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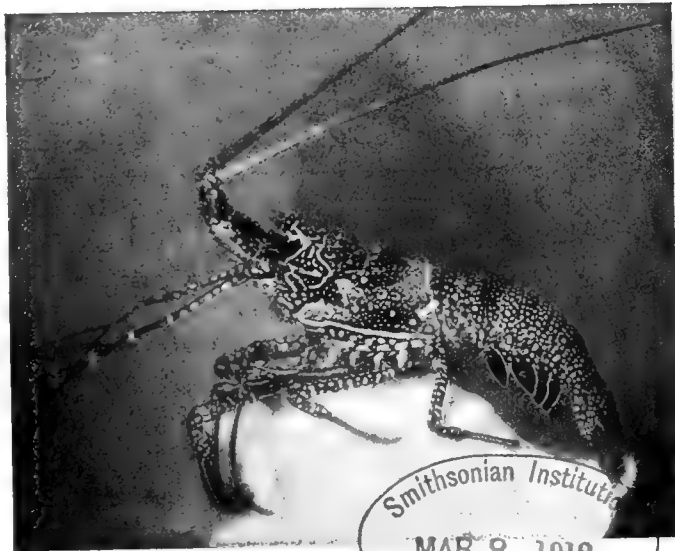
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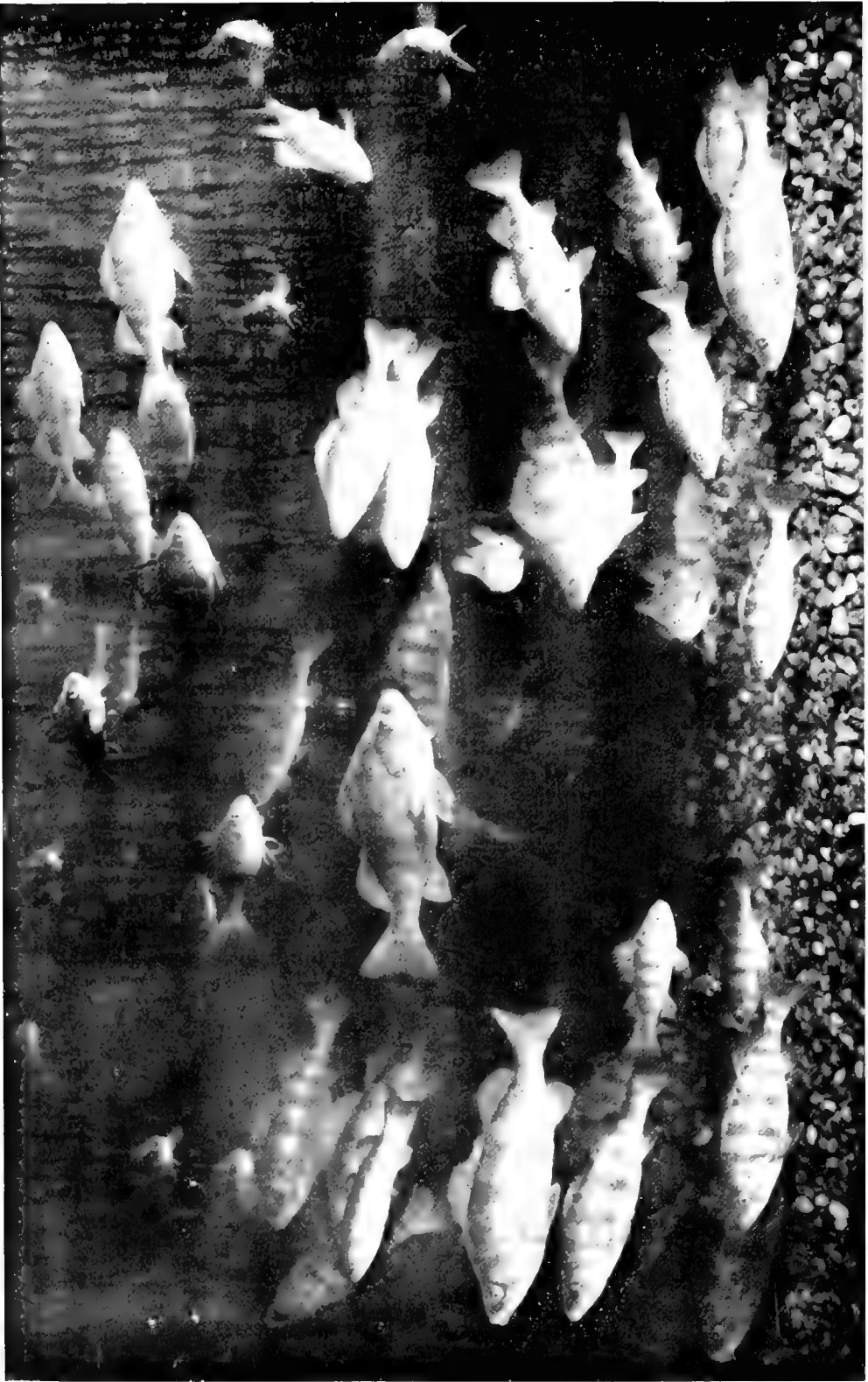
ZOOLOGICAL SOCIETY BULLETIN

AQUARIUM NUMBER

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Prepared and Edited by DR. RAYMOND C. OSBURN

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YELLOW PERCH IN THE NEW YORK AQUARIUM

ZOOLOGICAL SOCIETY BULLETIN

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UGLY FISHES

THE charm of beauty has been sung by poet and discussed by philosopher from time immemorial, but the fascination of ugliness has been almost wholly neglected. Beauty of form, of motion, of color in all nature have been extolled as though there were in reality more of nature in the presence of these qualities than in their absence.

Considering this attitude of the human mind toward that which it holds to be praiseworthy in nature, it is not strange that much has been written concerning the fine colors, the grace of motion or the symmetry of form of many or even of most fishes, since most fishes do possess one or all of these qualities to some noticeable degree. Now while there can not be the slightest objection to lauding the beautiful, I maintain that the few fishes which do happen to be lacking in this respect should not go unmentioned on that account. For while sym-

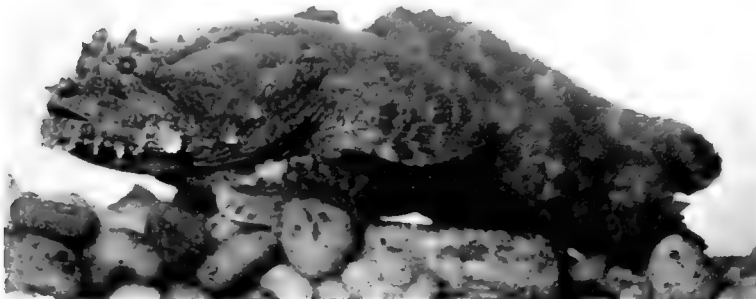
metry, grace and pleasing colors undoubtedly may make a fish attractive, yet even in the absence of these qualities it is possible for a fish to be attractive by reason of positive ugliness. I say *positive* ugliness, for ugliness such as is possessed by the fishes mentioned in this article is not to be classed with mere absence of beauty. Like the ugly man in the story, these fishes are "professionals" and have a deep-seated, in-growing ugliness that gives them a fascination all their own.



COMMON PUFFER

Of course there are all degrees of fishy ugliness, and the fascination for the beholder which some un-beautiful fishes possess, comes often from some un-fish-like quality rather than from pure ugliness. Take as an example the big green moray. It is hardly a beautiful fish, at least to the eyes of the layman, but people will crowd around the moray tank to enjoy the sensation of a good spine-thrilling shudder, and not because the moray is ugly, but because, forsooth, he looks somewhat like a snake! Or, take the seahorse. While I would not for a moment suggest that the seahorse, adopted as the ensign of the Aquarium, is ugly, still he possesses as little beauty, as that term is understood among fishes, as one could desire. He is a most interesting and attractive little creature—because of features that are not fish-like. The only things about him that seem to show a relation to ordinary fishes are his fins, and they usually vibrate so rapidly that they cannot be seen. The visitors at the Aquarium will stand three or four deep around the seahorse tanks and admire him for what he appears not to be.

To introduce at once the highest degree of ugliness might prove too much of a shock to the mind of the reader, who, presumably, is accustomed only to the consideration of beauty. Therefore, we will begin with the puffer or swellfish. The accompanying cut will bear out the statement that, as far as form is concerned, he is no beauty, and only a casual glance at the movements of a specimen in the tank will reveal the fact that he is anything but graceful. His colors are well enough except that he has green eyes which might indicate a consum-



COMMON TOADFISH
He is as impudent as he is worthless.



TOAD-FISH (Ventral view)
He looks like a wide-mouthed tadpole.

ing jealousy. His disposition is ugly too, and his sharp teeth, like a pair of nippers, are well fitted for biting off the tails and fins of his neighbors or for taking a piece out of the unwary finger. Yet the puffer is not without his interesting points. His habit of inflating himself into a ball by means of either air or water, which is retained by a valve in the throat is one of the curiosities of nature. Mitchill mentions that "it is a piece of sport common enough among fishermen to burst them between two stones, when the air is let loose with a noise almost equal to the report of a pistol." While this may be entertaining to the fishermen, it is rather hard on the fish, and it is not to be encouraged. The puffer is ugly and interesting in about equal proportions.

The toadfish, flat-headed and big-bellied and looking more like a wide-mouthed



THE EEL-POUT

tadpole than a fish, is interesting to the naturalist from many points of view, but he is certainly not pretty. The fishermen are not friendly toward him, for he is a voracious feeder and his appetite is wholly incommensurate with his size. For this reason he makes away with the bait intended for some larger fish and when he is hooked he is good for nothing. But the visitor at the Aquarium always looks twice at the queer little fish with the bull-dog jaws, which appears to be, and in reality is, the personification of piscine impudence.

The eel-pout, also known as the muttonfish, possesses several important points of ugliness, as the figure shows. But it is a useful fish and perhaps for that reason its appearance should be excused. It reaches a length of about three feet and has considerable importance as a food fish.

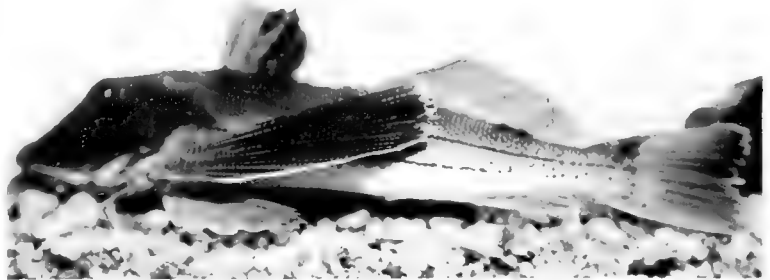
Another local fish that can easily qualify for this article is the orange file-fish. This species, which is greatly lacking in the matter of color, form and movement, was discussed in the November, 1912, Bulletin. A glance at the frontispiece of the Bulletin mentioned will show why the visitors at the Aquarium find it difficult to pass the filefish tank.

The gurnards or sea-robins are often gorgeously colored, a fact which has led some writers to refer to them as handsome fishes. It is evident, however, that such persons could have looked no farther than the colors or they would have hesitated to apply such a term to any fish with a head like a sea-robin's. It looks very much as though nature, realizing that she had made a mistake in giving the sea-robin such a head, had tried to even things up by adding the bright colors. Any one

can see at a glance that it is only a compromise.

The sculpin is rather handsomely barred with black and greenish, but no one would be misled on that account into calling him a beautiful fish. In the words of DeKay, "When freshly taken from the water and irritated they do present rather a formidable appearance. The head is swollen to twice its usual size by the distension of the branchial membranes; the spines stand out prominently, and the rays of all the fins become erect." But even when quietly resting in the water the sculpin is sufficiently uncouth in appearance.

Compared with its relative the sea-raven, however, the sculpin becomes quite a normal appearing fish, for the sea-raven looks as though he were designed for the express purpose of frightening naughty water babies into decent behavior. The head, which appears to have been originally intended for a much larger fish,



COMMON SEA-ROBIN



THE COMMON SCULPIN

is covered with protuberances, ridges and ragged flaps of skin, the bulging eyes are set high upon the top of the head, and the lower jaw is undershot like that of a prize bull-dog. The colors, which are quite variable, are often very bright, but while they might appear handsome on another fish, they seem to make the sea-raven even more repulsive. They give the impression of warning coloration, as though the fish were poisonous, rather than of decoration. The sea-raven reaches a length of about two feet and a large specimen is indeed a fearsome object to behold.

But the palm for ugliness, if in this case such an award is permissible, must unquestionably go to the angler or goosefish. He is the quintessence, the superlative degree of all that is forbidding and abhorrent in the fish world. Dr. Bean passes him by with the remark that he is "a fish of singular ugliness of appearance," but this expression is far too mild. He is a piscatorial nightmare, whose every aspect is repulsive, and if he possesses any redeeming feature whatsoever, it has thus far escaped notice.

Besides the names given

above, he is known as the bellows-fish, fishing frog, monk-fish, devil-fish, head-fish, all-mouth and satchel-mouth, and the application of most of these terms is evident. At the first glance the goosefish seems to be all head, but this is a mistake, for his stomach is astonishingly capacious. When he opens his mouth it looks as if the whole upper half of the fish were coming loose, but there is space enough left somewhere to contain an enormous quantity of the

various fishes which make up his bill of fare. Where he keeps it all is a mystery. The head and the ridiculously small body are covered with ragged fringes of skin which make him look as if he were in the last stages of dissolution and this impression is heightened by the flabby softness of the flesh. The head and the anterior part of the body are flattened out as though he were trying to escape observation by squeezing himself into the sea floor. And such is really the case, but for reasons of domestic economy and not from any special modesty on



COMMON SEA-RAVEN



THE SEA RAVEN IN SWIMMING ATTITUDE

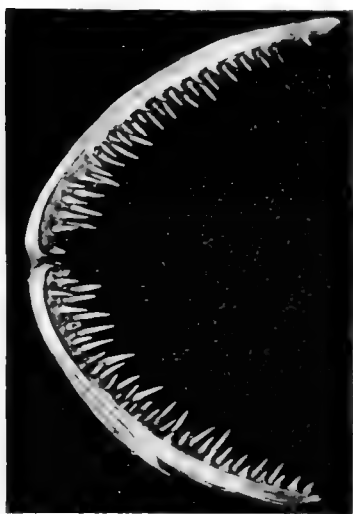
his part. He is a firm believer in the proverb that all things come to him who waits, so he lies in patient obscurity dangling his tempting lure, until some unwary fish is attracted by it and swims above him. Then with one mighty spasm the whole seabottom in his vicinity seems to rise

to engulf the unlucky prey, which is held fast by an array of horrid backward-pointing teeth. The success of this stand-pat policy is sometimes his undoing, for fishermen are said to open him up to obtain the numerous fishes contained in his stomach.

The angler reaches unlimited capacity and a length of about four feet. But though this fish is repulsive in every point of person and character, it must not be supposed that he does not attract attention when on exhibition. Quite the contrary—which brings us back to our original proposition that there is a great fascination in pure unadulterated ugliness.

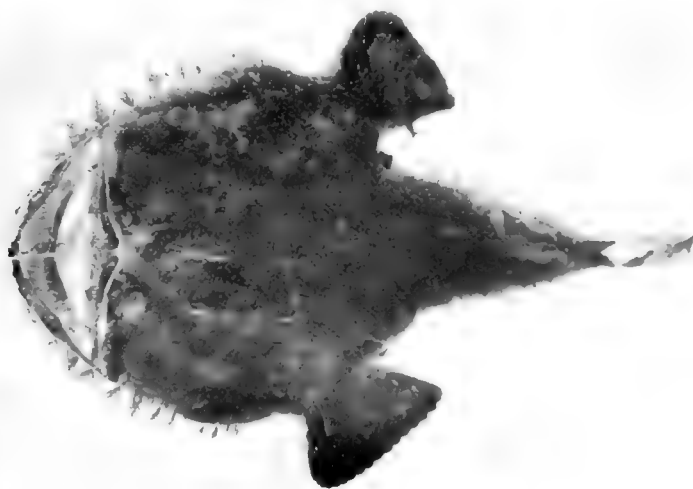
Giant Turtle of the Amazon.—

Four specimens of this turtle (*Podocnemis expansa*) arrived at the Aquarium on February 24 from Manaus, Brazil,—nearly a thousand miles up the Amazon river. According to the best of our information it has never been exhibited before in this country. The shell reaches a length of three feet, making it a giant among the fresh-water turtles. Bates in "A Naturalist on the River Amazon" treats very interestingly of the habits and economic status of this species.



JAW OF THE ANGLER

The powerful teeth project backward to hold the prey.



THE ANGLER

One of the lures is seen projecting forward, the other is laid back in the resting position on the top of the head. This specimen was about three feet long.

BLACKFISH AND CUNNER.

IT is safe to say that there are no fishes better known to the shorewise angler from New Jersey to Nova Scotia than are the Blackfish and the Cunner. They belong to the Wrasse family (*Labridae*), which has many representatives in various parts of the world, but which is limited in our region to these two species. Not only are the Blackfish and Cunner common everywhere along the coast, but, like the poor, they are "always with us." Even if they may seem to disappear at times in colder weather, they are merely hibernating in crevices in the rocks or similar situations.

