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NATURE MAGAZINE

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TO STIMULATE PUBLIC INTEREST IN NATURE
ANA
MCMXXIII

NOVEMBER · 1935

THE GALAPAGOS ISLANDS 100 YEARS AFTER DARWIN

Waldo L. Schmitt

WINGS OF THE STORM

Howard L. Mendall

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NATURE MAGAZINE

PUBLISHED BY THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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Photographic Notes

BY SAMUEL BROWN

Stereo-Photography

In response to persistent requests from our readers for an article on stereoscopic photography, we are devoting a part of these notes to this particular subject. Twenty years and more ago, viewing of stereo pictures was a favorite pastime. Teachers used them in classrooms for group teaching and study. Modern stereoscopic equipment has kept pace with the times and practically perfect instruments are available.

Before we enter into a discussion of modern methods and instruments, we feel that a brief description is not amiss. When we look at an object we see it in three dimensions: length, breadth and depth. Only two of these are apparent when viewed with one eye, and the third dimension, i. e., its thickness, depth or relief, escapes us. Thus near and distant objects appear to be flattened out instead of standing out separately.

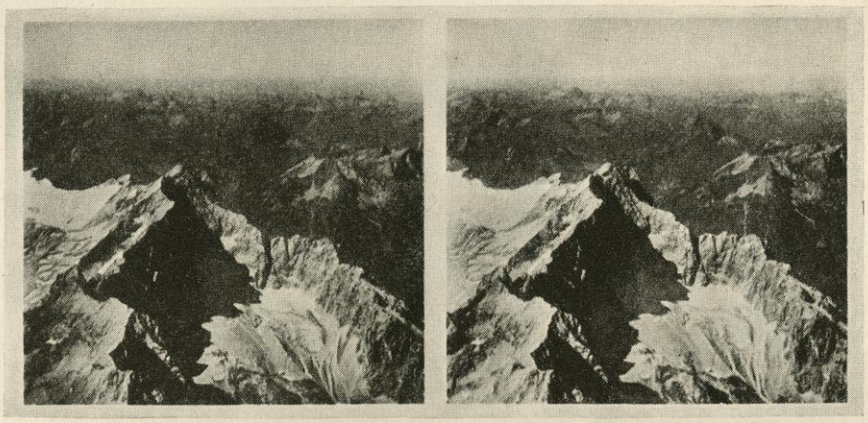
As the separation between the eyes is about 2½ inches, each eye sees a distinct but slightly different picture of every object upon which it is directed, the object being viewed from two different points at the same time. These two pictures are blended, in the brain, to form a single record in all three dimensions.

Stereoscopy, then, is simply a method which follows the natural way of seeing things with two eyes. A stereo camera is fitted with two lenses set horizontally and separated by about 2½ inches and takes two pictures from slightly different points of view. At first appearances, these two pictures appear to be exactly alike. However, when placed in a stereoscope—which is a little instrument for viewing stereographs and permits the right eye to see only the right hand picture and the left eye to see only the left picture—the two are blended by the brain and the subject is seen as the eyes saw it when the picture was made.

While most of the principles that apply to the taking of regular pictures are true of stereographs, the latter require some special precautions for good results. For example, a view of a distant range of mountains would be of little or no value as a stereo subject because of the lack of foreground to give the illusion of depth. Good perspective is of extreme importance and therefore the necessity of foreground objects cannot be too strongly emphasized.

Stereoscopic pictures must have detail down to the minutest degree, so high speed lenses should only be utilized when short shutter speeds are of great importance or because of lack of light. (Small apertures, such as F. 11 to F. 22 are to be preferred.) If detail is absent there is nothing from which to form the three dimensional image. There is no "stereo."

Special cameras for the taking of three dimensional pictures are available. Outstanding are the Verascope, Heidoscop and Rolleidoscop, but these instruments are only for the advanced stereo enthusiast who wants the finest type of instrument obtainable.



A TYPICAL STEREO-GRAPH TAKEN WITH THE EHO STEREO CAMERA, ONE OF THOSE NOW DESIGNED FOR THIS WORK

Another outfit, called the "Eho Stereo Camera", consists of the camera and viewer and is one of the most complete, inexpensive and efficient instruments for three dimensional photography.

Owners of Rolleiflex, Rolleicord and Leica cameras are fortunate in that their manufacturers have made stereoscopic accessories which may be purchased and attached to their respective cameras.

The "Stereo-Fitment" for the Rolleiflex and Rolleicord is an accessory which fits on the tripod. The camera is attached to the first mentioned and the necessary separation is mechanically attained. Two exposures are necessary and must be made with the same shutter speed and diaphragm opening and as quickly as possible in succession.

The "Stereoly" attachment for the Leica, provides a simple accessory which is easy to manipulate and permits making stereo *snapshots*. It fits over the lens and makes both exposures simultaneously using half the film for each picture. Stereo negatives are printed on positive film and viewed through the Leica Stereoscope which magnifies the image about five times.

In passing, it may be noted that regular prints for the album may be made from either of the stereo negatives.

In step with modern advancement, stereo pictures may be made in natural colors by using Dufaycolor film. This film comes in sizes to fit the Leica, Rolleiflex, Rolleicord, Eho, Rolleidoscop and any other stereo camera which takes standard size roll film.

WINTER AFFORDS SUCH PHOTOGRAPHIC CHANCES AS THIS SNOW SCENE

The beauty, depth and natural appearance of a stereograph can only be fully realized by viewing some of these pictures. Imagine an excellent specimen of an orchid, a rose, a beautiful scene, or the picture of a plant, animal or insect which can be seen as often as required as it appeared naturally, *in three dimensions*. When taken in color, the beauty and lifelike appearance are beyond description.

(For the convenience of our readers, this writer has obtained descriptive material of the following items mentioned in this article: Heidoscop, Rolleidoscop, Eho Stereo Camera, Rolleiflex, Rolleicord and Leica cameras, Stereo-Fitment, Stereoly and Dufaycolor film. Address the department editor and enclose a stamped self-addressed envelope for reply.)

* * *

Shutters

When considering the purchase of a camera, the choice of its lens equipment is of primary importance. The speed and advantages of the various types together with their supplements have been discussed previously in these technical articles. We now come to the part of the camera which is of almost equal importance—the shutter. The range of instantaneous speeds and its efficiency go hand in hand with the lens to determine the versatility of a camera.

Practically all box and some folding cameras are equipped with what is known as a *rotary* or *primitive* shutter. This consists of a disk with a hole in it and a spring. When the lever is pressed, the hole passes before the lens and makes the exposure. The speed of this shutter never varies and its duration is between 1/15 and 1/30 of a second.

Better type cameras are fitted with *diaphragm* shutters; when used in cameras having more than one lens they are referred to as *between-lens* shutters. These consist of two or more leaves which open and close rapidly. Into this class falls a great variety of shutters allowing instantaneous exposures ranging from one full second to 1/500 of a second.

Much depends upon what is called the efficiency of any shutter, or the amount of light it will pass in a given time. All shutters work at their maximum efficiency when used for long instantaneous exposures (1

sec. 1/2, 1/5 or 1/10 of a sec.) or when used in connection with a small diaphragm opening. This is clearly seen when it is understood that time is taken for the shutter to open completely and to close again. If an exposure of 1/100 of a second is given, approximately 50 per cent of this time is used in opening and closing, and the shutter is fully open for only 50 per cent of the time. Allowing a further 20 per cent representing the time during which the shutter is in action, but not fully opened, we would say that the shutter has an efficiency of 70 per cent. If the same shutter were used to give one full second exposure, the time that the shutter is in action is such a small percentage of the full exposure time that it is negligible and can be disregarded entirely and the shutter would be practically 100 per cent efficient. If the camera is used at a small diaphragm opening, the shutter would not have to open so far to be fully efficient. A first class shutter reaches an efficiency of 80 per cent but many others fall as low as 50 per cent.

* * *

"Trade Hints and Books"

Large Pictures from Small Cameras is a small 32-page booklet giving full directions for enlarging, choice of paper, exposure, special effects, manipulations, formulae, mounting, etc. If you do your own developing, printing and enlarging, or are interested in this field, you should have this little book. Available free from this department. Please enclose a stamped self-addressed envelope plus a one cent stamp with each request.

* * *

Nature photographers who own Leica cameras will be interested to learn of the "Remote Control Device." This permits the photographer to set the camera up where wild animals or birds are likely to appear and then operate it from a comparatively long distance with the aid of two strings. He can thus expose a roll of 36 pictures without touching the camera. Write to E. Leitz, Inc., 60 East 10th Street, New York, N. Y. for details.

* * *

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* * *

Visograph is an enlarging developer into which bromide paper is dipped and then exposed under the enlarger. The print develops by itself and when the proper contrast is reached, it is rinsed in water and fixed. Write to Central Camera Co., 230 S. Wabash Ave., Chicago, Ill., for complete details.

* * *

"The Leica Manual" by Willard D. Morgan, Henry M. Lester and Contributors—500 pages, 350 illustrations. Morgan & Lester, Publishers, One Pershing Square, New York, N. Y. Price $4.00.

It has been said that no one man can know everything about everything. Pho-

tography has so many phases that it is hardly expected that one writer should be able to cover the entire field. The editors of the *Leica Manual* invited 22 authors to contribute 29 chapters in their own specialized field. The result is a book which can almost be called an encyclopedia on photography.

I would like to stress one point. While the *Leica Manual* covers the whole field of *Leica* photography, it is *not only* for the *Leica* owner. Miniature photography has grown to tremendous popularity and this book gives, in detail, instructions in every photographic field, which can be applied to any miniature camera. Owners of larger cameras will be delighted with the many chapters covering lenses, filters, enlarging, copying, color, infra-red, aerial photography, etc. If you are a doctor then the dental and opthalmic chapters will be of special interest. For astronomers there is the chapter on astronomical photography. The naturalist will welcome the chapters on insect and panorama photography and photomicrography. Lack of space forbids me to say more. However, I feel that the *Leica Manual* will undoubtedly prove to be the photographic "best seller" of the year.

* * *

Getting Ahead in Photography by H. Rossiter Snyder covers a range of interesting and unusual subjects. If you are interested in taking pictures which are of real human interest and having universal appeal, you should read this book by a real professional journalist-photographer who knows his subject. Fomo Publishing Co., Canton, Ohio. Price 75c.

* * *

All who have any photographic problems or difficulties, or who wish to have negatives and prints criticized, are invited to correspond with this writer who will give his personal and prompt attention to each inquiry. Address the department editor. We wish all of our readers to take advantage of this service.

Cordially,
Samuel Brown.

●

To Audubon

Fusing an already established genius as a novelist with well-rounded research and study, and adding to these a naturalist's affection for his subject, Donald Culross Peattie has written a beautiful biography in *Singing in the Wilderness*. He subtitles this "A Salute to John James Audubon", and this it is—a charming, understanding, entrancingly written book in which Mr. Peattie adds a new triumph. Dr. Herrick has given us, without any doubt, the finest and most complete works on the life of Audubon. Nothing can surpass them, or equal them. It had seemed to us that there was little more to be said, but Donald Peattie has said it. The answer lies in the fact that it is no more fair to compare Mr. Peattie's book with Dr. Herrick's than it is to compare the motion picture with the spoken stage. They both employ different methods. Dr. Herrick has painstakingly gathered, weighed and marshalled the facts into a work that will live through the ages. Upon some of these facts dealing with the early life and later romance of Audubon Mr. Peattie has built his story. He has drawn

upon his perspicacity as a novelist and brought life and action into a logical elaboration of these proved facts. He has brought Audubon, his father, his foster mother, his sister and his wife as truly to life as does an accomplished writer of fiction. And yet it is not fiction. Why bother, indeed, to try to classify this book. Suffice it that we are indebted to Mr. Peattie for having written it and to Putnam for publishing it. The price, if we may come to that, is $2.50.

Finger Lakes Birds

The bird life of the Finger Lakes section of New York, particularly those found there in the summer, is the subject of the latest Roosevelt Wild Life Bulletin to come to hand from the New York State College of Forestry at Syracuse. This is Volume Six, Number Three, of these Bulletins from the Roosevelt Wild Life Forest Experiment Station. This is the work of Charles J. Spiker, field naturalist at the Station. It is a popular account of the birds and includes many interesting pictures.

A Fitting Commemoration

Twenty-five years ago this year Glacier National Park was wisely set aside for the enjoyment of generations to come. A land of great mountains, glaciers and alpine lakes, it is also the country of the Blackfeet Indians. Theirs is a noble tribal name, and today the Blackfeet provide one of the many charms of Glacier Park. It is, therefore, particularly fitting that such a book as *Blackfeet Indians* should be published by the Great Northern Railway in commemoration of the silver anniversary of the Park that this railroad exclusively serves. Many have probably seen the beautiful calendars gotten out by the railroad presenting the splendid paintings of members of the Blackfeet Tribe done by Winold Reiss. We know of many of these calendars carefully preserved on account of these paintings.

Now comes this perfect commemorative volume. Within its covers, in large size, gorgeous in color, we find forty-nine of Mr. Reiss' paintings. Supplementing them is a concise and valuable historical account of the Blackfeet by Frank Bird Linderman, a man who has lived among the plains Indians for half a century. The whole is beautifully printed and will be coveted by anyone who sees it, for not only is it physically superb, but it is, as the foreword so well says, "a book of beauty that is sadness; of courage that inspires; of duplicity that makes a white man's conscience squirm. It is a book of loneliness, the awful loneliness that fills the world from earth to sky, when a soul has lost its gods, its faith, its bearings."

It is doubtful whether any commercial publisher would undertake the production of this book and have done it so outstandingly well. The Great Northern Railway, however, is vastly and justly proud of its identity with Glacier National Park. So, without thought of profit, it has made this significant contribution to American history, and modestly identifies itself with this book by way of a copyright line in tiny type. Copies may be obtained from the Educational Director, Great Northern Railway, St. Paul, Minnesota, at $3.50.

The Platypus

It is not strange that the platypus should have come in for so much publicity, for an animal of so many physical contradictions cannot help but attract interest. It has been described in articles, discussed in a book or two, and shown in picture. Now comes *The Platypus, Its Life and Habits* by Robert Eadie. Here we have a discussion of this duck-billed fellow, as the title suggests, and this is embellished by some sidelights on "Splash", a tame platypus. Mr. Eadie's book has the advantage of brevity and condensation, and is designed for the layman. It is, nevertheless, complete and interesting. It is published by Stilwell and Stephens Pty. Ltd., Melbourne, Australia, and it sells for five shillings five pence postpaid.

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In November

IT WAS of November that William Cullen Bryant, who was himself born on the third of this month, wrote those lines—

> The melancholy days are come, the saddest of the year,
> Of wailing winds, and naked woods, and meadows
> brown and sere—

which have given permanent form to the expression of the feelings of so many in late autumn. In our own temperate zone it is indeed most likely that in November will come that interlude of rain and chill and dreariness between the glorious burst of autumn colors and the softer beauty of winter snows—time when the damp chill of the woods and the acid odor of the rain-soaked fallen leaves being worked upon by the almost omnipresent bacteria make hiking or hunting a solitary thing even with companions—time also when the coziness of the indoors is spoiled by a lingering discontent with all housing projects and a reluctance to submit again to the siege of winter.

Yet this normal expectation of November may not be realized, and instead may come a continuing Indian summer ending abruptly with a welcome snowfall just before December. Bradford Torrey wrote of such a November in 1888, and one who in the present decade annually near the end of this month goes from Potomac tidewater to the confluence of the Allegheny and Monongahela Rivers usually enjoys a pleasant November and prepares himself for a "sudden change in the weather" during his trip, with the prospect of storms and snow in the mountains. The occasion, however, remains one of thanksgiving. Only reluctantly does any lover of Nature wish elsewise the manifestations of the seasons.

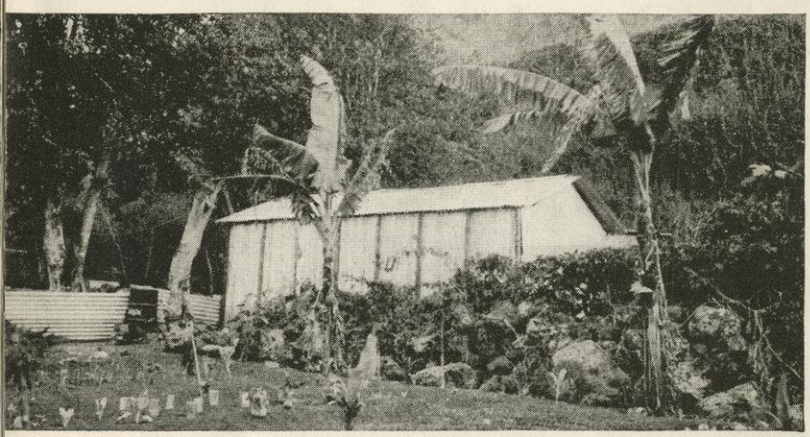
If one can warm the blood to the point where the chill and dampness are realized only superficially, there is in fact a tart experience that comes with the feeling of wind and rain in the face and the push of soft earth against feet that are more used to the pounding of pavements and hard floors—an experience the tang of which finds one leaning forward eagerly. And there is an abundant reward, not only in the knowledge of one of Nature's phases but also in the objects revealed. Though the white oak still shows leaves of brown-gold or red-purple, and other broad-leafed trees are still in color, one has in the woods in November a feeling that seems to include the suggestion of a well-sophisticated bashfulness. For one then sees things that he knows his fellow creatures of the woods have meant to hide—galls and cocoons, the nests of wasps, the homes of gray squirrels in tree crotches, the pendant pouches of the orioles, the loose structures high in the trees that crows have guarded all summer, and the dozens of other nests. When he finds sticktights and burdocks on his clothes, however, the walker in woods and nearby fields is assured that he belongs in the outdoors and is serving a purpose. If he bumps a witch-hazel tree, the pods burst and he knows that he has again been useful. It seems all right then to enjoy the witch-hazel's still-lingering blossoms that are preparing for next year's seeds, as well as the hanging fruit of the sycamore, the retiring brilliance of the red of the partridge berry, the lingering goldenrods, dandelions, gentians, and asters, or the houstonia. And it is nearly as exciting to see in autumn a flower that persists after the others have gone as it is in spring to see that which comes early.

As this delight brought by the flowers late in fall recalls early spring, so also do the birds of November bring to mind the birds of March. Comparable food conditions in these two border months of winter, or some influences less apparent to the rational human mind, keep with us in November the waterfowl, grebes, loons, and other birds that feed in the rivers and ponds, leave when the ice comes, and return as soon as the sun once more seems to grow warmer. In the more northern parts of the States the month affords the year's last views of the picturesque kingfisher poised on an overhanging branch or flying away with its startling rattle. The woodcock lingers also as long as the rain-softened earth, from which the bird's flexible bill can extricate earthworms, is still unfrozen. In regions where they have made themselves at home with us Americans, the European starlings are again becoming conspicuous, gathering in flocks for their not-too-welcome winter sojourn in the shade trees of city streets or close to the sun- and steam-warmed walls of man's buildings.

In autumn the mammals, too, come more prominently into the thinking of most Nature lovers. Rabbits, foxes, and deer are brisk as the weather grows colder, and in the west the wapiti is bugling in the excitement of his mating. But the sleepers—the woodchuck, black bear, skunk, jumping mouse, and bat—are storing the last of the fat for the torpid weeks of winter, and the chipmunk is busy gathering its food for the snow-bound meals in its burrow.

The season's predominant thought is of winter to come, the library chair becomes more comfortable during the last part of the month, and as the outdoors person of other seasons—with all due thankfulness—approaches the end of another season of fruitfulness, he may turn to accounts of Nature's manifestations farther away. Perchance, he may read of eels that even as he reads are on their way to the ocean to lay their eggs and never come back to the streams, or of salmon that have already made their way up streams to lay eggs and never go back to the ocean. And the thought of cod at this season spawning off the coast of New England, laying their millions and millions of eggs, may—even with all the coolness of November—bring a reassurance of life so abundant that no oncoming winter need be feared.

By HOWARD ZAHNISER.



Modern Crusoes in the Galapagos. Above, the Wittmer family at home (Photographed by H. W. Manter), and Mrs. Wittmer preparing a snack by the open hearth of her kitchen. Left, home and garden of the late "Baroness" of Charles Island. (Photographed by H. W. Manter.) Below, the "Baroness" and her two companions, Robert Philippson beside her and Rudolph Lorenz just behind. Friedrich Ritter on one of the mountain peaks of Charles Island with Heinz Wittmer standing beside him. Below, Ritter's home (Photograph by C. McLean Fraser), and his companion, Doré Koerwin, feeding a young burro they caught in their garden. It is a descendant of those brought to the island by former settlers, perhaps those of Darwin's day a century ago.

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The Galapagos Islands One Hundred Years After Darwin

By WALDO L. SCHMITT
Curator of Marine Invertebrates, U. S. National Museum
Photographs by author unless otherwise credited

Through the generosity of Captain G. Allan Hancock of Los Angeles, California, Dr. Schmitt has been enabled to accompany three of his scientific expeditions to the Galapagos Islands as a member of the scientific staff of his motor cruiser, the *Velero III*.

Dr. Schmitt has visited the islands Charles Darwin specifically mentions in his *Journal of Researches* made during the voyage of the *Beagle* in 1835 and has made personal observations and scientific collections on each of them. Darwin's Journal and his more recently published *Diary* should be read in connection with the present article.

THE Galapagos Islands might well have been called Nature's laboratory of experimental evolution; a visual demonstration of the facts and the principles of evolution, they are, to this day, a living epitome of the *Origin of Species*. Hence, ever since the publication of Darwin's Journal, they have been a major scientific attraction and perhaps have been visited by more scientific expeditions than any other area of similar size in the world.

One hundred years ago this very year Charles Darwin first set foot on those islands. This year I traveled some of the selfsame trails he traveled, trails unchanged since that early day. Among those I covered is the one on James Island up to the salt crater lake where, under the bushes along its shore, he saw the skull of the captain of a sealing vessel, slain there by some of his sailors. I did not see that skull; no doubt it had long since turned to dust or had been removed in the course of the century intervening between his visit and mine. But I did see two dead men on the beach of one of the other islands, bleached and mummified by the sun's tropic rays on the black lava sands of bleak and barren Marchena, nearly forty miles to the north of James.

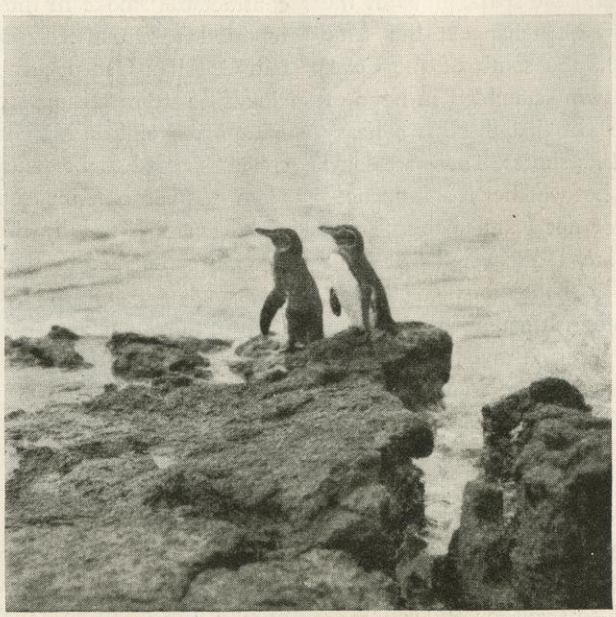


PHOTO BY KARL SCHMIDT, CRANE PACIFIC EXPED.

GALAPAGOS PENGUINS ARE INTERESTING
These are particularly so because their home is under the Equator

Darwin spent a week on James Island. I was there for three brief visits. Other shelters, now fallen, have taken the place of earlier ones, and other salt workers have come and gone since he was there. Upon the crest of the crater wall stands an old rusty engine for operating an abandoned cable-way, idle and dilapidated. Goats, descendants of the original flock that escaped Admiral Porter's men back in 1813, still are plentiful.

