it to be correct. I had not previously thought of it but a variety of remembered experiences has convinced me of its truth. I am grateful to Miss Roe for relating the observation, but it brought forth strong opposition from those who would not receive it as new but persisted in calling it an error. Error should be corrected, but information should be received and valued, although it may be absolutely new and at first difficult to understand. How else can we ever learn, how else can we be an Association, if we do not try to see things in Louis Agassiz's spirit, and be, as he was, a real teacher in imparting our knowledge to others? Think care-

fully when you feel like correcting an error and decide whether you may not be resisting the incoming of knowledge. It is dangerous for any naturalist, however competent, to announce a discovery.

I have edited scientific magazines for twenty-seven years, and in that time have published original observations from the ablest scientists in the United States. Not many statements escape criticism, no matter from how reliable an observer, but the people are numerous who will reject the knowledge and call it an error, "I have had experience in my garden, but I have not seen the things about which you make statements." That is a wrong spirit on the part of a learner. Such scepticism is the greatest drawback to the gaining of information. Every one of us is naturally inclined to think with the mistaken wise man of old that "All men are liars." I have learned, after a quarter century of editorial experience, to believe that the majority of men are truth seekers and truth speakers. Every one that tries to observe correctly should be received with grateful regard, and his statements accepted in good faith. The troubles of this world are owing not so much to conflict between right and wrong as between personal rights.

Beware, my friend, when you go on a platform and make statements in regard to what is new or not generally known. If a man has a message let him deliver it; receive him with courtesy, and accept the information as true unless you can disprove it. But how ready opposition is to spring forward. "I have never seen that in my garden; therefore it is not true." One who has worked extensively in the astronomical garden knows that astrology is a remnant of past superstition. The real lover of nature knows that these monstrous things printed in the almanacs, and showing the different parts of the human body, with arrows pointing at a nude and disemboweled human being, are the rankest nonsense. He that knows from scientific investigation knows that horsehairs do not become worms, he that has studied the subject scientifically knows that the moon does not control the weather, yet all these are dangerous topics when mentioned in the presence of the ignorant. Whe-

ther I agree with a statement or not I am willing to receive it, to consider it, and to hear every argument in its behalf. We have in this Association many minds and many points of view, and we get our best value by comparing ideas with the other fellow. Be ready fully to consider an honest statement of a careful observation, whether or not it coincides with what you have seen in your own garden. Always ask yourself, "Am I trying to correct an error, or am I rejecting valuable knowledge?"

"It is Good for the Children!"

A remark often made by visitors at ARCADIA is that nature study is good for the children. Why? Why, as distinctive from the good of the adult? Nature study if it is good for any one it is good for every one and the older the recipient, and the larger his brain and heart the better is he able to profit by the study and the love of nature. Can it be possible that this great universe has become fully comprehended in the kindergarten or even in the high school? If so, does the pupil immediately afterward lose his ability to understand the glories and beauties of this world? Nature is good for everybody but it is best for the one who has lived the longest and knows the most. Would I for one moment go back to my boyhood and the frog pond near the old home and think that that is the place in which nature study can be best pursued and is best adapted to my needs? Those were days of intense greenness when I had only a trivial understanding of the wonderful expanse of this world. No, a thousand times no. I hope to enjoy nature study twenty years hence more than I enjoy it at present, because I shall then have acquired the experience of twenty more years and the knowledge attendant on twenty more years of study. The remark that nature study is good for the children is, I believe, a good indication that the person that made the remark is in need of a whole lot of missionary work to teach him what nature study is. It is noticeable that such a remark is never made by any one who has spent years in close study and communion with Mother Nature. The veteran naturalist or scientist does not

say that nature is good for the children but that it makes him a child. Said Sir Isaac Newton, "I know not what others may think of my intellectual attainments but for myself I feel like a child wandering on the beach picking up here and there a pebble, perhaps one more brightly colored or more interesting than another, while the great ocean of truth rolls unexplored beyond." Fancy his stating that the exploration of the "ocean of truth" should be relegated to the child! No, he felt that even his colossal intellect was too puny to be adequate to the situation. It is also noticeable that the great nature study Teacher of nineteen hundred years ago was not talking to children when He drew his illustrations from nature, but to adults; He realized that the greatest lessons that the human mind can grasp are best conveyed by the simple observations and direct teaching of nature.

One of the most encouraging signs of modern times is the growth of nature study among adults. There was a time, a few centuries ago, when nature study was limited to the recluse, to the one who did uncanny things and made mysterious collections of unfamiliar objects. That put nature study somewhat in bad repute. Then came, in more recent years, a recurrent wave of object teaching in the schools, followed by the so-called nature study, usually limited in its scope to the germinating of a few seeds, the examination of a few butterflies and moths, with casual glances at a few tadpoles and a few common birds. Then has come the modern era with nature as a resource of life, when the professional or the business man of the city hies away from his laborious tasks to seek relief in the suburbs or the country. It is this renaissance of nature study that has made possible such magazines as "Country Life in America," "The Countryside," "House and Garden," "The Guide to Nature" and others. Herein lie the great hope, joy and inspiration of nature study for the future. No longer a matter limited to the kindergarten or the uncanny recluse, but for the whole-souled man or woman who, tired of empty fashion and purposeless days, seeks rest and recreation in real things. It is worth

more to humanity to turn the thoughts of an excitement loving adult, engrossed in the fashionable frivolities of the day with its gossip and scandal, to the study of the wonders and beauties of this glorious universe, than it is to take a child from his innocent play to force him to study nature. The child naturally and unconsciously follows the drift of his home environment, and the examples of his elders whether for good or evil. The most important thing is for the adult to manifest a hearty interest in the "real things." That the master intellects of the country are turning their attention to the stars, the plants, the groves and the mountains for real nature study is hopeful. We firmly believe that the greatest joy of eternity will be that eternity will not be long enough to enable us to discover all the new things in this infinite universe. No one will be graduated; every one will become more and more efficient and joyous in the pursuit of the knowledge of the works and workings of the Master Mind.

I have somewhere read that a guide showing a musical but flippant young woman the home of Mendelssohn, or perhaps it was Beethoven, saw her rush to the old piano, pull off her gloves, push up her sleeves with an air, "Now you are going to hear something worth while, and I am going to tell my friends, when I return home from this sight-seeing tour, that I have actually played on this famous composer's piano."

From one end of the instrument to the other she rattled, to see if all the keys were still in action. Then as she started a popular air, she turned to the guide and said, still playing, "I suppose a great many musicians visit this room?"

"Yes," he said, "some famous ones. Paderewski was here only a few weeks ago."

"Oh!" she exclaimed rapturously. "How dearly I would have loved to hear him play. I suppose he made this old piano nearly talk."

"No," said the guide, "he stood silent for a long time and when one of the party asked him to play, he said sadly, as he hastily brushed his eyes, 'No, I am not worthy to play on that piano.'"