BLACKFISH OR TAUTOG (*Tautoga onitis*, Linnaeus): The popularity of this fish is attested by the number of pet names that have been applied to him, such as chub, salt-water chub, sea-tog, Moll, Will-George, besides smooth blackfish and oyster-fish, and occasionally toadfish, but it must not be confused with the common toadfish which is quite a different species.

The blackfish was evidently well known in the early days of New England. It was described by Linnaeus in 1758. Several specific names have been applied by later writers who were misled by the variations in color exhibited by this species. The name of the genus *Tautoga* was given by Mitchill in his report on the fishes of New York in 1814. Mitchill states that the name which is evidently Indian, is of Mohegan origin, and DeKay adds that the word means "black," which is the ordinary color. However, it varies from blackish to greenish, pale-bluish or bluish-black, and sometimes shows metallic reflections. These darker colors are spread without any particular arrangement over the back and sides. Sometimes the whole dorsal surface will be nearly solid black or again it will be broken into irregular spots and blotches, and often there will be several shades of color on the same individual. Occasionally irregular bands of the darker color

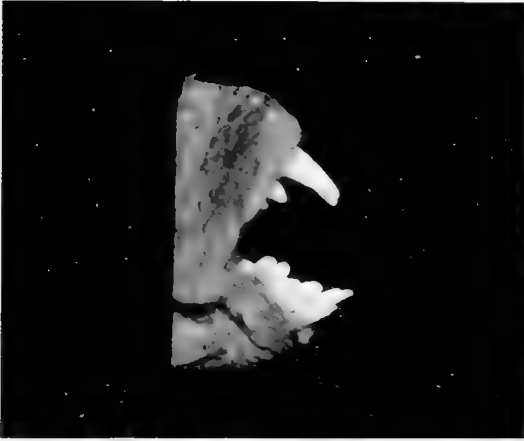
will appear on a background of greenish or dark pigmentation. As a rule the older individuals are much darker than the young ones, and the blotches less sharp in outline.

The blackfish occurs in shallow water along the coast from Virginia to Nova Scotia. His presence, however, is not always evident, for in the colder months he seeks a crevice between the rocks, or some similar situation, and hibernates until spring warms him up. The young ones often remain in quite shallow water along the shore, sometimes simply burying themselves in the sand or mud, while the larger ones usually seek somewhat deeper water. As a rule, in the vicinity of New York, the hibernation lasts from the latter part of November till about the first of April, or while the temperature of the water is below 60 degrees Fahrenheit. They are sometimes speared during the colder months in the mouths of the New England rivers, and they are sometimes frozen to death when hibernating in too shallow water.

The blackfish delights in rocky pools and uneven bottom close to shore where the seaweeds are abundant and is common on oyster beds. His diet consists of sea-foods of various kinds, barnacles, marine worms, crustaceans and other similar delicacies. For the purpose of obtaining these he has a set of strong, projecting front teeth. These are somewhat separated and are placed at such an angle that they look



A YOUNG TAUTOG



TEETH OF TOUTOG

They are adapted for crushing shells, barnacles, etc.
Natural size.

as though they were about ready to fall out with Rigg's disease or some other dental malady, but as a matter of fact they are ankylosed to the jaw so firmly that they are strong enough to bite barnacles from the rocks and crush the shells of molluscs, crabs and other ordinarily well protected sea animals. There is a separate set of teeth farther back on the gill arches, known as the pharyngeal teeth, which further macerate the food before it is swallowed.

The blackfish has a somewhat bull-headed appearance and this does not belie his character, for every angler is well aware that determination is his principal asset and also that his large head contains a fair amount of brains. The blackfish does not strike like many other fishes when taking the bait, because the natural feeding habits are such that he first nibbles the food before attempting to swallow it. So, in fishing for the tautog, it is well to give him his own time. When, however, he starts to run it is well to bring him up with a turn for when he finds himself hooked, he immediately starts for the bottom with the intention of going all the way. If given the opportunity he will very shortly find some means of taking a half hitch in the line around a rock or other projection, or about seaweed, with the result that the angler loses both his leader and his fish. Some fishes are willing to give the angler a fair fight in the open, but not so with the tautog. He considers discretion the sum total of valor and he is almost as wise as he is determined. Many

an old blackfish has finally been captured bearing a series of hooks embedded in his jaws as evidence of the number of times he has managed to escape the unenviable fate of occupying a position in the frying-pan.

The blackfish reaches a considerable size; specimens three feet long and weighing nearly twenty-five pounds have been recorded, but ordinarily fish weighing six or eight pounds are considered large. It is an excellent food fish, its flesh being firm and white and of good flavor.

In this vicinity the eggs are laid in the latter part of April. They are very minute, only one twenty-sixth of an inch in diameter, and they float at the surface separately. In the spawning season the female is said to go into shallow water six or eight feet in depth closely attended by numbers of males who swim slowly round her at the surface, often with portions of the body projecting above the water. The eggs hatch out very quickly. At a temperature of 71 degrees only two or three days are required for hatching. In colder water a longer period is required. The young fish is transparent except for the pigment of the eyes and is only one-twelfth of an inch in length. Though hatched at the surface they soon make their way to the bottom, where they spend the remainder of their lives. Ordinarily they are quiescent in habit and swim but little, though they can be active enough on occasion. They may often be seen lying on the bottom partially turned over on one side as though enjoying a siesta. It is essentially a bottom fish and no doubt its mottled, irregular coloration affords it some protection in its natural habitat. They find good hiding places in and about sunken wrecks and piles. Mr. W. I. DeNyse of the Aquarium staff informs me that some years ago the wreck of a tugboat was raised from the bottom of Gravesend Bay in early March and when placed in dry-dock three barrels of blackfish in the hibernating condition were taken from crevices in the hulk. Like many hibernating animals, the eyes at this period are covered by a thick film of mucus which renders them blind. The film is shed or dissolved with the rising temperature of the water in spring. Mr. DeNyse also states that young tautog are frequently found hibernating between the valves of dead oyster and clam shells and in the cribbing of

locks, and that on one occasion he lifted an old leather boot from the bottom and found it to be the winter quarters of two young blackfish, each about five inches in length.

The young fish do not seem to be affected by the temperature as readily as the adults and remain active after the larger ones have become dormant. Mr. DeNyse states further that on one occasion in Gravesend Bay a sudden fall of temperature, before the usual time for hibernation, so chilled the large individuals in shallow water that they were numbed and stiffened by the cold and were washed ashore in large numbers where they were gathered up. Besides those eaten by the collectors several hundred pounds of these fish were marketed.

In the Aquarium the blackfish are very hardy and easily kept and have lived for several years in confinement. Young specimens make very attractive fishes for the balanced salt-water aquarium. They are slow in growth.

THE CUNNER OR BERGALL (*Tautogalabrus adspersus*. Walbaum): If the opinion of the average salt-water angler were asked as to the merits of this fish, his remarks, or a portion of them at least, would probably be unprintable. The cunner is a fish that is always in the way when you wish to catch something else. He is a perfectly good food-fish when he gets big enough to find after being dressed, but he seems to take a fiendish delight in getting just big enough to steal all the bait and to stop growing at that point. It is said that off the reefs about Martha's Vineyard and Nantucket they sometimes reach a weight of two and a half pounds, but in places where they can make nuisances of themselves they seldom seem to get larger than a quarter of a pound.

But while the cunner is gall and wormwood

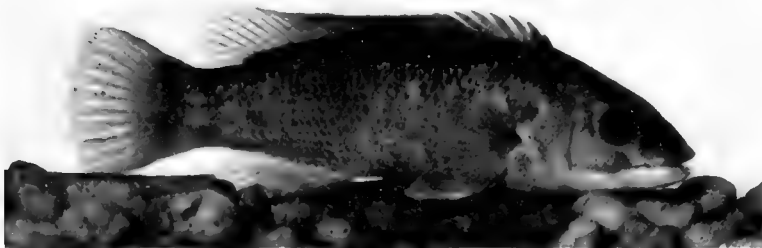
to the angler in pursuit of either meat or sport, he is an everlasting joy to the youthful heart. He will bite at anything and under all circumstances and the way a three-inch specimen will take out a boy's line affords the youthful fisherman no end of excitement. He is to the young salt-water angler what the bullhead, shiner and yellow perch, all rolled into one, are to the inland boy.

As with most common fishes a great many local names are applied. Besides cunner and bergall, which are most widely used, he is known as the bengall, gall, chogsett, perch, sea-perch, blue-perch, nipper and baitstealer, the last two as a reward for his propensity in making away with the bait. While the name "gall" is evidently a contraction of bergall it is strikingly applicable to the character of the fish.

The colors of the cunner are quite variable, though bluish and brownish predominate. There is usually a brassy reflection on the sides and spots of brassy often appear on the head and back. The young vary in color more than the adults and sometimes are nearly all yellowish, greenish or brownish, but, as a rule, dusky or black bands and spots of varying size and distribution are present, and there is a black spot on the anterior part of the dorsal fin. The color variations have led to the description of a number of supposed species, but subsequent study has shown that these intergrade in all directions.

The bergall does not seem to hibernate in winter as does his relative the tautog. As a result many of them are frozen during extremely cold weather. However, it can scarcely be the degree of cold, but the amount of local change in temperature that effects them in such cases for the species is distributed commonly as far north as Labrador.

The eggs of the cunner, like those of the tautog, are extremely small, less than a millimeter in diameter. They float at the surface and hatch out quickly, in five days, at a temperature of 56 degrees. Spawning takes place in June (farther north in July) and though the young are only one-twelfth of an inch long at hatching,



A YOUNG CUNNER

they reach an inch in length by the first of August.

This is distinctly a shallow-water fish, delighting in rocky pools where the seaweed grows abundantly. It also finds favorite hiding places about the piles of docks. In spite of its small size a considerable catch is marketed. Bean states that 300,000 pounds are sold annually in Boston. They are taken on hand-lines and in traps baited and set among the rocks. The cunner is a hardy fish and has lived for several years in the tanks at the Aquarium.

THE PUGNACITY OF FISHES.

THE fighting qualities of the various so-called game fishes are well known to the angler. In fact the true sportsman is attracted only by those qualities. But the terrific rushes of a tuna or the great leaps of a tarpon and the temerity with which a sword-fish sometimes attacks his would-be captor can be readily understood when we consider the pain and desperation of a fish that finds himself held fast. Self preservation is the first law of nature, and such fighting is only a natural exhibition in the attempt to escape. The males of many species of fishes become especially pugnacious during the breeding season, often fighting desperately for the possession of the female until one is overcome and driven away. Many fishes are bold even to the point of recklessness in defence of their nests, often attacking fishes and other objects many times their size.

But fighting in self-defence or to protect the young or in ante-nuptial combat, is not what we wish to consider here. Many fishes fight among themselves, apparently, like the knights of old, from sheer love of fighting, or, it may be, from want of anything better to occupy the time.

During the years that the Aquarium has been inhabited by fishes many conflicts waged by the denizens of the pools and tanks have been witnessed. Some species never show any pugnacious habits in confinement, but like "little birds in their nests agree," in the words of the old school reader. Others appear to be habitually quarrelsome and never satisfied unless chasing each other or lying in wait to bite a piece out of one of their own or some other species in the same tank. The angel-fishes, beautiful as they are in appearance, have perhaps the most devilish disposition of all. A tank

of angel-fishes reminds one of the notorious even-tempered family who were all mad all the time! They frequently bite at each other with their strong parrot-like jaws, or thrust sidewise with the sharp spines on the cheek, and often some member of the group is so scarred by these conflicts that he must be removed from exhibition and placed in a reserve tank behind the scenes, where he may recover if not too severely injured. Apparently the only way to keep them from fighting would be to place each one in a separate tank.

The sergeant-major one would naturally presume to be warlike, and this expectation is fully realized, for two individuals, probably to decide a question of rank or some *affaire d'honneur*, will sometimes fight until nearly all the scales have been abraded from one or both of the combatants. The parrot-fishes also are very truculent in disposition, and, being provided with weapons of no mean merit, they sometimes inflict serious injury upon each other before they can be separated.

The giant groupers are apparently so lazy and self-satisfied that one would hardly suspect them of possessing any bellicose qualities. Occasionally, however, something disturbs their ordinary serenity of disposition and a Brobdignagian duel is precipitated. The most serious altercation among these fishes occurred some time ago when two of these big groupers weighing forty or fifty pounds each engaged in a lively conflict in one of the wall tanks. Before the attendant could separate them one of them had suffered the loss of a considerable portion of the gill-cover which the other had bitten off. The injured specimen was placed in solitary confinement in a reserve tank where after some months he recovered sufficiently to be placed on exhibition again.

The watchfulness of the attendants usually prevents the fatal termination of these misunderstandings, but occasionally a fatal injury is inflicted. Such a case happened when two large green morays engaged in a vicious encounter, during which one of the combatants was disemboweled and had to be killed. These eel-like fishes are extremely powerful and active and coil and strike like snakes. Their teeth are long, backwardly directed and firmly fixed, and their bite is much feared even by fishermen. Along with their ability to inflict injury goes a perfect willingness to exercise it,

and probably no fish is gifted with a more diabolical disposition.

Among the fishes which always appear to be hunting trouble with others of their kind are the puffers or swellfishes. It is difficult to keep a tank of these fishes in decent condition for exhibition. The sharp, scissor-like teeth of the puffer seem especially adapted to the removal of the fins and tails of his neighbors, and while these appendages will grow out again if not injured too deeply, some time is required for this process. The toadfishes often fight like little bull-dogs, biting and retaining their hold with great tenacity. They sometimes seize each other at the same time by the jaws and hold on until the necessity for breathing compels them to let go. Their teeth are sharp, as anyone who has tried to investigate a toadfish nest with his bare hands can testify, but beyond scratching each other considerably, they seem to receive no particular damage as a result of their altercations.

The classical examples of pugnacity in fishes are the stickle-backs, the Siamese fighting-fish and the Hawaiian Uu. The male stickle-back is especially quarrelsome, and if the little fellow's courage were equalled by his size, he would indeed be a terror.

The Siamese have taken advantage of the mimic warfare of the tiny "fighting fish" (*Betta pugnar*) to obtain a great deal of amusement and even excitement. Dr. Jordan writes of this: "The Siamese are as infatuated with the combats of these fishes as the Malays are with their cock fights, and stake on the issue considerable sums, and sometimes their own persons and families. The license to exhibit fish-fights is farmed and brings a considerable annual revenue to the King of Siam. The kind kept especially for fighting is an artificial variety, cultivated for the purpose."

The Hawaiian natives seem to be the only people who have been able to make practical use of the bellicose disposition of any fish. They capture the Uu alive and suspend it near the lurking places of the species in crevices of rock. Jordan states: "It remains there with spread fins and flashing scales, and others come out to fight it, when all are drawn to the surface by a concealed net. Another decoy is substituted and the trick is repeated until the showy and quarrelsome fishes are all secured." It is left to the reader to draw his own moral.



TEETH OF PUFFER

They are sharp, very powerful and cut like a pair of shears.
Natural size.

THE NEW YORK AQUARIUM NATURE SERIES.

The following papers in this series of publications may be obtained at the Aquarium or will be forwarded by mail on receipt of price:

Sea-Shore Life, by A. G. Mayer, 181 pages, fully illustrated, cloth	\$1.20
The Northern Elephant Seal, by C. H. Townsend (reprinted from Zoologica), 15 pages and 21 figures25
The Cultivation of Fishes in Ponds, by C. H. Townsend, 32 pages and 13 figures; cloth ..	.50
..... paper..	.20
Chameleons of the Sea, Some new Observations on Instantaneous Color Changes among Fishes, by C. H. Townsend, 7 pages with 10 figures and a color plate by Charles R. Knight15

A booklet on the care of small aquaria and their inhabitants is in course of preparation by Raymond C. Osburn.

The Aquarium numbers of the New York Zoological Society Bulletin, which deal entirely with aquatic subjects, may be obtained in the same manner as the above publications. The back numbers up to and including March, 1912, may be had for 10 cents. Beginning with November, 1912, these Bulletins are considerably enlarged and are sold at 20 cents each.

Post cards, both in black and white and in colors, showing various animals in the Aquarium, may be obtained at two for five cents or the set of twelve for twenty-five cents.

ZOOLOGICAL SOCIETY BULLETIN.

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ELVIN R. SANBORN, Editor.

VOL. XVI. No. 56.

MARCH, 1913

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(ELECTED SINCE JANUARY 1, 1913.)

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ATTENDANCE AND THE WEATHER.

It might be supposed that during bad weather when people cannot remain out of doors the attendance at indoor places of amusement and recreation would be increased. The records at the Aquarium, however, seem to indicate that the New Yorker remains at home in inclement weather.

The month of January, 1913, was remarkably mild, with the result that there was a

quite unusual attendance at the Aquarium, totaling 126,931 for the month, which was 27,284 more than for the same period last year. The beautiful April-like Sunday of January nineteenth brought out 9,548 visitors, the largest attendance for any day in the month. The greatest number of visitors on any single day for January, 1912, was 6,211 on Sunday, the twenty-first. As the exhibits were just about the same as last year, the great increase in attendance for this month seems, without doubt, to be due to the unusually fine weather.

VERTEBRATES AT THE AQUARIUM.

IN the Annual Report of the New York Zoological Society for 1912, the writer has given a complete list of all the vertebrated animals that have been on exhibition in the Aquarium since this institution was opened to the public, more than sixteen years ago. The catalog is accompanied by notes in regard to the length of life of these animals. While the list is entirely too long for publication in these pages, it may be of interest to repeat certain data in more concise form.