Tagus Cove, the Banks Cove of Darwin's narrative, indenting the western

CAPE BERKELEY, A BOLD VOLCANIC HEADLAND, REMNANT OF A HUGE CRATER

A little to the north of the Cape, the Equator crosses the Galapagos Islands

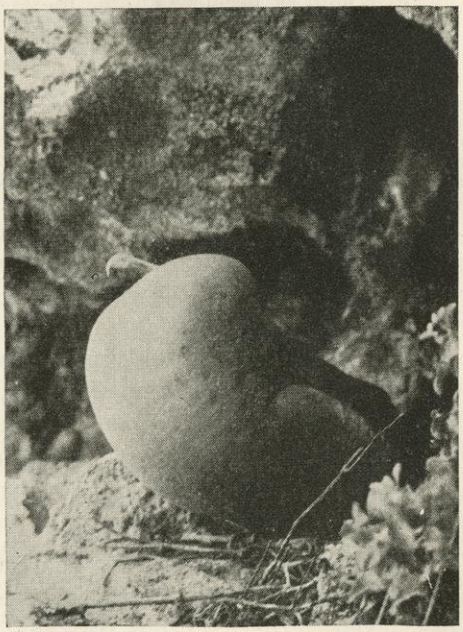
shore of northern Albemarle, is little changed except for the disappearance of the tortoises from the vicinity. The precipitous rock walls of this breached crater-harbor today carry no end of large, painted calling cards of yachts from all parts of the world, and of tuna fishermen and a scientific expedition from far away Los Angeles, for among them appears the name of Captain Hancock's trim motor cruiser, the *Velero III.* Three successive scientific expeditions has she brought to these enchanted isles. At anchor far back in the most sheltered place in the cove lies the small yawl of the circumnavigator, Robinson, who was saved from an untimely end by an emergency appendicitis operation by U. S. Navy doctors who flew over from Panama on a wireless hurry call. A placard on the yawl requests visitors to pump the bilges. We found that this had been done before us, and that the sails and the spark plugs of the engine had also been removed, perhaps at the same time. The large crater lake to the south of the Cove, down whose dusty slopes Darwin scrambled in hope of a drink of fresh water, is so salt that there is a heavy whitish encrustation along all its shores. There are some evidences of changes in level, but whether it is influenced by tidal fluctuations outside or not I am unable to say. As heavily salt as its waters are, I discovered that some mollusks, a few crustaceans, a filamentous green alga, and a host of small silver-white fish make it their home. The fish, *Eucinostomus californiensis,* proved to be a well-known marine species and so may be indicative of a former, or even present, direct connection with the ocean through subterranean fissures.

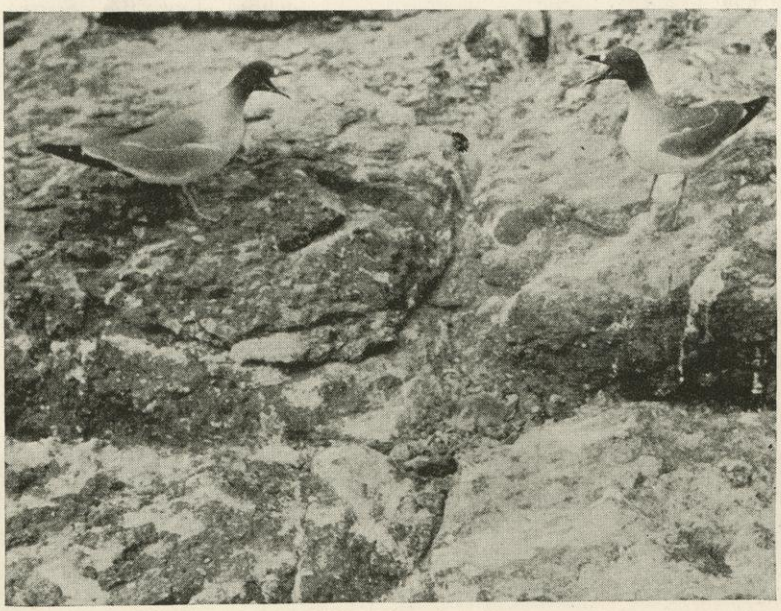
There is no mistaking the wholly volcanic nature of the Galapagos. On every hand are craters of primary, secondary, and lesser degree, fumaroles, cones, and vents, a graphic example of vulcanism to the *n*th degree. Darwin thought there must be at least two thousand craters of one sort or another. The Valley of Ten Thousand Smokes would suffer, I believe, by comparison. Indeed, much of the Galapagos scenery, and especially that about Christopher Point, the most westerly projection of southern Albemarle, prompts one instinctively to exclaim, "The Valley of the Moon!" No more typically lunar landscape is to be seen anywhere else on earth.

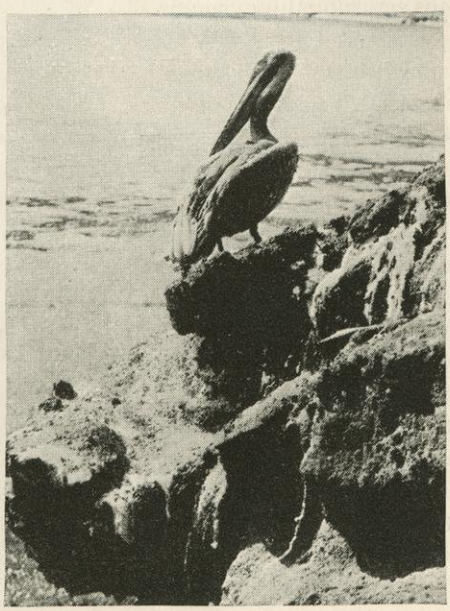
On September 29, 1835, Darwin records seeing a small jet of smoke curling from the summit of one of the great craters of Albemarle. Steam jets to this day are not an uncommon sight on this same island, and adjacent Narborough as well. Darwin never witnessed any real volcanic activity during his sojourn in the Islands, nor have I, yet there have been a number of spectacular, though minor, disturbances through the intervening years. During August and September, 1897, the Webster-Harris expedition found one of the volcanoes on James active, exhibiting brilliant illumination of the sky by night and considerable smoke in the day. A limited eruption was reported from southern Albemarle in 1901. In 1928 Captain G. Allan Hancock, then in the *Oaxaca,* found great clouds of steam arising from the sea near the shores of Mangrove Point on Narborough where one of the minor craters seemed to be pouring molten lava into the sea from some submarine fissure. A similar phenomenon had been observed by the Beebe expedition in April, 1925, accompanied by some subterranean activity. Beebe saw smoke, steam, and gas arising from the slopes of one of the mountains back of Cape Marshall, on the east side of northern Albemarle. At this time, some lava was actually observed flowing into the sea near shore. To some extent, at least, the activity of this volcano continued over into the next year, being reported by William K. Vanderbilt as still erupting in March, 1926.

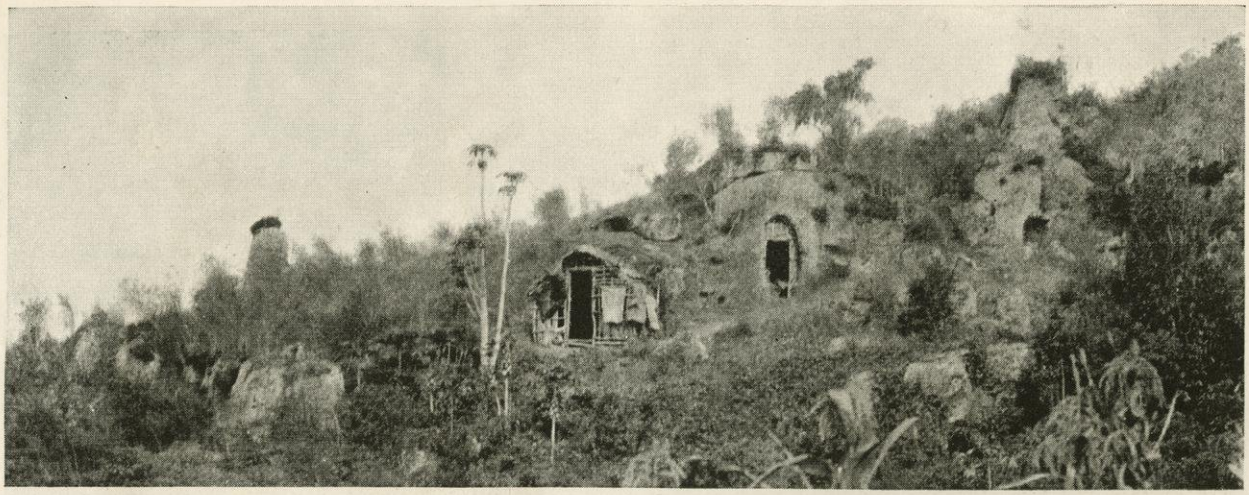
A great part of Chatham Island, especially the northern end and lower portions, is lava-covered and barren. The *Beagle,* on which Darwin served as naturalist, sailed around this island and anchored in several bays, without discovering that in its high interior it is perhaps the most fertile, certainly the best watered, of all the Gala-

Here are some of the common Galapagos birds. Frigate birds are seen everywhere about the islands, usually flying high in the air except when on the nest in the tops of the small shrubs, as is the bird at the left, above. At its right above, is the blue-faced booby, its nest a few pebbles in a slight hollow between rocks. Boobies are much preyed upon by frigate birds, which derive much of their food by forcing boobies in flight to disgorge their catch of fish. In the breeding season the male frigate bird, with his brilliant scarlet-red throat pouch, is a striking sight. One is shown at the right. When the pouch is fully inflated one can scarcely see the bird for its pouch. Below, at the left, a pair of Galapagos gulls discuss matters, while, just distinguishable, is a fluffy chick on a nest of gravel. The brown pelican of the Galapagos, quite contrary to first impressions, is not the species common to the Pacific, but is West Indian. Ornithologists have never succeeded in distinguishing specimens taken in the Galapagos from those taken in the West Indies. The three photographs in the column to the right were taken by Dr. H. W. Manter. Drs. Manter and Fraser were also members of the scientific staff of the 1933-34 Hancock Expedition to these Pacific Islands.









PIRATE CAVES IN VOLCANIC GAS POCKETS

It is said that these first served as habitation for early buccaneers. They were last occupied by the Wittmers until they built their own home

pagos group. It is the only island in all the archipelago with permanent streams of fresh water. In these streams one may find, as we did while on the Hancock expedition, the new species of fresh-water fish, *Agonostomus hancocki,* and a brilliant blue fresh-water shrimp, *Macrobrachium olfersii,* which is widely distributed from Mexico through Central America to northern South America. Totally uninhabited in Darwin's time, Chatham now supports a larger population than any other of the islands. Between two and three hundred persons cultivate its extensive, fertile plantations, work in the sugar mill when this is in operation, and engage in cattle raising for export to the mainland.

At last we come to Charles Island, or Floreana, where Darwin spent the latter part of September, 1835. It was the only one of the Galapagos then inhabited and, at that time, supported about as large a population as exists on Chatham today. He found between two and three hundred inhabitants whom he described as "nearly all people of color who have been banished for political crimes." They were living in an apparently prosperous agricultural community consisting of some fifty or more crude little homes distributed among as many little chacras, or farms.

The trail that Darwin traveled up from Black Beach to the settlement is the same today, and as your shoes sink in the sandy, volcanic soil, you stir the dust his shoes also raised along that very trail. At intervals you cross rough lava outcrops and, higher up, a good rich loam that he, too, trod a hundred years ago. It is indeed a thrill for any naturalist to retrace Darwin's steps and to behold the very scenes he himself described as though but yesterday, so little have they changed. The tortoises and the land iguanas have disappeared, while of the original settlement which he found there, or of some of the later attempts to colonize, only traces remain—occasional bits of stone wall or foundations, wild cattle and pigs, burros, dogs, and cats, even chickens, a few plants that may have escaped cultivation, and a host of orange and lemon trees.

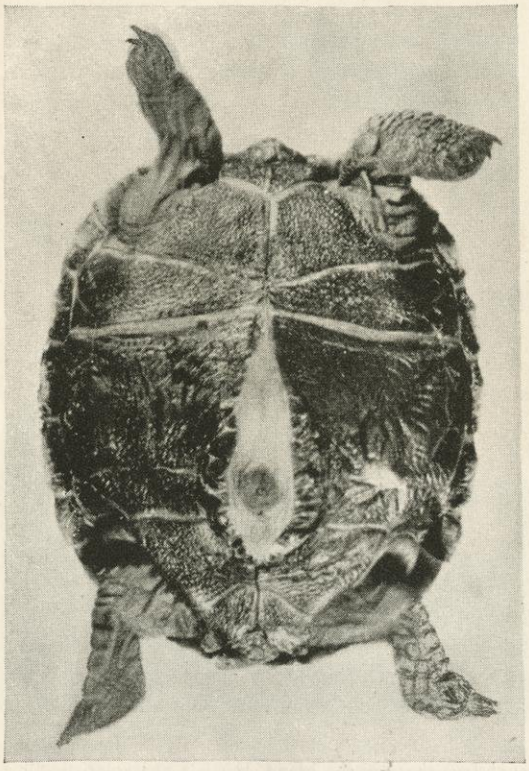
These trees, though running wild, are still flourishing in great profusion, so that in season the fruit falls to the ground for want of hands to gather it. Magnificent trees bear as delicious oranges as any you ever tasted! These trees must well be a hundred years old or more; some have boles a foot thick. They reach skyward nearly ten times the height of a man and are loaded down with an abundance of golden fruit. A Charles Island citrus grove is an unforgettable sight. When the ripe fruit falls, the ground is covered, heaped up with it, under each tree. Then the wild pigs swarm up the lower slopes of the Cerro de Paja, the large central mountain at whose foot the orange groves are at their best, and the wild cattle come over from the southwestern part of the island to feast, so that the place is no longer safe for man. The wild boars and the powerful, fierce, black Spanish bulls are not to be trifled with.

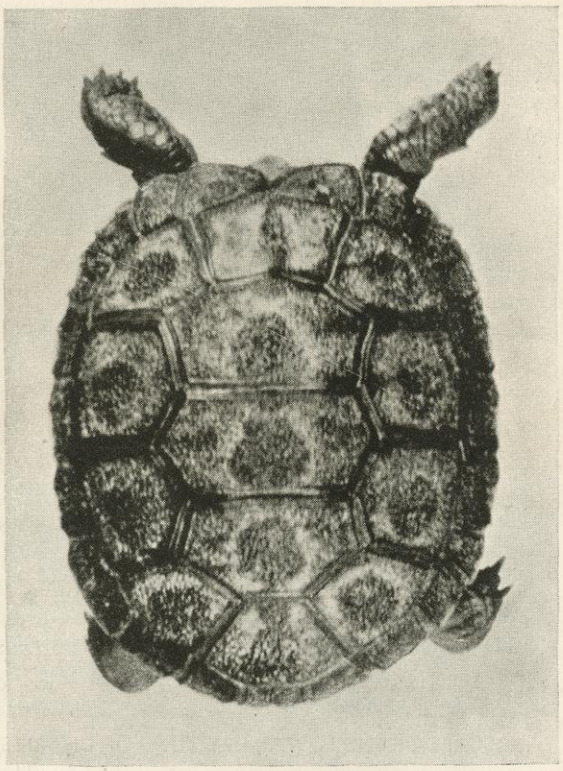
PHOTO BY KARL SCHMIDT, CRANE PACIFIC EXPED.

THE EXTRAORDINARY FLIGHTLESS CORMORANT

Its wings are about the same length as those of the great auk and it cannot fly

Beneath the trees the soil is black and moist, with a thick covering of leaf mold from which I obtained numerous isopods and small, shelled snails. One must not, however, let impressions of these

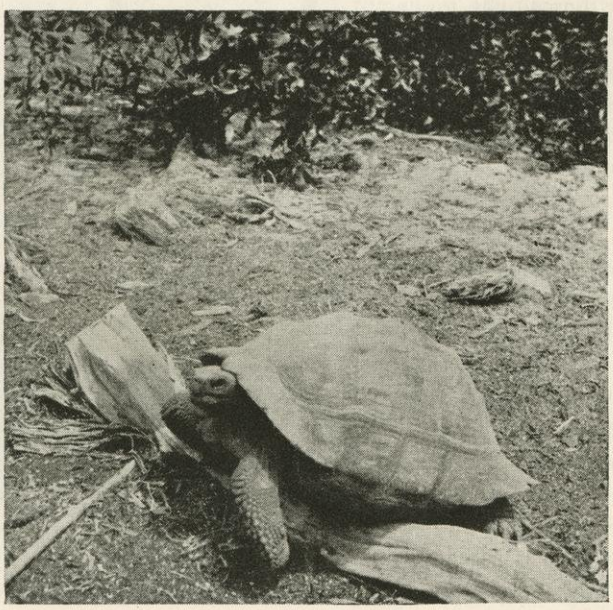


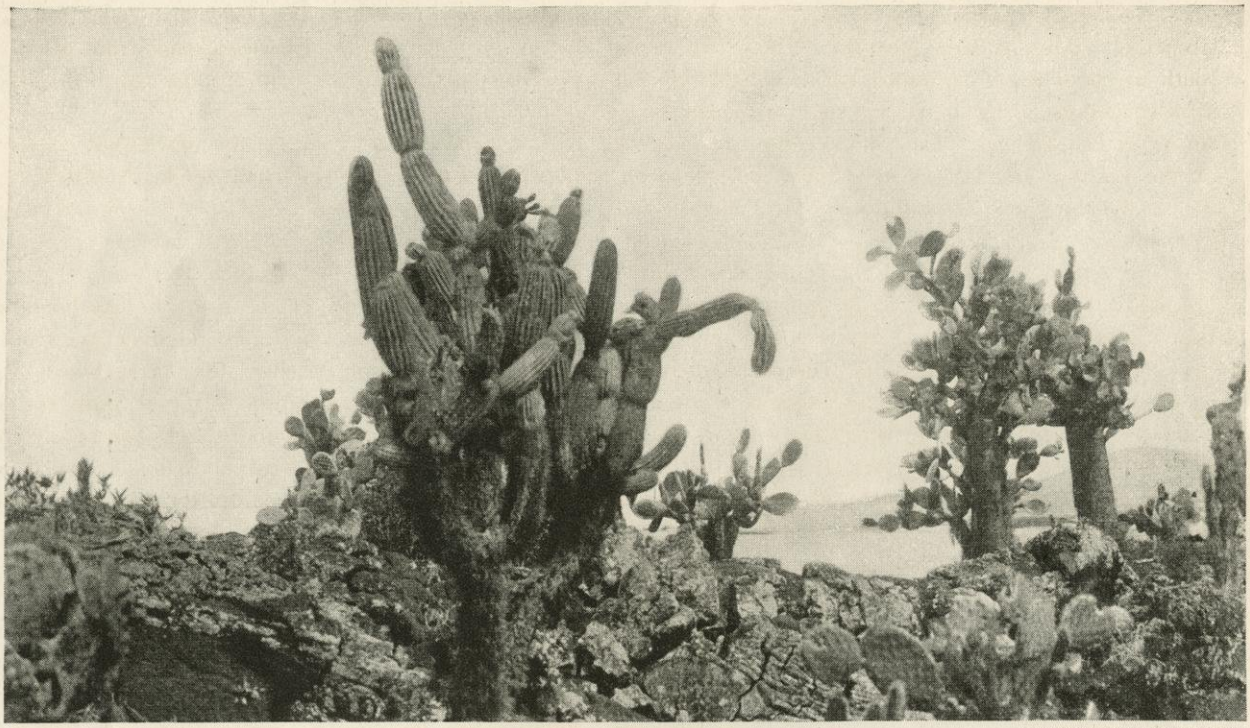


Ventral and dorsal views of one of the youngest and smallest tortoises ever found in the Galapagos. Hatched January 14, 1933, it was ten days old when photographed by W. Charles Swett, executive officer and scientific cinematographer of the Hancock Expeditions. Two and a half inches long, it weighed two and one-half ounces. The still membraneous umbilical area shows place of attachment of yolk stalk of egg.

At left a land iguana of about three and a half feet long beside the stalk of a tree cactus, South Seymour.

Below, two larger tortoises, the baby above being compared to one of them. (Photographs by C. McLean Fraser.) These larger specimens are of moderate size. An average full grown male weighs three hundred pounds.





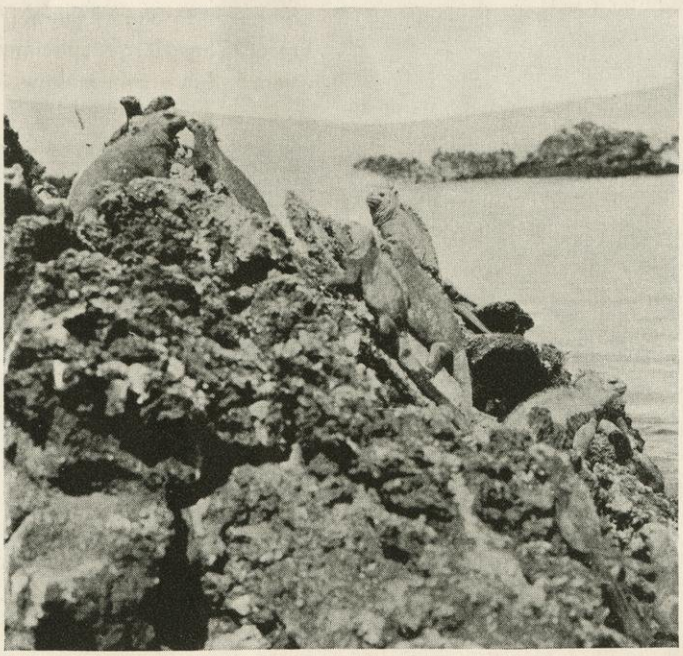
PHOTOGRAPH BY C. MCLEAN FRASER

LANDSCAPE OF THE LOWER, DRY ZONE OF CHARLES ISLAND

Tree-like cactuses on the rough lava shore of the island. This is a characteristic view of scenes one will find in many such locations in the Galapagos

fertile uplands mislead him, for all the islands below the eight hundred foot level are like deserts, sere and gray and brown, with dry, dead grass, many cactuses, and stunted trees with tiny, drab leaves, an adaptation to the dry belt in which they live. The lava flows and other volcanic ejecta at these low elevations are scarcely, if at all, weathered, and emphasize the general sterility of the lower reaches of the islands. On many islands it is next to impossible to get about freely because of impenetrable thickets of acacia bushes and trees, seemingly extending for miles and armed with most vicious thorns. The lower regions receive precipitation only at rare intervals and then only during the brief rainy season.

While no island except Chatham has any permanent streams of any description, the higher elevations of those that extend above the eight or nine hundred foot level are frequently bathed with heavy fogs or mists, known locally as garuas, resulting from the clouds that gather about the "mountain peaks" or, rather, crater tops. The highest of these are to be found on southern Albemarle and on Narborough, where they attain a height of about five thousand feet. Tagus Mountain is four thousand feet high; the volcanoes of James and Chatham are under three thousand; while on Charles the greatest elevation does not exceed 1780 feet. The garuas yield appreciable moisture that at times amounts to a good drizzle. These wet mists may be of short duration, or may last as long as four to six days at a time with occasional breaks.



MARINE IGUANAS SUNNING THEMSELVES

These inhabitants of the Galapagos feed on marine algae and are most agile swimmers

The climate of the Galapagos has been described as ideal. Despite the fact that the archipelago lies directly under the Equator, the average temperature is quite low, ranging between 70° and 80°. This uniformly low and even temperature is due to the Humboldt current, a cold stream that sweeps up along the coast of South America from the Antarctic regions and turns westward off northern Peru to swing through the islands. Not only

does it cool the air mass above it, but it also keeps the temperature more or less uniform. When the sun is south of the Equator it warms the Humboldt current somewhat, thus giving the islands their warm and rainy season in February and March. When the sun is north of the Equator, the islands have their coolest season, during the third quarter of the year, July, August, and September.

Along with other natural advantages such as a fertile upland and, in some parts, ease of penetration, Charles Island possesses two good springs, a poorer one, and a few insignificant seepage puddles. The island therefore has been the scene of a number of attempts at colonization since the first settlement, which Darwin saw, ceased to exist about ten or twelve years after his visit. Severe and almost disastrous droughts are not unknown, and to such droughts, no doubt, as much as to the fact that most of the attempts at colonization were largely penal colonies, may be ascribed their successive failures.

Louis Agassiz, who called at Charles Island on board the U. S. Coast Survey Steamer *Hassler* in 1872, reports a drought in which one thousand, two hundred head of cattle perished. Another one of equal severity was observed here by Captain Markham of the British Navy seven and a half years later. As recently as the early months of 1934, the expected rainy season did not materialize and the poorest spring failed. Consequently a little group of three settlers who were dependent on it was broken up, perhaps under tragic circumstances. Here had lived a "Baroness" and two men who had entertained us at tea on two previous occasions. The "Baroness" and one companion, Robert Philippson, disappeared. Rudolf Lorenz, the other man, said they had left for the South Seas. At the first opportunity thereafter he, too, departed with a Norwegian fisherman in a forty-foot open boat with no sails and a little, decrepit engine with the intention of making Chatham, there to catch the occasional supply and mail boat for Guayaquil and home. It was he and the fisherman, who perished together of thirst, whose bodies I saw on the beach of bleak and barren Marchena. This is one of the lowest islands, rising scarcely to eight hundred feet in the highest part and so one of the driest, with immense expanses of rough, unweathered lava and a few scattered patches of dry, grassy growth and occasional cactuses.