That is the way I feel here in the observatory or the laboratory at ARCADIA where we come in touch with the master minds of the ages, in the great universe of truth, where we realize how brief is a lifetime of even the intensest study, and that the sum of all human knowledge only feebly, imperfectly comprehends the great thoughts of the Eternal Mind of the Creator. But you, my visitors, intending to be appreciative and encouraging say, "What lovely work this is. It is perfectly delightful for the children."

But upon second thought I perceive that you are right. We are "children," no matter how old or learned. We are all in God's kindergarten school.

Congratulations to John Burroughs.

John Burroughs was eighty years old on Tuesday, April 3rd. We extend to him our heartiest congratulations. He is an ideal naturalist. He is a poet, teacher and general scientist combined. He represents an old type which, while it has not exactly disappeared, has, in these days of specialists, a general tendency to wane. He carries on the work in the spirit of Gilbert White, Wordsworth, Henry David Thoreau, Emerson, William Hamilton Gibson and others. He not only sees the things in nature really worth detailed study, but finds in the great world of outdoors a realm of hopefulness, encouragement and uplift for humanity. The study of nature is not always commendable. It may be as miserly and despicable as the hoarding of gold coins. It may be as selfish as Scrooge. But combined with the love of a Burroughs, it becomes a gospel for humanity, giving entertainment to the children, exhilaration to youth, philosophy, encouragement and hope to old age.

The real spirit of a naturalist is love of country; that is, literally, the country outside as well as "the city of worlds and palaces." It loves these things for their own sake and for what they represent to humanity. It believes in their sacredness and in the right to protect them, and this is only another expression for patriotism at its highest and best. John Burroughs, in every sense of the word, is a true patriot; he believes in protecting the country. He has inspired others with a love for

every phase of country and country life. He has somewhere cited the example of a real love of country as illustrated by an Irish servant girl, who had been in America for only a short time, and who was found in the kitchen crying as she washed the potatoes, because they reminded her of her home in good old Ireland. The naturalist's real love covers every rock and rill and templed hill. The rocks speak, and music swells the breeze. That spirit exemplifies patriotism.

A Head Master who is a Grand Master.

An ideal head master of a private school for boys is somewhat rare. I say ideal because that includes a wide range of capacities; the same truth applies to the principal of a girl's school. I have known a good many private schools, but I have in mind especially the boys' school. In the past ten years I have known intimately at least four boys' schools that are now things of the past. A chain may have some good links but in order to pull the load or to hold the anchor securely every link must be good. It is not enough to be a good business man, a good classical scholar, a good disciplinarian, a good provider for the table, a good athlete, a good preparer for college, a good inspirer in outdoor life, a moral man, an efficient man, a good executive, a good sympathizer; indeed, it would take a long list of words to describe the qualities needed by the head master of a private school for boys.

I knew one man was a good athlete, who won the boys, but he was not successful. I knew another man who prepared for college in an ideal manner. He was strictly moral but not more than sixty per cent on business. There is probably no occupation that requires so wide a range of capacity as that of the principal of a school for young people, especially, as I believe, for boys. The requirements for a girls' school are not so severe as for a boys' school, as any one who has any experience in both will surely vouch for, and it is evident that this is true because more boys' schools fail than do girls' schools. It sometimes seems as if al-

most any one can manage a girls' school with at least fair success.

The old-time type of head master, unquestionably the best that I have ever known, was the late Hiram U. King, of the King's School of Stamford. In his day and generation, Mr. King met the ideal conditions about as well as they could possibly be met. The modern requirements of a head master while perhaps no more and no less rigorous still are different. In these days when we hear so much of the spontaneous development of the child's will, the situation becomes more trying for one who must deal with the sons of wealthy parents. The problem of discipline and of securing thorough, energetic, efficient work that is not a make-believe was never, in the whole history of education, so difficult as it is at present. It is not a difficult thing to get a clientele for an easy road to learning. Let the plan be mapped out as to attract and encourage, then sprinkle in fifteen or twenty sentences filled with pedagogical and mystic words and the whole thing is well started toward financial success, but sooner or later it will be observed that something is lacking, and that that something is the most important of all.

The more I think of it, the more I do not know how any one can ever become thoroughly successful as head master of a boy's school. The requirements are so absolutely diverse, and in some cases so directly antagonistic.

Looking over the field and carefully considering all the boys' schools that I have known, and some of them were good, I would mark them carefully on a percentage scale. The highest would be John M. Furman's Irving School, Tarrytown-on-Hudson, New York. I have known that school for almost two decades and I have watched it carefully. It is only for the good of the cause that I am mentioning this grand master of a private school for boys. He has not known that I have been observing his work so carefully. He will be astonished when he reads these words. As he is a modest man he may be indignant at my boldness in bringing him out before the public. Fortunately are the parents who have a son in the Irving School.

Best Values from Indian Emblems and Customs.

Personally I should not want to get insurance for my family by carrying a tomahawk, wearing feathers and the other belongings of a red Indian, nor should I wish to march about the town after a brass band. But I recognize there are plenty of people who like that kind of thing. Hence the success of the Independent Order of Red Men as an insurance organization.

I think that I could find some ways for my daughters or my girl friends to get nearer nature without wearing an Indian costume and without adopting Indian customs around a camp fire. But nevertheless I recognize the merits of these ceremonies and appreciate the fascination that they have for many girls. For these reasons I cordially welcome the noble red Indian and his faithful squaw as symbolized in these Indian emblems and customs including even the pom, pom, pom and the high stepping dance. It must be admitted that each of us has an element of the savage down deep in the breast. The primitive appeals to us and there is a charm whether for man or woman or girl in the imitating of the American aborigines.

You will observe that I have omitted mention of the boy. He is not admitted to the camp of the Camp Fire girl. One reason why the organization of the Woodcraft League seems to be ideal is that it provides for the boy as well as for the girl. If Camp Fire girls are to gain a place in the estimation of young people, it would seem necessary to form a similar organization for Camp Fire Boys. If a thing of the kind is good for the girl why not for the boy?

One that loves the woods and fields and a nearness to nature in every respect cannot fail to hail with delight the growing prosperity of the Woodcraft League. It is well balanced and is not unfair in providing for only one sex.

But there is an even greater reason for the supremacy of the Woodcraft movement over all other organizations in which Indian emblems and customs are employed. Mr. Ernest Thompson Seton, who some fifteen years ago

started this great movement, has had a variety of imitators, but none have surpassed his organization in the genuineness of its Indian outdoor spirit. It is an artistic movement and I surely could not prefer one who goes in the spirit of commercialism to teach me the poetry of Hiawatha. Athleticism, however good and efficient, fails at the essential point, if it is limited to athletics or if athletics are made the most prominent and conspicuous feature. Mr. Seton has wisely put first the artistic and emblematic spirit. This he knows from A to Z. He is a master in Indian lore. He has lived for much of his life in close study of the Indian customs, habits, sign language, and has so intimately mingled with chief and squaw that he himself is almost an Indian, at least so far as getting the Indian's point of view is concerned. And even better than that, he is on intimate terms with nature. If I were about to adopt any form of Indian dress or custom, I should seek help from a naturalist. Mr. Seton is a proficient naturalist. He has included in his Manual an unusually large amount of nature study.