The list contains nine species of aquatic mammals, namely, white whale, common dolphin, manatee, California sea-lion, Alaska fur-seal, harbor seal, California elephant-seal, harp seal and West Indian seal. Due to the conditions of indoor confinement, most of these animals succumb in less than a year to pulmonary diseases. The record for longevity is held by a harbor seal which lived eight years. A West Indian seal lived five years and a California sea-lion that has been on exhibition for five years is still apparently in fine condition.

The only bird that has been on exhibition was a young loon that occupied a place in the center pool for a few weeks before it was sent to the Zoological Park.

Thirty-four species of reptiles have been on exhibition during this time, of which thirty were turtles. The longest lived of these have been a specimen of the Pacific green turtle, fifteen years, and a loggerhead turtle, twelve and one-half years. Both of these are still living. The fresh-water turtles usually last only a couple of years, but specimens of the snapping turtle and soft-shelled turtle, still living, have been

in captivity five and four years respectively.

Of the amphibians twenty-three species have been shown. The hellbender and congo-eel have lived for five years and the Japanese giant salamander and the mudpuppy four years. Various other species have lived for two to three years.

Naturally the greater portion of the lists consists of the fishes, which total three hundred and twelve species. Of this number ninety-two species are from fresh-water, one hundred and twenty-four from local marine waters and ninety-six are tropical marine fishes from Bermuda and Key West. This list might have been greatly increased if any attempt had been made to secure the less common fishes and particularly the smaller, less conspicuous species of the fresh-water minnows and darters, which are very numerous. However, it has been the policy of the Aquarium management to exhibit especially the food and game fishes, which are of particular interest to the angler and the general public. The tropical fishes have been exhibited also on account of their gaudy colors and in some cases because of the unusual form. A few of the local species such as the sea-horse, angler and sea-robin are regularly exhibited on account of their peculiarities of form.

Some species of fishes are very long-lived in captivity. One specimen of the common striped bass, which was brought to the Aquarium as a two-year-old, in the spring of 1894, is still living and promises to attain his majority the coming May. However, he is the only one left of fifty-five brought in at the same time. Specimens of the common gar-pike and the short-nosed gar-pike have spent eighteen years at the Aquarium and are still living. These fishes and the striped bass were brought in long before the building was opened to the public on December 10th, 1896.

A number of other species have lived for a long time. Some of these are:

Mudfish or bowfin	12 years, still living
Channel catfish	5 " " "
Goldfish	8 " " "
Bull-head	5 " " "
Pearl roach	10 " " "
Whitefish	5 " " "
Rainbow trout	5 " " "
Brook trout	5 " " "
Stickleback	4 " " "

Yellow perch	5 years
Climbing perch (India)...	8 "
Common sturgeon	5 "
Common eel	7 "
Common scup	4 "
Sea drumfish	5 "
Blackfish or Tautog	7 "
Cunner	4 "
Squirrelfish	5 "
Green moray	4 "
Nassau grouper	7 "
Yellowfinned grouper	4 "
Black grouper	4 "
Gray snapper	7 "
Lane snapper	6 "
Blue striped grunt	5 "
Sheepshead	4 "
Blue angelfish	5 "
Common triggerfish	5 "

The conditions surrounding many species of animals in the Aquarium are far from normal and probably the longevity of animals in confinement is a fair measure of the approach attained in the matter of food, temperature, etc., to the conditions of nature.

SEA-HORSES.

There seems to have been an unusual number of these queer little fishes along our coast the past summer,—at least there was less difficulty than usual in securing a supply for the Aquarium. Among those obtained was one male specimen that apparently transcends all records for size. According to the literature at hand none have been observed to reach a length greater than about six inches. The longest measurement of the specimen referred to was seven and one-quarter inches, though the head of the sea-horse cannot be entirely straightened out. Measured over the angle formed by the head and body the length would be considerably greater, for the head was one and five-eighths inches long and the remainder of the body six and one-half inches. The greatest girth of this specimen was three and one-quarter inches.

Sea-horses are always variable in color. Of the specimens taken the past summer some were pure yellow, others pure brown and others were variously blotched.

Catalufa (Priacanthus arenatus).—A beautiful fish, never before exhibited, arrived at the Aquarium in February from Key West, Florida.

ATTACHED ANIMALS.

FREE movement in animals seems to possess so many advantages over the fixed or sessile habit of life that one unacquainted with the facts would hardly suppose that so large a number of aquatic animals would find it advantageous to attach themselves during some portion of their life. Yet some groups like the sponges, bryozoa and brachiopods are characteristically fixed, and numerous protozoa, the majority of coelenterates, a few worms, some echinoderms, many mollusca, some crustacea and many ascidians show this habit. A few fishes are able to attach themselves at will and some larval amphibians are fixed for a short period. This leaves only a few minor groups of invertebrates and the higher vertebrates in which no examples of the attached habit appear.

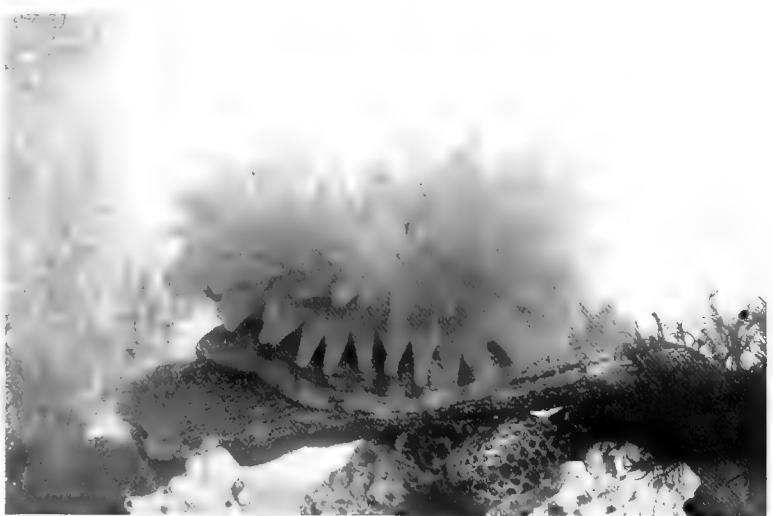
The attachment may be permanent after fixation, or it may be merely temporary, and in some cases it may be assumed at will. The advantage of such fixation is not always clear, and it is certain that it is not the same in all cases. In many marine animals living near the shore-line, attachment, either permanent or temporary, may serve to prevent the animal from being washed ashore in rough weather. In many forms, such as the encrusting corals, bryozoa and ascidians, it undoubtedly aids in protection from the predaceous enemies. In parasitic species the reason is clear enough. In certain cases permanent fixation seems to have been arrived at through crawling or creeping stages; in others it has come about through temporary attachment.

The means of fixation are as variable as the groups in which this habit occurs. It may be by means of an adhesive secretion, by a sucking disc, by hooks or spines as in some parasitic species, by branching root-like structures, by horny or calcareous matters, by cellulose as in the ascidians, or by special grasping organs as

may be noted in certain rotifers and crustaceans.

Several different methods of holding fast may occur within the same group. Thus the coelenterates may have an adhesive base, as in the common hydra and sea-anemone; there may be a horny secretion as in the case of most hydroids, and this may take the form of an expanded base, a trailing adherent rhizome, or of radical fibres, while in the corals and millepores the secretion is lime. In the mollusca attachment may be secured by means of a lime secretion as in the common oyster; by horny fibres as in the salt-water mussel; by the expanded foot as in many gastropods, or by suckers as in the temporary attachment of the octopus. In the crustacea it may be by a calcareous or horny secretion as in the acorn and goose barnacles respectively; by a branched, root-like absorbing organ as in the parasitic barnacle *Sacculina*, or the copepod *Lernaea*; by a tube as in the parasitic barnacle *Duplorbis*, or by hooked thoracic appendages, as in the parasitic isopods and some copepods.

It is evident that for purposes of distribution a free-moving stage must sometime appear in the life history of every form. Such a time occurs always in the larval life and, as a rule, a striking metamorphosis follows the attachment of the free stage. Thus the larvae of sponges, corals, oysters, barnacles and bryozoa swim about for a time and accomplish their dis-



CRIMSON SEA ANEMONE (*Tealia crassicornis*)
Note the basal disc by which it is attached to the stone.

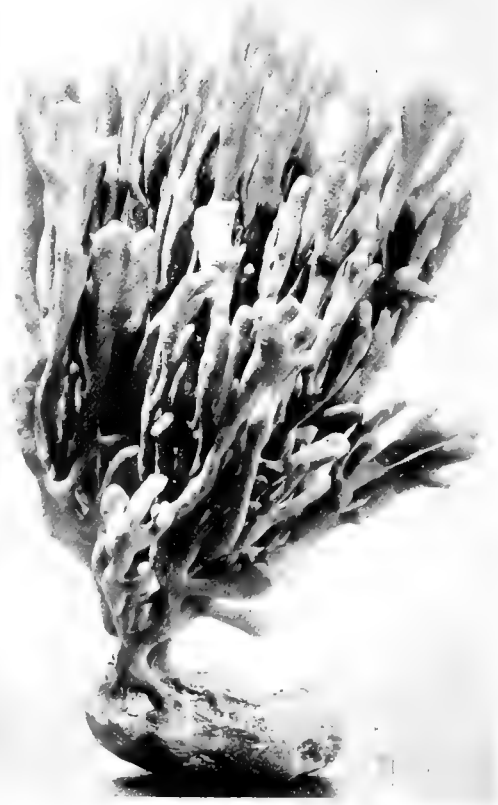
tribution, after which they become permanently fixed and are altogether different in appearance. The free-swimming stages of many animals were described as distinct species in many cases until the life history became known.

In some groups there is a definite alternation of generations; one stage fixed and reproducing sexually, followed by a free generation having sexual organs. Thus in the hydroids there are polyps which reproduce by budding. Some of the buds break loose from the colony and undergo further development into the sexual stage known as the medusa or jellyfish.

In many cases a temporary attachment is necessary for the development of the individual. Thus while most crinoids remain fastened after attachment, in the genus *Antedon* the individual severs the connection after a time and again becomes free. The same thing is true of the genus *Fungia* among the corals. In the mollusca, the common scallop, after passing through the free-swimming larval stage, attaches itself by means of horny fibres, but after a time it loses this connection and thenceforth remains free. In the fresh-water clam, also, a larval free-swimming stage (known as the Glochidium) is present, but the larva then attaches itself to the gills or skin of a fish and leads a semi-parasitic life for a time, following which it again breaks away to lead an independent existence for the rest of its life. Among the amphibia, the young tadpole of the frog, after hatching from the egg, fastens itself for a short time to the stem of a water plant or similar object, by means of suckers around its mouth. After a short period this attachment is severed and the suckers are shed.

Among the forms which may attach or release themselves at will are certain protozoa, such as *Stentor*; some coelenterates, such as *Hydra* and *Leucernaria*; the species of rotifers (wheel-animalcules) which possess a grasping foot; many species of worms provided with suckers; numerous crustacea which attach themselves by their appendages; and fishes, such as the lamprey eels, which fasten themselves by a sucking mouth to the bodies of other fishes or to stones; the lump-suckers (*Cyclopteridae*), sea-snails (*Liparidae*) and the remoras (*Echeneidae*) which are provided with sucking discs formed from modified fins.

Protozoa.—The great majority of the one-



FINGER SPONGE (*Chalina arbuscula*)
This specimen, a foot in height, was attached to a pebble.

celled animals are free-moving, and this is true even of the parasitic species, most of which are able to move about to some extent within the body of the host. The best known examples are *Stentor*, already alluded to as anchored at will, and *Forficella*, which is ordinarily fixed but which may, in the presence of untoward conditions, break away from the stalk by which it is attached and swim into a new locality, where it may re-attach itself and secrete a new stalk. In the colonial *Epistylis*, the attachment is permanent. A remarkable growth of this form was recently figured covering a crayfish from Prospect Park Lake, Brooklyn. (See the Bulletin of the New York Zoological Society, No. 54, Nov., 1912, p. 927.)

Sponges.—These animals generally maintain their position by means of adhesive secretions of the cells in contact with the substratum. The sulphur sponge burrows into the substance of shells disintegrating them and forming nodular

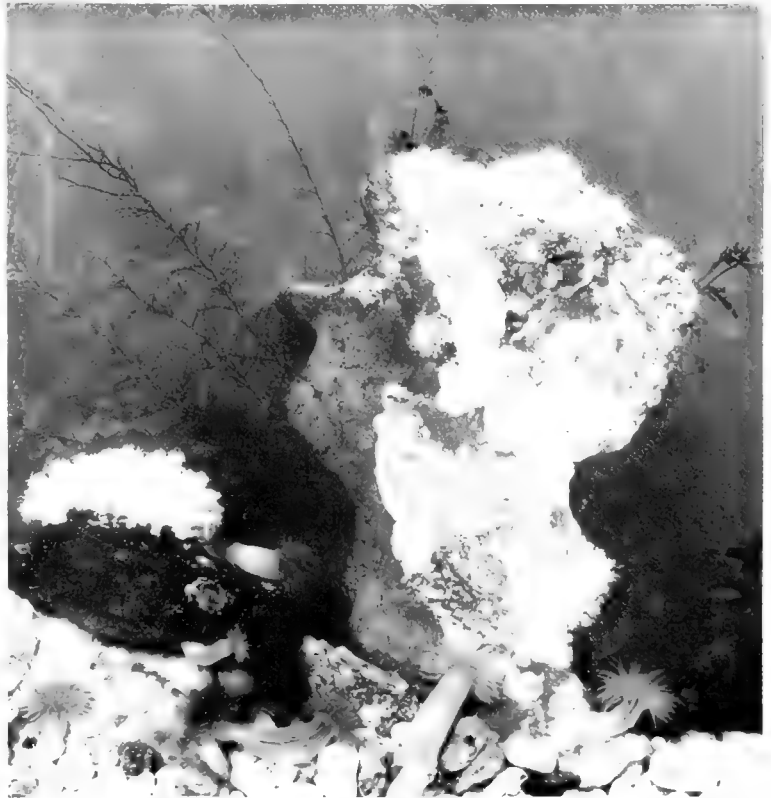
irregular outgrowths on the surface. The sea-biscuit (*Suberites*) and similar species which grow on sandy or muddy bottom have long horny fibres which penetrate the sea bottom to hold the sponges in position. In the Venus flower-basket and glass-sponge the fibers are siliceous, and in the latter these take the form of a twisted rope of very stiff bristle-like fibers which may be a foot or more in length. These are modified spicules of the sponge, just as in the sea-biscuit they are modified spongin fibres.

Coelenterates.—The common fresh-water hydra is ordinarily held in place by an adhesive base, but if food becomes scarce or other conditions improper the animal liberates itself and crawls off in search of more favorable surroundings. The sea-anemone fastens itself in the same manner and is capable of a very slow creeping movement. The majority of hydroids attach themselves by means of a horny secretion and the same is true of the sea-fans or gorgonias. Such forms are never able to free themselves. The corals and the millepores are made fast by means of a calcareous secretion and these also remain permanently fixed. Nearly all of the jellyfishes are free-swimming at all times, but the primitive *Leucernaria* has the ability to attach itself at will by means of an adhesive disc. The larval stage of *Aurelia* and certain other jellyfishes is sessile as a polyp for a period, in which condition it is known as a "scyphula." Scyphulæ, probably those of the common jellyfish *Aurelia flavidula*, have lived for some years in the balanced salt-water aquaria at the New York Aquarium. They propagate freely by sexual budding, but have never metamorphosed into the adult sexual condition.

Rotifers.—The tiny wheel-animalcules are either free living, fixed or parasitic. There are two distinct meth-

ods of fixation among those which attach themselves. In one case there is a pincer-like organ at the posterior end of the body and with this apparatus the rotifer may anchor itself to any object, but such forms rarely retain the grasp for any great period. The other method is by means of a cement gland opening upon a basal expansion and species which have this method of attachment usually remain fixed as long as the conditions of life are satisfactory. Some of these build very beautiful cases into which they can retract the body when in danger.

Worms.—Numerous parasitic worms are either temporarily or permanently fastened to the body of the host by hooks or suckers, or by both at once. The adult tapeworm as an intestinal parasite, is attached to the mucus membrane, and when once it obtains a hold, never loses it. In some cases the rostrum is provided with retroserely curved hooks which catch in the membrane, or the cells of the lining wall of the intestines are drawn into the suckers on the



SEA-ANEMONES, WHITE CORALS AND HYDROIDS
One-half natural size.

head of the worm. The fluke worms are provided with one or more suckers by which they retain their position upon or within the body of the host. Some of these worms apparently do not change their position once they have located themselves, but others move about more or less. Many marine worms live permanently in tubes of calcareous or other matter, cemented to shells, rocks, etc.

Leeches also anchor themselves when feeding by means of suckers, but these parasites affix themselves only temporarily. The highly modified myzostomas, parasitic on crinoids and starfishes, retain their hold by hooks on the appendages. Some of these external parasites move about over the host, while others live in a sessile condition and stimulate the tissues of the host to the formation of a sort of cyst somewhat like a plant gall. One species is an intestinal parasite.