Antedating the advent of the Baroness by a little more than three years, a German physician and dentist, Friedrich Ritter, with his companion, Doré Koerwin, located on Charles Island near one of the two good springs, the one most often referred to by the early navigators, as it was just about a forty-five minute steady climb from the Black Beach landing. Arriving in July, 1929, equipped for a lengthy sojourn, he established himself and his companion with what he considered sufficient shelter and the necessary garden for pursuing a vegetarian existence. When I first met him in 1932 he seemed to have turned his energies more to writing his scheme of philosophy and of life as it should be lived untrammeled by the conventions of modern civilization than to improving his place. He died December 2nd, 1934, just before my third visit to Charles Island, from ptomaine poisoning or apoplexy, it is said. Doré returned to Germany.

The Baroness had come to the island best equipped of all the settlers, having included eighty to ninety sacks of cement in the extended inventory of things she brought along. Coming with much less of the world's possessions than either Ritter or the Baroness were the Wittmers, who settled themselves by the third and perhaps best spring of the three on Charles Island about two months before the arrival of the Baroness. They, like a truly modern Swiss Family Robinson, achieved most and are today the only residents on the island. The family consists of man and wife and two sons, one a boy of sixteen, the other a native Galapagan who was born on the island in January, 1932, about four months after his parents had settled there.

Out of lava boulders roughly squared with a crowbar and cemented with mud from the spring nearby, Wittmer and his older son constructed a substantial and livable home. They fashioned their furniture and what interior trim there is from native wood. The roof is of the hides of wild cattle. With the return of the belated rains, the garden is flourishing again. During the last six months Mrs. Wittmer and the younger boy have been visiting her home in Germany. She will return to her family on Charles Island this winter.

As in Spanish a fresh water tortoise is a *galápago,* the Galapagos will ever be a reminder, in themselves, of their most striking zoological feature. Because of these tortoises, the islands received countless visits from buccaneers and whalers, merchant-men and vessels of war, as well as numerous scientific expeditions. Galapagos tortoises are good eating and the source of a fine, tasty oil, as good as the best drawn butter. From Dampier's early *Voyages* we learn that his crew greatly relished the oil saved from the tortoises they killed and that they made use of it "instead of butter to eat with dough-boys or dumplings."

Of the flesh of the tortoises, Darwin recalled that "the breast-plate roasted (as the Gauchos do *carne con cuero*), with the flesh on it, is very good; and the young tortoises make excellent soup; but otherwise the meat to my taste is indifferent." I also have eaten tortoise meat. The piece I got, however, was like stringy beefsteak. On telling some of the natives of my experience, I was assured that I must have had a very poor cut.

In the very palatability of their flesh, the excellence of their liver, and the delicacy of their fat, the tortoises have written their own death warrant. Before there was a Panama Canal, it was a long way around the Horn from the home of the American whaling fleet in New England to the hunting grounds of the Pacific sperm whale—three years and more to the cruise. In all that space of time, food and fresh meat were needed on every ship by many hungry men. What more suitable source of food supply could be desired than these giant tortoises? Given a chance to (Continued on page 312)

STORM WARNINGS WERE OUT ALL ALONG THE ATLANTIC COAST

The birds on the coastal islands seemed to sense it, some of them to glory in it. Gulls and double-crested cormorants testing their strength by flying into the wind

WINGS OF THE STORM

By HOWARD L. MENDALL

THE North Atlantic ocean was in the throes of a midsummer gale. Liners were battling to hold their courses, and small craft were speeding to sheltered harbors. From Virginia to Maine, the coast was lashed by a storm that the Weather Bureau reported was one of the worst in a quarter of a century. The full force of the blow had not yet reached Maine, but storm warnings were being displayed, and all craft were advised to seek shelter at once.

I was aboard a forty-foot cabin cruiser enroute from Rockland to Boothbay Harbor, about five hours journey. As the boat rounded Owl's Head and approached Munroe Island, we received, for a few moments, the full force of the storm. But almost as quickly as we had struck the open ocean, we entered Mussel Ridge Channel with its breakwater of islands. Here the vessel rode more easily. I went forward with notebook, pencil and glasses to observe the activities of the birds in this gale. All summer I had studied water fowl under fair weather conditions, and here was my chance to watch them in a storm.

The first noteworthy point was the lack of herring gulls. I had spent the greater part of the three previous weeks in this same Mussel Ridge Channel, visiting every nesting site, and the water had been alive with gulls. Now, only occasional birds were seen, and most of these were immature. I was puzzled and wondered if they were all on the islands seeking shelter from the storm. But this answer was unsatisfactory, for within the channel the wind was not severe.

The solution came a few minutes later, however, when we approached Fisherman's Island, on which the gulls nest in countless numbers. We were nearing the open ocean again, and there was a steady line of gulls going from the island to a spot about a half mile out at sea. I could not observe the object of their attention, due to poor visibility, but it was certainly food, and the birds were busy. The young gulls were lined up on the windward side of the island. Although some of them were more than two months old, not one was flying today. This was their first real storm.

Was the raging Atlantic proving a hardship to the gulls? It certainly was not—rather it was a boon; for whatever the food consisted of, it was in great quantities.

I fully believe the birds were actually loving the gale. As they fed the young on shore, they threw out their necks and gave utterance to an almost laughing cry. A few would rise high over the island, and on spread wings, they would soar with the wind, wheel directly into it for a brief instant, then turn and soar again. Tiring at last of this sport, for indeed it seemed as if it must be a sport, they would fly steadily outward in the face of the wind to feed again.

Not far beyond Fisherman's Island lay Marblehead Island. This is the home of double-crested cormorants, one of the few such nesting sites on the entire United States coast.

Although the locality is called an island, it is merely a pile of steep rocks rising about fifty feet or so above the water. Even on relatively calm days it is not always easy to land, so strong are the swell and undertow around it. Today the island presented a dejected picture. The surf broke completely over the southern end, and in the intervals

between baths, the young cormorants could be seen huddled together. Some of them were only a week or two old despite the fact that it was the latter part of August. In a few of the nests that I knew contained very young birds, the parents were brooding, but most of the young were left to themselves. The older birds, fully feathered and nearly ready to fly, were congregated en masse on the windward side of the island. This group formation is always impressive, appearing at a little distance like a slowly moving jet-black cloud, but it was doubly impressive today, for the cloud was hidden at regular intervals by white dashing spray, only to reappear again with an uncanny suddenness.

The scene shifted altogether too quickly, for the boat ploughed on. Slowly, black-capped Marblehead Island faded from view until it was finally lost in the mist, which by now was almost a drizzle. The wind was steadily increasing and the boat tossed frantically. A small sailing vessel was having a battle to keep off the rocks and make Tenant's Harbor. The Metinic group of islands was completely hidden from view and the familiar thoroughfare looked vastly different. Gigantic rolls of green water swept toward us. They threatened completely to engulf us, only to sweep underneath as the boat rose high on their crests and slid down the other side.

DOUBLE-CRESTED CORMORANT NEST
When the storm reached its height, spray dashed over this nest and battered the colony of birds

As we were passing Mosquito Island, I saw what appeared to be a patch of brown weeds floating on the water ahead. But as we approached nearer, the weeds miraculously changed into living beings—Northern phalaropes, thousands of them. They covered more than half an acre of ocean surface, rising and falling with the swell. Now they were far above us—now they were below us, as the big rolls of ocean swept toward the boat. They had discovered a mass of kelp with a banquet already laid for them. As we neared the mass, the birds opened up a pathway. They did not fly; there was no confusion; simply a well organized movement to permit a passage. The turning back of the Red Sea in Biblical times could hardly have been more spectacular to watch than the opening made in this living blockade. The birds did not spread out until we were almost upon them, and then their movement was in proportion to the progress of the ship. The tiny beings would scarcely wait until we were through before they closed in again, and I had a view of the boat completely surrounded by the flood of fairy-like birds.

We left the phalaropes, once more a solid brown sheet, and continued by Port Clyde. Everywhere, the surf was shooting high into the air. Everywhere, there were evidences of the severity of the storm. An empty, half submerged punt drifted by, relic of someone's carelessness.

The next act in this drama of the storm was laid in Davis Strait. A group of islands, called George's Islands, extends from the mouth of the St. George River seaward for four or five miles in the general direction of Monhegan Island. Davis Strait, the thoroughfare for small craft, passes through the center of this group of islands, between Davis Island and Thompson's Island.

Three ledges lie off the shore of Thompson's Island, on the middle one of which was an osprey's nest. Built in the top of a dead spruce stump, it was about eight feet above the ground. The adult ospreys were making wide circles overhead, and one fully grown young was observed huddled close to the nest.

The birds were not flying high, for even their sharp eyes found the drizzling mist a handicap. The white breasts, contrasting against the gray sky, made a picturesque scene as these birds scaled into the wind. As I watched, one of them wheeled in his scaling, halted for a second, closed his wings and dropped downward with the speed of a comet. He struck the water with terrific force, disappearing entirely from view. When he arose, he had a large fish, which he bore nestward.

Meanwhile a larger bird had appeared overhead and I recognized it as a bald eagle. Slowly, with powerful strokes, he flew toward the second osprey but kept far above it. The osprey sensed trouble and gave utterance to an occasional scream, but continued its search for food. It saw something, paused a moment, and then swooped downward after the manner of its mate.

The eagle, with a shriek of battle, followed suit, and the meeting took place just as the osprey left the water with its fish. The eagle halted his plunge with breath-taking suddenness and swept under the smaller bird, who was trying to turn aside. Wheeling sharply, the eagle came back again, passing under the osprey and forcing it higher. Three times the eagle flew under his rival, threatening with talons and beak. Then he attacked! Striking

THE SEEMINGLY INHOSPITABLE ROCKS OF MARBLEHEAD ISLAND

Yet here nest one of the largest of the few colonies of double-crested cormorants along the Atlantic Coast. They capped the island with moving black

with his wings, the white-headed giant appeared completely to envelop the frantic osprey, who still clung to his fish. But he was unable to fight both wind and eagle, and eventually the fish dropped toward the ocean.

As suddenly as he had attacked, the eagle left the osprey and plunged after the fish. His hopes were short lived, however, for attracted by the screams of its mate, the other osprey was flying to the rescue. When the fish dropped free, the hawk sped after it. There was a mad struggle for possession of the prize, as the eagle reached it at the same time as the osprey. But the result had to be declared a draw when the fish fell into the water and disappeared beneath the surface.

Disgruntled, all three birds shrieked lustily, and even the young bird in the nearby nest could be seen flapping his wings as if in disgust. For a few minutes, the ospreys followed the eagle toward Davis Island, but they were soon outdistanced, and abandoned the chase. The last I saw of them, they were again circling above their nest. The curtain of mist and rain brought an end to their act.

The rest of the trip was made up of anticlimaxes, the greatest thrills having already been provided. At Old Hump Ledge, another colony of cormorants was seen between the intervals of spray baths to which the ledge was being subjected. Overhead, a few laughing gulls were scaling. Now and then a common or an Arctic tern would skim by on graceful, swallow-like wings, uttering its harsh but plaintive cry as it sought food.

Birds were becoming noticeably fewer, however, for we were encountering the roughest part of the entire trip. A black guillemot, or sea pigeon, was seen occasionally, swimming and diving in the surf without apparent regard for the storm. These birds have always impressed me as being hardened to the rigors of whatever weather Maine may produce, and today my opinion was strengthened. They were like little black and white gems in a setting of white-tipped green ocean.

Near Pemaquid Ledge we received another impressive demonstration of the power of the storm, for although the navigation chart showed nearly thirty feet of water here, spray was dashing fifty or more feet into the air. It was the first time during his thirty-odd years of sailing these waters that the captain had seen breakers in this locality.

After another hour's run, we rounded Ocean Point and entered Boothbay Harbor, with its comparatively calm water. Our trip was over.

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Although he has been writing only a short time, John Lindsey Blackford has already acquired a group of sincere admirers. Mr. Blackford returns to our pages in the December Nature Magazine with a charming story of birds in winter entitled "At the Ice King's Board." Have you ever seen the white muffs of snow that the winter wind now and then rolls when in a playful mood? Charles Fitzhugh Talman tells about these in another of his fascinating weather articles. Frank Brockman gives us a different sort of article about Christmas trees, and S. Judson Ewer discusses that attractive friend of the Christmas season, the partridge berry. These and other features will be found in Nature Magazine next month, with, of course, the rotogravure pages filled with fascinating pictures.

KENTUCKY BLUE-GRASS

By F. LAMSON-SCRIBNER

NUMBERING a hundred and fifty or more species, widely scattered throughout the temperate regions of the world, the blue-grasses embrace many that are of great agricultural and horticultural interest. The best known and the one most highly valued for hay, pasturage or lawns is Kentucky blue-grass, which derives its name from the region where the limestone soils are particularly suited to its growth. It is the "smooth meadow grass" of Europe, where it is a favorite wherever grasses are grown. In New England it reaches maturity in June and it is known as "June grass" to the farmers of that section.

Kentucky blue-grass makes an excellent turf and its creeping rootstocks hold the turf firmly so that the sod defies erosion under ordinary circumstances. The leafy stems, culms, and open or spreading panicle with slender branches, two to five from each point of growth, bear near their tips the rather small, green spikelets. The spikelets are usually pale or grayish green, but sometimes, for reasons not well understood, they are quite dark and less rarely distinctly red when seen in the field en masse.

KENTUCKY BLUE-GRASS

Probably the best known of this group of important grasses, it is not confined to the State for which it is named

Many small areas in a blue-grass field appear highly colored in the bright sunshine.

Rough meadow-grass, *Poa trivialis,* is closely allied to Kentucky blue-grass, differing only in having the leaves and stems decidedly rough, and no creeping rootstocks. This species has a preference for moist cool meadows. It is a native of Europe, where it is more frequently cultivated than in America.

Canadian or English blue-grass, *Poa compressa,* is also from Europe, but is now thoroughly naturalized in North America, having been introduced many years ago for the improvement of our neglected pastures. It is a regular soil grubber for food, extracting nourishment under conditions wholly unsuited to the needs of its relatives that we have mentioned. Canadian blue-grass grows to the

DETAILS OF KENTUCKY BLUE-GRASS

The drawing shows the creeping rootstock, a five-flowered spikelet from one of the panicles and a single floret from the spikelet. Web-like hairs at the base of the floret distinguish it

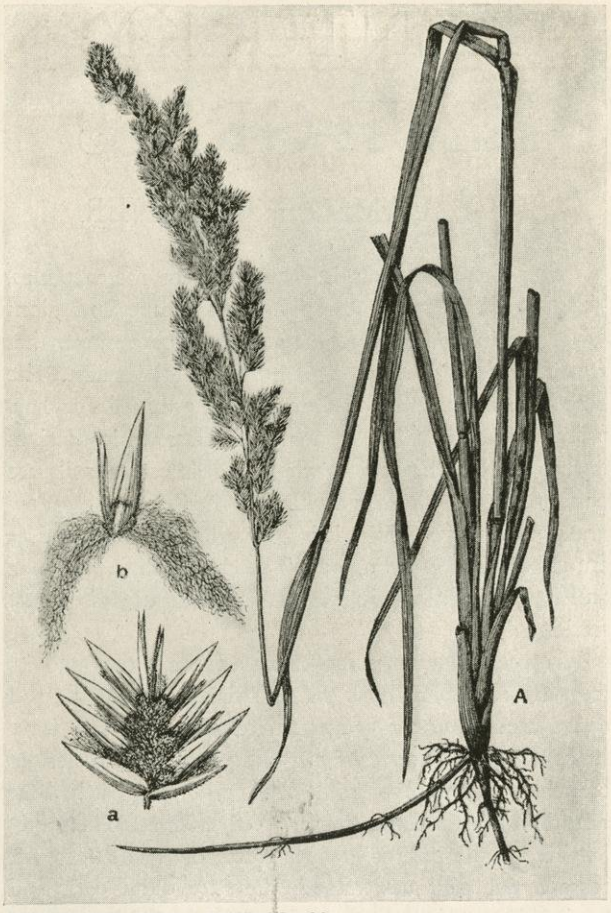
height of from one to two feet and is remarkable in having its flattened wiry stems strongly compressed.

Among the smallest of the blue-grasses is the little cosmopolitan six-weeks blue-grass or "low spear-grass", *Poa annua.* It is rarely more than six to ten inches high and begins to bloom in early spring along with the dandelions, and its flowering season extends throughout the summer. This grass has a habit of intruding into all sorts of places—old gardens and neglected grounds, like some rascally weed. That this tiny grass is one of the harbingers of spring, presenting vivid bits of green close beside retreating banks of winter's snow is its chief, but not its only charm. It is generous with its early seeds supplying good dinners to many a song bird on its spring flight northward. We watch for this little *Poa* as the seasons pass and the first spring view of its cheering tufts of emerald green always inspires feelings of happiness.

There are several diœcious blue-grasses—that is species which have the male or staminate flowers on plants separate from those that produce seed—the pistillate plants. Texas blue-grass, *Poa arachnifera,* is of this type. The only difference between the sexes in this case is that the florets in staminate plants are naked, while in the seed-bearing plants they are clothed at the base with very fine flocculent white hairs. The inflorescence in the Texas blue-grass is a densely, many-flowered, contracted panicle. The stout root system of many rhizomes is well indicated, as are the two kinds of florets.

The largest of the blue-grass group is the great tussock-grass, *Poa flabellata,* of New Zealand and other islands of the South Pacific Ocean. It attains a height of about six feet, and is valued for pasturage and for paper making.

Another important diœcious species is the seaside blue-grass, *Poa macrantha,* common along the sandy shores of the Pacific from California, northward. It is a strong-growing species with unusually large spikelets as indicated in its specific name *macrantha*—large flowers. The light colored or tawny spikelets are half an inch in length, and a field of this grass, when in full bloom, is conspicuous and makes a display that is rather attractive.



DETAILS OF TEXAS BLUE-GRASS
A plant showing the strong, creeping rootstock and the densely flowered panicle. Also a five-flowered spikelet and a single floret with long cobwebby hairs at the base

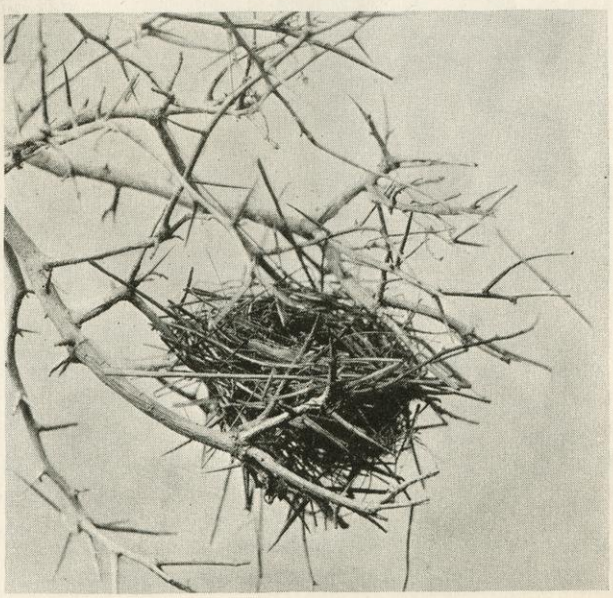
The *Poas* are the blue bloods of the grass family of most ancient origin. They represent a primitive type; preeminently builders of land, they are in perpetual contest with the winds and rains to extend their domain or preserve their holdings, and are thus valuable allies.

A Thorny Home

By FLORENCE BOYCE DAVIS

JUST why a song sparrow should build in a scrub thorn-apple, where she and her mate were in constant danger of being impaled on sharp spines is one of Nature's mysteries. The sidehill pasture was dotted with thorn bushes, and it appeared to be a favorite sparrow settlement. The first morning we climbed the hill every mullein stalk seemed to hold a song sparrow, or a chippy, singing at the top of his voice. We found many little hair-lined chippy nests tucked away in the thorn bushes, but the song sparrow's site was quite the most perilous. It was so strange, that we went back in the fall, after the leaves had fallen, and took the picture.

From the appearance of the nest, we judged eggs had been hatched there, and the babies had lived to grow up. How often had the parents faced that thorn barricade!



FEATHERED NEW YORKERS

Many birds find sanctuary within the City's borders

By RAYMOND S. DECK

Photographs by the Author

A FIELD SPARROW

One of the many diminutive citizens of New York not found upon the tax rolls or voting lists of the great City

I STOOD, on a balmy May evening not long ago, in a swampy wilderness of cat-tails in one of the five boroughs of the world's metropolis. The day was almost spent. From off toward the misty skyline of Manhattan's towers came the grinding roar of subways, bearing the City's millions home; a sleek commuters' train clattered by over glistening rails; from a boulevard a hundred yards away sounded the din of motor cars, the blare of horns, the rumble of empty trucks.

Gnuack! gnuack! Calling softly, a pair of wild black ducks appeared in the flushed sunset sky. On winnowing wings they crossed the marsh and flew off across an artery of highway traffic. In a minute they were back, to flare sharply and drop behind a screen of cat-tails where lay the silver surface of a creek. A lone night heron floated overhead. Virginia rails cried *tink-et* as they threaded unseen soggy trails; marsh wrens gurgled, and from a strip of fringing woodland a yellow-throat sang of *witchery*. In a grassy arena a few rods off, a big brown bird with a long bill took form, as a circlet of snowy plumes appeared about its neck. The bittern advanced with an ungainly waddle to the center of his island stage. *Oomp! galoomp; oomp! galoomp!* his love-song boomed across the marsh. With each *oomp,* the long neck shot out and up; with the *galoomp,* it snapped sharply back against the bird's breast. After a broadside of *galoomping,* the bittern drew his head close against his body, and advanced threateningly with open bill, as though to do battle with a rival; finding none bold enough to meet his challenge, he vanished in the vegetation. Night fell as I sat and listened to the concert of spring marshlands, the calls of many birds, the mournful trill of toad choruses, a single wild thread woven into the roar of a man-made world.

That heartening hour on an expanse of primitive marsh was but one of many such enjoyed the year around by city-bound New Yorkers. Not only does the great City have avian oases like that land of cat-tails, preserved inviolate as sources of a tremendous water supply, but there are great parks and remnants of ocean beach and salt marsh which yet survive within the City and her outskirts to offer sanctuary to the birds; there are the ancient migratory flyways of the coastline and the Hudson Valley which in their season pour a mighty feathered tide through New York skies.

Most stirring perhaps, of all pageantry of New York City birds, is the winter procession of wild black ducks and mallards drifting down the Hudson River on blocks of ice from frozen bays to northward. From the smooth parkways of Riverside Drive one may watch the wildfowl floating on their frigid crafts in pairs and fives and tens. Now and again a ferry boat blast sends a flock whirring into the air or a puffing tug comes too close for their wild hearts, but they fly only a few hundred yards upstream and light again. As they approach 125th Street with its stream of ferries and occasional big ocean steamers, the ducks all leave the ice cakes and shoot away upriver. Against the smoke of factories or dense lanes of automobiles and lofty apartment houses, they are a novel sight. Other wild ducks winter within the City limits too. In the Bronx, where the much-travelled Shore Road bridges a narrow tongue of Pelham Bay, one may, in February, look out at greater scaups rafted in hundreds on the urban waters. Three or four years back they were there in teeming thousands; that was before drought and too many guns had wrought tragic havoc with their ranks. Once the shooting season ends the scaups show little fear of man. In scattered flocks they feed close to the shore, an easy stone's throw from the road, hardly deigning to look up from their diving as cars skim past or stop beside them.