But there is still another reason why the Woodcraft Movement is superior to all other emblematic organizations. Mr. Seton has with himself associated experts in camp life, Indian lore and nature study. The spirit in which he has opened this great movement has the stamp of genuineness. It does not savor of money-making nor of a commercial enterprise. He has with him many great, good and eminent men, not only in his Council of Guidance, but in his National Council. Their names may be obtained by writing to the office. Mr. Seton years ago originated the idea and gave it wide publicity in his beautiful book entitled, "Two Little Savages."

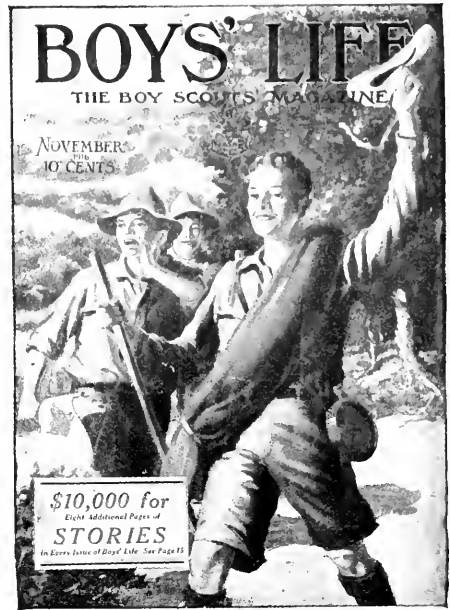
In the Woodcraft Manual are seventy-nine pages devoted to genuine nature study that should meet with the hearty approval of every naturalist whether he swings the tomahawk or the pocket lens. We cordially commend to every reader of this magazine The Woodcraft League of America. Full particulars may be obtained from the office at 13 West twenty-ninth

street, New York City. That inspired camper and enthusiast with boys and girls, Philip D. Fagans, is the Executive Secretary. He will give full information on request.

Appreciates the Nature Work.

In an article on "Boys' Life," published in "Scouting" for April 1st, Mr. Frank Presbrey, of the Editorial Board, writes as follows in regard to the nature study department, "On Nature's Trail."

"Nature Study—the gospel of the out of doors—has been given increasing prominence in 'Boys' Life' in the past year. Since the first number issued under the Boy Scouts of America, every issue has contained information and instructions which would help the Scout in the outdoor features of his scout work, and increase his fitness for life in the open. In the past year we have added to this by engaging the services of an eminent naturalist, Dr. Edward F. Bigelow, President of The Agassiz Association, to conduct a department in which special and successful effort has been made to increase the interest of boys in the processes of nature.



his department. The boys are taking hold of the work in a gratifying manner, as is evidenced by the receipt of many excellent, original observations. It is evident that boys can not only march and camp and do many helpful things, but that they can use their eyes



"It is gratifying to report that this department, carrying its many advantages to boys, has proved to be one of the most popular features of the magazine."

Naturally the editor is personally pleased by these good words, but he is even more pleased by the success of

to see the interesting things of nature. We cordially recommend every Member of The Agassiz Association, and every reader of THE GUIDE TO NATURE to send to the Boy Scouts of America, New York City, for a sample copy of "Boys' Life." The office of publication is 200 Fifth Avenue.

A Summer Camp Interested in Nature.

Ideal in picturesque location are The Aloha Camps at Fairlee, Vermont, under the management of Mr. and Mrs. E. L. Gulick. They are successful and generally popular on account of their ideal surroundings and the true and enthusiastic love of nature on the part of the managers, especially of Mrs.

Gulick. They are among the few that have the real spirit of The Agassiz Association. Note the following words. They are worth a reading and a careful study:

"We would foster reverence and loving thought for the great Spirit over and around us, and, as children of one Father, seek to cultivate insight and



THE WIDE DINING PORCH AT ALOHA CAMPS.

sympathy with all life, whether it be that of our brother, the chipmunk, who scampers chattering over out tent-fly at an early hour, our little sister the humming-bird, finishing her exquisite nest, or our variously natured camp-mates, for all are of one family—children of one Father.”

It is evident that the Aloha Camps

young people to see except the road in which they are walking, but here is a camp that intends to look upward. We have heard much of camps that talk about their tennis fields and baseball grounds, but here is a camp that will look at the realms of nature, and will do something with nature. Listen to these gratifying and refreshing words.



FLOWER GARDEN AT THE HIVE.

merit their wonderful success. The editor of this magazine believes that it is sacrilegious to take young people to nature and not into nature, in other words, to take them to a summer camp merely for athletics, entertainment and tuition fees. Much as these camps have accomplished, yet Mrs. Gulick says, "I have never been satisfied with our nature work and am always looking with eager interest for the right leader to inspire the girls in the love of nature work." She tells of two eminent specialists that she has engaged to interest the young people this coming year. One is Dr. Alfred Gunderson, of Floral Park, Brooklyn, who will take with him a telescope with a four and a half inch object glass. That is a good sized telescope to take into a camp; it is as large as will be needful. The young folks will study the stars and make a chart of the map of the heavens. Is not that glorious news? We had begun to think that there is nothing for

"Our region is especially rich in ferns and in a few rather rare orchids, and as we are near woods we have a good many birds that generally are not around towns. At the Hive, our camp for little girls, last year we had a regular gardening class and they learned all the common garden flowers and vegetables. They planted seeds and learned to transplant the young seedlings, and they learned a number of common weeds. They were very proud of having planted and later gathered radishes, lettuce and at least one or two servings of peas. We are having again the same work at the Hive for the little girls."

Of a specialist that visited the camp, Mr. Alfred Kinsey, Mrs. Gulick writes that he took the girls on many walks to study ferns, flowers, sedges and grasses, also birds and stars. This is something really to the point. No other letter from a camp has reached our desk that rings so true with the

real nature spirit, and a longing to follow in that direction, as does this letter from Mrs. Gulick. The Aloha Camps are on the right trail. They are in nature, not merely near nature. May they live long and prosper, and everywhere increase their good influence.

Dealing with Nature through Necessity.

For years we have pleaded through the pulpit and the Sunday school for a nearness to nature. The motto of The Agassiz Association is "Per Naturam ad Deum."

For years we have pleaded for nature as a factor in education. School authorities and teachers have been urged to make nature a part of the curriculum.

But who would have thought that the great World War, and the absence of vegetables from the cellar, would turn the thoughts of people everywhere to good old Mother Nature? She has given her children an awful spanking to make them love her more and to appreciate her better. What our eulogies of her beauties, what the enthusiasm of the poet has failed to do, the kitchen and the pocketbook are now going to do. The cry everywhere is, "Plant something, even if it is only a hill of potatoes." We are creatures of the earth though we often slap Mother Nature in the face or turn away from her with pathetic indifference; but she is bringing us back home and drawing attention everywhere to seeds, fertilizers, growing plants and the plow. Every community should see to it that practical nature study lessons are now taught regularly.