Bryozoa.—These minute animals are attached throughout life, except in the larval stage. The free-swimming larva possesses an adhesive gland by which it fastens itself. It then undergoes a metamorphosis, which is followed by the usual colonial development in all except one small primitive group (genus *Loxosoma*), in which the separate individuals are fastened by a cement from the pedal glands. The colonial species, which are very numerous, have evolved various methods for attachment of the colonies. In all cases there is a secretion of chitin forming an ectocyst, or outer wall of the body. This, in many cases, is further strengthened by a secretion of lime, giving firmer attachment. The colony is spread in a layer over the substratum, or portions of the colony may rise free from one or more basal cells. In the case of the species which have a single basal cell, the attachment is usually made more secure by radical fibres, sometimes very numerous, which arise from other cells of the colony, and assist in holding it in position. In not a few instances the colony spreads by means of a rhizome, occasionally burrowing partially or entirely within the substratum. In one case, the fresh-water *Cristatella*, the colony is able to move about slowly.

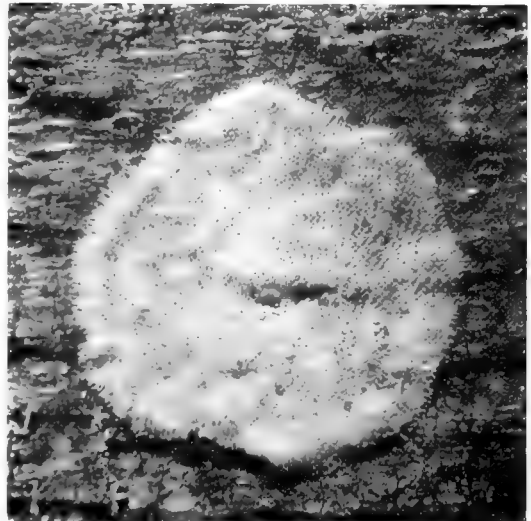
Brachiopods: As a rule the members of this group are attached by means of a pedicle or stalk passing between the valves of the shell



BRYOZOA ENCRUSTING A PEBBLE
(*Membranipora monostachus* above and *M. tenuis* below).
Enlarged twice.

or piercing one of the valves. Rarely, in fossil forms, the foot is absent and the animal is fastened by the whole under shell.

Mollusca: It is natural that in such a large and variable group different methods of attachment should have been evolved. Three methods are common. First, by means of horny fibres



AN ENCRUSTING BRYOZOAN
(*Lepralia pallasiana*) growing on a board.
Enlarged twice.

forming what is known as the byssus, such as in the common salt-water mussel. The fibres are secreted by a gland in that portion of the body known as the foot in the free-moving mussels and clams. In the second case, typified by the common oyster, the under valve is attached directly by a secretion of lime, often so firmly that it is difficult to dislodge it. The oyster is said to trap the raccoon sometimes by catching his foot between the valves of its shell. In the third case, which is common to many of the univalves or gastropod mussels, there is an expanded disc or foot which, in attachment, acts like a sucker. In most cases these forms move about by means of the same organ. Thus the common water-snails hold fast by this foot and move slowly along in search of food. The limpet is a very much flattened gastropod which as a rule moves about but little. It is astonishing how firmly these animals can retain their hold. The ear-shell (*Haliotis*) of the Pacific coast holds to the rock so firmly that a large one has been known to trap an animal attempting to feed upon it. In one recorded case a coyote inserted his snout under the shell, when the haliotis closed down upon him holding him a prisoner. The octopus which uses its suckers for holding its prey also uses these same structures for holding onto rocks. So powerful are these suckers that the weight of the animal may be lifted by the suction of a single disc.

Crinoids: The sea-lilies are now found only at considerable depths in the ocean and are with a few exceptions permanently fixed to the bottom by means of a jointed calcareous stalk which is cemented to a rock or other object by an expanded base composed of a calcareous secretion.

Crustacea: Numerous methods of fixation have been evolved in this group. The parasitic copepods and isopods usually retain their hold upon the body of the host by means of hooked appendages, but in some of the copepods, for example, *Lernea*, there is a branching, root-like sucking organ for attachment. The barnacles ordinarily are fastened by means of a chitinous stalk, or by a secretion of lime, but in the parasitic species there may be a branched or tubular absorbing organ. The hermit crab keeps its hold upon the shell in which it lives by means of the last pair of abdominal legs,

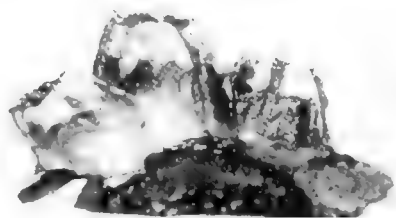


GOOSE BARNACLES
Attached to floating timber.
Much reduced.

which are especially modified for the purpose. It may release the hold at any time.

Ascidians: The sea-squirts secrete cellulose, a substance otherwise found only in plants, and by means of this secretion many species attach themselves to the sea-bottom. They grow singly or in colonies, sometimes forming soft crusts on rocks, shells and sea-weeds. The simple ascidians are sometimes very much appressed to the bottom, but they may be greatly elongated or stalked. In the latter case the base of the stalk is often greatly expanded or divided into finger-like processes for better anchorage.

Fishes: None of the fishes attach themselves permanently, but in a number of widely sepa-



ACORN BARNACLES
Attached to bark of a pile.
Natural size.



This beer glass, brought up from the sea bottom, had several boat-shells (*Lepidula*) attached to it.

rated groups arrangements for holding fast temporarily by sucking discs have been evolved. In the lowest group of fishes, the lampreys, there is a sucking arrangement surrounding the mouth. These fishes are temporarily parasitic upon other fishes and the sucking apparatus contains the mouth and piercing teeth or a rasping organ to obtain food.

The species known as sea-snails (*Liparidae*), lumpfishes (*Cyclopteridae*) and cling-fishes (*Gobiesocidae*) have a sucking disc on the under side of the thoracic region. In the sea-snail and lumpfish this is an elaborate affair formed by the modification of the united ventral fins. In the cling-fish, these fins are separated and the disc which lies between the fins is formed by folds of modified skin. Some of the gobies (*Gobiidae*) also have some ability for adhesion by means of the united ventral fins. The sucker enables these fishes to hold fast to rocks along the shore without danger of being washed upon the beach. Whether it may have other uses is not known. So powerful is the grasp of these sucking discs that the writer has lifted a stone weighing a pound and a half by grasping a three-inch fish which was attached to it, and

some one records lifting a bucket of water by means of a lumpfish fastened to the bottom of the bucket.

The remora or shark-sucker has on the top of the head a sucking disc formed by the modification of the first dorsal fin. This fish ordinarily attaches itself to the body of a shark or other large fish, apparently for the purpose of transportation, since it does the shark no injury. It can swim rapidly, however, on its own account, and darts about to pick up scraps of food when the large fish is feeding, or to capture fishes too small to be of interest to the shark.

One of the strangest examples to be found among fishes is that of a South American catfish inhabiting the mountain streams of the northern Andes. This fish has a sucking arrangement formed by an expansion of the under lip. It is not only able to hold on by this disc, but with the help of spines on the ventral fins is able to make its way up vertical rock walls past cascades.



A CLING-FISH (*Arbacia eos*)
The broad sucking disc is formed anteriorly by the ventral fins, and posteriorly by the skin of the belly.
Enlarged twice.

GENERAL INFORMATION

MEMBERSHIP IN THE ZOOLOGICAL SOCIETY.

Membership in the Zoological Society is open to all interested in the objects of the organization, who desire to contribute toward its support.

The cost of Annual Membership is \$10 per year, which entitles the holder to admission to the Zoological Park on all pay days, when he may see the collections to the best advantage. Members are entitled to the Annual Reports, bi-monthly Bulletins, *Zoologica*, privileges of the Administration Building, all lectures and special exhibitions, and ten complimentary tickets to the Zoological Park for distribution.

Any Annual Member may become a Life Member by the payment of \$200. A subscriber of \$1,000 becomes a Patron; \$2,500, an Associate Founder; \$5,000, a Founder; \$10,000, a Founder in Perpetuity, and \$25,000, a Benefactor.

Applications for membership may be handed to the Chief Clerk, in the Zoological Park; Dr. C. H. Townsend, N. Y. Aquarium, Battery Park, New York City, or forwarded to the General Secretary, No. 11 Wall Street, New York City.

ZOOLOGICAL PARK.

The Zoological Park is open every day in the year, free, except Monday and Thursday of each week, when admission is charged. Should either of these days fall on a holiday no admission fee is charged. From May 1 to November 1, the opening and closing hours are from 9 o'clock A. M. until one-half hour before sunset. From November 1 to May 1, the opening and closing hours are from 10 o'clock A. M. until one-half hour before sunset.

NEW YORK AQUARIUM.

The Aquarium is open every day in the year: April 15 to October 15, from 9 o'clock A. M. to 5 o'clock P. M.; October 16 to April 14, from 10 o'clock A. M. to 4 o'clock P. M. No admission is charged.

PUBLICATIONS.

The publications of the Society are for sale at the prices affixed below. Address H. R. Mitchell, Chief Clerk, New York Zoological Park.

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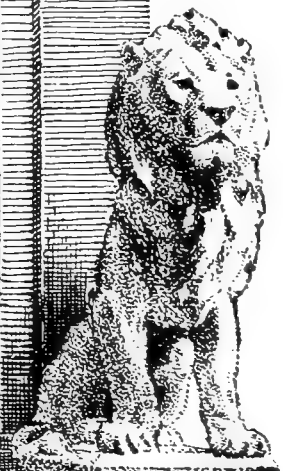
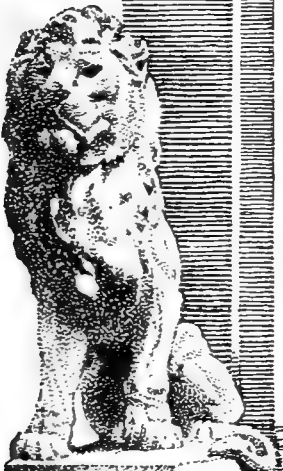


ZOOLOGICAL SOCIETY BULLETIN



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ZOOLOGICAL SOCIETY BULLETIN

Wild Life Protection Number

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PART OF THE WICHITA NATIONAL BISON HERD ON ITS RANGE, FEBRUARY, 1913

ZOOLOGICAL SOCIETY BULLETIN

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VOL. XVI

MAY, 1913

NUMBER 57

WILD LIFE PROTECTION WORK OF THE ZOOLOGICAL SOCIETY

SEVERAL years have elapsed since the publication of the previous wild life protection number of this BULLETIN. During that interval several great tasks have been undertaken, and important victories have been won. It now seems desirable to offer to members of the Society a Bulletin containing full reports of the activities that thus far have been touched upon in our Annual Reports only in the most brief manner. The Society's record of things accomplished in this field may fairly be regarded as a unique exhibit, because up to this date no other zoological institution or corporation has interested itself vigorously and persistently in the prevention of the extermination of species.

The sportsmen of America, and of the world at large, preserve game to-day in order to kill it tomorrow, a motive essentially selfish and merciless. It is only a very small minority of sportsmen who have progressed upward so far that they desire to preserve wild birds and mammals in order that the world may enjoy them alive!

This Society takes little interest in the preservation of game in order that it may subsequently be slaughtered. To-day our great concern is for the preservation of species from extinction, and the retention of all the useful and beautiful forms of life, for present peoples and for posterity. The exigencies of the times

laid upon the Zoological Society a burden of responsibility that could not be evaded or ignored; hence our enlistment in this great campaign.

The tremendous onslaughts now being made upon wild life by a great variety of forces, loudly call for vigorous warfare on the part of all men and women who would save our best wild life from annihilation. The enormous number of guns and gunners, dogs, horses, boats and automobiles operating against killable birds and mammals are, when viewed en masse, enough to alarm any friend of wild life. Fortunately, the conditions of the hour constantly call forth new fighting men. During the past five years the Army of Destruction has been beaten in many campaigns, and it will be still further driven back in the near future.

THE BAYNE NO-SALE-OF-GAME LAW.

This measure marked the beginning of a new period of fierce fighting for wild life, and at the same time it ushered in a series of victories. It may well be chosen as the starting-point of this review of recent events.

In the fall of 1910, certain interests making for the destruction of wild life went up to Albany with a fixed determination to repeal the excellent laws recently enacted against late winter and spring shooting and the sale of wild birds' plumage for millinery in the State of New York. The strength of this destructive movement rendered the outlook very serious.

In sheer desperation, the Zoological Society decided to inaugurate an aggressive campaign. For years the sale of game had been carried on in New York enormously to the detriment of wild life. New York was the greatest dead-game market on the continent. A bill was drawn to suppress forever the sale of wild native game in this State, and Senator Howard R. Bayne, of Staten Island, bravely consented to introduce it, and champion its cause in the State Senate. In the Assembly, Hon. George A. Blauvelt undertook to render similar service. An officer of the Society raised a special fund (of \$5,025) with which to meet the legitimate expenses of the campaign.

The result is familiar history. All the organizations actively working for the cause of wild life protection rushed to the support of the bill and to oppose the repeal bills. The result was a tidal wave of insistent public sentiment that swept the Bayne-Blauvelt bill through the legislature with only one dissenting vote. And yet, Senator Bayne declared after the event, in a speech at Albany, that when he consented to introduce the bill he had not the faintest hope that a measure so drastic and revolutionary ever could be passed in the State of New York.

The Bayne law is working admirably. It has cut down the slaughter of ducks in Currituck waters at least 50 per cent!

THE MASSACHUSETTS "BAYNE LAW."

In 1911, Massachusetts girded her loins and set out to enact a duplicate of our no-sale law; and again a tremendous struggle ensued. The fight was more fierce and bitter than in New York. When the struggle was well on, and the tide was setting against the defenders, a message came down to the Zoological Society, stating that the war chest was empty. At once the "discretionary campaign fund" that financed the New York campaign contributed about \$1,000 to the Massachusetts struggle, for use in arousing the public, and spreading correct information. We are inclined to think that that accession of strength at the most critical moment of the campaign fairly turned the scale: and *the fight was won*. Incidentally, all the vicious repeal bills were defeated.

THE AUTOMATIC GUN CAMPAIGN IN NEW JERSEY.

While the no-sale struggle was in progress in Massachusetts, President Ernest Napier and his colleagues of the New Jersey Game and Fish Commission decided that the time had

come when the use of automatic and pump shot-guns should no longer be permitted in hunting the game of New Jersey. Prohibitive bills were introduced in both houses of the Legislature, and the fight began.

The companies that produce those slaughter guns are strong and tenacious fighters. Whenever a hearing is held on an "auto-gun bill," there will Mr. Thomas Marshall be found, with an array of local and imported legal talent, and a few alleged sportsmen. The Zoological Society was called upon for aid, and cheerfully entered the campaign, furnishing quantities of literature and other material. The New Jersey members of the Zoological Society rendered excellent service. The bill passed both Houses of the Legislature, by large majorities, and went to the Governor.

The attorneys for the gunmakers asked for a hearing, which was granted. For nearly two hours Governor Woodrow Wilson listened to the arguments. The contentions of the gunmakers' attorneys that (1) the bill was unconstitutional, (2) confiscatory, and (3) class legislation, Governor Wilson "failed to follow," and two hours later *he signed the bill*.

THE STRUGGLE FOR A BAYNE LAW IN CALIFORNIA.

By a rather odd adjustment of conditions, the Zoological Society has been brought in close touch with the leading zoologists and game-protectionists of California. Very soon after the enactment of our no-sale-of-game law, a digest of it was printed and widely circulated by Californians, under the caption, "An Object Lesson to California." Professor W. P. Taylor and Director Joseph Grinnell, of the University of California, were urged to bring about a combination of state societies interested in the preservation of wild life, and that was speedily done. The result is a splendid organization called the California Associated Societies for the Conservation of Wild Life, consisting of eight scientific societies, chiefly zoological. "The Flint-Carey" bill, to stop the sale of native wild game, was introduced in the legislature, and immediately it was assailed in great force by thousands of men, and many newspapers, who claim that a *poor* sportsman who can not afford to belong to a ducking club should be permitted to *buy* ducks and geese for his table! That absurd proposition is the foundation of the opposition.

In California we see what a band of zoologists can do, when once they are aroused. It is an object lesson to the world! The vigor, the

good judgment and the force of their campaign is beyond all ordinary terms of praise. They have published three numbers of a "Western Wild Life Call," packed full of forcible facts, arguments and cartoons, and they have been widely circulated. It seems impossible that so splendid a campaign should fail to succeed, but in any event, the complete success of the movement is *only a question of time!*

While the California struggle was entering its most active stage, eastern defensive organizations were invited to subscribe to the campaign fund of the Associated Societies and the Zoological Society promptly forwarded \$400. In order further to promote the interest of the occasion, the Society forwarded 175 copies of "Our Vanishing Wild Life," to all members of the legislature and other persons in a position to influence the result.

THE STRUGGLE IN LOUISIANA.

In the early summer of 1912 a legislative upheaval of game laws and game commissioners occurred in Louisiana. Certain conditions had become so obnoxious to the people that the new legislature threatened the complete destruction of the state game warden system under a state commissioner, and the delegation of game protection to the counties, independently. Such a retrogression would have been a calamity of considerable magnitude. In the face of this crisis, the Zoological Society was called upon for help to avert a disaster. Recognizing the need of some one at the storm-centre who could speak from experience and with great authority regarding warden systems and game-protection principles in general, the Society engaged Mr. James S. Whipple, of Salamanca, New York, for seven years State Game Commissioner of New York, to go to Louisiana. Mr. Whipple went as the Society's special representative, and placed his services at the disposal of Mr. E. A. McIlhenny, who was directing the campaign.