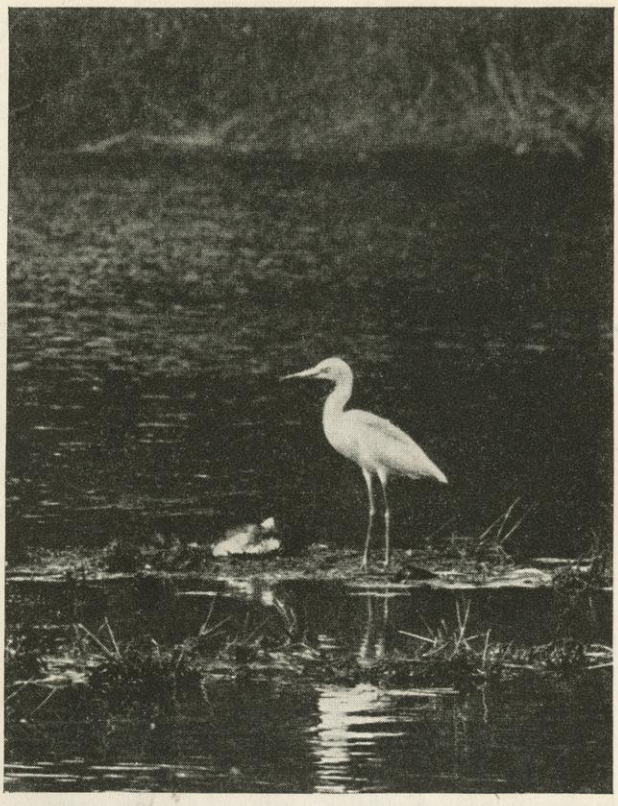
A JUNCO IN A CITY SANCTUARY

The little bird resident lights on a log beside bloodroot and hepatica, now rarely to be found

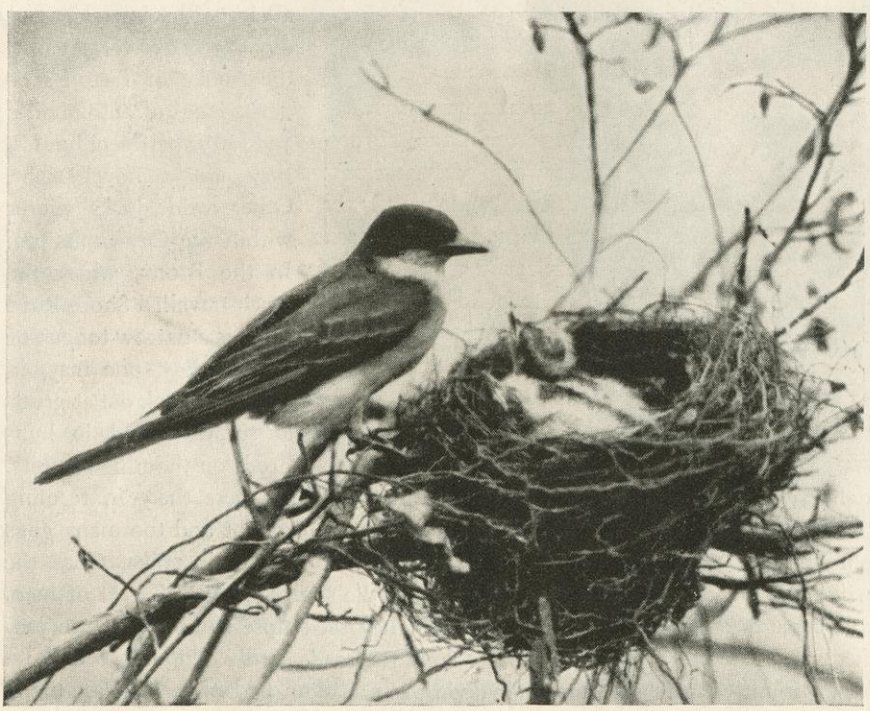
The City's big lake-like reservoirs have their winter quotas of wildfowl too, with mallards and black ducks—and scaups and golden-eyes among them—flocking in hundreds on Hillview Reservoir and a dozen other huge concrete pools.

Paradoxically, the very presence of endless miles of brick and steel renders New York a happy place to watch the drama of migration. Such parks and yards as are scattered sparsely here and there become island sanctuaries where birds concentrate in rich variety and abundance. Because of this I have been able to observe, within a few minutes, a score of species in a single Brooklyn yard during the high tide of late spring migration. Oven birds and thrushes, catbirds, vireos and warblers of half a dozen kinds become marooned together in isolated clumps of grass and shrubs and trees, until night comes again to shroud their journeys over seas of buildings. From such cause, "The Ramble" in Central Park has become a famous bird-walk, where sixty-odd migrant species sometimes can be seen in a single day. And even the shyest birds sometimes tarry long within this altered world that man has wrought. Sparrow hawks spend the year in Prospect Park, exacting an easy living from the gamin hosts of starlings and house sparrows, and a year or two ago it was a classic sight to watch a certain duck hawk dart from his wonted resting place in the eaves of a lofty office building, to filch a pigeon from a flock wheeling over Columbus Circle, in the very heart of Manhattan. Tiny big-eyed saw-whet owls spend every winter in the evergreens of City parks and larger homegrounds, and in summer the little screech owl sounds his mournful trill from the elms along Fifth Avenue itself.

At feeding stations maintained for some years past in one section and another of New York City, I have trapped and banded a varied lot of birds; mourning doves, rails, and other elusive kinds among them. Bob-whites and ring-neck pheasants have joined juncos, chickadees and sparrows of divers sorts about my sunflower seed and chick feed. Catbirds and chipping sparrows have nested among my outskirt lilacs, wrens raised their young in boxes nailed to the garage, orioles swung their silvery cradles high in the sidewalk maples. It is in the large parks, though, that New York birds make their homes in fullest numbers. In Central Park, situated as it is in a Manhattan center of dense population, few species except vireos and like high-nesting kinds can raise their broods among swarming crowds of Sunday picnickers; but in the ample meadows and forests of Van Cortlandt Park, the Bronx Zoo grounds and Forest Park, uncounted wild birds still rear their broods as in the long ago. In one and another of these fine public parks rose-breasted grosbeaks, cuckoos and other retiring forms still may be seen about their homes, and wild



A SOUTHERNER NORTH FOR THE SUMMER
The little blue heron deserts his Southland swamps to spend the summer season on New York's suburban reservoir



A KINGBIRD REARS HER FAMILY
Many a family in the avian world is raised each year within the city of New York

ducks leading their broods from path-side nesting sites to urban creeks. In virgin hemlock forest in the Botanical Garden, veeries still spin their spirals of golden song. Ruffed grouse yet drum their muffled thunder from about suburban reservoirs, and woodcock whistle aloft as spring dusk falls.

New York's warm heart encompasses a world of gardens, ranging from tiny pavement plots to glorious places with trees and pools, trellises blanketed with scarlet blooms for humming birds. Most harbor bird baths and feeding shelves as well as a nesting box or two. All add their bit of encouragement to the ranks of bird-kind, loath as birds are to relinquish their ancestral domain to man.

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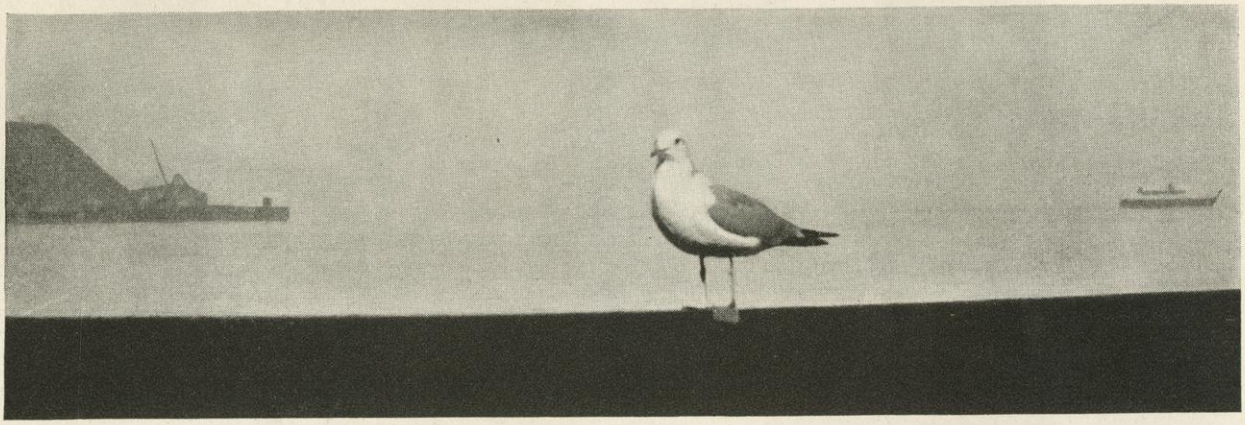

Gulls of San Francisco Bay

By FLORENCE D. GRIFFITH

WHEN Don Manuel de Ayala sailed through the Golden Gate in those far distant days, the sea gulls ushered in his fleet. So it has ever been in each scene of the sea—this bird with plaintive cry, circling, diving, ushering at will. It was the ever-faithful, ever-curious, yea forever hungry and pursuing gull, that gave his sanction as through the pages of history came the now world-famous ferry fleet of San Francisco Bay.

And now, with a dream come true, a dream that threatened to remain always a fancy—the erecting of San Francisco-Oakland Bay Bridge—the sea gulls circle round, perch on or glide past this new path of transportation. They ride, too, the ferries which will perhaps be no more when the bridge is completed—ferries from which bread and bits of delicacy have been tossed to them for many years. Amid the teeming modern activities of San Francisco Bay these birds seem to symbolize the thread of history as it travels the path of modern advancement.

When the greatest ferry fleet of the world is replaced by the longest and greatest bridge of the world—what then of the gulls?—They'll fit their lives into progress, even as do we humans, and—let us hope they'll like it!

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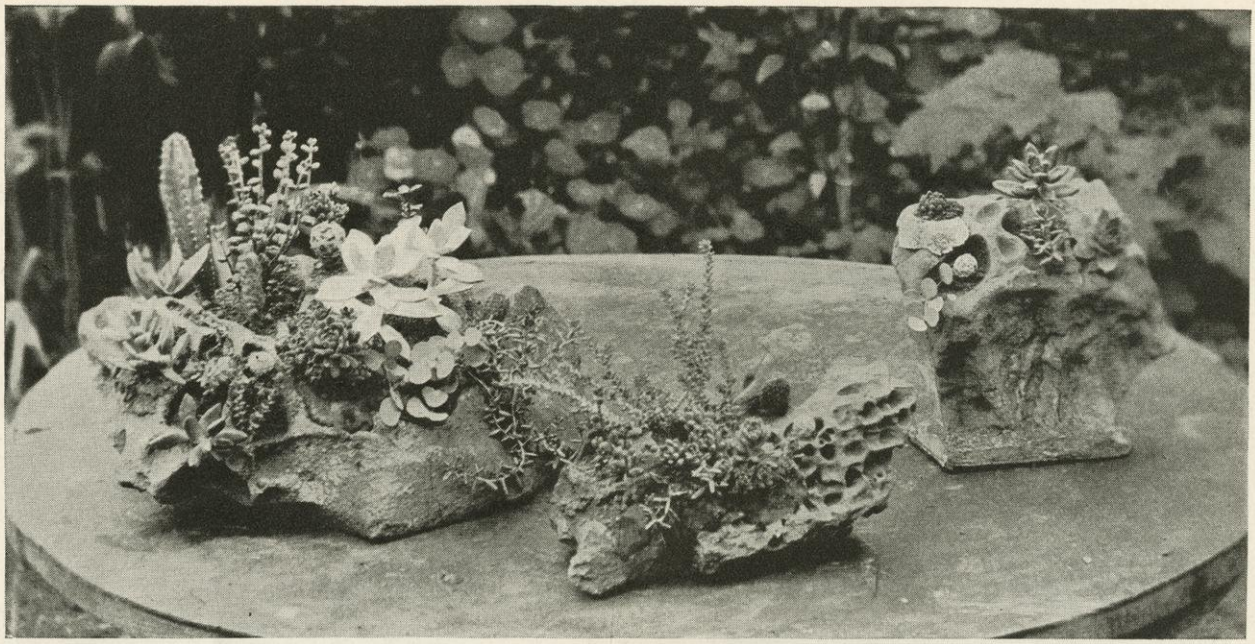
Termite Head

By NATHAN C. JOHNSON

MORE and more householders are discovering that the foundations or other parts of their homes are infested with termites, boring ants that have become a national menace. In fact, many dismayed house-owners are amazed that these insects possess such an ability at destruction and can undermine the building so completely and disastrously. The microphotograph at the right may give some indication of why these insects are so successful in their building-wrecking activities. This picture shows, much enlarged, the head of the termite and his truly frightfully efficient digging apparatus. The life habits of the termites have been carefully studied in order that effective means of control may be devised. The best methods involve the use of concrete for all construction that forms the point of contact between woodwork and the ground.



MINIATURE GARDENS LODGED IN THE PUDDINGSTONE CUPS

This curious rock formation found along the California Coast lends itself to these small gardens in a way that is distinctive and apart from the conventional dish garden

Puddingstone Gardens

By RUTH INGRAHAM

On the Pescadero Coast, in California, is a peculiar conglomerate rock known as puddingstone. The theory of its formation is that under great pressure, presumably at the bottom of the sea, sand and fine gravel became petrified, and the larger loose pebbles and stones that lay in it became fast embedded. In the course of time, either through volcanic action or a more gradual process of upheaval, this conglomerate rock rose above the surface of the water, becoming a part of the coast line. Then, through the action of the waves, erosion took place, the softer sandstone giving way and releasing the "plums" from the pudding. This has left a rock honeycombed by holes varying in size from that of the tiniest pebbles to cobblestones.

When the "dish-garden" idea swept our community, I cast about for something less conventional than bowl, saucer, or manufactured rock container. My eyes were suddenly opened to the possibilities of the dainty, fanciful little pieces of rock brought home from seashore visits.

A dollar or so invested in midget varieties of cactuses and succulents, plus some delightful hours of playtime, brought results. I could not accept the popular notion that all a cactus needs is sand and drought on which to flourish, any more than I could believe that orphans thrive on neglect. The man who sold me the cactuses upheld my theory that nourishment and moisture are essential to their best development. Because the cups and depressions in the puddingstone are shallow, there seemed to be the more need for a rich mixture of soil, so I sifted together sand, leaf mold, fertilizer and garden soil, assuming that each little guest would find sufficient of what he liked to thrive and be happy. I had no formula, but practically everything has lived and flourished.

These little gardens are watered every day—in the heat of summer, more than once—from a bottle having a sprinkler top that permits a light but thorough shower of tiny rain. Some of the soil will wash out of the wee cups; so this has to be replenished occasionally with a teaspoon shovel. The plants grow rapidly, and every now and then one needs to be taken out, separated, and reset; or an ambitious leaf or limb needs to be pinched off or trimmed off with small scissors, to preserve harmony of proportion in the whole effect. Then there is the delightful business of starting another miniature garden with these bits of trimmings; for almost every scrap of cactus or succulent will grow if given the opportunity.

The little gardens develop such charming individualities that one comes to think of them much as live pets. The group in the illustration won two ribbons in the 1934 local flower show. The tallest of the three I named El Capitan. He is a staunch little rock for which I made a pedestal of plaster of Paris by setting him firmly, in an erect position, in a shallow cardboard box filled with the mixture. When it had hardened, I pulled away the cardboard, and there stood El Capitan on his own. He was the first of the group to make his début at a flower show, where he got a ribbon at once. Another garden took on the aspect of a Japanese picture, without any design on my part.

I have not attempted to learn the names of all my plants. At the nursery I merely say, "Please give me one of this, and two of that." Thus I escape being embarrassed by forgetting a lot of long names; to all of like mind, I recommend this method of shopping. Besides cactuses I have used tiny plants of many kinds on occasion.

Thus, by the expenditure of some time and very little money, have come these really beautiful toy gardens.

The Nature Picture of the Month

The Bell Sparrow of the valleys and foothills of California and the Colorado Desert is the subject selected for special award this month. The photographer is Wright M. Pierce of Claremont, California. In selecting this picture it was necessary to choose from among a number of splendid photographs submitted by Mr. Pierce, some of which will appear in forthcoming issues of this section. While some of the others are perhaps more perfect technically, this one demanded patience and represents a triumph over the difficulties of bird photography. The picture was taken with a Graflex camera.

Mammals from Here and There

The Galagos are confined to tropical Africa, where they represent the true lemurs, which are confined to Madagascar. They are clothed in silk-soft fur and are distinguished from all other lemurs by their large, hairless ears, that can be folded up on occasion like a beetle's wings. Other outstanding features are their eyes, rich brown and immense in size in comparison to the head. The Galagos vary in size from that of a squirrel to that of a small cat. The Maholi Galago in the photograph is a native of East Africa. A newcomer to the Galago menage clings to the limb below its mother.

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Not a particularly charming little creature to look at, Zech's mole rat belongs to a family of rodents known as mole rats from their burrowing habits. True to their underground life their ears and eyes are almost rudimentary. The dental equipment reminds one of our own pocket gopher, and points to a preferred diet of roots and bulbs.

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Of all the existing rodents, the Capybara is the largest, attaining a length of about four feet, it may be aptly described as a giant water guinea-pig. It is found in the waters of the great rivers of South America from the Orinoco to the La Plata. While it feeds largely on aquatic plants, it also eats the bark of certain trees, and such fruits as it finds beside the rivers.

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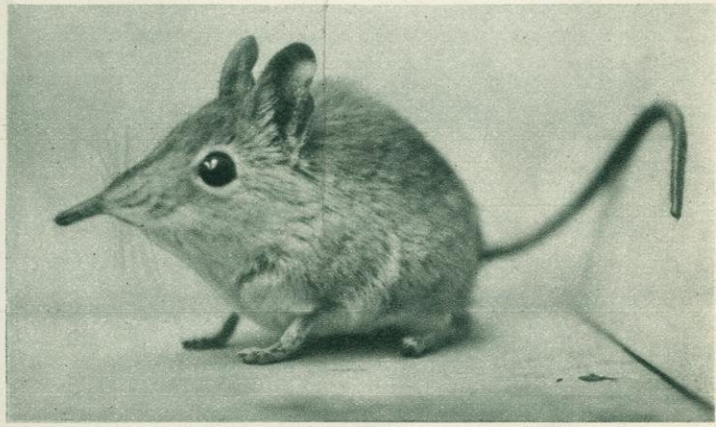
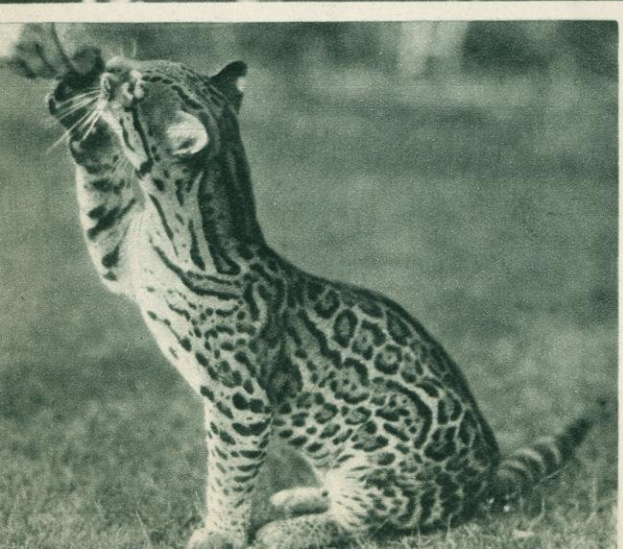
One of the most picturesque of the wild sheep is the Aoudad, or Barbary Sheep, of the highlands of North Africa, which has some affinities with the Goats. Their home is in the mountains of the Atlas range that fringes the Sahara Desert back of Algeria. Somehow they survive and prosper on the sparse vegetation of what is little more than a mountain desert. They are frequently captured and domesticated by the Arabs. The mane covering the chest of the rams give them a sage and majestic look.

From the eastern part of India comes the Slow Loris, differing from the true lemurs in its deliberate motions. It has a solemn, hesitating way in pursuing the insects that make up most of its food. Here it is sneaking up on a banana. Also charged with slowness, or laziness, is the three-toed sloth of Central American jungles, seen hanging upside down to a jungle vine. The ocelot of Nicaragua is far from slow, however, and the little mouse-like jumping shrew of Africa gets about with amazing rapidity. It has to to keep alive. Basking in the Swiss sunlight the marmot seems lazy, but he can disappear from view in the twinkling of an eye.





From such as this the great Stradivarius must have received inspiration for his violin scrolls. Many an artist has drawn upon Nature for designs, and the beautiful symmetry of the uncoiling Ostrich Fern is an outstanding example of Nature's own artistry. This and the following fern pictures by Bruce Metcalfe.

The purple cliff-brake in its native range pretty well confines itself to limestone. Our habit of transporting limestone for building, however, has brought this beauty to many a haunt far from its native ledges, and there it is often tolerant of semi-acid soil, especially if a little mortar joins the rocks of its new home. The bluish gray-green tint of its leaves, which remain over winter, with its shining stems of purplish-brown, makes this a very attractive species. Sometimes, under cultivation, it grows so rankly that the individual plants are merged in the mass, as in this photograph, but even a plant of two or three leaves is a beautiful sight in the crevice of a sheer wall.

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All of our spleenworts are dainty and attractive, but this one with the name suggesting the well-loved maidenhair fern is perhaps the dearest of all. In its native haunts it is likely to find root-hold in such a narrow crevice that it cannot be lifted without injury, but dealers grow such stout-rooted specimens that there is little excuse for robbing the rocks of their natural ornaments. The distinctive name comes, of course, from the shape of the tiny leaflets, which suggest those of the maidenhair. Often the rare walking fern will be a companion of this lovely rock dweller.

To the northern traveler the rusty woodsia brings to mind granite cliffs that border glacial lakes, where masses of this hardy fern form mats wherever they can find root-hold. Not only in our own north, but in boreal Europe and Asia, this ancient dweller has persisted from the time, thousands of years ago, when the vegetation started to reclothe the cliffs that in still earlier ages had been overwhelmed by the grinding glaciers pushed southward by the ice-king. The "rust" that gives the characteristic appearance to its legions, and the common name, are reddish scurfy scales that grow thickly on the under side of the fronds and on the stems.

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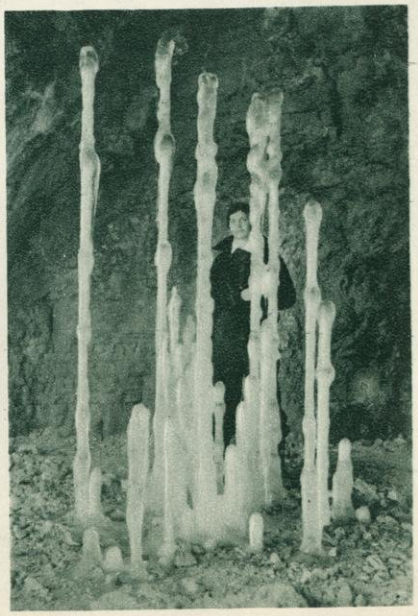
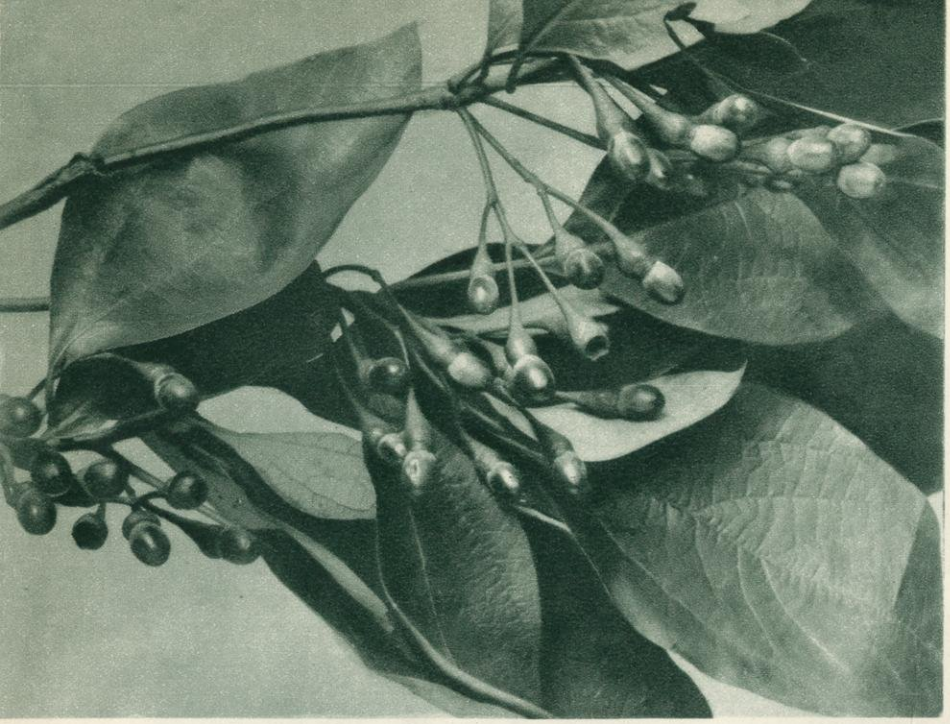
Also northern in its range, and doubtless with a lineage as ancient as our northern woodsia, the common polypody still clothes the wandering boulders and the ledges that have served as the skeleton of the lands of our northern hemisphere since plants came to cover earth's nakedness. It forms a sod of its own on the surface of a rock, and many a boulder as large as a house is roofed over by its mats. In their mountain homes, many a junco or hermit thrush hides her nest in the shelter of a tussock of this friendly fern, which ages ago pioneered to prepare a place for these songsters.

On these two pages are seven pictures submitted by readers to the Rotogravure Editor and purchased in accordance with the offer to buy outstanding photographs in addition to the monthly special award. The picture of the police dog puppies is the work of Frank G. Greissinger of Long Beach, California. While its wings whirred and its long bill sought nectar, Harry L. and Ruth Crockett of Phoenix, Arizona, snapped the shutter of their Zeiss Trona camera and caught this view of the black-chinned hummingbird.

Patient waiting rewarded Raymond S. Deck of Pelham, New York, with the picture of the little blue heron in its immature white garb, stretching its wings.