Greenwich and Stamford have organized associations to cooperate with the farm bureau to develop every inch of land, and every lover of school gardens is shouting, "Hurrah!" At last, the parents are bringing pressure to bear upon the teachers to have the children devote some attention to corn, beans, potatoes, even if they do happen to forget the name of some little village in Madagascar, some river in South America, and what is the chief occupation in Central Africa. The question has come, "What are you going to do right here in Stamford and Greenwich for vegetables for the table? That is real, prac-

tical nature study. One cannot grow a hill of potatoes without learning something about Mother Nature's ways. As the corn grows aloft, one's knowledge of our greatest grass plant cannot but increase.

Three cheers for old Mother Nature! For allies we now have all the fighting nations of the world and all the neutrals that are supplying food to those nations and themselves.

Snow in April.

BY CAROLINE CLARK HINTON, ATLANTA, GA.

O'er everything is spread
A garment soft and white,
'Tis winter's last good-bye
Before her northern flight.

The air is misty warm,
The sun is welcoming Spring,
The tears of winter cause
The brooklet's voice to sing.

April's Woodland.

BY C. R. PIETY, SCOTTSBURG, IND.

I wandered through a woodland fair
Upon an April's day;
That Nature's garb was grand or rare
Is not enough to say.

The earth was gowned in velvet green,
The sky in silk so blue,
The sun wore mail of golden sheen,
And seemed a-wooing too.

He kissed the wild-flowers, little fays,
That dwell in glade and glen;
They danced about with pretty rays,
And perfume proffered him.

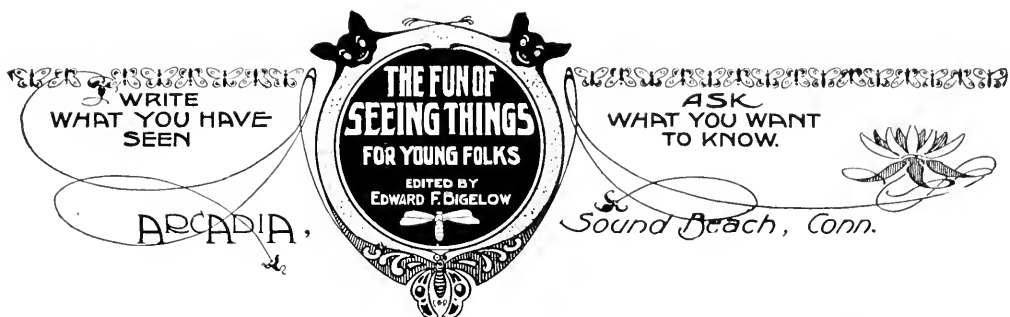
He lavished gold on stream and lake;
The wavelets gleamed with glee,
And vapor gave with which to make
Some cloudlets fair and free.

He smiled on song-bird: and they sang
With all their might and main,
And hill and vale and wildwood rang
With the sweet ecstatic strain.

He caused the stately forest kings
To put on toggery proud,
And all the wary woodland things
To laugh and talk out loud;

The breeze their messenger they made
To bear the news so gay,
And o'er the hill and through the glade
He rushed the live-long day.

Oh pretty scenes that ne'er knew paints,
Oh poetry unpenning,
And sweet songs sung by woodland saints,
Ye are God's gifts unfeigned.



The Pig is Useful, Petable and Interesting.

"A twelve-year-old girl, Margaret Lowery, of Mt. Sterling, is the champion pig raiser of Ohio, having been chosen from 628 contestants."

This item in "The Ohio Teacher" especially attracted my attention because the pig is worthy of careful attention

from many points of view, and most certainly a young person who has raised a pig better than six hundred and twenty-seven other young people could raise one is entitled to careful consideration. So I at once wrote to this famous pig raiser and she replies as follows:

Sterling, Ohio.

To the Editor:

I picked out two Duroc-Jersey pigs. They were weighed up the first of June. One pig weighed 57 lbs. and the other 54 lbs. I fed the pigs three times a day, giving them corn, millfeed and milk. They also ran on blue-grass pasture. My pigs got a bath twice a week. They gained 1.99 lbs. per day, on an average of 3.76 cts. a lb. I will send you my grades:

Grade on daily gains	100
Grade on cost gains	80
Grade on exhibit	100
Grade on story	96
Grade on judging	75
Total	445

The pigs were to be fed from the first of June to the last of August, keeping an account of all fed them. They were shown at the Madison County Fair the last of August. At the end of August my pigs weighed 213 and 228 lbs.

Yours truly,

MARGARET LOWERY.

Now here is a good suggestion to young people. A thing that is useful is beautiful and a thing well done is commendable; therefore we take great pleasure in presenting this little Miss Lowery who sees interest in a commonplace pig and out of that interest has won great success. In this connection it will be well for us to read what Mrs. Anna Botsford Comstock says of the pig.



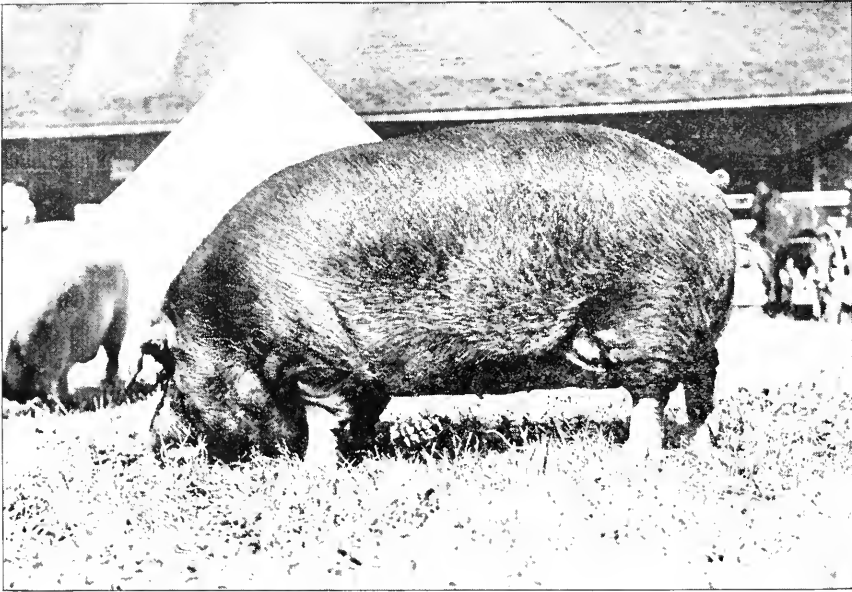
MISS MARGARET LOWERY.

"A nice little pig with a querly tail,
All soft as satin and pinky pale,
Is a very different thing by far,
Than the lumps of iniquity big pigs are."

"The change noted in this rhyme between the little pig and the big one is

taught to hunt for truffles, which are edible fungi growing upon tree roots far below the surface of the ground.