Mr. Whipple's presence and influence proved of great value to the cause. As a final result of the struggle, not only did Louisiana take no steps backward, but Mr. McIlhenny's bill, materially limiting the possibilities in the sale of game, and doing many other good things, was enacted into law. Thus was a victory achieved in the place of what promised to be a calamity.

OTHER CAUSES.

The Society's campaign to suppress the importation of millinery plumage, and in behalf of the McLean Federal migratory bird bill, will be mentioned in other articles in this BULLETIN.

THE FEDERAL MIGRATORY BIRD LAW.

THE Shiras-Weeks-Anthony bills for the Federal protection of "migratory game birds," started by Mr. Shiras as far back as 1904, made no substantial headway until the insectivorous migratory birds were included. On September 18, 1912, the Zoological Society forcibly pointed out the strong prospect that no migratory bird bill ever would be passed by Congress until driven through by an overwhelming public demand for the safety of *the crop protecting birds*. It was also pointed out that the progressive destruction of insect-eating birds rendered the passage of a Federal protective bill a matter of vital interest to *every producer and consumer of farm products!* It was claimed that much valuable time had been lost by talk about the game-bird feature of the bill, when the necessity to protect the insectivorous birds should have constituted the leading line of attack.

On March 6, 1912, the date of a public "hearing" on three bills for the protection of "migratory game birds" or "wild fowl," not one of those bills provided for the federal protection of our *insectivorous birds!* At that hearing thirteen men appeared, nine of whom represented organizations, and out of the entire number only one man, Mr. T. Gilbert Pearson, addressed the Committee in behalf of the insectivorous non-game birds, or even mentioned them.

On April 24, Senator George P. McLean, of Connecticut, introduced a bill (S. 6497) "to protect migratory game and insectivorous birds in the United States," which was immediately reported to the Senate, without amendment.

During the remainder of that long and quiet session of Congress, it was not deemed wise to risk a vote on either of the migratory bird bills. The people who do not shoot had not yet spoken.

On the floor of the House, February 27, 1913, Mr. Cox, of Indiana, uttered this significant declaration regarding the comparative motive powers of the game birds and the insectivorous birds in passing the McLean bill:

"The whole bill is a delusion and a snare. It would have been impossible to put the bill through simply to protect the game birds; and in order to get it through they had to couple with it a provision about which the fathers of the measure cared nothing whatever!"



GAME SLAUGHTER IN TEXAS: WITH AUTOMATIC AND PUMP GUNS, AS USUAL.

In September, 1912, the Zoological Society began the greatest educational campaign that it ever had prosecuted up to that time. With the aid of Mr. T. Gilbert Pearson, of the National Association of Audubon Societies, Mr. William S. Haskell of the American Game Protective Association, Commissioner John M. Phillips and Dr. Joseph Kalbfus of the Pennsylvania State Game Commission, and Dr. George W. Field and Mr. William P. Wharton of Massachusetts, a demand for the Federal protection of the useful migratory birds was strongly presented at Indianapolis, before the Fourth National Conservation Congress, October 1 to 4. The illustrated report of Dr. Hornaday's Committee on Wild Life Protection of that Congress was published by the Zoological Society, and forwarded to 1,850 newspapers, with an appeal for help. Every agricultural paper and every State Grange was called upon by letter, for practical assistance. Many articles were written for publication, and illustrations were sent broadcast.

The result of that campaign was very gratifying. Over 1,100 newspapers and twenty-four magazines and reviews published our articles or articles of their own, and these appeals caused thousands of letters to be written to members of Congress, asking for the passage

of the McLean-Weeks bill. The State Granges took up the matter, and passed it on down to their branches, with excellent results. At the same time, there was a general outpouring of interest and support from organizations all over the United States.

Shortly before Senator George P. McLean's now famous bill was voted upon in the United States Senate, the Zoological Society placed in the hands of every member of Congress a copy of "Our Vanishing Wild Life." In speaking of its effect in the Senate on the passage of the McLean bill, a Senator wrote to the Society as follows: "Your book arrived just in the nick of time, and it put a fourteen-inch hole through the hull of the enemy from side to side!"

During the debate in the Senate, Senator Jacob H. Gallinger, of New Hampshire, referred to the Society's campaign book in the following terms: "Last evening I spent an hour or two in looking over Hornaday's recent work on that subject [wild life protection], and I wish every Senator would peruse that book, and ask himself the question whether the work the Senator [Mr. McLean] is engaged in, in trying to pass this bill, is not one that ought to command the co-operation and support of every man in public life."

The Society appealed to each member of Congress for what is now the Federal migratory bird law. Toward the close of the session, the responses indicated overwhelming majorities for the bill. The tidal wave of public demand that was created by placing the facts of the situation before thousands of newspapers and tens of thousands of people finally swept the McLean bill through both houses, despite the protest (in the House) of Representatives Mondell and Cox, and a very few others. The vote in the House in favor of sending the measure to the Conference Committee was 285 to 15. For general information it should be stated that by the advice of a wise counselor in Washington, to insure a vote in the House even after the Senate had once passed the bill unanimously, the Senate added it to the agricultural appropriation bill as an amendment, and in that honorable and exalted position it passed the House by the vote stated above.

Some of the friends of the measure questioned its full and perfect constitutionality; but that point created hardly a ripple of interest. The need for the law was so urgent, all over the United States, and the demand for it was so universal and overwhelming, all doubts and objections on technical grounds were swept aside by the needs of the American people. It was a matter that affected the market-basket and the dinner-pail; and notwithstanding their old traditions regarding "the sovereign rights of the States," the people of the South (with valuable cotton crops to protect from the boll-weevil) strongly supported the bill, and never once raised the question of states' rights.

The law thus placed on the national statute books is the greatest wild life measure that ever came before Congress. It will exert an enormous influence for good on our bird life. The rules and regulations will be laid down and promulgated, after careful study and the hearing of expert opinions, by the Department of Agriculture. We can depend upon it that many an unfair, mean and destructive state law will now be corrected for the greatest good of the greatest number! In the few states that still meanly permit the shooting of waterfowl in savage winter weather and in spring, that abuse of privilege will be brought to a sudden end. The slaughterers of our song-birds, swallows, martins, woodpeckers, chickadees and other birds of great economic value will now get what they deserve. The country is now thoroughly aroused, and is ready to back up the Secretary of Agriculture to the uttermost.



THE AUTOMOBILE IS A GREAT PROMOTER OF BIRD-SLAUGHTER

The members of the Zoological Society may have the satisfaction of knowing that their organization did its very utmost to help accomplish the McLean law. One of the most valuable features of the service rendered by its officers was in pointing out and insisting upon *the best line of approach to success*. In our judgment we fully agree with Mr. Cox, that the fight for the Shiras-Weeks-Anthony-McLean law was won under the banner of the useful insect-eating birds, and not the game birds which most sportsmen protect *only to kill*.

In the near future we believe that Congress will give to the Department of Agriculture at least \$200,000 per year with which to enforce this law throughout the length and breadth of the land. The country will be satisfied with nothing less than universal enforcement, and whether it costs \$200,000 per year or \$1,000,000 per year, it will be cheerfully paid. What is even the last figure in comparison with an annual loss of four hundred and twenty millions through noxious insects!

Incidentally, our abiding faith in the intelligence and the sincere good will of Congress toward distressed wild life has again been splendidly justified. W. T. H.

With this number of the BULLETIN we offer a colored plate, by Miss M. E. Eaton, showing five of the beautiful and curious birds of the world that are being exterminated for the feather trade. The species represented are the cock-of-the-rock of South America; the famous resplendent trogon, or "quetzal," the national emblem of Guatemala; the greater bird-of-paradise; the scarlet ibis, and the snowy egret which produces the "white badge of cruelty."

Let the bird-lovers of the world ask themselves: "Can we allow such birds as these to be exterminated for the enrichment of a few milliners?"

"I know no way of judging of the Future but by the Past."—Patrick Henry.

REPORT

of a select committee, of the Senate of Ohio, in 1857, on a bill proposed to protect the passenger pigeon.

"The passenger pigeon needs no protection. Wonderfully prolific, having the vast forests of the North as its breeding grounds, traveling hundreds of miles in search of food, it is here to-day and elsewhere to-morrow, and no ordinary destruction can lessen them, or be missed from the myriads that are yearly produced.

"The snipe (*Scolopax wilsonii*) needs no protection. * * * The snipe, too, like the pigeon, will take care of itself, and its yearly numbers can not be materially lessened by the gun."



THE LAST LIVING PASSENGER PIGEON
Now in the Cincinnati Zoological Gardens. 20 years old in 1912

THE FOLLY OF 1857 AND THE LESSON OF 1912

(Facsimile of the frontispiece of "Our Vanishing Wild Life.")

"OUR VANISHING WILD LIFE."*

DR. HORNADAY'S latest book, "Our Vanishing Wild Life," is the first thorough and systematic treatment of this important subject. The volume is appropriately dedicated to Mr. William Dutcher, founder and president of the National Association of Audubon Societies. There is an appreciative Foreword by Professor Henry Fairfield Osborn, who not only indorses the subject matter of the book, but approves the author's vigorous style in presenting it.

The author's preface of the book partly prepares the reader for what is to come. His very first statement bearing on his subject—"Beyond question, we are exterminating our finest species of mammals, birds and fishes according to law!"—will challenge the attention of every thoughtful person. He establishes the literal truth of this thesis, by a careful and complete consideration of the past and present condition of our native mammals and birds, and by an examination of the game laws now in force in each State of the Union. He names eleven species of birds which have been actually ex-

terminated since 1840, and includes *twenty-three species* in a "Partial list of North American birds threatened with early extinction." In the chapter entitled "The Extermination of Species, State by State," the summary of the species which have become extinct, and of the remnant that remains in each State, is fairly startling.

Dr. Hornaday's description of "The Regular Army of Destruction" makes it only too plain that he is not resorting to hyperbole in employing that phrase. He shows that in 1911, twenty-seven States issued 1,486,228 regular hunting licenses, and he estimates that the twenty-one States which either issued no licenses, or did not report the number issued, "turned out a total of 1,155,996 gunners, making for all the United States, 2,642,194 armed men and boys warring upon the remnant of game in 1911. We are not counting the large number of lawless hunters who never take out licenses," he adds, and then he propounds this very pertinent question: "How long can any of the big game stand before the army of *two and one-half million well-armed men*, eager and keen to

* Published by Charles Scribner's Sons, 153 Fifth Avenue, New York. Cloth, octavo, 428 pages, 94 illustrations and 10 maps. By mail, prepaid, \$1.65.

kill, and out to get an equivalent for their annual expenditure in guns, ammunition and other expenses?"

In the chapter entitled "Unfair Firearms and Shooting Ethics," Dr. Hornaday directs attention to the ominous fact that these cohorts are rapidly being armed with repeating shot-guns, which will discharge six shots in six seconds or less, and, worse still, *automatic* shot-guns, which are reloaded and cocked by their own recoil, and will fire *five shots in four seconds*, or less. Five large concerns are producing these guns at the rate of about 100,000 a year, and, as a matter of course, the market-hunters and pot-hunters are especially eager to own and use them. All these facts prompt Dr. Hornaday to ask the following pointed question: "Are the American people willing that their wild birds shall be shot by machinery?"

The scope of the book is very broad. Conditions in this country are most thoroughly discussed in such chapters as "Slaughter of Song-birds by Italians," "Destruction of Song-birds by Southern Negroes and Poor Whites," "Extirmination of Birds for Women's Hats," "The Present and Future of North American Big Game," "The Economic Value of Birds," "How to Make a New Game Law," "New Laws Needed; a Roll-call of the States" (four chapters, in which are presented careful analyses of the game laws of the various States, accompanied by definite recommendations for needed reforms), and "Bringing Back the Vanishing Birds and Game." There are also most interesting and instructive chapters on "The Present and Future of African Game," "The Present and Future of Game in Asia," "Destruction of Birds in the Far East" (by Mr. C. William Beebe), "National and State Game Preserves and Bird Refuges," "Game Preserves and Game Laws in Canada," and "British Game Preserves."

The book contains an enormous mass of facts and statistics, to which are lent interest and verisimilitude by many half-tone illustrations from life, besides drawings, cartoons, maps and charts.

Col. Theodore Roosevelt, in an extended review of the book in *The Outlook*, has this to say of it:

"This book should be studied in every legislature. I commend it to women's clubs just as much as to farmers' associations. It should be read by all intelligent, far-sighted and public-spirited men and women throughout the Union. Moreover, when they have read it, let them not be content with impotent indignation, but let them do all they can to act on the advice it contains."

G. G.

THE BIRDS BENEFITED BY THE NEW FEDERAL LAW.

NATURALLY the number of species, families and orders of birds that will now come under the protection of the Federal law becomes a matter of keen interest to the public at large. Mr. Lee S. Crandall, Assistant Curator of Birds in the Zoological Park, has made a reasonably careful enumeration of the migratory birds that enter or pass through the United States, and his summary of species is as follows:

GAME BIRDS	118
<i>Anseres</i> , 46; Mergansers, 3; Ducks, 29; Geese, 12; Swans, 2.	
<i>Paludicolae</i> , 13; Cranes, 3; Rails, 7; Gallinules, 2; Coots, 1.	
<i>Limicolae</i> , 57; Shore-birds.	
<i>Columbae</i> , 2; Pigeons and Doves.	
NON-GAME AQUATIC BIRDS	117
<i>Pygopodes</i> , 23; Grebes, 6; Loons, 4; Puffins, 2; Auklets, 3; Murrelets, 2; Guillemots, 1; Murres, 3; Auks, 2.	
<i>Longipennes</i> , 36; Skuas, 1; Jaegers, 3; Gulls, 18; Terns, 13; Skimmers, 1.	
<i>Tubinares</i> , 40; Fulmars, 4; Shearwaters, 8; Petrels, 10; Tropic-birds, 1; Gannets, 2; Darters, 1; Cormorants, 10; Pelicans, 3; Man-o'-war Birds, 1.	
<i>Herodiones</i> , 18; Ibises, 3; Herons, 15.	
HAWKS AND OWLS	27
<i>Raptores</i> , 17; Vultures, 1; Hawks and Eagles, 16.	
<i>Striges</i> , 10; Owls.	
ODD BIRDS	38
<i>Coccyges</i> , 3; Cuckoos.	
<i>Aleyones</i> , 1; Kingfishers.	
<i>Pici</i> , 11; Woodpeckers.	
<i>Macrochires</i> , 23; Goatsuckers, Swifts, Hummingbirds.	
PASSERES OR PERCHING BIRDS	310
Total Species	610

GARDEN PARTY

The Annual Garden Party, under the auspices of the Ladies' Auxiliary of the New York Zoological Society, will be observed in the Zoological Park, Thursday, May 8, 1913, from three until six o'clock. Should stormy weather prevail, this function will be postponed until the next clear day thereafter. Refreshments will be served.

MEMBERS' DAY.

The Annual Members' Day will be observed at the Administration Building in the Zoological Park, at 2 o'clock, Monday, May 19, 1913, upon the invitation of the Board of Managers. Refreshments will be served.

ZOOLOGICAL SOCIETY BULLETIN.

Departments:

<i>Mammals</i>	<i>Reptiles</i>
W. T. HORNADAY.	RAYMOND L. DUMARS
<i>Birds</i>	<i>Aquarium</i>
C. WILLIAM BEEBE.	C. H. TOWNSEND.
LEE S. CRANDALL.	RAYMOND C. OSBURN

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Each author is responsible for the scientific accuracy
and the proof reading of his contribution.
ELWIN R. SANBORN, Editor.

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MAY, 1913

SANDPIPER SPORTSMEN.

There are thousands of grown men and big boys who shoot little sandpipers, swallows, martins, nighthawks, whipperwills, larks, black-birds, woodpeckers and doves for "sport" and for "food." These are the sandpiper sportsmen; and unless all signs fail, their activities soon will come to an end. The public is at last thoroughly aroused against these slaughterers of small things, and also against other gunners of many other kinds.

The McLean Federal law to protect 610 species of migratory birds was driven through Congress by the force of outraged public sentiment. "Unconstitutionality" and "state-rights" doubts were swept aside with almost savage impatience. It was plain that the hour for a general reform had arrived. Now that that measure is the law of the land, people far and near are beginning to write letters asking for its immediate enforcement, "before the next hunting season comes on"!

At a conference recently held in New York with Dr. T. S. Palmer, of the Department of Agriculture, the sportsmen present announced their readiness to take their medicine, for the greatest good of the greatest number, provided the medicine is generally distributed, and properly shared by their neighbors. The indications are that the United States will be divided into three zones, and in each of those zones uniform regulations will apply. We may presently expect to see the seasons for wild-fowl shooting all over the United States settled on a basis satisfactory to all, except market-shooters and the most reckless gunners.

At the New York conference, the friends of the crop-protecting birds asked for the immediate suppression of the sandpiper sportsmen,

and the inauguration of a universal five-year close season on all shore birds. By shore birds are meant all members of the Order Limicolæ, as zoologically constituted.