While the gannets of Bonaventure Island, Gaspe, Quebec, have been often photographed, there have been few more appealing pictures than this one of the mother on her nest, photographed by Mrs. Osborne S. Mitchell of Toronto, with her kodak. Harry and Ruth Crockett are also responsible for the charming portrait of the young male rufous hummingbird proudly displaying its first gorget of feathers. The gargantuan ice stalagmites were discovered and photographed by G. H. Bainbridge of Scotia, New York, in the Tory Hole of the Indian Ladder section of the Helderberg escarpment in Albany County, New York. These were formed by the drip of water through the ceiling rock. Dora E. Mead of Victor, New York, is responsible for the interesting picture of the cypress knees.





By Their Fruits

Photographs by L. W. Brownell

For many of her children Nature has wisely provided her trees and shrubs with fruit, that birds may find strength and that nut-eaters may lay up a supply for the cold season and help the plant to spread its seed. For the Nature lover, also, the fruits of trees and shrubs are interesting to study and useful in identification. All of our fruits and nuts, of course, have been derived from those of the wild. Birds find many welcome meals in the fruits of the sassafras, bluish-black berries with distinctive red stems that culminate in a thick scarlet calyx at the base of the fruit itself. While this tree is not easy successfully to transplant from the wild, it can be propagated from seed or root cuttings and add much to one's home grounds by attracting bird visitors. Conspicuous, both in size and color, are the fruits of the big leaf magnolia. They are less cone-like and more rounded than other species of magnolia, and are distinguished by their marked rose color. They are, however, profuse in the number of seeds, which are easily obtainable. Man has joined with the squirrel in his appreciation of the shellbark hickory fruit. These fruits hold within the thick, woody, yellowish husk a four to six-ridged nut, sharply pointed at each end and enclosing a sweet kernel. The husk splits to the base when the fruit is ripe.

Found in the cool woods, frequently under evergreens, the little red fruits of the wintergreen have furnished a tasty morsel for many lovers of the woods who know its secrets. These berries ripen in October and remain on the plant through the winter and into the next summer.

The hard seeds of the locust are borne in characteristic flat pods. In certain species, notably the rose-acacia or moss locust and the Kelsey locust or Carolina mountain rose, the pods are distinctly showy with a purple color when entirely ripe. Those of the common locust are most familiar.

Growing in the dunes back from the tidal waters and adorning sandy wastes all along our coasts and larger lake-shores the beach pea will be found bearing its well-filled veiny pods. It is also known as the sea, seaside and everlasting pea.

The Virginia creeper, whose five leaflets often help near-poets and amateur botanists to write prose or verse intended to assist in identifying the three-leaved poison ivy, is one of our most friendly vines, apart from its inability to harm us. Woodbine it is usually called in the north, and it is everywhere welcome. It clothes porch or fence with Nature's own screen, clinging with some of its flower stems that have become tendrils, and which also bear disks that stick tenaciously to wood or stone. If you love grateful shade, gorgeous autumn colors, and a bird cafeteria all in one, plant a vigorous root of this member of the grape family. The rather insignificant greenish flowers may be ignored, but not the fruit.

Poke-weed or poke-berry is a rank herb that will come up year after year from a deep taproot. It is one of a group with many species in the Americas, Asia and Africa. An oriental species is cultivated rather widely as a pot-herb, and in the south the sprouting shoots of our own species, *Phytolacca decandra,* are cooked like asparagus, and are preferred by some to that food plant. But it is as a bird food that this rank grower is most useful.

Butternut is the native walnut that bears the long rough-shelled nut that as boys we sought so eagerly in the early autumn. It grows farther north than the commoner black-walnut, and its kernel is more oily, whence its common name.

The American sycamore, also called buttonwood from its pendant fruit-balls, ranks as our largest hardwood, excluding the nut-bearers. A contest some years ago was won by a sycamore in Indiana that was 150 feet high, 45 feet around near its base, and had a spread of 100 feet. The eastern form, *Platanus occidentalis,* is the best known, but another closely related one grows on our western border. One of the most interesting and characteristic features of this tree is its smooth outer bark of greenish white, which becomes loose and falls away in early spring. The sycamore is often planted as a street tree.

Gray's sedge is a notable example of a group usually classed by the ordinary observer as merely a kind of "grass". The clusters of sharp-pointed achenes will serve to distinguish many of the species of this group from other grass-like plants. Sedges are important as furnishing food for many of our migratory birds when they come down from the north.

The sweet gum, *Liquidambar,* is dear to the hearts of the children of the South, for from its bark exudes the delicious gum that gave rise to its common name, and, we suspect, its scientific generic name also. The leaf, with its five to seven sharp-pointed divisions, scarcely ever marred by insects, is one of the most beautiful borne by any tree. In autumn the foliage colors the river valleys with its patches of reddish-maroon.

Owl Quintuplets

Photographed by Edwin Way Teale

It was the appearance of two round gray faces with four round yellow eyes that started the trouble. These peered from a knothole nest about twelve feet up the trunk of a big maple. In this home the parent screech owls had raised a family of quintuplets that caused almost as much excitement as the famous babies of Ontario. It was, however, a desire to photograph the family that brought things to a head.

When, on the early evening of their first appearance at the nest hole, the five were brought down to be photographed, the parents went into action. One straw hat was ruined and the observers fled for safety. The birds were returned to the nest. The next morning another attempt was more successful so far as the parents were concerned, but the quintuplets themselves seemed always to wait until the shutter was ready to click, and then scramble over each other.

Then, in the midst of all this, they suddenly discovered what fun it was to fly. One would launch out and make a bumpy landing, to be followed immediately by the others. When they were posed, the sun would go under a cloud or the wind would sway the branches. By mid-afternoon the cameraman called it a day, but the owlets were still as fresh as ever and objected to being put back in the nest.

THE OWL QUINTUPLETS, QUIET
FOR A MOMENT

Having travelled by air from northern Wyoming, these young antelopes have settled down to a life of luxury on the New Mexico ranch of Arthur Newton Pack, president of the American Nature Association. Just how luxurious an existence is theirs may be gathered by the inviting, out-sized nursing bottles being proffered by Peggy Pack, to whom has been assigned the important post of chief nursemaid to the antelope herd. Only one of the five at the left seems to have an appetite outweighing its curiosity at being photographed. However, they seem to tag along with nursemaid just the same.

★ Conservation ★

A section of Nature Magazine devoted each month to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

ARTHUR NEWTON PACK, *Editor*

COURT DECISIONS HELP ★ ★ ★ MIGRATORY BIRDS

Important decisions that strengthen the hands of the Biological Survey, charged with the administration of the Migratory Bird Treaty Act of 1918, which gives effect to the Migratory Bird Convention of 1916 between the United States and Canada, have been handed down recently. One case concerned an action instituted by certain residents of Kentucky to enjoin the United States Marshal and the United States District Attorney from enforcing a regulation made by the Secretary of Agriculture that deprived them of the right to hunt mourning doves in Kentucky during September. The complaint questioned the right of the Secretary of Agriculture to issue a regulation curtailing their "rights" without giving notice to interested parties and an opportunity for a hearing. The other concerned a violation of the regulation prohibiting baiting the birds. In both of these cases the principle is recognized that hunting is not a right, but a privilege extended to certain persons under restrictions imposed for the benefit of the whole people.

In the Kentucky case the injunction was denied by Judge H. Church Ford, of the United States District Court, Eastern District of Kentucky, at Lexington, Kentucky, on August 31, 1935. The reasons for his decision in favor of the United States (and the birds) may be gathered from the following excerpts:

"In making the migratory bird treaty with Great Britain, the policy stated is to provide adequate protection for migratory birds by establishing close seasons during which no hunting should be done. * * * Congress recognized that, in fixing and altering, from time to time, the close season, regard must be had to conditions of distribution, abundance, etc. * * * It seems clear that, in authorizing the Secretary of Agriculture to meet these varying conditions, Congress was merely conferring administrative functions within the narrow limitations of the treaty, regulated by a very clearly defined standard and to effect a clearly announced purpose. * * *

"To sustain the contentions of the complainants in this case would obviously mean serious impairment, if not the destruction, of all effective national action for the protection of our valuable migratory birds. Such a result would perhaps be far more disastrous to the sport in which these complainants are interested than the slight restrictions of which they now complain. Concern for the welfare and protection of our migratory birds is not by any means limited to those whose chief interest in them rests in the sport of hunting and killing them. The object of providing for their protection and preservation reaches far beyond the motive of the huntsmen and the sport of hunting."

In the baiting case, tried in the District Court of the United States for the Southern District of Georgia, Savannah Division, Judge William H. Barrett, on September 5, denied the demurrer to the indictment against Leo F. Griffin on the grounds, in part, that "prohibition of hunting is general. The lawful right to hunt migratory birds is only where there has been a permission granted by the Secretary of Agriculture. Permission to hunt doves over a baited field is affirmatively prohibited. Thus we have the act prohibiting hunting altogether unless permission be had, and not only an absence of that permission but a positive prohibition by the Secretary of Agriculture that hunting in this way will not be allowed. * * * The result is that the demurrer to the indictment is overruled in each and every part."

These notable cases of recognition that those who do not hunt are entitled to have a say in the disposal of our threatened birds mark added forward steps in our responsibility.

THE DOVE ★ IN COLORADO

The women of Colorado have just given us a heartening instance of what intelligent organization and initiative can accomplish in conservation. We cite the case in some detail, hoping that it will prove an example that may be followed in many other states where equal need for similar activity is sadly needed.

In 1931 the Colorado Legislature passed an act in which occurs a statement to the effect that the State and

Federal laws relating to Migratory Game should conform as to season.

For several years the mourning dove has been protected in Colorado, where it is properly held in high esteem. But Colorado, in common with most of our states, has a diminishing game supply, and the State officials are hard-pushed to find enough game to satisfy the purchasers of hunting licenses, the proceeds of which support the game department. Under the Federal regulations recently promulgated, the duck and goose season does not begin until October 21. So some local sentiment was drummed up in favor of reopening the season on doves, and the Department of Agriculture was asked to grant an open season. Willing, apparently, to assist the sportsmen, the Department granted the request.

There ensued some indignant protests from State officials concerning what was termed an invasion of the rights of the state. This action seems to have brought the matter to the attention of interested people throughout the state. Protests were made by the Colorado Federation of Women's Clubs, backed by the State Federation of Garden Clubs and the Denver Women's Press Club, and encouraged by prominent ornithologists and conservationists within the state, to the Biological Survey, the Federal Bureau concerned, and steps were taken to bring the matter to the attention of interested women throughout the state. The participation of the State game officials was suspected and the suspicion found to be well-founded. Representatives of both the State and Federal agencies expressed opinions that lead the general student of conservation, unprejudiced except in favor of the helpless birds, to conclude that the responsibility was divided. But the champions of the dove were less concerned with the details of responsibility than with the fate of their cherished bird. They put the matter up to the Governor. He decided that the laws of Colorado give protection to the mourning dove, and that the laws will be enforced.

We cannot refrain from pointing out that these organizations, made up of intelligent thoughtful women, possess a power for the protection of our harassed wild life that needs to be developed. This is not the first time that their power has been invoked, and, since the need for their services seems to be constantly increasing, we hope to see the women of all worthwhile organizations take the place in guiding conservation policies that their mentality and inherent humaneness so earnestly urge.

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IDEAS CHANGE ABOUT KILLING OF THE COUGAR

It is always a source of satisfaction to have one's prediction come true and one's stand vindicated. We have always held that man was again upsetting Nature's balance by organized warfare on cougars and other predators, and that, in so doing, was creating additional problems. It is with pleasure that we quote the following from a radio talk prepared by the National Park Service for use by its representatives:

"There has been a decided change in ideas since the day when it was thought imperative to kill off all the cougars, horse-killing cats and destroyers, as they were called. Here is a picture of what happened in Kaibab forest which is on the north rim of the Grand Canyon. The deer had increased by 1919, since all the cougars had been killed, so that the range was threatened. They were beginning to consume more forage than the range could produce. The deer kept increasing and the forest kept diminishing. By 1924 the deer had increased until more than seventeen hundred were counted in one meadow. Winter came, deer died of weakness and starvation and those that lived ate every leaf and twig they could reach, until the whole country looked as though a swarm of locusts had swept through it. Finally, as the only cure, the country was thrown open to hunting and by 1930 the deer were greatly reduced. But it will probably take fifty years of careful management to cover the scars made by this over population of the deer as the result of overgrazing. Not only had the cougars been killed off, but the coyotes, bobcats, and eagles, all of which help to keep down the number of deer. So man, the arch predator, had to take their place in the emergency.

"If there had been more moderate hunting of both deer and predators, the situation in the Kaibab forest would not have occurred. Deer and cougar have lived together for countless centuries before the white man came along to protect the deer. We can only conjecture the part that the cougar has played in developing the deer into a creature of fleetness, grace and alertness. We do know however that when predators have been removed from certain areas deer have lost their fleetness and beauty."

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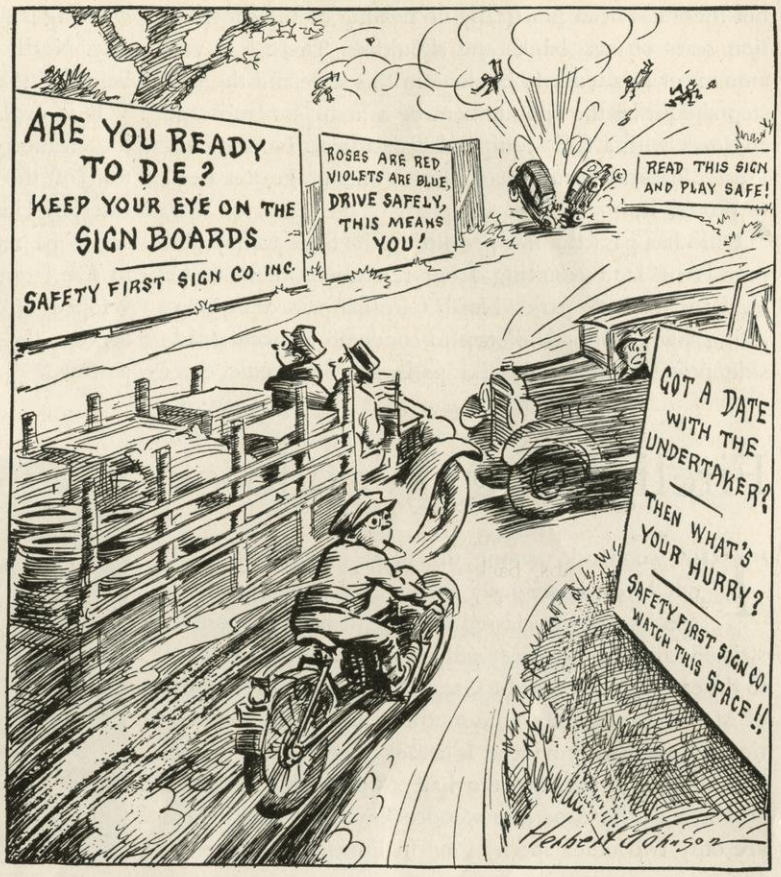
With Warren F. Eaton in charge of the special department of the National Association of Audubon Societies for hawk and owl protection, the Hawk and Owl Society has called upon its members to throw their weight behind his work. Mr. Eaton, organizer and first secretary of this Society, has been forced to resign as secretary in order that he may devote himself to his new responsibilities. Feeling that it would be wasteful to duplicate the work, the Hawk and Owl Society will cooperate with the National Association but continue as an organization, for the moment to a less active degree than it has up to now.

The Living Wilderness is the name given to the publication of the Wilderness Society that makes its bow with a September issue. We welcome this publication to the conservation field. Both the magazine and the Society are dedicated to the vital and considerable task of checking the currently increasing trend toward sacrificing the little remaining wilderness area in this country on the altar of so-called progress and development. This first issue of the magazine is introductory, setting forth the real—even dire—need for action and laying a foundation of policy and fact as indication of the task ahead.

Progress in Roadside Legislation

By ELIZABETH B. LAWTON

Chairman of the National Roadside Council



MAKING THE HIGHWAYS SAFE—FOR SIGNBOARDS

RESPONSIVE to a growing public demand for control and improvement of the environment of the rural highways, many measures were submitted to State Legislatures during their 1935 sessions. Many of these failed of final enactment largely because of the effective lobbies of the organized billboard industry. Other measures were successful in progressive states where the public regards safe and enjoyable driving on highways, built at great expense by the people, as more important than the activities of an industry capitalizing upon this vast public expenditure.

Maine, one of our greatest summer vacation states, witnessed a determined fight by the billboard industry against the enactment of a law requiring a license fee from each sign company and a permit fee of one dollar for each sign. The measure, which was passed, also prescribes a fifty-foot setback from the center of the travelled highway and forbids the erection of signs within 300 feet of any public park, reservation, public forest, public playground, school, church, or cemetery. No sign may be placed within 300 feet of the intersection of the highway with another highway or railway where vision would be obstructed.

With the terrible toll of motor accidents on the highways still mounting, increasing recognition is being given to the distraction of attention by billboards. These signs are placed where they will be most certain to attract attention, and curves and intersections are favorite sites. The message of the billboard is designed to command the passerby to look, and highway authorities are beginning to realize that it is that momentary look that so often results in disaster.

Another interesting development in roadside improvement is found in legislation restricting signs on places of business. Maine's law provides that a roadside enterprise with not more than two signs, and neither more than 100 square feet in area, is exempt from restriction. All signs more than these two pay the usual permit fee of one dollar. Such a law will improve such a highway as U. S. Route 1 between Portland and Portsmouth, along which hundreds of filling stations, fried clam booths and other enterprises affront the eye with fifteen or twenty signs each.

New York took cognizance of the same idea in the MacNaboe Law, barring signs from places within 500 feet of parks and parkways, except where they are erected upon business property and are not more than 24 square feet in area and do not extend more than 15 feet above ground level.

In California, this year, defenders of the roadsides had a fight to kill six bills fostered by the billboard industry and designed to vitiate the present law. The California Roadside Council reports a complete victory.

In New Jersey the Roadside Council successfully fought off the attempt of the billboard industry to revoke the present tax of three cents per square foot on all signs. Full effect of the New Jersey law has been held up by a ruling of the tax commissioner holding that renewals of contracts for signs erected prior to January 1931, when the law went into effect, exempted these signs from taxation.

Strong fights were waged in both New York and Connecticut for effective billboard legislation but the billboard industry lobby was successful in defeating them. Increased public sentiment was aroused, however, forecasting future support.

New York State should soon rank among the states leading in roadside development if she carries out the intent of her new law which authorizes roadside planting along present highways and requires the planting of slopes and shoulders and the setting out of roadside

trees on all new construction. For some time, under the influence of Colonel Green, Director of Public Works, the state has been planting elms along main highways, but there has been practically no healing of the construction scars on raw banks and shoulders. There is a vast amount of this work to be done in this state and the first step should be the appointment of a first-class landscape engineer with a fully-equipped department. No state has greater natural beauty than New York, or greater need to protect it.

Ohio has passed a law permitting the State to buy odd parcels of land resulting from relocation, these to be used for roadside parks. North Carolina passed an interesting law enabling the State to condemn adjacent roadside property along Federal parkways for scenic easements. While this law was passed primarily to meet the Federal requirements for the right of way along the projected Shenandoah and Great Smoky Parkway, the wording is sufficiently broad to apply to any Federal parkway. North Carolina already has the power to condemn land for roadside parks.

It is expected that a great impetus will be given to the creation of roadside parks through the proposed action of the Land Program of the Department of the Interior. Unproductive lands adjacent to main highways are to be retired and used as recreation areas. Ranging in size from five to five hundred acres, they will be developed through the cooperation of the National Park Service, the Land Program and the State Highway Department.

Firelighting Woodcock

THE woodcock, among the more interesting of all our birds, is seriously endangered. Among all our species that are classed as game, it has the most restricted range, for it exists only in our eastern states west to the eastern border of the Great Plains, south to the Gulf of Mexico, and north to the southern part of the southern tier of Canadian Provinces. It breeds over its entire range, and winters in the southern half. Within this restricted area live all the American woodcock in the world. There are only two other species, one in Eurasia, the other in Java.

Woodcock have always been favorite quarry since wildfowling was classed as a sport. While North America's larger game birds remained abundant the woodcock held its own fairly well, for the devotees of sport were relatively few in number. But this condition was not to last, for, with the increase in population and the numbers of sport shooters, the stock soon dwindled. A bird that lays only four eggs, and is exposed to gun fire from July to April, must soon feel the strain. Thirty years ago it was classed as a disappearing species by some of our leading naturalists and sportsmen. Twenty years ago, after the enactment of the Migratory Bird Treaty Act, under which it receives Federal protection, its removal from the list of game birds was demanded by many, but this was not to be. Gradually seasons were reduced, and bag limits were lowered, until the legal daily limit was set at four, and the season at one month. But since the month begins in the northern part of the bird's range in September, and advances by stages as the birds move south, some of them are exposed to the gun for four months. Need we say that the woodcock continues to decrease?

In the Federal regulations governing the hunting of woodcock, for the present year, one-month open seasons are provided as follows: Wisconsin, *September 23 to October 23;* Maine, New Hampshire, Vermont, Michigan, and North Dakota, *October 1 to 31;* New York (including Long Island), Delaware, New Jersey, Pennsylvania, Ohio, Indiana, and Iowa, *October 15 to November 14;* Massachusetts, Rhode Island, and Connecticut, *October 21 to November 20;* Missouri, *November 10 to December 10;* Maryland, Virginia, West Virginia, Kentucky, Arkansas, and Oklahoma, *November 15 to December 15;* and North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Louisiana, *December 1 to December 31.*

The western limit of the woodcock's range includes the extreme eastern parts of North and South Dakota, Nebraska, Kansas, and Texas, and in this strip the bird occurs in comparatively small numbers. Of these states, only North Dakota and Oklahoma permit its shooting; in the others it has protection by State laws. Other scattering states that forbid its shooting are Illinois, Tennessee and Florida.

When we were boys we read in an old *Harper's Magazine* a very interesting story of the woodcock. It was written by T. B. Thorpe and appeared in May, 1869. The general characteristics of the bird were given, and how it was beloved of the sportsman. But what most interested us was the story of a method of hunting it called "firelighting." The scene was laid in Louisiana, and a spirited drawing showed how it was done. A stalwart negro, who accompanied the hunter, carried a pole from which depended an iron basket holding a fire of pine knots that lighted up a good-sized area of Mississippi River bottomland, and revealed to the "sportsman" the bewildered birds that he sought. The tender birds were cut down at short ranges, and even the method of charging the

muzzle-loaders with the small loads that were necessary to avoid blowing the birds to pieces is described. We quote:

> There is no sport on the globe more thoroughly favorable for the winter home of the woodcock than the narrow strip of country running from the mouth of the Mississippi up the river for about three hundred miles. This alluvial formation in winter is about equally divided between lowland and half-dry swamps. Here, hidden away among the almost impenetrable cane-brakes, lagunes, and bogs, with an abundance of food that is almost incredible, the woodcock flourishes in unprecedented perfection. Here, in Louisiana, the bird becomes thoroughly nocturnal, and life-long residents in the vicinity of its haunts, who make day-hunting a constant pastime, never have the slightest idea that the woodcock is in the locality; in fact, I doubt if the bird in Louisiana was ever hunted in the ordinary way with dog and gun. On the contrary, a murderous sport, entitled "Woodcock Fire-lighting" prevails, which is so unusual that our literal description of it, published many years ago, was deemed by the highest authorities "the chimera of a distempered brain". * * *
>
> Your natural repugnance to the unsportsmanlike means of proceeding is overcome in the excitement. The indulgence in wickedness blunts moral sensibility, you begin to like this thing. * * * Two hours sport and you have slain at least thirty birds, and the torches, which are flashing all around you, have followers equally successful.
>
> Proud of your success, so far as the possession of the game is concerned, but inwardly conscious of the illegitimate character of the sport, you wend your way home, and don't get thoroughly satisfied with yourself until you dine off the birds, which you consider came so questionably in your possession—a well-cooked Louisiana woodcock, thoroughly roasted, spitted on his own bill, and properly tempered with condiments, and a glass of generous wine, with good company to keep you in countenance, is a great quieter of even a sportsman's uneasy conscience.
>
> So abundant, indeed, are the woodcock at times in the regions we have alluded to, that unconscionable fellows of the baser sort have gone out at night, armed with a torch, and beaten the birds down with long reeds; and thus obtained, we have seen them hawked about in the picturesque streets of Louisiana villages at the nominal price of a few shillings a half-bushel. * * * The apology or defence of the unseasonable hunter, "that if I don't kill the bird somebody else will", is a sophism unworthy of the true sportsman. It is difficult to resist the remark that the law should protect this valuable bird from indiscriminate slaughter. Under the same sun, in the same Everglades, and beside the same streams, which in times past were musical with the simple and plaintive note of the woodcock, we now find scarcely a bird. They have been driven away by the pot-hunter, and by the criminal thoughtlessness of "gentle people", who can not, as will the pot-hunter, excuse their conduct under the necessity of pecuniary gain.