"Though the pig's eyes are small, they gleam with intelligence. Pigs are often trained for shows, by teaching



THE DUROC-JERSEY PIG.
Cut from the "Cornell Rural School Leaflet."

not altogether the pig's fault, but rather because of the poor care given him by ignorant people who make him a creature of filth.

"A little pig makes a charming pet. It is pretty and neat and very intelligent. It will soon know the little master or mistress who feeds it, and will follow those it loves like a devoted dog. It is sufficiently clever so that it may be taught many tricks, and will repay patient training.

"One of the most interesting things about a pig is its nose; this fleshy disk surrounding the nostrils is a most sensitive organ of feeling. By its use a pig can select corn from chaff; at the same time it is so strong that with it the ground may be rooted up in search for food. A pig's sense of smell is as keen as that of a dog, and there are many instances on record of a pig being trained as a pointer for hunting birds; it shows a keener intelligence in this capacity than do dogs. In France, pigs are

them how to pick out cards and count, and many other intelligent tricks. When the pig is allowed to roam in the woods, it lives on roots, nuts and forage, being especially fond of acorns and beechnuts; and it has a remarkable record for destroying rattlesnakes. The pig has quite an extended language which its little master will become interested in studying. There is the constant grunting which keeps the herd of swine together; there is the squeal of anger and discontent; the satisfied grunt of enjoyment of food, the squeal of terror, and a nasal growl of defiance, and many more vocal expressions."

And whatever is missing in the garden, the sun-dial must not be lacking. The sun-dial has been beautifully called the "garden altar." Is it not fitting? Nothing so impressively sounds the religious note of the garden.—Abram Linwood Urban in "The Voice of the Garden."

Nature Experimenting "A Life-saver."

In the very busiest of the business section of Philadelphia is the mammoth department store of Gimbel Brothers. The general manager of that store is Mr. A. A. Christian who was a country raised boy and, like many another country boy, has by his enthusiasm, concentration, resourcefulness and ability to do sustained hard work achieved the big position of general manager of this very popular store. Gimbel Brothers are known everywhere. They not only have a big store in Philadelphia but a mammoth establishment on Broadway in New York City.

It is always of interest to note how an efficient, hard working business man of the city finds recreation, literally recreation, in enthusiastically developing attention to some country occupation. When Mr. Christian as a little boy was playing around the chickens on the old farm, undoubtedly he and members of his family would have been greatly surprised if some one had told him that the interest developed from that boyhood association would ultimately produce the finest and best laying hen in the world. But such is the actual situation. We take pleasure in presenting herewith a photograph of this remarkable hen which laid three hundred and fourteen eggs in one year. In response to an inquiry, Mr. Christian has sent us the following letter.

LADY EGLANTINE'S RECORD AND METHOD.
Philadelphia, Pennsylvania.

To the Editor:

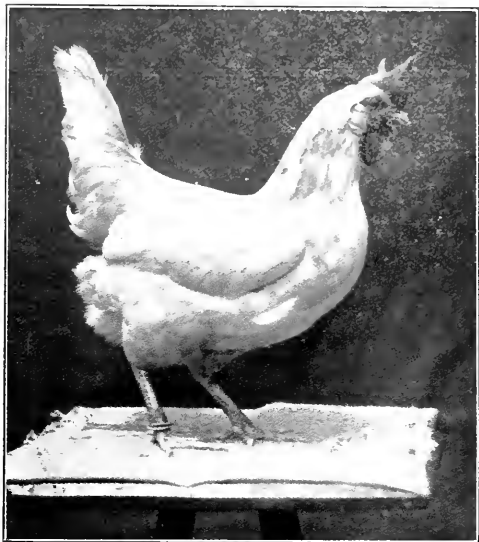
"Lady Eglantine," a pure bred single comb white Leghorn, laid three hundred and fourteen eggs from November 1st, 1914, to October 31st, 1915, in the International Egg Laying Competition organized by the "Philadelphia North American" and held on the grounds of the Delaware Agricultural Experimental Station (Delaware College), Newark, Delaware, the record being official and attested by Dean Harry Hayward of the experiment Station.

This is the world's record, two hundred and eighty-eight egg record having been reached both in this country and in England, but not officially exceeded. Professor Laurie of Adelaide, South Australia, is justified in believ-

ing that Australian hens have laid as many as three hundred eggs, but there they average the work of pens and do not trapnest individuals.

The Eglantine catalogue of 1916 has Lady Eglantine's story and Dr. Hayward O. K'd the matter before I printed it.

We are straight breeders of single comb white Leghorns and no other



THE FAMOUS "LADY EGLANTINE."

breed. While my farms are in Maryland—eighty-eight miles from Philadelphia—they are my hobby and life-saver, only practical work on sound scientific lines being permitted. My son-in-law, Temple Smith, is a graduate of Maryland Agricultural College, and my poultryman is a hard student. I was a country raised boy.

I make every mating at my desk here or O. K. matings submitted, all the work based on written records.

We follow Mendelic system of breeding simplified to the laymen's understanding, and I enclose a blue print showing one of our pedigree mating pens for this year.

This pen, one of ten whose work will be analyzed by a foremost Mendelic scholar, is carrying out one Mendelic principle of using highest pedigree male with about third-line available females, for we have scores of females of higher egg records. Other pens carry along other phases, all based on consistent scientific work for the betterment of the breed.

"Lady Eglantine" died August, 1916, of enlarged heart, probably the outcome of poultry show exhibitions in New York and Philadelphia before she had recovered from the weakening effects of moulting. The night of the day she completed her record at Newark, Delaware, she was taken by train to Maryland, with an automobile trip to the farm. She laid next day as though nothing had troubled her. That was egg three hundred and fifteen but did not count in record. She laid for some months after period of moulting.

What I have said of egg records covers all breeds of chickens including Langshans. Every straight bred fowl is good and makes honest, sensible appeal to men and women.

We hold to Leghorns because they can be bred to produce the most dollars' worth of eggs per year. Fall laying, non-sitting, late moulting are traits best held in Leghorns. Their big white eggs bring highest prices always.

Money—there must be always some measure of expression. You would prefer a gardenia to a common rose because harder to make of greater value.

A. A. CHRISTIAN.

A Garden for Every Boy and Girl.

In view of the high cost of food products all possible use should be made of the small and large plots of ground in cities and villages, writes A. J. Brundage, State Boys' and Girls' club leader of the Connecticut Agricultural college, and continuing, says:

"By careful planning and diligent effort small areas are capable of yielding vegetables in quantities that will markedly supplement the family budget. The small garden areas may impart, in addition to the vegetables harvested, pleasure, exercise under healthful conditions and moral and mental development through contact with the soil.

"Boys and girls learn to work by working or learn to loaf by loafing.

"The home garden offers an ideal opportunity for them to learn to work, and if this is carefully planned and supervised the boys and girls, in addition to the practical gardening experience, will learn how to keep simple records, will realize the joy and respon-

sibility of ownership, some of their time will be profitably employed, and they will become producers and good citizens.