While there may be a few differences of opinion regarding close seasons for game birds, the people of the United States are practically of one mind regarding the insectivorous birds. These birds must and shall be preserved. On March 4, 1913, the period of slaughter of useful birds expired. Henceforth, the men and boys who kill the birds that protect our crops and trees will have to reckon with the Federal Government. The day of neighborly tolerance for law-breaking bird-killers, and sympathetic juries and judges, has gone by. The people at large are now in dead earnest about bird-protection, and the sandpiper sportsmen will do well to put away their guns. W. T. H.

THE DISTRIBUTION OF OUR CAMPAIGN BOOK.

The Zoological Society is now rounding out a publicity campaign which, so far as we are aware, is quite without a parallel. The Executive Committee considered Dr. Hornaday's new book, "Our Vanishing Wild Life," a publication of so much importance to the practical conservation of wild life that it decided to send a copy to every law-maker in the country, and also to many other persons who are in a position to influence legislation in that cause. Accordingly, the Board of Managers of the Society was invited to provide a fund to meet the expenses of a very large and costly distribution, which involves an expenditure of nearly \$11,000. The following members of the Board responded promptly to the appeal:

Mr. Andrew Carnegie	\$1,000
Mr. Percy R. Pyne	500
Mr. C. Ledyard Blair	500
Mr. Watson B. Dickerman	500
Mr. Cleveland H. Dodge	500
Mr. George F. Baker	500
Mr. Samuel Thorne	500
Mr. Ogden Mills	500
Mr. Emerson McMillin	500
Mr. James J. Hill	500
Mr. Mortimer L. Schiff	500
Mr. Grant B. Schley	500
Mr. Frederick G. Bourne	500
Mr. Lewis R. Morris	300
Mr. Edward S. Harkness	250
Mr. George C. Clark	250
Mr. Robert S. Brewster	250
Mr. C. F. Dieterich	250



N. Y. Zoölogical Society Bulletin.

VICTIMS OF THE FEATHER TRADE.

Examples of the species being exterminated for Milliners' use.

Cock-of-the-Rock
Snowy Egret

Greater Bird-of-Paradise

Resplendent Trogon
Scarlet Ibis

Mr. F. Augustus Schermerhorn	250
Mr. George J. Gould	250
Mr. Lisperard Stewart	250
OTHER CONTRIBUTIONS.	
Mrs. Russell Sage	\$1,000
Mrs. E. H. Harriman	250
Mr. Charles Greer	100
The Ladies' Auxiliary, Mrs. Henry F. Osborn, President	91
Total	\$10,491

This fund made it possible to send a copy of "Our Vanishing Wild Life" to the following: The United States Senate, 50 copies; the House of Representatives, 530 copies; 39 State Legislatures sitting in 1912, and Alaska; total, 5,144 copies; the Justices of the United States Supreme Court, 9 copies; the Governors of all States and Territories, 51 copies; State Legislature clerks, 78 copies; State game commissioners and wardens, 105 copies; sportsmen's clubs, 284 copies. Total to date, 7,051 copies.

In order to lend distinct personal significance to the gift of this book, a letter calling attention to the nature and purpose of the volume, signed by Madison Grant, Esq., Chairman of the Executive Committee, was sent to each recipient, and each book sent out was wrapped separately and personally addressed.

The members of both Houses of Congress received their copies in ample time to admit of their perusal while the McLean Bill for the protection of migratory birds was pending, and it has been freely stated that Dr. Hornaday's convincing presentation, especially of the case in favor of the insectivorous birds, did much to bring about the passage of the McLean law.

Many gratifying responses have come to the Society from National and State law-makers who have received the book. For example, the governors of five States have promised to veto all bills which provide for the further destruction of useful or harmless wild life, while fourteen governors have expressed warm approval of the movement as a whole.

Hundreds of expressions of keen sympathy with the cause have been received from members of Congress and of State Legislatures, and there can be no doubt that the book, which soon will be in the hands of every American law-maker, and also thousands of other friends of the cause throughout the country, will exert a powerful influence in jarring the people to wakefulness, stimulating public opinion, and converting it into action in support of wild

life conservation. Unquestionably the volume will promote innumerable betterments in legislation to that end.

The difficulty of appealing effectively to the great mass of the people always is the most serious obstacle to be overcome in advancing the cause of wild-life protection. Once the interest of the great silent majority is fairly aroused, the success of the cause is assured.

G. G.

THE PURCHASE OF MARSH ISLAND BY MRS. SAGE.

The news contained in the brief statement of Mr. Madison Grant in the Annual Report of the Executive Committee that the Director of the Park "exerted an important influence" on the purchase of Marsh Island, may have caused some surprise, but it is entirely true.

In 1911, Mr. Edward A. McIlhenny, of Louisiana, came to New York to seek subscriptions toward the purchase of Marsh Island, and he approached several persons believed to be able to influence the result desired. For some reason, however, he did not call upon Dr. Hornaday, or make the matter known to him in any way. His mission was unsuccessful and disappointing.

When he again came to New York, in the winter of 1912, his second call was at the Zoological Park, where he laid before the Director the whole story, with exhibits consisting of a map, photographs and binding options. When he mentioned the amount of money yet to be raised by subscription (\$132,000), for a tract of far-distant wild land and water, Dr. Hornaday said:

"That is a good thing; but the subscriptions must be in four figures or above, if you ever win out! I know of just two persons in New York who might take a helpful interest in this plan. They are Mr. Robert W. De Forest and Mrs. Russell Sage. I will give you a strong letter to Mr. De Forest, and he will at least hear what you have to say. Incidentally, I will vouch for you and your plan, because I think that what you propose would be a great achievement for wild life, and something worth while."

The letter that Mr. McIlhenny carried away with him half an hour later instantly enlisted the active interest of Mr. De Forest, and from that day (January 24, 1912), the purchase of Marsh Island by Mrs. Sage rapidly progressed to the well-known conclusion.



BLACK DOG: WICHITA NATIONAL BISON HERD, FEBRUARY, 1913

AN OBJECT LESSON IN BISON PRESERVATION

The Wichita National Bison Herd After Five Years.

By ELWIN R. SANBORN.

FIVE years have now elapsed since the New York Zoological Society presented fifteen bison to the United States Government, and established them as a national herd in the Wichita Forest Reserve, southwestern Oklahoma. The time that has elapsed is sufficient to demonstrate either the success or failure of the undertaking. The inception of the plan found many who were willing to wager that at the end of the first year not one animal would survive the ravages of the Texas fever cattle ticks. To those doubting Thomases, it becomes a pleasure to say that the Wichita bison form the most perfect herd of wild hoofed animals that the writer has ever seen.

There may be herds of bison in other parts of the world that are in as good condition, but there can be none that excel this one. From the original herd of fifteen head, three were lost during the first year, and the twelve ani-

mals remaining have increased to thirty-eight. This represents a gain of 216 $\frac{2}{3}$ per cent, and considering that there is not one weak or unsightly animal, the percentage of increase seems to afford convincing proof of the success of the experiment.

To every person who for any reason is interested in the wild animals of North America, the Wichita National Bison Herd is an inspiring sight. Its members roam over the grassy prairie, apparently as free as their ancestors of a half century before, who made the wallows and trails which they use to-day.

As the visitor enters the Forest he experiences a sensation of arrival within a well kept and even immaculate private game preserve. The sun-cured grass spreads a soft, clean, tan carpet under the gnarled branches of the oak forest. The trail bends in and out through the trees, now descending to cross the rocky bed of

a stream and then drifting along through a lane of black-jack and post oaks to the crest of a low hill where it winds through an open glade covered with mesquite grass. In the forest and through the glades runs the trail until it attains a high, open point in the valley where the panorama of the Preserve sweeps away to the west and north, a panorama of rolling prairie and timber-bordered streams, disappearing in the hazy-blue foothills of the weird, boulder-covered mountains which surround it on every side.

Two prong-horned antelopes spring up from the grass and bound away, their white rump patches marking their queer, stiff-legged flight long after their forms are no longer visible. A huge bull elk challenges your passage through, but conquers his resolve and turns away, his numerous family following his measured pace down the draw. You ride on, up one billowy rise and down another, along the line of the boundary fence which stretches like a silver ribbon glistening in the first rays of the rising sun, until you slip from your horse at the buffalo yards. Away north, on the Range, the bison are swinging along toward the feeding corral, responding to the sight of the Ranger's horse and his long, echoing call.

The line increases in length when the outlying and solitary bulls pick up the trail of the main body. The pace quickens, and the calves and young bulls, unable to restrain their impatience, break into an easy lope. Comanche, now eleven years old, stalks along in the van, still the leader, though being hard pressed for that honor by his young offspring. The long shadows spread out before them and against the blackness of it and their long, shaggy hair their heavy breath breaks into long white plumes in the crisp, morning air. Along the fence of the corral the Ranger has spread the Kaffir corn and cane; long golden stalks with deep red and yellow clusters of seed. As the first bundle is tossed over the fence, the fast approaching herd breaks into a gallop and the dust rises in clouds. Down into the gully of Cache Creek and up again, the long, waving line disappears and reappears. Old Comanche catches a bundle on his stubby horns, gives it a mighty shake and scatters the fluttering stalks about him. The herd moves along the dividing fence, bellowing and plunging as they receive the bundles.

The corral is a cloud of dust, and an animated picture of healthy, vigorous bovine life. Each animal is round and plump, and every hairy coat glistens with health. The calf that was only six months old when shipped from New

York, has expanded into a monstrous bull, with a huge head and a great, shaggy mane. Mr. Rush has named him "Black Dog," in honor of a Comanche Chief. Unable to take care of himself on his arrival, he was put into a small corral and carefully reared on "chop" and selected food. How successfully this was accomplished the picture that this great, shaggy fellow presents is sufficient proof.

Between the oldest bull down the line to the youngest calf, there is little to choose, and there are none that are not well developed, perfect animals. There are several large bulls, and Quannah, Lone Wolf and Comanche are just now at the point of determining the question of supremacy. In spite of his years, old Comanche is yet maintaining his place as the leader of the herd. Thus far there have been no signs of any change through in-breeding and Mr. Rush's thorough knowledge of cattle breeding has been of the utmost value in keeping the standard of excellence so high. Dr. Hornaday maintains that in herds of wild animals roaming free in vast ranges, the ordinary dangers of inbreeding that are to be feared in domestic cattle closely confined, entirely disappear.

During the winter months the food of the herd is Kaffir corn and cane, and its food value for all hoofed stock has the unqualified endorsement of every cow-man in the country. It is estimated that two bushels of the shelled Kaffir corn are the equivalent of three bushels of oats for stock that is not working.

The cattle tick that once literally was the bug-a-boo of the cattleman, no longer has any terror for him. A Federal law that covers the zone of the natural breeding life of the tick provides that all outgoing and incoming cattle shall be dipped. For this purpose, both the Forest service and various shipping points on the railroads are equipped with corrals and vats where cattle and horses may be dipped, and in consequence of this, the complete eradication of the pest in the near future is assured.

As one leaves the bison range and rides alone into the forest he is impressed with another feature of the Wichita National Preserve,—its bird life. In this also we find a striking object lesson in protection. An unutterable silence lies over the whole landscape; a silence that would deprive this lovely valley of some of its charms, were it not for the wild creatures that have there found a haven of refuge. There is, however, hardly a quarter hour in a day's ride that some interesting form of bird life is not flashing before your eyes. Red-headed, red-



PROTECTED WILD DUCKS: WICHITA NATIONAL FOREST

bellied, hairy and downy woodpeckers ply their trade on every hand, now industriously inspecting the bark of the trees, now gathering acorns and depositing them in holes in the trunks, or, perched high on a single dead limb beating a lusty tattoo on its hard surface until the sound reverberates down the canyons like a well-played note of a xylophone. It is a sound so mellow and so resonant, that it is hard to believe that a bird could produce it by any other means than its throat, so faultless is the rhythm.

The sap-sucker, chickadee, robin, flicker and our old friend, the song sparrow, present themselves in the most comradely fashion. The titmouse carefully drills into an acorn at the base of the oak from which he may have just gathered it and then, perching upon a branch, raises his head to the blue sky above and pours forth his thanks in gushing song. Down near the borders of the rocky creek, not one, but scores of azure-coated jays wage continuous warfare with as many kingfishers, each little army defending and besieging a choice hollow tree for which neither has the slightest use, until put to shrieking, scolding rout by a flock of inquisitive crows.

If, by chance, you throw your coat over a convenient bush, one or more house wrens, or perhaps a rock wren, will flutter out of the sleeves or pockets as you resume it. From a clump of

buffalo grass scurry a covey of quail, and the drumming whirr of their wings disturbs a flock of mourning doves, whose whistling flight sounds like the hum of the wind through the rigging of a ship. Close to the trunk of a dead tree is a battered branch with a brown stub projecting above it. A puff of wind transforms the stub into the ruffled plumage and blinking eyes of a belated screech-owl, whose wanderings in the night, like those of the dusky horned owl in the red elm on the creek bank, have been terminated by the rising sun.

A cotton-tail rabbit jumps from the thicket like a jack-in-the-box, and his twinkling feet speed down the trail with a long, easy lope that suggests a feeling of security. You are tempted to accept his tantalizing invitation for a race, until a rustle of dried leaves draws your attention to an open glade. Into the patch of sunlight steps a stately white-tailed buck. He rests his startled gaze on you for an instant, and then slips into the oak scrub. Another takes his place, and in turn follows on. Like a motion picture the deer move in and out until twenty flashing forms have passed and the snapping twigs and crackling leaves betray the direction of their hasty flight until the sounds are lost in the depths of the forest.

As the trail follows the meanderings of Panther Creek, the oak scrub disappears and

in its place appears a stately grove of pecans, elms, cedars and oaks of more pretentious growth. Through the openings of the trees, pools of water flash back the rays of the sun. Although the streams are dry in winter, there are places in their wild and rugged course where long, deep holes have been gouged out by the terrific rush of torrents in the rainy season.

In such basins the water remains the year round. Deep under the cliff that marks the foothills of Cedar Mountain, with the pendulous branches of elms arching over, there is a natural reservoir that bids defiance to the coldest northers that ever blow. The brooding silence is unbroken save for the soft pat of our horse's hoofs, or the tremulous note of an owl awakening from his day-time sleep.

Unconsciously you guide the horse with care, as though it would be sacrilege for a human sound to thrust itself into the peaceful spot. Alas! Like all things that are too carefully done, a stray oak branch lies directly underneath the horse's hoof. It bends, cracks and echoes through the wood like the report of a pistol. There is an interval of silence, then a roar as though a pent up waterfall had launched itself over a cliff. The air is filled with the sound of flapping wings, and the quacks of flying ducks. By tens, and scores, and hundreds the ducks launch themselves into the space above the trees, flying chiefly in squads. Each successive rise sounds like surf beating on an ocean beach, and the sharp vibrations of their wings passing overhead, as they gain proper momentum for their flight, is like the humming of a giant aeolian harp.

But after all you have disturbed them only a trifle. They are supremely confident of safety from attack, and therefore lazy. The crackling branch is the only gun they ever hear in the Wichita Forest. Now that they have been reminded, they stream away into the oak forest across the valley and fill their crops to overflowing with tiny sweet acorns that lie on the ground. In two hours they will all return and rest as contentedly on the surface of the pool as before. There are hundreds of these secluded water-holes and all are sought and found, not by a thousand ducks, but by tens of thousands. Every night at sunset, and every morning at sunrise, the sky above throws back the long streamer-like bands of flying ducks, wending their way to the feeding grounds, or back to the sheltering pools. A golden eagle on a cottonwood branch is the only disappointed spectator, and as you clatter through the rocky

ford he indolently launches himself into the air and spirals aloft to join his mate high above the crags of Cedar Mountain.

Warden Frank Rush has worked unceasingly to put the surrounding country in touch with the Preserve, by constructing through the Forest roads that radiate to all the outlying towns. Where the roads cross the omnipresent and irrepressible creeks, substantial bridges of cement have been placed. The construction of these concrete bridges is another example of the astonishing versatility of the Warden; and concrete work that can endure the radical climatic changes of an Oklahoma winter without cracking is exceedingly well done. The bridge across Cache Creek at Forest Headquarters is an ambitious piece of work, and on its surface there is not a single defect.

During the past three years, the main road to Cache, the nearest railway station, has been entirely re-constructed, and at nearly all times will support heavy traffic. This is the road over which the bison were hauled to the Range in the Fall of 1907. At this day, such an effort could be carried out with an ease that was absent on that eventful trip.

Five years ago, in the face of many doubts, and prophecies of evil, Warden Rush accepted the responsibilities of his position in a very serious fashion; and it was well for both the Wichita Bison herd and the National Forest in general that their fortunes have been directed by a highly intelligent and conscientious man.

The first years of the bison herd were years of anxiety for both Mr. and Mrs. Rush, but with painstaking care the animals were brought through in safety. Now they are practically immune to the fever, and are thoroughly acclimated. Although a multitude of duties make life at Headquarters both arduous and trying, good management has brought its reward—an abundant prosperity. My winter in the Wichita Forest will always be a pleasant memory, and my only regret is that I cannot describe in a more graphic manner the wonderful work that has there been accomplished. All that has been told has been experienced, and because space has its limitations is the only reason that I have not told all that there is to tell.

As a home for wild animals, the Wichita National Forest presents great possibilities. Over 4,000 cattle graze in the Preserve each year, finding abundant water and food. The dense oak scrub provides the best of shelter, and there is no reason why the hardier of the North American ruminants should not thrive and prosper there in equally large numbers.