All this happened nearly a century ago and may be supposed to pertain to a custom practised only in the good old days before restrictions were imposed on sportsmen. We have read many pages relating to woodcock protection during the past thirty years, but we recall no statement in print that even implies that this method of killing woodcock is still employed on the banks of the lower Mississippi. Yet even now, this year, with this beautiful bird fighting its last helpless battle for existence, it faces annihilation by a method that the writers of the sixties were ashamed to describe. Even now, with the full knowledge of the authorities, both State and Federal, and with the added help of modern equipment in the way of guns and means of illumination, the woodcock, breeding mainly in the northern states, and seeking in winter their ancestral haunts in the south, are slaughtered by firelighting without regard to daily or seasonal limits or the principles of common decency.

This practice, as we learn from reliable sources, is particularly prevalent in the region north of Lake Pontchartrain. Here, an industrious hunter may bag in a single night as many as fifty birds and in a season as many as a thousand. In adjoining parts of Mississippi, where the woodcock is less numerous, the same methods prevail, but are naturally less successful. We have no knowledge as to the aggregate numbers destroyed, but it must be very large. The birds command a market price of about one dollar each, which is reasonable considering the growing scarcity of this delicacy. Apparently the hunter has ready cooperation in his work of extermination from those who ought to know better.

We cannot suppress the suspicion that the influence of those who support this local industry is a vital factor in the apparent inability of the authorities charged with the protection of this migratory bird to take cognizance of the disgraceful state of affairs thus briefly outlined. Shall we calmly wait, year after year, several decades after well-informed authorities have pointed out the threat of extinction that hangs over this unique bird, while the officials who are supposed to protect it publish their schedules of legal seasons and bag limits, knowing all the time, better than you and I, the true state of affairs? In other words, shall politics continue to drive to extinction our woodcock, as it is destroying our waterfowl?

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THE Sam G. Anderson Memorial Association, whose object is to perpetuate Anderson Hill Wild Life Sanctuary, has recently been incorporated.

Sam G. Anderson needs no introduction to conservation-minded readers of NATURE MAGAZINE. To all others we will state that Mr. Anderson was a sportsman of the old school, one who lived to see the apparently inexhaustible wildlife diminish dangerously under the many unfavorable factors that accompany the intensive occupation of the land. This condition many have seen, but all too few have drawn helpful lessons from the experience. Sam Anderson was one of those few.

Long before his counsel was sought as a member of the Advisory Board, Migratory Bird Treaty Act, he had established a Wild Life Sanctuary on his farm near Hutchinson, Minnesota, and had given to it generously of his time and funds. Always honest and fearless, he brought to all gatherings interested in conservation an original viewpoint emphatically and clearly stated, such as is too seldom encountered in such places. His pleas were always on the side of the birds.

Sam G. Anderson has gone away, and so his friends have associated themselves to preserve the Sanctuary that typifies his attitude toward the wild things that he loved.

We bespeak the kindly offices of all friends of Sam G. Anderson, and this means all those who are interested in the fate of our wildlife. J. F. Gould, 2540 Park Ave., Minneapolis, Minnesota, is Chairman of the Association.

PLANTING SEEDLINGS IN A FOREST PLANTING IN MICHIGAN

PHOTOGRAPH FROM THE U. S. FOREST SERVICE

In planting such a region as the shelter belt, however, young trees will not be planted so close together and the processes of planting will vary with the special problems of the area

Covering Nature's Nakedness—A Sacred Duty

By FLOYD A. JOHNSON

Not being a forester except from a practical point of view the writer rather hesitates to venture far into the subject of trees—those noble masterpieces of the Master-Builder. However, having been a close and observant student of Nature since early boyhood I have, through painstaking observation, definitely come to the conclusion that Nature herself has set aside certain portions of her anatomy upon which she will tolerate and provide the proper nourishment to foster and encourage the growth of various species of trees, both hardwood and soft wood, both deciduous and coniferous; and too, she has set aside other portions whereon she has forbidden the same trees to flourish. Regardless of all this, how often we find ourselves arguing with Nature over the matter, even going so far as to work contrary to her wishes and purposes by expending much time, labor and money in an effort, I might say a sincere effort, to have trees in the form of windbreaks and woodlots on sites and in locations where Nature never intended trees to grow. Any time man works contrary to the established rules of Nature he will, in the end, defeat his own purpose.

The heading of this discourse might, at this point, appear confusing. However, I hasten to say that it is indeed a sacred duty to cover Nature's nakedness, but let me mention before proceeding further that it was not to be construed that all this said nakedness was to be covered with trees—there is other cover that should, and must eventually, be supplied where trees can never be utilized; however that will be discussed later.

It is scarcely necessary for me to draw the reader's attention to the fact that in most parts of the great prairie region of the Middle West trees were originally confined to certain localities on the natural drainage area, usually along tributary streams; the lesser ravines and gulches of the upper watersheds; low spots that accumulated more or less moisture during rains and the spring thaws; and, of course, all lowlands adjacent to our larger rivers and creeks. Why was this true? Simply because it was the most natural place in the world for trees to take root and grow. They were possessed of the richest of soil through water erosion action; they were bountifully supplied with the necessary moisture at all times to produce growth; and because of these two most important reasons, plus a seedbed constantly prepared to intercept floating seed during the decline of each freshet, Nature selected these locations for her tree claims of the prairie states.

Yes, it is true that man has started and made a fair success of trees on the upland. It can be done where cost and constant care is not considered, but taking all instances where artificial cultivation and watering has not been resorted to and I dare say very few trees of a worthwhile development will be encountered, and when these are, they will be found in locations where more or less surplus water is trapped and permitted to find its way to the subsoil after each shower. Growing trees on a scale that is absolutely required of us today can not be accomplished on the average rank and file of upland in the Central States unless a constant system of irrigation is supplied, and of course that is impractical.

When the great Tree Belt for the Central States was being mentioned, great things were being predicted for it. Under the original plan it was impossible for me

to get excited about it—perhaps I should have, but I didn't. In the first place, on the uplands, with a soil made by Nature to supply grass for buffalo and cattle, man cannot change the country suddenly into a tree producing area—it simply cannot be done in a practical, successful and economical manner without irrigation. There are, however, certain areas within this proposed Tree Belt that are producing and will produce trees, but you cannot lay the country out into checkerboard pattern or strips and then tell all those flat acres and bald upland knobs: "you have to produce trees for our Tree Belt Program". So I am happy to see the plan being reconsidered, moderated and whipped into one that will cooperate and work hand in hand with Nature—not with her here and against her there—like a balky team.

Insofar as the Tree Belt is confined to those locations where trees have demonstrated their ability to survive and grow it will be a success and I am for it—the more acreage it includes the better for mankind it will be, but let us confine our efforts and spending to locations, and to species that we know will pay some dividends. If it is wind and water erosion on our uplands that we wish to check, let's do that with grasses, sweet clover and brush growth—the way Nature would do it if we would only keep livestock, the mower, the plow and fire away from it a few years. By management of this kind the cost would be more in keeping with the results which we would have every right to expect. It is not the intention of the writer to criticise any practice being carried out by any forestry department, but merely to express one man's views on a subject which strikes close home. This article cannot be concluded without saying a word in praise of the noble work being carried on by members of the hundreds of CCC camps now located throughout the United States. These camps are doing a mighty good job in two ways—they are giving our young men a worthwhile training and they are benefiting our forested areas in several ways. It is hoped that these camps will become a permanent fixture. To my way of thinking they are the greatest single thing in the "New Deal", and are producing results which will be more and more appreciated as time goes by.

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Guests in the House of Nature

"MOTHER NATURE" is a phrase that should not be spoken without thought of its meaning, but rather with full intent and reverence. Nature not only is our mother by generation, but, a true mother, she offers always that solace we humans so often sorely need. Where do we turn, instinctively, to rest the body and soothe the spirit? Where to escape from the rush and jangle of every-day life, and to seek respite, even if briefly, from clashing human contacts? Where but to Nature, her woodlands and waters, to be at one for a time at least with trees and herbs, and all living things?

Seekers of recreation, comfort, peace, we are guests in Nature's house and we should so conduct ourselves. Not only courtesy as guests, but gratitude as pilgrims to a healing shrine, should guide our actions. How then do we behave? Alas! that it must be confessed man's behavior towards Nature has been as a rule anything but that of courteous guest or grateful worshipper. Rather has he been an ingrate and a vandal.

Assuming that everything must be subjected to his imperious desires he has devastated woodland and marsh, polluted lake and stream, and so disregarded the interests of his fellow creatures, all children of Nature, that in some cases he has already caused, and, in many others, now threatens to cause their extermination. The killing of wild creatures for so-called sport, that is, for fun, is an extreme example of a human attitude toward Nature that is the very opposite of what it should be.

Some of us understand the situation and are greatly concerned about it, others understand and do not care, while still others neither know nor care. Those who know nothing of the impending extinction of many forms of wildlife may be light-hearted and because of their ignorance excused. Those who are exploiting Nature, however, surely realize the situation at least in part and should have an attitude quite different from the defiant one they so generally assume. Those of us who both know and care are today almost in despair as to the fate of our wildlife.

If the exploiters, those who apparently have no feeling that they are Nature's guests, cannot be curbed, there is no hope; the process of extermination will go steadily on. If all those in some degree Nature lovers will work faithfully at all times for the cause, possibly the exploiters can be curbed.

If a way can be found certainly to insure the preservation of Nature's children all, it would be for us a most wonderful, a most beautiful thing.

Nature has been most kind to us, should we not repay her?

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With more and more attention devoted to conservation problems, there is a coincident demand for trained men in conservation work and a demand for courses of training. Several colleges, including Pennsylvania State College, now provide such courses with a well-rounded curriculum in this field. Qualified men with a viewpoint of interest in wildlife for wildlife itself are a great need.

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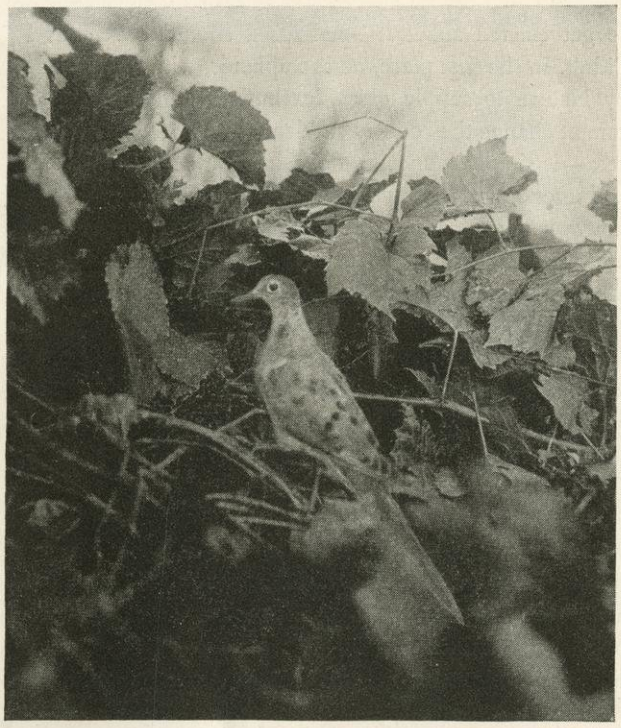
Out in the Lake States foresters are having their troubles protecting their tree plantations from the ravages of the snowshoe rabbit. The snowshoe rabbit varies in population over seven- to nine-year cycles, and becomes exceedingly numerous just at the end of the cycle. It is at this time they raise the foresters' blood pressure by making hearty meals on the succulent buds of newly planted trees.

THE MOURNING DOVE



ABOUT a year before his death, Edward Howe Forbush, one of the few genuine conservationists who ever gained a seat on the Federal Migratory-Bird Advisory Board, told us that he was convinced that the mourning dove would go the way of the passenger pigeon unless some means could be found to limit drastically its shooting. At that period the inhumanity of luring the birds to the shooting fields by baiting with grain or, in the drought regions, by water, and of allowing its shooting as early as September 1, when many of the birds still have young or eggs in the nests, was being brought forcibly to the attention of bird lovers and the better class of sportsmen. When Forbush died, there was no one of like caliber to take his place on the board, and the particular line of defence that he had planned was never carried out.

There have been, it is true, some efforts to reduce the rate of decline of this lovable bird. Its baiting, after a series of bitter battles, has been outlawed, and the daily bag-limit has been reduced from the twenty-five per day that was then prevalent. During the past few years, the Labor Day hunter in the southern states, coming back from his day of sport in the broiling sun, has been entitled to bring home not more than fifteen or twenty decomposing doves in his game pockets.

The mourning dove is everywhere a favorite. Its habits are virtually irreproachable for it is a year-long destroyer of the seeds of many troublesome weeds, and it is very seldom injurious to harvestable grain. In the crops and stomachs of three doves were found respectively the seeds of 6500, 7500 and 9200 weed-plants. The bird lays only two eggs at a clutch, but has been able to maintain its numbers to a remarkable degree by its habit of raising several successive broods, especially in the South. Eggs have been found in some part of the United States in practically every month of the year, but May, June, July and August are the principal nesting months.

In conformity with the greater degree of protective consciousness that has long been the rule in the northern states, recognition of the dove as a legitimate game bird has until recently been confined almost entirely to the southern half of the United States. The period of the dove's importance in this direction dates from the time when the bobwhite, following the vastly increased shooting that accompanied the common use of the breech-loading shotgun, began to become scarce. With the depletion of the bobwhite, and the growth of sentiment against the killing of robins, meadowlarks and nighthawks, the abundant mourning dove advanced in favor. Now it is popular as a means of satisfying the demand for targets—a demand that is fostered largely by the commercialization of sport to an extent that has led to the recognition of game-killing as an adjunct to a major industry that must be kept alive at all costs.

True to their traditions, and influenced in part by the lesser abundance of the dove there, the northern states have continued to consider this bird as too precious to be sacrificed for sport. But as other small game has grown scarcer, an increasing pressure to legalize its shooting has gradually resulted in its being added to the game list in Illinois, Minnesota and South Dakota. This year Federal regulations have recognized this demand, and further, at the request of the State Game Warden, granted a Federal open season in Colorado, where the bird has been protected for several years. But both the State and the Federal Government failed to reckon with the women of Colorado, who promptly petitioned the Governor in such numbers that he wisely issued an announcement declaring the state law protecting the mourning dove to be in no way invalidated, and that it would be enforced.

Of even greater importance may be the decision of a Kentucky judge presiding over a recent case in Federal court. Not content with the more than liberal open season that the Federal regulations afford (September 21 to January 5) local sportsmen instituted an action to enjoin the Federal officials from putting into effect a regulation that delayed the opening of the shooting season on doves until September 21, and which deprived them of the right to hunt doves for the entire month of September.

In denying the injunction, the judge pointed out that: "Concern for the welfare and protection of our migratory birds is not by any means limited to those whose chief interest in them rests in the sport of hunting and killing them." This recognition by high tribunal of the fact that the cause of protection far transcends the motive and concern of the hunter enunciates a principle that has been far too seldom put into effect, and in consequence our wildlife has suffered a degree of persecution that in some cases has resulted in actual extermination.

HOW THE BUNKHOUSE LOOKED WHEN TRANSFORMED INTO A NATURE HOUSE

The collection was built up hit or miss but every item in it had some real relation to the life and experience of the Girl Scouts who brought it into being

A CAMP VENTURE

Wherein the gray-haired "Bird Lady" builds a Nature House

By ISABEL TREMBATH

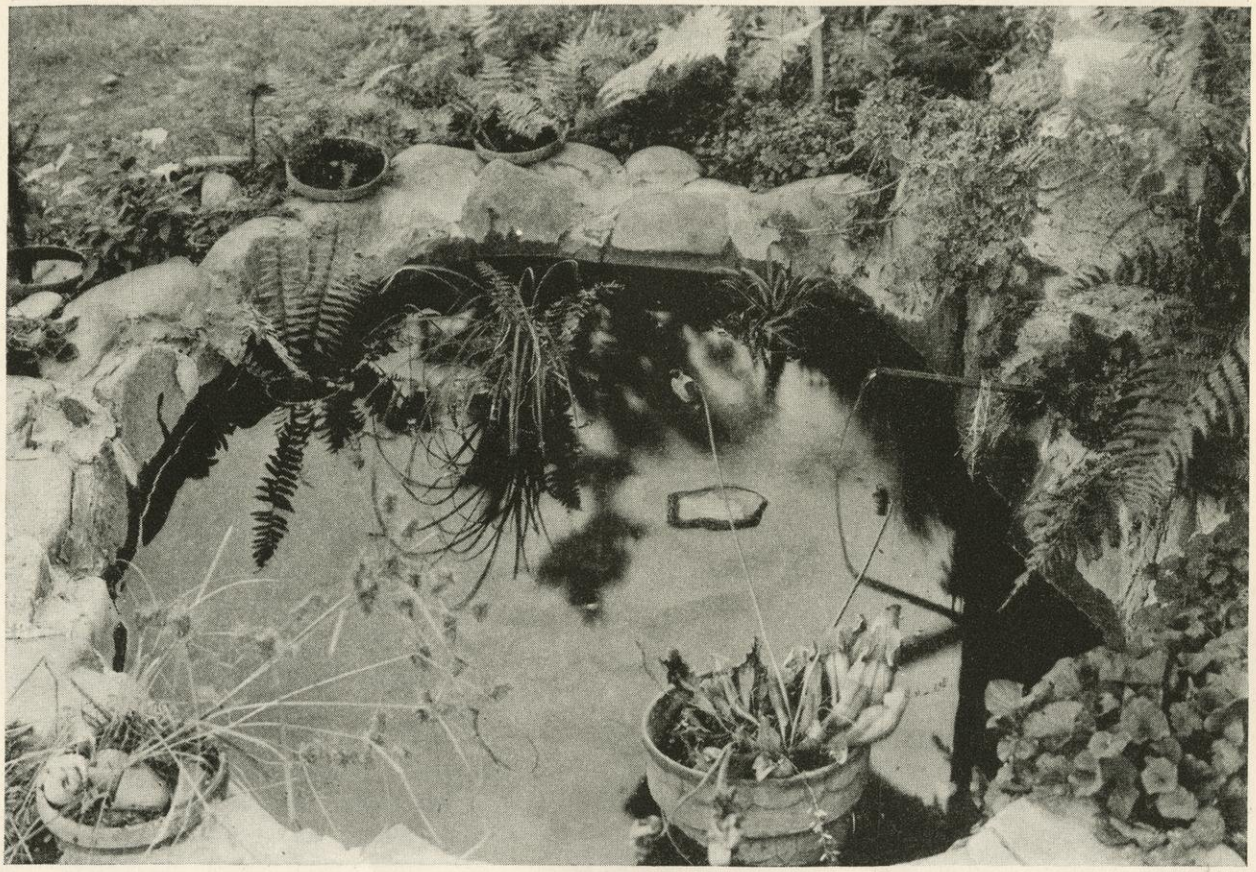
"NO MORE book-trained Nature teachers for this camp," said the Powers That Be. "We want a Nature Counsellor who has been trained outdoors, and we want a natural history museum on the grounds for our Girl Scouts."

The gray-haired "Bird Lady", who had never taught anything in her life, and to whom Nature was an absorbing hobby only, gasped and protested that she knew nothing of museums, almost nothing of Natural Science, and absolutely nothing of Girl Scouts! The Powers That Be said it was "time she did!" So she was taken to the camp and vaguely told that "here was her job." At this point, the Powers That Be discreetly vanished.

The prospect certainly was not encouraging—one large room at the end of an old but solid bunkhouse, that had been used to store canoes; no funds to speak of, and no equipment, except a few books and some back numbers of NATURE MAGAZINE; a crate of flower pots and useless bird houses from the five-and-ten. "Impossible!" said the Bird Lady. But wait! Outside was a broad open meadow, surrounded on all sides by a fringe of woodland, the grand old Susquehanna River at its feet, and tall Pennsylvania mountains towering above it. An indigo bunting was singing among the dogwood blossoms; grand old pines and tulip trees, and elms nearby; giant sycamores were along our side of the river bank; a gleaming array of white birches crowned the cliffs on the other side of the river. A rabbit nibbled clover at the edge of the open, and a colony of wasps were busily building a nest on the wooden awning over the window.

No equipment! Why, there was everything right at hand for a Nature House, and Girl Scouts by the hundreds, or so, to help assemble it. The word "Museum" was dropped then forever.

The old bunk house was scrubbed until it looked and smelled clean. The four big screened windows were brushed free of spider webs, but the wasp nest was not disturbed—it was our first exhibit. A long table for specimens was brought in, a smaller one for a work table, and some pictures of mammals, birds and flowers covered our bare walls; benches put in place, and we were ready for business. Any Nature House business must flourish



THE OVERFLOW FROM THE BUNKHOUSE WENT OUTDOORS

The pool in the Nature House garden boasts a hungry frog and many wild plants grow about it and in the shade of the new plantation of trees made by the Scouts

when eager Girl Scouts tell helpful friends what they are doing.

The Public Library from a nearby city loaned us a collection of carefully selected books on Nature subjects; somebody brought some fish bowls; someone else donated goldfish. A one-legged English thrush, donated by a pet store, was established in a large cage, where he lived happily all summer. From a nearby lake came a dozen lovely small turtles. A collection of beautiful shells and corals was contributed, soon followed by an old-fashioned bookcase with glass doors, in which we could keep our treasures.

A nearby bit of woods proved to be a veritable nursery for ferns, and our stock of ten-cent flower pots, soft green in color, were just the thing to hold precious specimens. Our long table, covered with oilcloth, was charming with one specimen of every kind that would live happily with us during the summer. When camp closed these were carefully set out among their larger relatives which would not live in the Nature House, but sojourned outside in the wild garden.

And how our exhibits multiplied! Beautiful mosses and fungi, and sometimes wild flowers, although picking flowers was discouraged.

Bees, hornets, katydids, and various other buzzy insects live comfortably in glass jars, as do crawly caterpillars, jewel-like beetles and gorgeous butterflies. Wild babies, such as rabbits or woodmice, are kept, admired, and studied for a little while and then released, for the Nature House rule is never to make anything unhappy.

Charts for study of trees, flowers, ores and a large bulletin for the recording of our camp birds begin to crowd the pictures on our walls, leaf prints in spatter work and smoke prints must have a place, plant collections grow, and we just naturally overflow to the outside of the bunkhouse, so in the three years of happy work, of which we are writing, we have started a wild garden which we hope will grow wilder as the years go by. Orange milkweed and blood-red bee-balm love the sun, but not so our large and varied collection of ferns, so, for needed shade, we have transplanted small trees of white pine, spruce, birch and maple. In the midst is built, mostly by the Scouts themselves, a tiny pool wherein lives a big green frog, who vies with a glorious pitcher-plant in catching insects, and to the pool also come the thirsty birds.

And so we have formed a center for all our camp Nature work, and Girl Scouts come and go at will. To study Nature? Not at all! Who wants to study anything during vacation? One runs in from her swimming to find out the name of the pretty blue flower growing in the edge of the river, and we are soon deep in flower talk. We stage a turtle race and find that turtles are not so slow, only not as fast as a garter snake, or a little red salamander—so on to a reptile chat.

Basket laden, we go to the fields to pick blackberries

for pies, and have a grand confab on wild fruits, edible and otherwise. A field glass just happens to be in the Bird Lady's basket, so when we hear a towhee calling, we sit down to rest and watch for him, and just naturally fall into a bird talk.

Our thirty varieties of grand old trees have parked on our camp so long that we are obliged to ticket them, and how can we label a tree without knowing its name? So with a leaf or a twig we go to Nature House to find out.

Thus we muddle happily along, without plan or system, always hoping that some chance word may strike root in the young lives about us, and help them to a fuller knowledge of Nature wonders, better powers of observation and more joy in living.

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The Least of These

CURRENT lists of creatures marked for slaughter so as to facilitate the production of more ruffed grouse for gunners to kill are headed by the following species:

Predators upon eggs	*Predators upon adults*
Skunk	Great Horned Owl
Fox	Cooper's Hawk
Raccoon	Sharp-shinned Hawk
Weasel	Goshawk

From the standpoint of the general conservationist the making of such lists is absurd from the start as each of the mammals and birds listed is just as much entitled to consideration as is the ruffed grouse. Of the mammals listed, the fox has a greater individual cash value than the grouse, and the skunk and raccoon are at least of equal value, leaving only the weasel as of lesser commercial importance. Regardless of their value to society in general, they must be sacrificed because one element of society is organized to exploit the grouse, upon which they sometimes prey.