"America needs a good navy on the land as well as on the sea. In the land navy there are three ships. The first of these is ownership—let a child have a garden of his own—give him an opportunity to earn a dollar and he will know better how to spend it. The second ship is partnership—the parent and community cooperating to make possible the best kind of training for boys and girls. The last ship is citizenship—in these days of the unsettled condition of nations, what is of greater importance to our own country than this? It is a result of the building of the two previous ships, and as the builder's experience and usefulness is enlarged by building, so is the experience and usefulness of boys and girls enlarged by the accomplishment of tasks worth while.

Two Beautiful Cover Illustrations.

We are indebted to Mr. Herbert W. Faulkner, Washington, Connecticut, for the beautiful illustration of daffodils, and the scenic effect, on the cover for our April issue. The cover illustration of this number represents the wild pink azalea, and the swallow-tail, yellow butterfly. The shrub is generally known throughout New England as the "swamp apple," because of a certain curious, juicy, delicious growth. Although it may be the result of disease, as the technical scientists say it is, it is delicious. Many country people think that it is the fruit of the shrub, and still others mistake it for a gall, the result of an insect's sting. It is, however, caused by the irritation of a true fungus growth.

Though maize in North Dakota is an uncertain crop for the white farmer, the native Indian tribes, from time immemorial, have cultivated a dwarf race of corn that bears regularly. There is a project now under consideration to cross this old native strain with some of the newer varieties, and thus, it may be, extend very considerably the commercial range of the plant.

Kill the Spring Fly.

Everybody everywhere is going for the spring fly or should be doing so. The Public Health Association of Greenwich issues a very interesting placard in which they state as follows:

"Flies carry disease. Save the babies.

"During the cold weather many flies find shelter in out-of-the-way nooks and corners about the house, where they pass the winter in a dormant condition. You will find them in cellar and attic, or lying on shelves and window sills of unused rooms, apparently dead, but in reality only sleeping. They are waiting for the return of warm weather, when they will wake up and start breeding new generations. They breed so rapidly that ONE fly in April may have a MILLION descendants in August.

"Kill the spring fly and get the whole million."

The Merchants' Association of New York City at 233 Broadway has issued a circular in which there are sufficient charges against the spring fly to cause every health loving person to swat it. A part of the appeal is as follows:

"The health and welfare of your readers must be of vital interest to you and we believe that any suggestion for the eradication of this dangerous and annoying household pest will be appreciated by every one fortunate enough to see your paper. We would also suggest that you call the attention of the pastors of the churches in your circulating territory to the desirability of teaching their people the iniquities of the house fly. Furthermore, school trustees and teachers would find it instructive and interesting to emphasize the importance of this matter in talks to the pupils on this subject. There are a number of authorities who believe that the germ or virus of infantile paralysis is disseminated by the fly and all efforts should be directed to prevent a recurrence of last year's dread experience by this agency."

Nature abhors a vacuum,
 But ugliness even more,
 So with magic mantle of loveliness
 She covers it swiftly o'er.

—Emma Peirce.

Spanning Hell Gate.

[NEW YORK SUN, APRIL 1, 1917.]

This town is so accustomed to the success of great engineering enterprises that the completion of the New York Connecting Railroad with its beautiful steel span across the treacherous channel of Hell Gate attracted little attention except among those who were directly interested in its building and those who have watched its progress.

To-day it will be used to give a complete all rail route from New England to the South, cutting out the trip around Manhattan and more intimately uniting the New Haven and the Pennsylvania railroads. The first train will run from Boston to Washington without breaking its trip, pioneer of a comprehensive service soon to begin.

Had laymen not ceased to wonder at the achievements of engineers they would marvel at this great work; as it is, men who know the details of its construction—they are not given to marveling—will regard with high respect the skill its construction demanded.

Daffodils.

BY RICHARD WALTHAM HANES, STAMFORD, CONNECTICUT.

A sunbeam came and kissed the earth,
 And gave the sleeping flowers birth.
 So in my garden, near the wall,
 The daffodils all heard its call.
 Like little children glad for play
 They hurried forth in bright array.

As through the day the sun shone down,
 And cast its radiant smile around,
 They danced about beneath the trees,
 All gaily nodding in the breeze.
 A golden host to welcome Spring,
 And to my garden pleasure bring.

E'en as the sun with his bright rays,
 Brings forth these messengers of praise,
 So cheerfulness in many hearts,
 Oft from a smile, its journey starts.
 Making mankind with pleasure thrill,
 As joyful as a daffodil.

The garden has many lessons to teach, but none does it more surely teach than this: If the cultivation of a garden does not promote the tender graces and extend the sweet charities of life, it is proof sufficient that we have not learned the secret of life, and are still outside of that knowledge which alone makes it truly one's own. —Abram Linwood Urban in "My Garden of Dreams."

THE AGASSIZ ASSOCIATION

Established 1875 Incorporated, Massachusetts, 1892 Incorporated, Connecticut, 1910

Our Uniontown Chapter.

The Uniontown Chapter (Pennsylvania) of The Agassiz Association has completed its first year, it being founded shortly after Dr. Edward F. Bigelow's visit to our Teachers' Institute in February, 1916. At the first meeting about fifty were present and these charter members elected the following officers: President, Robert C. Miller; Vice-President, Katherine Rhodes; Secretary, Margaret Cottom; Treasur-

Stevenson of Mt. Pleasant, Pennsylvania, a bird enthusiast.

Entomology was studied under the instruction of Mr. T. N. Brown, an entomologist of more than local fame, who illustrated his lectures by his fine collection of over eighteen thousand species of insects, some specimens of which he donated to our own permanent collection.

Reptiles have been studied, illustrated with living specimens from the joint



OUR UNIONTOWN CHAPTER.

er, William Stacy; Corresponding Secretary, Marion H. Dampman; Curator of Collections, Professor D. H. Conway.

The Chapter now has a membership of over seventy, possesses the rudiments of a museum, has the nucleus of a library and promises to be a growing organization.

The club has studied ornithology with relation to bird migration, classification, nesting habits, etc., being especially assisted in this by Miss Viola

collections of Messrs. R. C. Miller and C. I. Balsley.

Lectures on astronomy have been given by Professor D. H. Conway.

Plant life has been studied under the guidance of Professor R. B. Taylor.

Much inspiration has come to the Chapter from its President, Mr. R. C. Miller, who is interested in all forms of nature study; and also from Mr. F. W. Wright, former Superintendent of the Uniontown Schools but now Deputy Commissioner of Education in Massa-

chusetts. Both these men have done much to promote the interests of the Chapter and our gratitude for the success of the year is due to them and the other good friends who have assisted us in so many ways.

The newly elected officers for the coming year are: President, Robert B. Taylor, Ph. M.; Vice-President, Charles I. Balsley; Secretary, Mr. Howard Goodrich. Other officers retained.

Marion H. Dampman, Corresponding Secretary.