LIST OF BIRDS NOW BEING EXTERMINATED FOR THE AMERICAN, ENGLISH AND CONTINENTAL FEATHER MARKETS.*

Species.	Locality	Species.	Locality.
American egret.....	Venezuela, South America, Mexico, etc.	Touracou, or plantaineater.	Africa.
Snowy egret.....	Do.	Velvet birds.....	Locality uncertain.
Scarlet ibis.....	Tropical South America.	"Grives".....	Do.
"Green" ibis.....	Species not recognizable by its trade name.	Mannikin.....	South America.
Hérons, generally.....	All unprotected regions.	Green parrot (now protected).....	India.
Marabou stork.....	Africa.	"Dominos" (sooty tern).....	Tropical coasts and islands.
Pelicans, all species.....	All unprotected regions.	Garnet tanager.....	South America.
Bustard.....	Southern Asia, Africa.	Grebe.....	All unprotected regions.
Greater bird of paradise.....	New Guinea, Aru Islands.	Green merle.....	Locality uncertain.
Lesser bird of paradise.....	New Guinea.	"Horphang".....	Do.
Red bird of paradise.....	Islands of Waigiou and Batanta.	Rhea.....	South America.
Twelve-wired bird of paradise.....	New Guinea, Salwatti.	"Sixplet".....	Locality uncertain.
Black bird of paradise.....	Northern New Guinea.	Starling.....	Europe.
Rifle bird of paradise.....	New Guinea generally.	Tetras.....	Locality not determined.
Jobi bird of paradise.....	Island of Jobi.	Emerald-breasted hummingbird.....	West Indies, Central and South America.
King bird of paradise.....	New Guinea.	Blue-throated hummingbird.....	Do.
Magnificent bird of paradise.....	Do.	Amethyst hummingbird.....	Do.
Impeyan pheasant.....	Nepal and India.	Resplendent trogon, several species.....	Central America.
Tragopan pheasant.....	Do.	Cock-of-the-rock.....	South America.
Argus pheasant.....	Malay Peninsula, Borneo.	Macaw.....	Do.
Silver pheasant.....	Burma and China.	Toucan.....	Do.
Golden pheasant.....	China.	Emu.....	Australia.
Jungle cock.....	East Indies and Burma.	Sun-bird.....	East Indies.
Peacock.....	East Indies and India.	Owl.....	All unprotected regions.
Condor.....	South America.	Kingfisher.....	Do.
Vultures, generally.....	Where not protected.	Jabiru stork.....	South America.
Eagles, generally.....	All unprotected regions.	Albatross.....	All unprotected regions.
Hawks, generally.....	Do.	Tern, all species.....	Do.
Crowned pigeon, two species.....	New Guinea.	Gull, all species.....	Do.
"Choncas".....	Locality unknown.		
Pitta.....	East Indies.		
Magpie.....	Europe.		

PRICES OF RARE AND BEAUTIFUL BIRD SKINS IN LONDON.*

Condor skins.....	\$3.50—\$5.75	Toucan Breasts.....	\$0.22—\$0.26
Condor wing feathers, each.....	.05	Red tanagers.....	.09
Impeyan pheasant.....	.66— 2.50	Orange oriels.....	.05
Argus pheasant.....	3.60— 3.85	Indian crows' breasts.....	.13
Tragopan pheasant.....	2.70	Indian jays.....	.04
Silver pheasant.....	3.50	Amethyst humming birds.....	.01½
Golden pheasant.....	.34— .46	Humming bird, various.....	3-16 of .01—
Greater bird of paradise:		Humming bird, others.....	1-32 of .01—
Light plumes—		Egret ("Osprey") skins.....	1.08— 2.78
Medium to giants.....	10.32—21.00	Egret ("Osprey") skins, long.....	2.40
Medium to long, worn.....	7.20—13.80	Vulture feathers, per pound.....	.36— 4.56
Slight def. and plucked.....	2.40— 6.72	Eagle, wing feathers, bundles of 100.....	.09
Dark plumes, medium to good, long.....	7.20—24.60	Hawk, wing feathers, bundles of 100.....	.12
12-wired bird of paradise.....	1.44— 1.80	Mandarin ducks, per skin.....	.15
Rubra bird of paradise.....	2.50	Pheasant tail feathers, per pound.....	1.80
Rifle bird of paradise.....	1.14— 1.38	Crown pigeon heads, Victoria.....	1.68— 2.50
King bird of paradise.....	2.40	Crown pigeon heads, Coronatus.....	.84— 1.20
"Green" bird of paradise.....	.38— .44	Emu skins.....	4.56— 4.80
East Indian kingfisher.....	.06— .07	Cassowary plumes, per ounce.....	3.48
East Indian parrots.....	.03	Swan skins.....	.72— .74
Peacock necks, gold and blue.....	24— .66	Kingfisher skins.....	.07— .09
Peacock necks, blue and green.....	.36	African golden cuckoo.....	1.68
Scarlet ibis.....	.14— .24		

*From "Our Vanishing Wild Life," by W. T. Hornaday, Chapter XIII. Also, "Tariff Hearings, No. 23."

OUR NEW CAMPAIGN: TO STOP THE IMPORTATION OF WILD BIRDS' PLUMAGE FOR MILLINERY

FULLY one hundred species of the most beautiful and curious birds of the world are now being exterminated to meet the demands of the feather trade, for plumes, feathers and skins to use on the hats of thoughtless women. If the American women of society and of fashion could be made to know the details of this trade, and what it means, they would be among the first to support this movement for the protection of birds from the feather trade. The stories published by the Audubon Societies, of the starvation of egret nestlings through the slaughter of parent birds, are incontestably true, and those telling of the extermination of certain birds of paradise are also true.

Remember that the feather trade is attacking the existence of an immense variety of birds, ranging from the condors and vultures, egrets, hawks, owls, birds of paradise and emus, down to the pheasants, ducks, callistes and humming-birds. No beautiful bird is spared unless fully protected by law.

The New York Zoological Society is strongly and permanently opposed to this slaughter. It challenges the right of the feather trade to exterminate the most beautiful birds of the world for millinery purposes. It objects to bird slaughter in New Guinea just as strongly as to bird slaughter in Florida! Every civilized nation has a duty in this matter which cannot be ignored.

On January 30, the Executive Committee of the Society asked the Ways and Means Committee of Congress to incorporate in the new tariff bill, now being framed, a provision that will absolutely stop the feather-millinery traffic throughout the United States. The argument, brief and exhibits of the Society's representative appear in full in "Tariff Hearings No. 23."

The full text of the Zoological Society's proposed provision is as follows:

At the end of Section No. 438 of the new Tariff Law, add the following:

"PROVIDED, that the importation of aigrettes, egret plumes or 'osprey' plumes, and the feathers, quills, heads, wings, tails, skins or parts of skins, of wild birds, either raw or manufactured, and not for scientific or educational purposes, is hereby prohibited; but this provision

shall not apply to the feathers or plumes of ostriches, or to the feathers of domestic fowls of any kind."

On April 7 the new Tariff bill that was presented to Congress contained this clause!

The Society is now endeavoring to place before the American people an impressive summary of facts regarding the awful extent and destructiveness of the feather trade. A large four-page circular, filled with information, has gone to every state, and that portion of the newspaper press which pays attention to the needs of wild life has been asked to assist in spreading the facts. We are asking the People to make their wishes known to Congress, and particularly to members of the House of Representatives.

It is important that *all the world* should know that at least 100 species of the most beautiful and most curious birds of the world are being *exterminated* for the feather trade. Unfortunately, there is not the slightest exaggeration in this statement. *No* wild-bird species that is pursued and killed for valuable plumage can possibly escape ultimate extinction. Even the countless *millions* of the passenger pigeon went down before the guns, clubs and nets of the market-hunters, and only *one* bird now remains alive.

The colored plate presented with this BULLETIN exhibits five species of the beautiful birds that now are relentlessly being pursued and slaughtered for the feather millinery trade. The greater bird of paradise is already practically a bird of the Past! The forests of the Aru Islands that once were filled with their beautiful forms are now silent and uninhabited. The native blow-pipe, killing for "the feather trade," has done its work. The two living specimens now in the Zoological Park probably are the last specimens of the species that we ever will be able to obtain.

For years the Royal Society (of London) for the Protection of Birds, aided by Mr. James Buckland, has besieged the British Parliament for a law to stop the London traffic in the plumage of wild birds. While considerable progress has been made, success has not yet been attained because of the fierce opposition of the feather trade, backed by the Chamber of Commerce! "The Trade" wants the money!

In America several States have stopped the sale of the plumage of North American birds for milliners' use, but the sale of such foreign birds as birds of paradise still goes on *generally!* This is entirely wrong

We have asked Congress to take the action that will forever wash our hands of the blood of these beautiful creatures, so far as millinery is concerned. The National Association of Audubon Societies is with us—or we are with it, whichever it may be! Australia has already enacted such a law as we are asking for. In that country the national watchword is "Advance, Australia!" The Australians have done so, and we are sorry we were not the first to reach the goal.

The cause is a great one—well worth striving for. *It is worth while* to work for a cause that, when successful, sweeps a shame and an abuse from half a continent! While the matter is not so great as the migratory bird bill, it is still so great, so far-reaching and so admirable when done that it may well claim the attention and the efforts of the best people of America.

The time has now arrived when every American woman, and also every man, who desires to strike a hard blow in defense of the persecuted birds of the world can do so. It can be delivered by writing in behalf of the Society's provision, directly and immediately, to all members of Congress outside the State of New York. The New York members need no urging on this measure!

Think what it would mean to end, for the whole United States, by only six lines of national law, the disgraceful bird-slaughter that now is going on in response to the demands of the traders in American fashions!

Of course, the National Milliners' Association will vigorously oppose our measure. It will denounce it as "unconstitutional," "confiscatory," "class legislation" and "oppressive." We expect all that, and more. Possibly one-tenth of one per cent. of the American people will be represented by that opposition; but will they prevail against the 99.9 per cent. who are firmly opposed to bird slaughter for the enrichment of "the feather trade"?

Ask your Congressmen to maintain our clause, *unchanged!*

HENRY FAIRFIELD OSBORN,
President New York Zoological Society.
MADISON GRANT,
Chairman Executive Committee.
WILLIAM T. HORNADAY,
Director New York Zoological Park.

HENRY FORD BECOMES BIRD PROTECTOR.

THE ranks of the bird protectors of America have had a great accession of strength and activity. Three months ago Henry Ford, of Detroit, manufacturer of automobiles, became so stirred up by the slaughter and disappearance of American birds that he began a tremendously vigorous independent campaign for better laws and better protection. His first efforts have been concentrated on the support of the McLean bill for the Federal protection of all migratory birds, a measure which for the past year has been urged upon Congress by many organizations that are actively engaged in saving our American birds. No bill ever before Congress affecting bird life has been so generally or so actively pressed as that which aims to place all migratory birds, about 600 species in all, under the protection of the Department of Agriculture. The six national societies in New York have been particularly active; but the movement has embraced the whole nation, from Boston to San Francisco.

Mr. Ford's advertising men in Chicago, under the direction of Mr. Glen Buck, were instructed to make the promotion of the McLean bill the chief business of their lives. Late in March Mr. Ford's final directions to Mr. Buck were: "Go to Washington and don't return until that bird bill has been passed!"

Only the men on the firing-line can quickly appreciate what Mr. Ford's interest has meant to the McLean bill. A thousand newspapers have been supplied with articles, of at least twenty different kinds, intended to awaken the sleeping American people. Thousands of telegrams have been sent in all directions, demanding attention for the bill and help in placing the needs of the birds before the people. For the first time, "big business" has been called upon for help, by a voice strong enough to compel attention.

Every bird lover in America, when the news is published, will rejoice and be thankful that a man like Henry Ford, with great resources at his command, has entered the lists as a champion of wild life, at this critical period of the struggle.

The cause of protection is literally starving for campaign funds, and it is a refreshing novelty to see campaign work on a large scale prosecuted without the embarrassment of weighing and measuring every dollar before it is expended.

PROTECTION NOTES AND NEWS.

OREGON has fully enacted a no-sale-of-game law, and her legislature has formally memorialized California to be a good neighbor and do likewise.

WISCONSIN killed in committee, by a vote of 6 to 1, a bill intended to reopen spring shooting.

NEW YORK'S Senators and Assemblymen are going to kill three bills to reopen the shooting of wild-fowl in January, and two bills to reopen the sale of game.

KANSAS has enacted no legislation adverse to wild life, but on the contrary has given five-year close seasons to quail and pinnated grouse.

ARKANSAS, under the leadership of Edward A. McIlhenny, made a strong fight for a long list of improvements in her wild life laws, but unpreventable accidents and calamities at the end of the session robbed the workers of a victory that had been earned.

CALIFORNIA is in the throes of a fierce struggle between a band of determined and vigorous zoologists and real sportsmen on one hand, and a host of hotel-keepers, market-men and alleged "sportsmen" on the other. *In the end*, the Defenders of Wild Life will win every point for which they contend; because the fight they are making is of the kind that always wins!

NEW JERSEY has begun a legislative war on stray cats that destroy wild life; and so has New York. The New Jersey Assembly passed the cat license bill, but in the Senate it was defeated.

The legislature of PENNSYLVANIA has just passed, by good majorities, the long-contested bill for a hunter's license law. For four long years this measure was fought by men of little judgment and less patriotism, but the campaign so gallantly waged by Commissioner John M. Phillips, Secretary Joseph Kalbfus and the real sportsmen of Pennsylvania finally has triumphed. Pennsylvania has also enacted, *unanimously, by both Houses of her Legislature*, a law prohibiting the sale of plumage of American birds for millinery, and to place the herons, eagles, ravens and shrikes on the list of protected birds. This was bitterly fought by a lot of men who are masquerading as "sportsmen," and doing much to disgrace the real sportsmen of Pennsylvania. They permitted themselves to be used as the stalking-horses of the millinery trade—and from this fact their real standing as "sportsmen" can be judged.

In FLORIDA Mr. Charles Willis Ward has inaugurated a movement to create a great bird preserve along the Caloosahatchie River, practically from the western Gulf coast to the Everglades. That region is to-day well stocked with bird life, and if it can be perpetually protected, it would soon contain a great avian population. Undoubtedly the white egrets will return—provided it is possible to protect them.

IOWA still maintains, in spite of all protests, her disgraceful spring-shooting habit. It is strange that such a state should persistently maintain an attitude so indefensible; but the new McLean law will work beautifully in all such aggravated cases as this.

In MASSACHUSETTS three bills to reopen the spring shooting of waterfowl have been defeated, jointly and severally, and a bill intended to permit the shooting of gulls has also been defeated.

In ALASKA the ruthless slaughter of cow moose by Indians, at all seasons of the year, is reported to be going merrily on. It is one of the anomalies of our Indian system that the Alaskan Indian should be regarded as a citizen of such paramount value and importance to the world that he should be granted game-slaughtering privileges clear beyond the wildest dreams of the most sordid white man. The slaughter by Indians of Alaskan big game out of season, and female animals at all times, should be stopped, instantly.

In BERING SEA the Norwegian whalers are now killing walruses, wholesale, for their oil, hides and ivory; and it is reasonably certain that the Pacific walrus will be completely exterminated within ten years from this date! This will be a very short and easy task; and the museums of the world that desire specimens of that marvelous animal are advised to make all haste in securing them. Already the annual slaughter is very serious; and unfortunately Bering Sea is not a "closed sea" in which killing at sea can be controlled.

From BRITISH COLUMBIA comes the news that the Elk River Game Preserve elk have increased to such an extent that some people are clamoring for an "open season." They simply can't abide seeing a lot of meaty elk roaming the mountains unkilld.

From WYOMING there comes from a reliable guide the estimate that in all that state outside the Yellowstone Park there are at this time *not more than 100* mountain sheep! The guide said: "If any friends of yours want a ram, they'd better come right away!" But no friends of ours will care to help exterminate that remnant; and the people of Wyoming are fatuous fools to permit any more sheep-killing within their state.