Leaving this rather low level of discussion as to cash values, it must be said that each of the creatures is just as great an achievement of Nature as is the ruffed grouse, just as worthy an object of study and admiration, and just as much entitled to benefit by any equitable program of conservation.

From an esthetic point of view any one of the birds of prey mentioned is fully as valuable as a ruffed grouse, some of them indeed more so in view of their rarity. The general conservationist, naturalist, or Nature lover is just as thrilled to see a goshawk as a grouse, to hear the hooting of a great horned owl as the drumming of a "partridge". He only desires that all be given an equal opportunity for existence in naturally appropriate numbers. It is the attempt to increase favored species at the expense of their competitors that threatens general conservation in many directions. It is based on special, not public, interests; on selfishness, not altruism, and is not for the general good. Were policies established for public benefit, not to mention the interests of wild life in general, there would be no such discrimination.

Every wild creature is in justice entitled to preservation, and man by attempting to suppress some and encourage others not only is acting arbitrarily and ruthlessly but also heedlessly and recklessly, not appreciating what is best for human society on the whole and in the long run.

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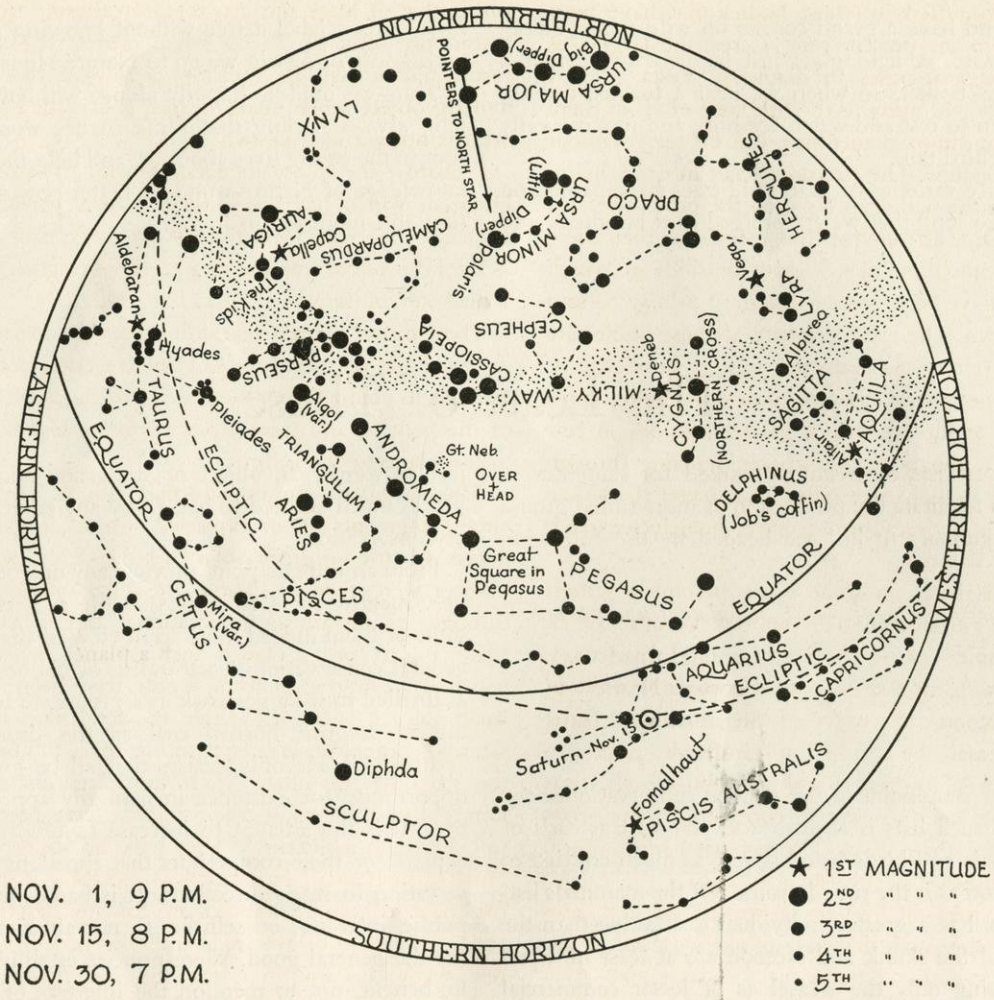
"By Their Deeds, Not Words"

THE *American Field* of April 6, 1935, has an interesting discussion of the term "true sportsman". The conclusion is that there are some, and that the number may be growing, but it finds evidence of great strength of purpose, but little strength of action. We ourselves think that the real underlying cause of failure can be summed up in one word: *Selfishness*. We quote from the editorial:

"If sportsmen were united in purpose and action they could certainly obtain laws that would abate abuses, and obtain, too, enforcement of them. With the power to protect their interests, they do not do it, and we ask if the failure does not indicate a backwardness that would not be displayed by true sportsmen.

"The men who tacitly submit to an injury that they could prevent certainly show a lack of proper manly spirit, and with the evidence of this displayed on every hand, what mockery it is to lay claim to character utterly above such supineness. American sportsmen must expect to be judged like others, by their deeds, not words.

"Foreign nations, with far inferior natural sporting facilities, are wise enough to take care of what they possess, while we, with abundance at our command, abundance but a trifle in comparison with what we once had, and still might have, but for the wastefulness of the past, sit idly down and see the supply grow less year by year, and do nothing but write and talk of our true sportsmanship. With such a record, we have much to be ashamed of, but little of which to feel proud."



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

Planets and Planetoids

Great and small worlds of the solar system

By ISABEL M. LEWIS

THE NINE principal members of the sun's family are well known by name and they need little introduction. They range from the giant Jupiter, out of which more than 1300 worlds as great as our own planet, Earth, could be fashioned, to the recently discovered pygmy, Pluto, which can be scarcely over a few hundred miles in diameter. Mercury we think of as the little one nearest the sun, blistering hot on one side and intensely cold on the other. Venus always wears her mask of dense clouds and in size is the twin of the earth. Earth, small though it is, we like to refer to as unique for it alone, we maintain, is able to support life. Mars, the little world of mystery, about one-seventh the size of Earth, has us guessing at times as to just how true this statement may be. Venus has us doubtful, too. Jupiter and Saturn, largest of all the planets, have claims to distinction because of their great size and large families of satellites, some of them rivals of the moon and Mercury in size. Saturn may also claim to be unique because of its imposing system of three concentric rings, and the fact that it is so light that it would float in water. Uranus and Neptune are also, like Pluto, worlds that have been discovered telescopically, in modern times. These two planets are great in size and circle about the sun at such great distances from this body that, viewed from either of them, our planet would be a telescopic object lost to view most of the time in the sun's rays.

In addition to these chief members of the solar system and their satellites there are a host of bodies circling around the sun that are referred to as minor planets, asteroids, or planetoids. The first four of these bodies to be discovered, in the first few years of the nineteenth century, are known by the names of Ceres, Pallas, Juno and Vesta, in the order of discovery. They are by far the

largest of the hundreds of these bodies that have been discovered up to the present time. Ceres, the largest, is estimated to be 480 miles in diameter. Vesta, with a diameter of only 240 miles, is the brightest of all of them and is the only minor planet that can be seen without the aid of a telescope. The asteroids occur in overwhelming numbers in the wide gap between the orbits of Mars and Jupiter. One astronomer has estimated that there are probably something like 50,000 asteroids of which perhaps 5000 have been observed and 1300 may be said to be well known. The great majority of these bodies are from fifty to five miles in diameter, and are faint objects, star-like in appearance, observed only on photographic plates exposed at the eye-end of great telescopes. A few are still smaller, mountain-like masses, hurtling through space, and only two or three miles in diameter. Less than twenty asteroids, it is estimated, have diameters exceeding one hundred miles.

The asteroids have, in some ways, become a serious burden to the astronomer. To compute the orbit of an asteroid so that it can be observed at some future date is a far more difficult task than to compute the orbit of a major planet. The discovery of the remarkable little asteroid, Eros, near the end of the last century came at a time when interest in these troublesome little bodies was lagging and the onerous task of computing their orbits to insure against their being lost appeared of doubtful value. The yardstick of the solar system is the earth's distance from the sun. When it was found that Eros came closer to the earth than any other body except the moon and an occasional comet, it was recognized that Eros aided accurate determination of the length of this yardstick. Its star-like image increased its value for this purpose. At close approach Eros is only 13,840,000 miles distant from the earth. Unfortunately such favorable approaches are rare. However, at favorable times, this little body has been observed with great care at observatories all over the world. A number of other interesting and remarkable members of the asteroid family have been discovered from time to time, and the fact is now generally recognized that it is worthwhile to observe, list, and find out all that is possible about the peculiarities of these relatively tiny bodies.

In the spring of 1932 two asteroids even more remarkable than Eros were discovered. They are known as the Delporte and Reinmuth objects, and are now listed as 1932 EA and 1932 HA respectively. The first of these comes within ten million miles of the earth but is much fainter than Eros. The second is still more remarkable. It has the shortest known period, 1.8 years, approaches within less than seven million miles of the earth, and has such a rapid daily motion that it is difficult to keep track of it. The greater part of its orbit lies within that of Mars and it is the only asteroid that comes within the orbit of Venus when nearest the sun. Unfortunately it will be difficult to recover this rapidly-moving object when again nearest the earth because its orbit is not yet well known.

Probably the most remarkable of all asteroids is Hidalgo, which has the longest known period of any asteroid, 13.7 years, and travels out as far from the sun as the orbit of Saturn. Judging from its brightness, it has a diameter of between 15 and 30 miles.

These minor planets also differ from the major planets in the shape of their orbits. They are elongated, on the average, as compared to the nearly circular orbits of most of the planets, and their orbits are more highly inclined to the plane of the ecliptic.

There are two theories as to their origin. They may be either fragments of an exploded world, or part of the debris of the original solar nebula, from which the planets were formed. These the huge planet Jupiter, through its disturbing gravitational forces, kept from coalescing to form a planet. Such a planet, however, if it had been permitted to form, would have been extremely small since it is estimated that the total mass of all the asteroids cannot be greater than one three-thousandths of the mass of the earth. With the exception of a few hundred of the largest, the asteroids have been likened to "detached mountains". They have no atmospheres because of their small size which would make it impossible for them to hold an atmosphere for any length of time even it they had originally been enveloped in gases. The remarkable variability in the light of many of them, including Eros, is attributed to the difference in reflecting power of different portions of their surfaces.

In November there are two periodic swarms of meteors due to appear. The Leonids, which will come from the direction of The Sickle, in Leo, should be seen in greatest numbers after midnight on November 14, 15 and 16. The Andromedes may be expected about November 23 and will come from the direction of the constellation Andromeda in the early evening.

Saturn is the only planet that may now be seen to advantage in the evening hours. It is in the constellation of Aquarius and will be in quadrature with the sun on November 27, when it may be seen due south at sunset. Jupiter passes from Libra into Scorpio this month. It will be in conjunction with the sun on November 27 and too close to the sun throughout the month to be observed. Mars is now low in the southwest, and cannot be well observed. It sets about three hours after the sun. Venus is a beautiful object in the eastern sky before sunrise. Mercury, also, is in the morning sky and will be at greatest western elongation on November 2, when it may be seen in the morning twilight near Spica.

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Trailside Treasures

THE LETTER

By JANE ADAMS PARKER

"IT CAME. It came," shouted Jerry. His voice rang out along the Old Trail, as his hurrying feet spanked against the hard path.

Aunt Dot, Jo and Rosy had gone down to the cabin, while Jerry had stayed to help Grandpa Arnold with some work at the museum. Now Grandpa came hurrying close behind him. The two reached the cabin, just as Aunt Dot and the girls ran out to see what all the noise was about.

"Here it is." Jerry waved the envelope over his head. "It's the letter from those other treasure hunters Mr. Jake knows down South."

"Come inside of the cabin," said Rosy. "It's too cold to read it out here."

There was a jolly fire in the stone fireplace, and they all sat down in a circle on the floor, while Aunt Dot opened the letter and began to read.

"Dear Friend Treasure Hunters up in Illinois:

"We suppose your snakes have all hidden away for the winter by now. But some of ours are still out, for they don't hibernate so long down here. (Hibernate, Mr. Jake says, means sleep until warm weather.) We thought we would write you some of the things we've found out about poisonous snakes. All snakes have teeth. But the poisonous ones have fangs besides. There are several kinds of rattlesnakes in the United States. They all have a head in the shape of a triangle, and rattles on the end of the tail. There are a lot of water moccasins in the swamps near here. Sometimes the big open mouth looks like a half-open water-lily floating on the water. That's why they are called cotton mouth, because their mouth is white like cotton inside. They are from three feet to six feet long, and are dull brown or dark green with very dark bands. The young have bright blotches across the back on a reddish ground.

"The copperhead is about three feet long. It is pinkish or light reddish-brown, or tan, with large chestnut-brown blotches on the sides, like the letter Y turned upside down. We heard a funny noise in the woods one day, and Mr. Jake thought it was a copperhead whipping its tail in the dry leaves. They do that when they are angry. But they'll run away, if you give them the chance.

"The rattlesnake, water moccasin and copperhead, all have cat's eyes. Mr. Jake says, 'elliptical pupils,' not round like ours. And they have a small hole in each side of the head, between the eye and nostril. That's why they are called Pit Vipers.

"The little coral snake

is so pretty you'd love him, if he wasn't poisonous. He's a small snake with a slim body and smooth shiny scales. His body is trimmed with broad rings of red and black, with a yellow border around the black. The coral snakes down here live in the ground most of the time. They eat other smaller snakes and lizards.

"We want you to write to us now, and tell us all about the queer things you have in Trailside Treasure House.

Very truly,

Jane, Bert, Jack, Louise."

"Well I'd like to see Jack," said Jerry. "Wonder what he looks like."

"Maybe they'd send us their pictures if we asked them," said Rosy.

"Well, it's about time Jerry and I brought some more wood, if we want to keep up the fire," said Grandpa Arnold. "Come on, Chick."

In a few minutes a great pile of wood was stacked in the corner and Jerry was just going to put down another armful when out hopped a little black cricket.

"It's Cheery Johnny," laughed Jerry. "Do all the crickets hide away for the winter, Aunt Dot?"

"No," said his aunt. "A few of them do. But Mrs. Cricket, like Mrs. Grasshopper, lays her eggs in the ground and then dies when it gets very cold."

"Anyway the ants don't die," said Rosy.

"No, indeedie," answered Grandpa Arnold. "They have to stay at work all winter feeding the babies and—I tell you what," he broke off suddenly. "Suppose we find out everything we can about ants before our next meeting. You'll be surprised what smart little fellows they are."

Jo had been sitting near Aunt Dot, as they talked, reading the letter over again to herself. "Why, Aunt Dot," she said suddenly, looking up, "here's something on the back of the page you didn't see. It says, 'P. S. We are sending you something for your Trailside Treasure House. It looks very vicious. But don't be afraid. It won't hurt you. J. B. J. L.' "

"Now we have something else to wonder about," said Rosy. "Let's play 'Guess' as we walk home." (To be continued.)

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The story of the Trailside Treasure folk has been appearing in Uncle Dick's Rambles for several months. Do you like these stories? Have you any suggestions about what you would like them to do? Won't you write a note to Uncle Dick and tell him what you think about this series of stories about Jerry and Jo and their friends.

•

PALS *By* E. E. SNYDER

Yes, you are right, sir
Thomas Catt
We should not fight
and disagree.

Let's sit together, paw
in paw,
Since we've decided friends
to be.

Now we will face both
friend and foe,
True pals for all the
World to see.

THE GALAPAGOS ISLANDS 100 YEARS AFTER DARWIN

(Continued from page 271)

digest the contents of their stomachs and clear their alimentary tracts, they could be stored away alive between decks and in the hold for many months, and thus always be fresh and ready for use.

Dr. C. H. Townsend, Director of the New York Aquarium, has long interested himself in the fate of the Galapagos tortoises. Long ago he bethought himself of the whalers' log books, a number of which have fortunately been preserved in the New Bedford Public Library. By making use of definite and specific records of tortoises enumerated as taken, his inquiry was narrowed down to the log books of "seventy-nine American whaling vessels only that made one hundred and eighty-nine visits to the Galapagos between 1831 and 1868 for the purpose of securing tortoises. Their combined catch during this period was 13,013."

Thirteen thousand and thirteen tortoises for only seventy-nine ships! At one time there were more than seven hundred vessels in the American whaling fleet alone, and the majority of these made repeated voyages to the Pacific during the so-called golden age of whaling. Dr. Townsend's count begins with the year 1831, yet British as well as American whalers were operating about the Galapagos during preceding decades. As he says, the tortoise history that lies concealed in the log books of vessels belonging to Great Britain and other countries formerly engaged in whaling in eastern Pacific waters can only be conjectured. There can be no questioning of the fact that the catch of the few ships whose records he was able to check represented but "a mere fraction of the numbers of tortoises actually carried away."

Though Dr. George Bauer, who personally had visited the Galapagos and made extensive collections there, had more meager data at his disposal than did Dr. Townsend, he surely was not far from the truth when he asserted that "over one hundred thousand tortoises have been taken from the islands since their discovery." Indeed, he may have underestimated the number.

To the past stupendous destruction of the tortoises by whalers must be added the tremendous toll taken of them by the tortoise-oil hunters, especially on Albemarle.

The inhabitants of Villamil, the settlement on the south coast of Albemarle, together with those from Santo Tomas, another settlement farther inland, number somewhat over a hundred. Except for these people on Albemarle, those living on Chatham, and the Wittmers on Charles, Indefatigable is the only other inhabited island. The population there consists of half a dozen Norwegians, about as many Ecuadorians, a Hungarian, a Spaniard with his wife and child, and an American couple of Danish ancestry. Most of these people live at Academy Bay; a few spend considerable time in the fertile moist zone high up on the slopes of the volcano which forms this island.

Indefatigable Island is one of the few on which tortoises are still fairly numerous. On two different occasions I have seen several dozen that the natives had brought down to Academy Bay. They are also still quite numerous on Albemarle, in spite of the havoc wrought there by oil hunters. On Charles and Barrington they are definitely extinct and have been for many years. On all the rest of the islands known to have had tortoises they are rare, with the one exception of Hood Island. In the course of the Hancock expedition of 1933-34 we encountered a party of Chatham islanders on Hood Island who had come over to fish and hunt and who had secured in the course of their stay about two dozen specimens of the species peculiar to this island, *Testudo hoodensis* of Van Denburgh, of which only five had been found in the previous eighty years. It is an encouraging indication. If afforded some protection against their present day enemies —dogs, cats, rats, and man and their competitors for food the cattle, horses, burros, and especially goats—it would seem that they might in time re-establish themselves in something like their former abundance. Thus they would again constitute a valuable natural resource in these islands.

The reputed weight and size of these giant galapagos is as remarkable as the numbers in which they must formerly have occurred. One of the early navigators claimed to have seen a tortoise that measured five and a half feet long, four and a half feet wide, and three feet thick. The largest specimen obtained by the Expedition of the California Academy of Sciences in 1905-6, measured 43 inches in a straight line, and 49½ inches over the curved shell or carapace. The heaviest tortoise of which there seems to be a definite record is a male in the collection of Lord Rothschild at Tring, who financed several expeditions to the Galapagos. When alive, it weighed 593 pounds. An average sized male, however, is nearer three hundred pounds in weight. The age that these large Galapagos tortoises may attain is problematical. If they are anything like the known records for their congeners of the Aldabran atoll in the Indian Ocean, they may under favorable conditions reach an age of 200 to 300 years.

The youngest and smallest Galapagos tortoises ever to have been taken are two secured by one of the Hancock Expeditions, on January 20, 1934, from residents of Indefatigable Island. These were real babies, both of them six days old, two and a half inches long, and two and a half ounces in weight. The litter of eggs from which they were hatched was discovered and brought down the mountain on November 24, 1934 to Academy Bay. On January 14 they hatched out in the sandy soil in which they had been placed beneath an overturned metal wash tub. One of these tortoises is being raised by Captain Hancock in California. I brought the other back with me to Washington. By the middle of July Captain Hancock's tortoise weighed 7¼ ounces and had grown to 4⅛ inches in length, a weight and size not attained by mine until some months later. In October the latter weighed 7½ ounces and was about 4¾ inches long in a straight line. This month, September, 1935, it is 17½ ounces in weight and 5½ inches long.

The giant tortoises are strictly vegetarian in their habits, cactuses, grass, and other herbage constituting their diet. The same is true of the large land iguanas. The marine iguanas, also vegetarian, subsist on marine algae, which they gather just off shore. Although perfectly at home in the water, they spend hours sunning themselves on the rocky shores of all the islands. They run larger in maximum size than their terrestrial relative, five feet long as compared to four. Their numbers seem to have suffered no diminution with the years. On the other hand, the land iguana being good eating, which the oily marine iguana is not, has been considerably thinned out where there are settlements of people. On Albemarle it is already rare, while on Charles, James, and Indefatigable it has become completely extinct.

What of the bird life of the Galapagos a hundred years after Darwin? It is, by and large, the same today as it was then. The endemic land birds are perhaps a little less tame on the inhabited islands, and the dainty little ground doves less numerous than in the early days. As many thousands went the way of cooking pots as did the tortoises.

As more has been written about the Galapagos birds than about any other form of life on the islands, I shall mention or figure only a few of the larger ones.

Penguins, usually associated with ice-bound Antarctica, are here encountered right under the equator. They are a species peculiar to the islands, the Galapagos Penguin, *Spheniscus mendiculus,* whose ancestors in the dim and distant past no doubt migrated there with the cold waters of the Humboldt current from the south polar regions.

Of interest, too, are the flightless cormorants, also an endemic species. With their helpless little wings, they seem but half-birds on land, but in the water they are superb swimmers and unexcelled fishermen.

Both penguins and cormorants, which have been reported by other expeditions as verging on extinction, were found by the Hancock Expedition to occur in a number of localities in the islands not heretofore reported. The prospects appear favorable for the continued existence of these unique species.

In the series of birds taken in the Galapagos by the *Beagle,* thirty-one species were represented. Today 108 species and subspecies are recognized in the same area. Strangely enough, the penguin, the flightless cormorant, *Nannopterum harrisi,* the brown pelican, and the flamingo, *Phoenicopterus ruber,* seem not to have been collected or observed by Darwin.

Darwin's experience and observations in the Galapagos Islands exemplify to the highest degree the great and everlasting value that may accrue to the world as the result of intelligent, understanding travel, and the careful observation and collection of objects of natural history. In his autobiographical notes he wrote, "The voyage of the Beagle has been by far the most important event in my life and has determined my whole career." Foremost among the results of that memorable voyage in his own estimation stood the observations and collections made in the Galapagos. In a small personal diary in which he recorded the outstanding events of his lifetime, he wrote opposite the general entries of 1837, "In July opened first Note-Book on Transmutation of Species.—Had been greatly struck from about month of previous March on character of S. American fossils—and species on Galapagos Archipelago.—These facts origin (especially latter) of all my views."

The significance of much that he saw in the Galapagos would have been lost upon him if he had not met Mr. Lawson, the

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Nature Magazine in School

IN NOVEMBER

Here teachers will find a delightful description of the plants and animals that they might expect to find on an outdoor excursion. Timely information on topics which may be the subject of discussion at school. This type of information is particularly valuable to those teachers who are not so familiar with natural history and would like to prepare themselves ahead of their classes.

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WINGS OF THE STORM

Since the thrill of discovery is the attraction that holds many persons to the tasks of science, such an article as this has a real place in a science course. Pupils in the upper grades of the elementary school and grades beyond could read this article so that they, too, might go adventuring with the author. Interesting information concerning the habits of water birds is also given that could be used in connection with "What Price, Fish"? published in the October issue of NATURE MAGAZINE.

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FEATHERED NEW YORKERS

To those city teachers who would like to give their pupils more appreciation of bird life than can be readily obtained from books, this article is encouraging. In cities it is true, if we look around us, that not only parks and gardens, but even abandoned lots, have their feathered inhabitants. It is true, too, that if these little creatures were properly protected from their enemies, fed and watered regularly that there would be many more of them in such places.

Even in the heart of a city a school could set up a bird feeding shelf and expect to have birds come. The right place for such a station would be in a quiet section of a school garden if one were available, if not, some successful ones have been attached to a window sill on a side of the building which is away from most of the commotion. It is important to feed regularly and to provide protection from cats. Through caring for their feathered guests pupils not only have an opportunity to observe something of the habits of birds, but to gain some appreciation of and love for them.

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KENTUCKY BLUEGRASS

In southern parts of the country November will not be too late to plant grass seed. Kentucky bluegrass is one of the best varieties of grass to plant, especially on school grounds where a strong sod is needed. It is wise procedure to let the children help in the work. Aside from gaining useful experience children have more respect for a lawn if they themselves have a part in planting and caring for it.