Will Report Each Month

A good suggestion comes from our Glenbrook, Connecticut, Chapter. Mr. Halbert C. Phillips writes:

"On a separate sheet I have prepared a report of our last month's meeting. I intend to do this each month. Will it be asking too much of you if I ask you to answer this letter at any length that may be convenient, and as circumstances warrant? I felt that last year we made a mistake in not keeping in closer touch with headquarters.

"Two lines of thought are always open to you in your replies: first comment suggested by the particular letter you are answering and, secondly, helpful suggestions on your own initiative."

Obtained a Rare Salamander.

Mr. Halbert Phillips through the Glenbrook boys' Chapter of The Agassiz Association has contributed to ARCADIA a live, spotted salamander, *Amblystoma punctatum*, caught in Glenbrook. This salamander is now on exhibition. This is one of our largest varieties, has a stout body and broad head and, as its name implies, it is beautifully spotted. While these salamanders are not especially rare they are seldom seen because comparatively few people look for them and, indeed, one might go hunting for quite a long time and never find one. They are not at all plentiful. He has recently been urging, especially the young folks, to hunt for these and other forms of salamanders. The Glenbrook Chapter is the first to find a specimen. The salamanders very soon, if not already, will take to the water where they will lay their eggs which resemble the spawn of frogs. A little later the adults may

be found under logs and stones, especially in thinly timbered sections. ARCADIA is taking a special interest in frogs, toads and salamanders and will heartily welcome any cooperation along these lines, especially of the rarer forms. The collection at present consists of two bullfrogs, (contributed by Mr. Ditmars of the New York Zoological Park) and this spotted salamander.

TEAR DOWN AGASSIZ HOUSE.

Building Owned by Harvard College Is So Badly Damaged by Fire That It Probably Will Not Be Rebuilt.

It is probable that the Agassiz house, at the corner of Broadway and Quincy street, Cambridge, which was damaged by fire last night to the amount of \$15,000 to \$20,000, will be torn down. The interior was so badly burned that it is said it will be hardly worth while to rebuild from the structure that remains. Practically all the partitions from the roof down to the second story are destroyed. The house, which since 1910 has been the property of Harvard College, was insured for \$10,000. If it shall be torn down, it appears that the land will stand idle for a while, for nothing had been projected for the site.

President Lowell and former Dean Hurlbut watched the firemen in their three hours' fight to save the building. They were specially interested for Professor Hurlbut's house is next door on Quincy street, and President Lowell's is not far away.

The fire was discovered about eight o'clock in the evening, and two alarms were sounded.

Mrs. Louis Agassiz purchased the house many years ago. It was a modest dwelling, but it has been renovated and added to until it contained thirty-six rooms and numerous bathrooms. It was spacious and substantial, with a high basement story of brick and a frame superstructure with a slated French roof. After Louis Agassiz's death, the house was used by the family of Alexander Agassiz; and a few years ago, together with the house occupied by Professor Hurlbut, was bequeathed to Harvard College. For two or three years after 1910, the Speakers' Club, a Harvard students' organization,

used the house. Last year it was occupied by classes from the Agassiz School of Cambridge, while a new schoolhouse was being built, and since then Harvard has lent it for the Cambridge Trade School for Girls and for city evening school classes.—Boston Newspaper.

Contributions for Little Japan.

Mrs. Charles E. H. Phillips, Glenbrook, Conn.	\$ 5.00
Well Wisher	5.00
Mrs. Charles B. Allyn, River- side, Conn.	5.00
Mr. Robert Stewart, Sound Beach	10.00
Mr. S. C. Hunter, New Rochelle, N. Y.	15.00
Mr. B. W. King, East Orange, N. J.	1.00
Mrs. Edward B. Close, Green- wich	10.00
Miss Laura Boorman, Palmer, Mass.	3.00
Mr. Theodore H. Kirk, Stamford, Conn.	1.00
Mrs. Robert McGinnis, Sound Beach	10.00
Mr. Charles F. Waterbury, Stamford	1.00
Mr. Fitch A. Hoyt, Stamford..	5.00
Mr. John A. Brown, Stamford..	3.00
Mr. Irving Bacheller, Riverside, Conn.	10.00
The Greenwich Academy	10.00
Mrs. Jesse Moore Chester, Green- wich	5.00
Mrs. I. Langeloth, Riverside, Conn.	20.00
Manitou Lodge	1.00
Mr. William Cohn, Stamford ..	20.00
Mr. Hugh L. Cooper, Stamford	5.00
Mr. Edwin Binney, Sound Beach	10.00
Nature Lover	2.00
Mrs. C. C. Hinton, Hartford, Conn.	1.00

Dr. Robert T. Morris, New York City	5.00
A Friend	1.00
Mrs. S. O. Edmonds, New York City	5.00
Mr. Don C. Seitz, Riverside, Conn.	5.00
Honorable Francis O. Winslow, Norwood, Mass.	10.00
The Lyman Hoyt's Son & Co., Stamford	5.00
Mr. James J. Horan, Stamford..	3.00
Cash	1.00

\$195.00

Previously acknowledged ..\$282.00

Total

For Growth and Efficiency.

Mr. Worcester Reed Warner, Tarrytown-on-Hudson, N. Y.	\$50.00
A Friend	10.00

Huge, Southern Bullfrogs.