An interesting activity for those pupils who enjoy collecting would be the making of a scrap book showing the wide variety in grasses.

In order that teachers and parents may further use Nature Magazine as an aid to the study of Nature and Science, this page is devoted to the following brief notes based upon articles in this issue and suggesting ways in which they may be used as a source of inspiration and information. To bring these Nature study thoughts to our readers we have obtained the services of one eminently qualified for the task, and this department is edited

BY ESTHER SCOTT

Instructor in charge of Elementary Science
Washington, D. C., Schools

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ROTOGRAVURE SEPARATES

We have received a number of inquiries from teachers asking whether extra copies of our Rotogravure Section could be obtained separate from the magazine. Most of these teachers wanted the extras for mounting, posting, scrapbook, or other class projects.

Owing to certain mechanical considerations in connection with printing the magazine, we have in hand some extras of the Rotogravure Sections from October, 1934, to September, 1935, inclusive. These are untrimmed and admirable for the above-mentioned purposes. The task of collating these, and the cost of making them, have made us hesitate about announcing their availability. However, there appears to be a definite demand and use for them.

Therefore we are making available complete, unbound and untrimmed sets of the first twelve months (192 pages of Nature pictures) of the Rotogravure Section at one dollar a set, or the first or last six months (Oct., 1934, to Feb., 1935, or March, 1935, to Sept., 1935) at fifty cents a set. Extras of one particular month are available at ten cents each as long as they last and *provided at least ten extras from any one month are ordered at one time.*

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ROADSIDE LEGISLATION

If all the teachers in the United States made up their minds to send out a generation of school children who disliked billboards, this means of advertising would disappear sooner or later. Even if we cannot get all the teachers we know to work with us, each of us who so desires can present certain facts in regard to billboard and roadside signs. There may be pupils in many classrooms who know of auto accidents that were caused by the driver looking at one of these signs when his eyes should have been on the road. There probably is in every community some spot rich in natural beauty that is hidden by some sort of a sign. Gradually, by occasionally calling the pupils' attention to these things, they, too, will come to realize that this form of advertising is a commercialized nuisance.

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THE ROTOGRAVURE SECTION

The rotogravure section of NATURE MAGAZINE offers teachers the opportunity to make a unique and useful collection of visual materials, as well as presenting some pictures which in themselves are worthy of a lesson.

In the October issue the owl quintuplets are an appealing picture, useful in overcoming some of the alarming prejudice manifest in many localities against all kinds of owls. In order to appreciate this picture the class should be given a background for it; this could be obtained by asking pupils to relate experiences with owls, by the teacher giving her experiences with screech owls, or by reading a good owl story. If possible, some screech owl pellets should be examined to encourage pupils to ask questions concerning the food of screech owls. From the picture pupils could see some of the adaptations that make possible the catching of small mammals. The sharp bill and talons equip this small owl to kill and eat such a creature as a mouse. The large pupils in the eyes enable maximum light to enter and make objects visible even in a dim exposure. The soft edges of the wing feathers muffle the sound of flight, and, on the other hand, the tufts of feathers back of the ear openings make the owl aware of very faint sounds.

Even a kindergarten or a first grade child could feel something of the majesty of the scene portrayed in the moose picture shown in the October issue. Before letting a class see this picture a teacher could build up a background of appreciation by asking her pupils to relate their own experience pertaining to mists and animals seen in the early morning. The opportunity should not be missed to use this picture to advance the cause of conservation. The fact that the moose was wading out, belly deep, in the water and several jumps from cover indicates that the animal had not been hunted recently or badly frightened.

In the October issue there were nine pictures of various stages in the life of the praying mantis. Since this is one of the beneficial insects, that help to maintain the balance of life, its value should be better understood. In the fall children often find mantis cases, and bring them to school. These cases may be kept outside a schoolroom window and only brought inside occasionally for observation. If the cases were kept continually inside the warm schoolroom they would probably hatch out so early in the spring that no aphids would be available for food. About May 1, when there are many insects to eat, is the normal hatching time for the mantids.

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PLANETS AND PLANETOIDS

Aside from presenting interesting information concerning the planets and planetoids, the map accompanying this article gives the teacher an opportunity to prepare herself for some of the questions that her pupils will ask, particularly if she calls their attention to the sky. The Pleiades, showing low in the east this month, attract the attention of many observant pupils. All grades, even the kindergarten, are interested in the stars. Young children often ask rather pro-

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AMONG THOSE PRESENT AT THE FOURTH ANNUAL CONVENTION OF THE FEDERATION OF WESTERN OUTDOOR CLUBS, AUGUST 31 TO SEPTEMBER 2, IN THE McKENZIE RECREATIONAL AREA, OREGON

Hiking and Camping Forum

Conducted by
ERNEST A. DENCH

Hiking and camping inquiries will be answered by mail if a stamped, addressed envelope is enclosed. Address the Forum editor.

We are now on the threshold of the period when getting soaked on the trail, or in camp, is a very uncomfortable experience.

Keeping reasonably dry is a "How" problem, solved by individual choice of the 50 clothing and equipment items of 44 manufacturers. You'll find them, along with practical advice, in our "Let It Rain" bulletin, 10 cents. If you are a member, remit only 3 cents.

Brevities

Pennsylvania Alpine Club is being revived. Under the executive wing of Colonel Henry W. Shoemaker, the PAC once had a membership of 2400, with 40 chapters throughout the Keystone State. A diplomatic appointment abroad compelled the Colonel to relinquish his hold when it was needed most. . . . There is a nation-wide movement for the construction of cycling paths along highways. . . . One criticism of farmhouse Youth Hostels in New England is that they are located too far away from mountain trails, necessitating long detours morning and night. No doubt this defect will be remedied in time. . . . Spokane Mountaineers celebrate their twentieth anniversary this month. . . . "The Shack Mouse" is the whimsical reporter of the Omaha Walking Club's camp. Our rodent friend's complaint is that OWC campers are careful to keep food out of his reach. Very touching, these OWC bulletin references. . . . "Thousands of feet above worry level" is the slogan of a government hotel in the southern Alps of New Zealand. Yes and no, regulated by the perpendicular status of the ascent. . . . On a par with this is a "small hill" in Mount McKinley country. Charles S. Houston is casual in the *American Alpine Journal* in recording this 5800 feet trifle. Probably is that when squeezed among peaks nearly four times as high. . . . Suck a prune pit when throat is parched and nothing drinkable is at hand. . . . Adhesive tape will prevent an opened can of evaporated milk from leaking. Punch the usual two holes and cover when breaking camp. . . . Walter Greene, well known for his efforts in extending the Appalachian Trail in Maine when help was scarce, is now coaching CCC crews on A-T trail construction and maintenance there. . . . Western State College Outing Club's week-end trips extend from Friday afternoon to Sunday night. At least one of Colorado's higher peaks is scaled on each trip. Autos are driven into the mountains as far as possible for the base of operations. . . . Pilot of a "fast" hiking group has never satisfactorily explained how he reached a mountain top half an hour behind the "slow" section. Perhaps they botanized en route! . . . The climb of Chocorua is remembered by Eleanor Early, author of *Behold the White Mountains*, because she contracted *Altiphobia.* Regard it as an addition to the hiker's vocabulary. . . . Occupations of applicants for membership appear in *The Trail Blazer,* which news bulletin Ralph L. Coryell edits for the New York chapter of the Adirondack Mountain Club. For some strange reason, letter carriers are bashful in coming forward! . . .

Heard of These?

1. A mountain cream intended as a skin protection above timberline. Porous, non-greasy, easy to wash off. Compounded especially for climbers by a western drug store, which fills mail orders.

2. Grim-looking photographs of that tormenting still-life monster—Poison Ivy and his allies. Firm issuing this free booklet specializes in preparations for skin infections and foot ills.

3. There are about 500 varieties of the versatile and nutritious soy-bean. Was grown here as a forage crop until 1917, when government discovered its high human food value. Is not the average American attitude today toward the soy-bean the same as the European in regard to corn, or maize—fit only for cattle? Southern specialist packs soy-bean products in several appetising forms. Educational booklet available.

4. A small vial of mercurochrome has a direct applicator instead of the messy glass rod or brush. The bakelite screw lid goes over drip top of bottle, which is shaken to release the fluid in small drops.

5. A semi-annual event awaited by many hikers and campers is the publication of a certain trail and camp products catalogue. Fall issue includes such new lines as an emergency kit (combined first-aid and enforced over-night sojourn), a featherweight ski parka, zipper duffle bag and a ladies' parka.

6. An improved glass-lined vacuum bottle, which, while not unbreakable, will withstand more hard knocks than older models.

7. A fibre-cloth vest suitable as a morning or evening windbreaker to have in reserve. Folds into a wallet which fits a coat pocket. Weighs only 4½ ounces.

8. Horsehide sheep-lined coat with a patented adjustable collar, which maker claims prevents cold from striking the neck.

For further details of the above products, enclose a stamped, addressed envelope with your request.

One "Yump" or Two?

Wanted: Enthusiastic, healthy youngsters (teen age) to join the XYZ Mountaineering Club. Varied activities include climbing, camping, and a full program of winter sports.

The above classified advertisement may —or may not—shortly greet the westerner at the breakfast table. A dearth of new members from the ranks of youth is what ails some of our western mountaineering clubs today. And the remedy appears to be the offering of winter sports in season. The separate ski clubs are gaining ground at the expense of the mountaineering clubs.

The youth movement also requires the formation of junior chapters, continually to infuse the adult chapters with new blood. Already the Seattle Mountaineers admit

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THE GALAPAGOS ISLANDS 100 YEARS AFTER DARWIN

(Continued from page 312)

Vice-Governor of Charles Island, who called his attention to the fact that the tortoises from the different islands were different and could with certainty be told apart. Had Darwin not, during the latter part of his stay, kept the specimens from the different islands distinct and separate, the importance of the data later uncovered by the systematists who classified his material could not have been discovered from his collections. James Ritchie, Professor of Natural History in the University of Aberdeen, says, "It is a strange comment upon the growth of an idea which transformed the thinking of the world, that it should have rested upon the casual information of the Vice-Governor of the Galapagos Islands, in the absence of which the collections from the different islands would have been commingled, and the all-important evidence lost."

NATURE MAGAZINE IN THE SCHOOL

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found questions regarding the objects that they see in the sky. Such questions as what makes the sun set?, why is not the moon always round?, how do the stars stay up in the sky? are often difficult to answer because they require some knowledge of the motions and forces of the heavenly bodies. However, ideas such as these involving relationship of the earth and other heavenly bodies are fundamental to an understanding of the common phenomena of the sky.

This particular article dealing with the planets and planetoids is a good lead towards a study of the whole solar system. Pupils interested in making observations might discover for themselves that the planets are to be seen in the sky following the path of the sun and moon. Other pupils might like to construct a home-made planetarium, using balls of clay modeled to scale to represent the planets. On such a device it would not be possible to show the relative distances of the planets from the sun. However, the radii of the orbits may be represented with string cut to scale. Models may be placed at the correct relative distances by measuring with these strings from a fixed point. One ingenious teacher hid the models of the planets in her classroom and permitted her pupils to hunt for each one by measuring from the fixed point with the string corresponding to the radius of the orbit of that particular planet.

THE MOURNING DOVE

This well written article on the mourning dove will arouse feelings of resentment against the wanton destruction of wild life. You and I who love the outdoors have a feeling of increasing fear as we observe the scarcity of many formerly plentiful species. Those of us who are teachers realize our responsibility so to present the problems of the interrelation of living things that each generation of school children will understand them enough to act intelligently re-

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Hiking and Camping Forum

(Continued from page 314)

qualified Boy Scouts to membership, while the Sierra Club has a flourishing junior section.

A resolution embodying the above findings was adopted at the fourth annual convention of the Western Federation of Outdoor Clubs.

The large lean-to shelter where the 93 conventionites assembled became, in turn, a meeting hall, dining room and theatre during the Labor Day week-end.

The foresighted hosts—Obsidians of Eugene, Oregon—had set up several large army tents in a pine forest grove near the shelter. The tents were christened after local peaks, providing plenty of material for the jesters. Among these tent dormitories were Broken Top, Bachelor, The Husband, Middle Sister and North Sister.

F. W. Mathias (Olympians) again assumes the FWOC presidency. Aaron Glasgow (Spokane Mountaineers) was re-elected secretary-treasurer. Edward Lenz (Trails Club of Oregon) is corresponding secretary for another year. The new vice-presidents are Thelma Chambers (Klahanee Club, Washington), Dr. Paul Spangler (Mazamas, Oregon), and Arthur Blake (California Alpine and Sierra Clubs).

Trails Club of Oregon will be hosts to the 1936 convention at their lodge in the Columbia River highlands.

Horse-Shoe Trail

Hikers and horsemen will jointly open up, maintain and use the Horse-Shoe Trail between Valley Forge and Manada Gap—139¼ miles—where it will "feed" the Appalachian Trail. Already three Philadelphia clubs—the Philadelphia Trail, Nature Ramblers and Back to Nature—have agreed to undertake maintenance mileage. This will be the first of a projected series of trunk bridle paths in Pennsylvania, patterned after such systems in Vermont and New Hampshire.

The incorporators of the Horse-Shoe Trail Club include some very well-known Pennsylvania people. Henry N. Woolman is president, and William Nelson West, 3rd., is secretary, operating from 1411 Walnut St., Philadelphia. He has a folder, with map, which he will send to any prospective user of the Horse-Shoe Trail. Enclose stamp for return postage.

And They Sung—

Sixty songs to fit outdoor occasions by outdoor people now repose within two printed covers. Although the cost is a penny a song, you are obliged to take all of them, at 60 cents, from the Mazamas, Pacific Building, Portland, Ore. The chief publishing activity of this well-known Oregon club is the annual *Mazama Magazine,* due from the press in early December. The monthly bulletins are included in the $2.00 subscription charged non-members. Mazama motto is "Nesika Klatawa Sahale," Chinook jargon for "We Climb High."

Hikers By Night

A sure enough way to commence an interesting discussion with a Prairie Club member is to compare a daylight trip with a nocturnal one. It will be a long time before our Chicago friends forget their two *Midnight to Dawn* hikes.

Although the first attracted a mere (?) 132, the second venture drew a crowd of 350, marshalled by more than 30 aides. Between the two hikes, the tell-another-hiker mode of communication got in its effective work. Others learned of the glamor of woods, meadows and beaches by night—the mysterious sounds and sights and the fragrant aromas.

Smokies Guide Book

Two years have elapsed since the first edition of the *Guide to the Great Smoky Mountains National Park* appeared. Second edition, now out, contains 20 additional pages. Expanded chapters are on trails, tourist accommodations and automobile tours. A few new photographs are noticed, although the preliminary base map (pasted insert) is unchanged. George W. McCoy compiled this concise handbook, 50 cents from the Inland Press, Asheville, N. C.

Adirondack Trails

New edition of *The Trails to Marcy* booklet replaces the one issued in 1932. Not a word or photograph has been changed; but the separate map carries, in colors, several additions to the Adirondack system of yellow, blue and red trails. Chief direction of the trail determines the color. The markers are round discs of colored linoleum. Gratis from State of N. Y. Conservation Dept., Albany, N. Y. Ask for Recreation Circular No. 8.

Forum editor has sympathetically listened to tales of woe from hikers who have visited the Adirondacks this past summer. CCC boys are working on truck trails. Whoever authorized them fears the legal consequences of labeling them as secondary roads—which is what they actually are.

The Wilderness Society timely voices the hiker-camper's viewpoint in the initial issue of *The Living Wilderness.* Raymond H. Torrey and Robert Marshall, in two separate articles, calmly but forcefully present the case. Wilderness Society's headquarters are at 1840 Mintwood Place, Washington, D. C.

A Week's Food Supply

What are the essential foods, and the quantities thereof, needed by the hiker-camper on a week's trip by himself?

Paul H. Schubert has made a number of such trips, and his one-man commissary department is stocked as follows:

Fats: Bacon (4 oz.) 2 lbs. Unsweetened chocolate (2 oz.) 1 lb. Nutmeat (½ oz.) ½ lb. Butter (1½ oz.) ½ lb.

Proteins: Cheese (1 oz.) ½ lb. Egg powder for soups (1 oz.) ½ lb. Milk powder (1½ oz.) ½ lb. Assorted meats according to choice (½ can) 4 cans.

Carbohydrates: Rye crisp or triscuit (5 oz.) 1½ lb. Quick-cooking oatmeal or flaky cereal (1 oz.) ½ lb. Rice (2 oz.) 1 lb. Raisins or dates, or half of each (2 oz.) 1 lb. Prunes and black figs (2 oz.) 1½ lbs. Powdered soups (1 oz.) 3 sticks, or ¾ lb. Sugar (1 oz.) ½ lb.

Weights in parentheses are the daily portions.

The rice should be prepared in double portions in order to have it ready to serve at the next meal with the left-over half can of meat (removed from can immediately after opening).

Staple et ceteras are coffee, tea and some salt.

It is one thing to have a correct assortment of foodstuffs, and another to produce balanced menus from them. The accommodating Mr. Schubert submits a typical day's menus:

Breakfast: Bacon with egg powder; dried fruit; cereal with milk powder; coffee; rye crisp or triscuit.

Lunch: Chocolate; nut meat; raisins and dates; rye crisp or triscuit.

Dinner: Powdered soup with bacon added; ½ can of meat; rice; rye crisp or triscuit; butter and tea.

Some will question Mr. Schubert's choice of unsweetened chocolate, knowing the craving for sweet things out in the wilds. This is a matter of personal preference, decidedly.

Ozarks and Ouachitas

No inland clubs appear to consider the Ozarks and Ouachitas in their itineraries. The first range, in a wild region that the Federal Government is gradually acquiring for recreational and conservation uses, extends over parts of three states—Missouri, Arkansas and Oklahoma.

The Ouachitas spread themselves in the last two states, but the summit, which soars above the rest, is in Oklahoma—Mount Magazine, 2800 feet. There is no elevation to match it between the Alleghenies and the Rockies.

Both the Ozark Playgrounds Association and the Missouri Fish and Game Department report there are no hiking clubs using such made-to-order terrain. Literature written from the hiker's and camper's viewpoint is non-existent. Leaders of inland clubs, looking for new places to explore, should be in their element here. The Forum editor will welcome any information from readers conversant with these two inland ranges.

Book Reviews Abbreviated

Climbing Days (Harcourt, Brace and Co., $4.00). Dorothy Pilley's mountaineering reminiscences, chiefly European.

Walking in the Grampians (Macmillan, $2.50). Scottish highlands guidebook expanded into a readable travelogue by Charles Plumb.

Walking Tours in Scotland (Grant and Murray, Edinburgh, 5 shillings). Thirty vacation itineraries in detail with maps, by Tom S. Hall.

High Up in the Andes (Putnam's, $2.75). Chatty, factual letters to friends back home from Josephine Hoeppner Woods, a mining engineer's wife exiled in Peru.

THE MOURNING DOVE

(Continued from page 315)

garding them. To do this well, we must recognize the many phases of interdependence involving plants as well as animals and that only one aspect can be presented at a time. It is good procedure, therefore, in the fall before and during the hunting season, to teach facts regarding the economic value of birds. This particular article gives information pertaining to the value of seed-eating birds. Teachers should use the facts regarding the life history of this bird to bring out such ideas as the following:

(1) Seed-eating birds annually destroy tons of weed seed which would otherwise interfere with crops. Insect-eating birds help to hold in check the hordes of insects. Flesh-eating birds reduce the number of rodents.

(2) When a species becomes abnormally scarce, the balance of Nature may be seriously disturbed.

(3) The time may come when man will have great need for species now threatened with extermination.

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A CAMP VENTURE

To those teachers who are looking for ideas to motivate science teaching, this article gives many suggestions as to types of collections and methods of display. The fall is the time to gather in materials for school collections, for it is then that children will still have in their possession some of the "treasures" found during the summer. Not every elementary school can devote an entire room to science activities—although there are many that do—but, every classroom teacher could, if she so desired, set aside a corner of her room for science material. Here specimens could be accumulated, mounted and studied, and science books invitingly arranged. In addition to the indoor museum this article suggests an outdoor laboratory. The tagging of trees, rocks, etc., near a school might develop into a Nature trail. The pool described in the Nature-house garden might well be in a school garden. In either place the same creatures would inhabit it and teach the same lessons.

If teachers who read this article could, in their own classrooms, preserve the spirit of this author, learning and teaching would be a delight. The collections were made spontaneously, the study grew naturally out of the questions asked by the children themselves. In so doing, the teacher derived as much pleasure as her pupils.

•

HORSFALL OR JUNCO

Members of a fifth grade class were shown some of the slides made from the bird pictures painted by R. Bruce Horsfall. On some of the slides the artist's signature was visible. Among the members of the class were twin girls. After the pictures the pupils were asked to write a paragraph about the bird they liked best. One of the twins wrote an excellent one. The other contributed the following classic: "The Bruce Horsfall has black on his neck and head. Bruce Horsfall has sharp claus. Has white on his breast and under his tail. Bruce Horsfall is found along the Pacific Coast."

BOOKS make

Following are some titles recommended by the American

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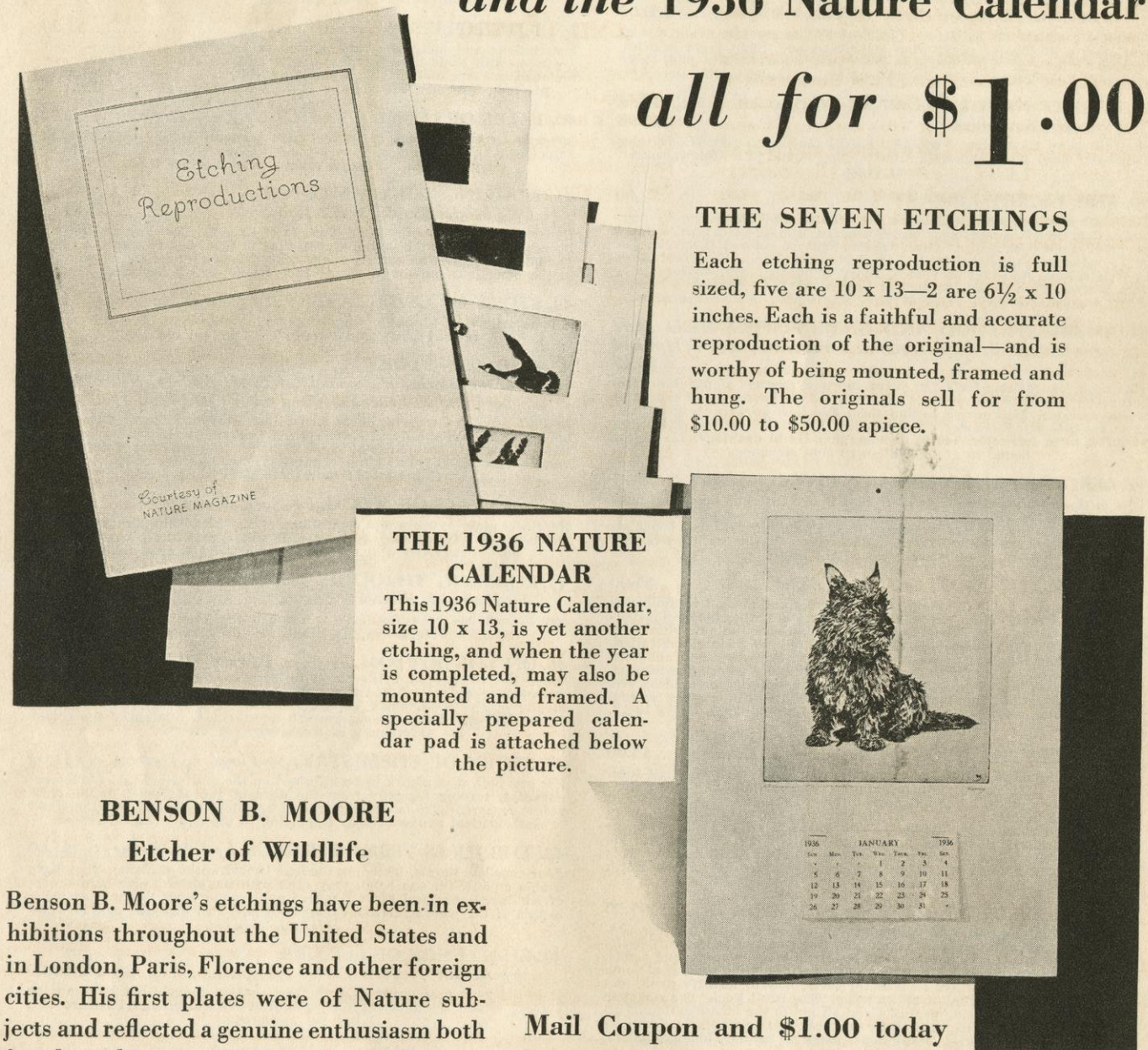

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