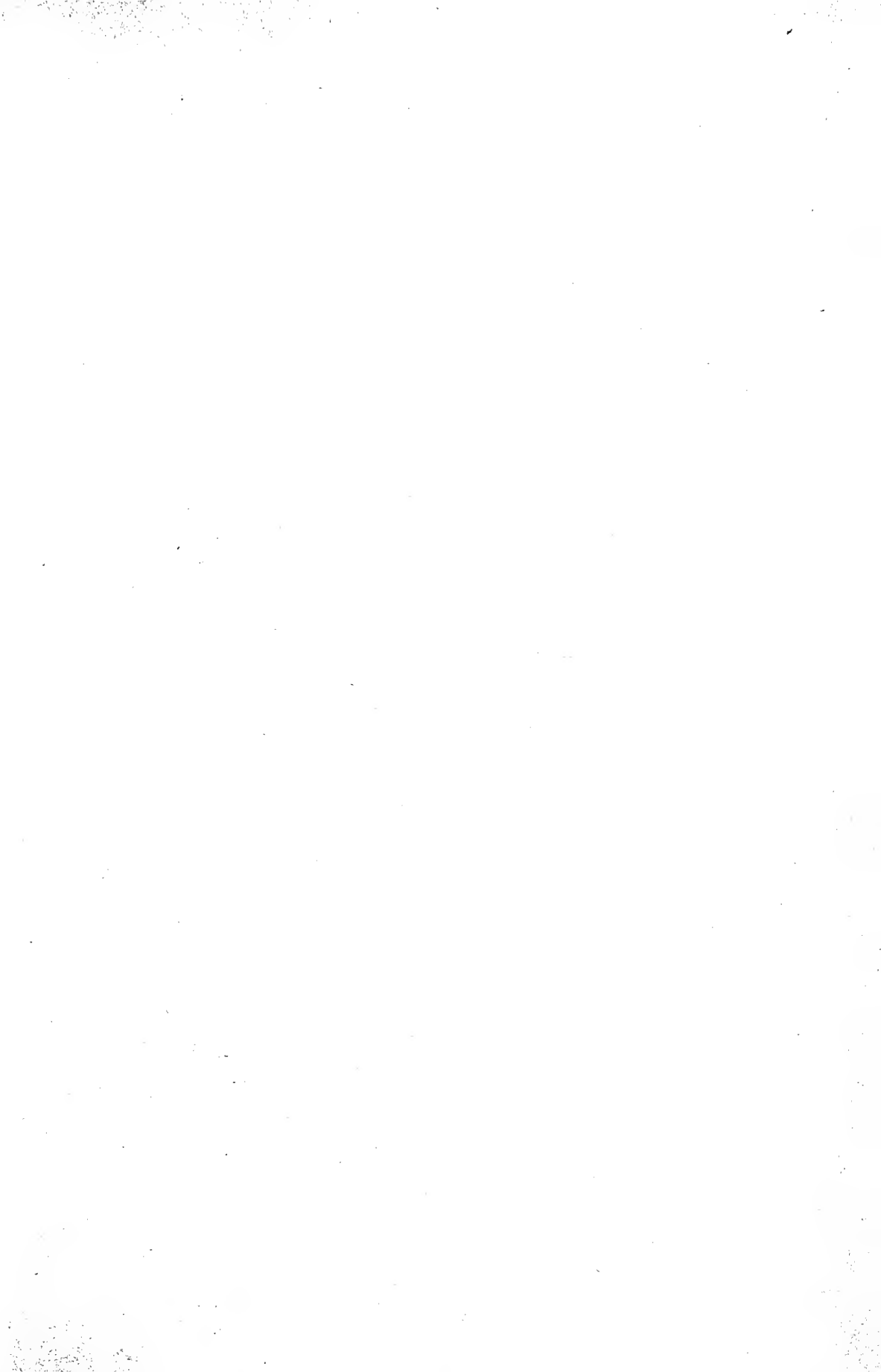
Raymond L. Ditmars, Curator of Reptiles at the New York Zoological Park, motored to ARCADIA from his home at Scarsdale on Sunday, March 25, bringing his family and several friends to spend the afternoon. He presented to The Agassiz Association a male and a female southern bullfrog. These alert yet bulky fellows take their food on a somewhat large scale. In the wild state they catch and swallow small birds. In captivity they are especially fond of mice and small rats, a diet slightly out of our common conception of the frog as limited to earthworms and small insects.

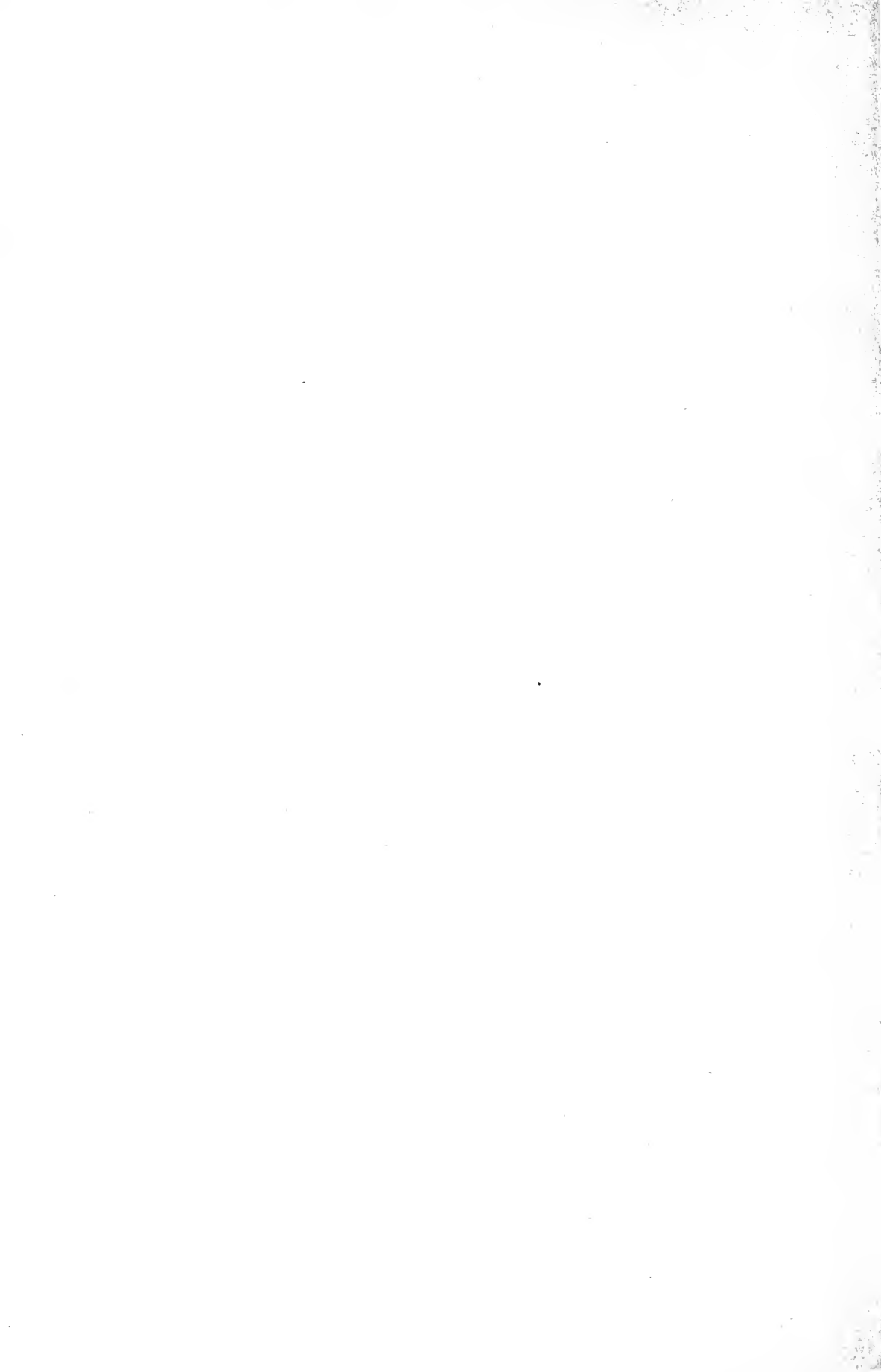
This spring extended studies in bullfrogs, salamanders and newts are to be carried on at ARCADIA, and any one who finds specimens along these lines is cordially invited to send them to ARCADIA. Especially are desired the local salamanders which seem unknown to most people.

Please remember this educational uplifting work in making your will.

Form of Bequest to the Association

I hereby give and bequeath to The Agassiz Association, an incorporated association, having its principal executive office at ARCADIA, in Sound Beach, in the town of Greenwich, Connecticut, the sum of -----dollars.





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