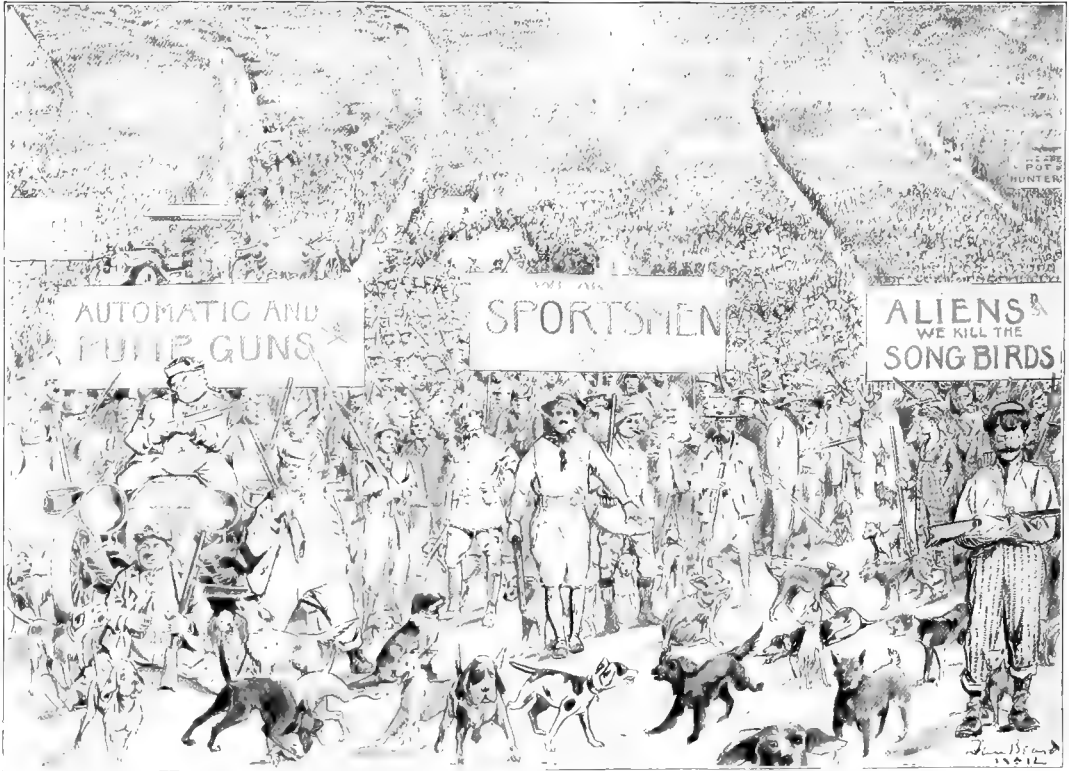
FEDERAL LAW FOR THE PROTECTION OF MIGRATORY BIRDS

[PUBLIC—No. 430, p. 23.]

[Extract from an Act making appropriations for the Department of Agriculture for the fiscal year ending June thirtieth, nineteen hundred and fourteen.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, All wild geese, wild swans, brant, wild ducks, snipe, plover, woodcock, rail, wild pigeons, and other migratory game and insectivorous birds which in their northern and southern migrations pass through or do not remain permanently the entire year within the borders of any State or Territory, shall hereafter be deemed to be within the custody and protection of the Government of the United States, and shall not be destroyed or taken contrary to regulations hereinafter provided therefor.

The Department of Agriculture is hereby authorized and directed to adopt suitable regulations to give effect to the previous paragraph by prescribing and fixing closed seasons, having due regard to the zones of temperature, breeding habits, and times



Drawn by Dan Beard

THE REGULAR ARMY OF DESTRUCTION, WAITING FOR THE FIRST OF OCTOBER

Each Year 2,642,271 Well-Armed Men Take the Field Against the Remnant of Wild Birds and Mammals in the United States

(From "Our Vanishing Wild Life", page 55.)

and line of migratory flight, thereby enabling the department to select and designate suitable districts for different portions of the country, and it shall be unlawful to shoot or by any device kill or seize and capture migratory birds within the protection of this law during said closed seasons, and any person who shall violate any of the provisions or regulations of this law for the protection of migratory birds shall be guilty of a misdemeanor and shall be fined not more than \$100 or imprisoned not more than ninety days, or both, in the discretion of the court.

The Department of Agriculture, after the preparation of said regulations, shall cause the same to be made public, and shall allow a period of three months in which said regulations may be examined and considered before final adoption, permitting, when deemed proper, public hearings thereon, and after final adoption shall cause the same to be engrossed and submitted to the President of the United States for approval: *Provided, however,* That nothing herein contained shall be deemed to affect or interfere with the local laws of the States and Territories for the protection of nonmigratory game or other birds resident and breeding within their borders, nor to prevent the States and Territories from enacting laws and regulations to promote and render

efficient the regulations of the Department of Agriculture provided under this statute.

There is hereby appropriated, out of any moneys in the Treasury not otherwise appropriated, for the purpose of carrying out these provisions, the sum of \$10,000.

Approved, March 4, 1913.

NEW MEMBERS.

(MARCH 1—APRIL 3.)

Founder,
Archer M. Huntington.

Life Member,
Samuel Pomeroy Colt.

Annual Members.

William H. Bliss,
Henry R. Bond,
Rudolph E. Brimnow,
Donald Campbell,
Roger H. Clark,
Thomas Crimmins,
Lockwood de Forest,
Edward C. Delafield,
Edward D. Dowling,
Mrs. Herbert M. Harriman,
Arnold Knapp,
Mrs. Harry K. Knapp, Jr.,
Harry Markoe,

James Cowan Meem,
H. Siddons Mowbray,
Frank A. Munsey,
A. W. Parker,
Lawrence Priddy,
D. H. McAlpin Pyle,
Karl F. J. Seifert,
T. P. Shonts,
Richard A. Strong,
Edward N. Taylor,
Robert C. Taylor,
Frank A. Vanderlip,
W. H. von Dreele,

Bryant Walker.

GENERAL INFORMATION

MEMBERSHIP IN THE ZOOLOGICAL SOCIETY.

Membership in the Zoological Society is open to all interested in the objects of the organization, who desire to contribute toward its support.

The cost of Annual Membership is \$10 per year, which entitles the holder to admission to the Zoological Park on all pay days, when he may see the collections to the best advantage. Members are entitled to the Annual Reports, bi-monthly Bulletins, Zoologica, privileges of the Administration Building, all lectures and special exhibitions, and ten complimentary tickets to the Zoological Park for distribution.

Any Annual Member may become a Life Member by the payment of \$200. A subscriber of \$1,000 becomes a Patron; \$2,500, an Associate Founder; \$5,000, a Founder; \$10,000, a Founder in Perpetuity, and \$25,000, a Benefactor.

Applications for membership may be handed to the Chief Clerk, in the Zoological Park; Dr. C. H. Townsend, N. Y. Aquarium, Battery Park, New York City, or forwarded to the General Secretary, No. 11 Wall Street, New York City.

ZOOLOGICAL PARK.

The Zoological Park is open every day in the year, free, except Monday and Thursday of each week, when admission is charged. Should either of these days fall on a holiday no admission fee is charged. From May 1 to November 1, the opening and closing hours are from 9 o'clock A. M. until one-half hour before sunset. From November 1 to May 1, the opening and closing hours are from 10 o'clock A. M. until one-half hour before sunset.

NEW YORK AQUARIUM.

The Aquarium is open every day in the year: April 15 to October 15, from 9 o'clock A. M. to 5 o'clock P. M.; October 16 to April 14, from 10 o'clock A. M. to 4 o'clock P. M. No admission is charged.

PUBLICATIONS.

The publications of the Society are for sale at the prices affixed below. Address H. R. Mitchell, Chief Clerk, New York Zoological Park.

First	Annual Report	Paper	\$.40	
Second	" " " "	Paper	\$.75	Cloth 1.00
Third	" " " "	"	.40	" .60
Fourth	" " " "	"	.40	" .60
Fifth	" " " "	"	.75	" 1.00
Sixth	" " " "	"	.75	" 1.00
Seventh	" " " "	"	1.00	" 1.25
Eighth	" " " "	"	1.00	" 1.25
Ninth	" " " "	"	1.25	" 1.50
Tenth	" " " "	"	1.25	" 1.50
Eleventh	" " " "	"	1.00	" 1.25
Twelfth	" " " "	"	1.00	" 1.25
Thirteenth	" " " "	"	1.00	" 1.25
Fourteenth	" " " "	"	1.00	" 1.25
Fifteenth	" " " "	"	1.00	" 1.25
Sixteenth	" " " "	"	1.00	" 1.25
Seventeenth	" " " "	"	1.00	" 1.25
"Our Vanishing Wild Life" (Hornaday)				" 1.65
Notes on Mountain Sheep of North America (Hornaday)				Paper .40
Destruction of Our Birds and Mammals (Hornaday)				" .15
The Caribou (Grant)				" .40
" " " "				Cloth .60
The Origin and Relationship of the Large Mammals of North America (Grant) Cloth \$.75				
Zoologica Vol. I. Nos. 1-7 inc. (Beebe), the Set 1.30				
Zoologica Vol. I. No. 8. The Northern Elephant Seal (Townsend)25				
Zoologica Vol. I. No. 9. Diseases of Primates (Blair)15				
Zoologica Vol. I No. 10. New Blood Pheasants (Beebe)15				
Zoologica Vol. I. No. 11. Feeding Habits of Serpents (Ditmars)50				
The Cultivation of Fishes in Ponds (Townsend)20				
Chameleons of the Sea (Instantaneous Color Changes in Fishes) (Townsend)15				
Sea-Shore Life (Mayer) Cloth 1.20				
Guide Book: New York Zoological Park (Hornaday) By Mail .35				
The National Collection of Heads and Horns (Hornaday). Large quarto. Parts 1 and 2 Paper, Each 1.00				
Bulletin Nos. 1 and 6 Out of Print				
Bulletins—bi-monthly Yearly by Mail 1.00				
Bulletins—single copies20				

Souvenir Books and Post Cards of the Zoological Park may be obtained by writing the Chief Clerk, New York Zoological Park, New York City.

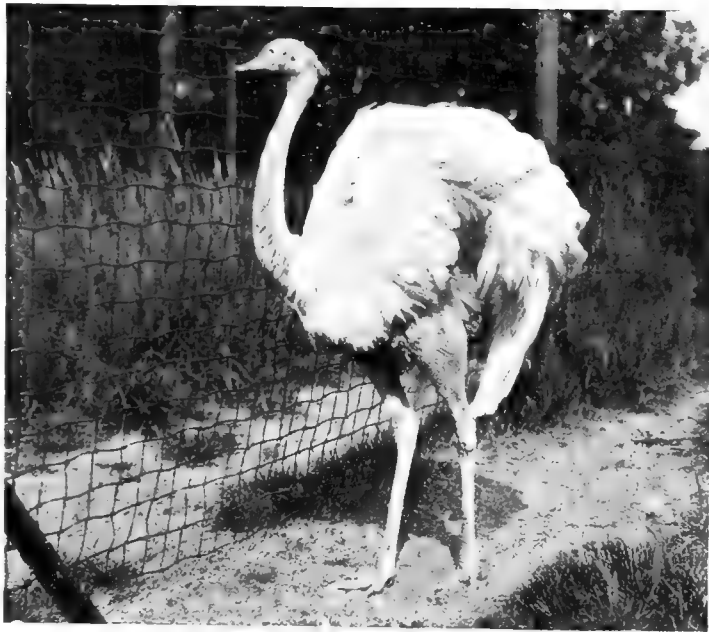
Publications and Post Cards of the Aquarium may be obtained by writing Dr. C. H. Townsend, Director, Battery Park, New York City.



WILD DUCKS UNDER PROTECTION IN THE WICHITA NATIONAL FOREST



ZOOLOGICAL
SOCIETY
BULLETIN



Published by
THE NEW YORK ZOOLOGICAL SOCIETY

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JUL 2 1913
National Museum

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ZOOLOGICAL SOCIETY BULLETIN

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MARSH GARDEN: BIRD VALLEY
Part of the Zebra House and Corrals in the middle distance.

ZOOLOGICAL SOCIETY BULLETIN

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JULY, 1913

No. 58

SOME RARE CROCODILES

By RAYMOND L. DITMARS.

EIGHT species of crocodilians are now on exhibition in the Reptile House and with this thoroughly representative series at hand the collection of our big saurians deserves special review. Following are the species represented: Indian Gavia, *Gavialis gangeticus*; Senegal Crocodile, *Crocodilus cataphractus*; Salt Marsh Crocodile, *Crocodilus porosus*; Orinoco Crocodile, *Crocodilus inermidius*; American Crocodile, *Crocodilus americanus*; Broad-nosed Crocodile, *Osteolaemus tetraspis*; American Alligator, *Alligator mississippiensis*, and the Rough-eyed Caiman, *Caiman sclerops*.

Seven years after the opening of the Reptile House, the author prepared a very full paper covering the care and growth of the American Alligator.* This paper reviewed the hatching and rearing of alligators in the Zoological Park and dealt with the practicability of alligator farming. Since the publication of this review our observations on the crocodilians have been continued under what we consider the best possible conditions. The tanks for the crocodilians are commodious, giving the reptiles ample room for swimming, while they are provided with banks floored with sand upon which the animals may emerge from the water. During the cold months of the year the water of the tanks is kept heated, by means of

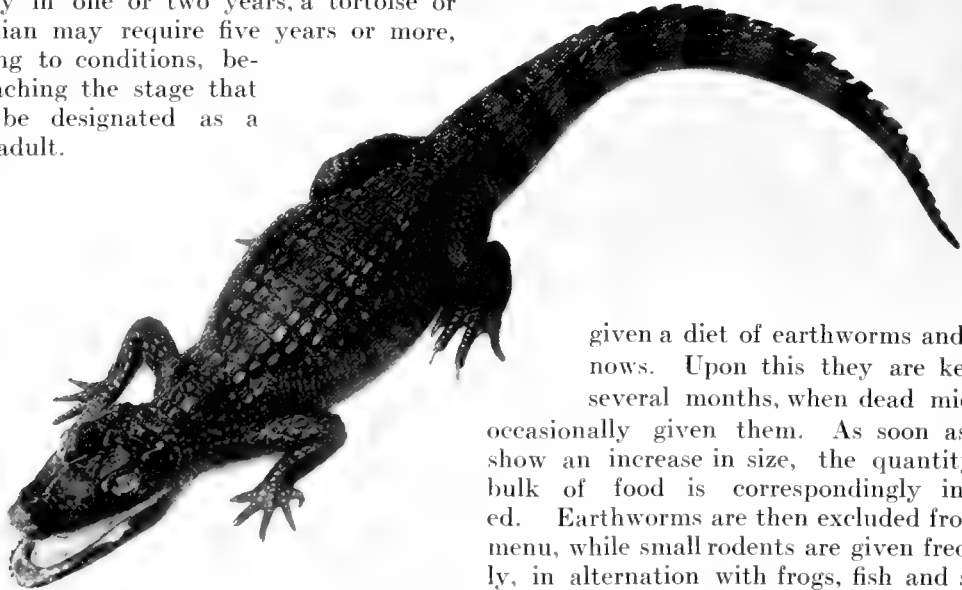
a submerged pipe, to a temperature varying between 90 and 95 degrees Fahrenheit, while the temperature of the Reptile House ranges from 75 to 85 degrees F. We find that if these reptiles are kept in water of a lower temperature than that mentioned, during the cold months they feed indifferently and irregularly, even though the temperature of the air is satisfactory. They prefer to pass the greater part of their time in the water, consequently this medium, to promote normal development must have a high temperature. Another point to be noted is the tendency for crocodiles to drown in cold water.

They cannot endure water at anywhere near the temperature of the hardy alligator and if thoroughly benumbed will sink to the bottom and die. This may be accounted for by the fact that the alligator extends into latitudes where hibernation is necessary, while no species of crocodile ranges far enough away from the tropical zones to encounter actually cold water at any time of the year.

While much has been alleged about the slow growth of crocodilians, we have found that theory has largely entered into the resulting descriptions of development. There is some foundation for the theoretical side of the question, for of all reptiles, tortoises and crocodilians grow slowly in comparison with

*Growth of the Alligator; 11th Annual Report of the New York Zoological Society.

the representatives of the other orders. While the average lizard or snake attains maturity in one or two years, a tortoise or crocodilian may require five years or more, according to conditions, before reaching the stage that might be designated as a young adult.



SPECTACLED CAIMAN

The protruding eyelids determine its common name.

From that point it continues to increase steadily in size until it reaches maximum, adult dimensions. The latter period, embracing a slower growth may cover from five to ten years—possibly more; and the reptile continues to survive to a surprising age as compared with lizards and snakes. Many of the theoretical assertions relating to the slow growth of crocodilians result from the observation of captive specimens under conditions that stunt them, namely, lack of sufficient sunlight, improper and vacillating temperature, lack of exercise and poor food. The average “pet” alligator is a suffering illustration. It appears to remain indefinitely the same size, or to grow at a rate that would require an interminable period to attain maturity.

In addition to the tepid water, high temperature of the building and moist atmosphere, the feeding of our crocodilians is a matter regulated with thorough system. It is very essential that they should receive plenty of bone nourishment. Beef and fish alone are insufficient to promote rapid growth, or cause the animals to attain a large size. Our very small crocodilians are

given a diet of earthworms and minnows. Upon this they are kept for several months, when dead mice are occasionally given them. As soon as they show an increase in size, the quantity and bulk of food is correspondingly increased. Earthworms are then excluded from the menu, while small rodents are given frequently, in alternation with frogs, fish and scraps of beef. Young rats and sparrows are soon added to the list.

It will be realized that this food produces good bone development. The larger specimens receive small hares, pigeons, and large fish, all of which are entire. This food supply, we are convinced, closely approaches the diet of the wild reptile. The amount of food consumed by our specimens is not as great as might be imagined. Usually they are fed twice a week, and at most three times a week. The average wild example should fare fully as well as this. If there is a scarcity of larger food it may always resort to a fish diet, for the waters of most of the bayous frequented by crocodilians usually teem with finny creatures.

It is of interest to note our observations to date of the growth of alligators hatched and reared in the Reptile House:

Hatched	Length	Weight
Oct. 1900.....	8 ins.	1¾ oz.
Oct. 1901.....	2 ft. 6 ins.	3¾ lbs.
Oct. 1903.....	3 ft. 9 ins.	14 lbs.
Oct. 1906.....	6 ft. 0 ins.	60 lbs.
Oct. 1912.....	9 ft. 3 ins.	190 lbs.

Except for the distinct difference in the outline of the snout, the various crocodilians look very much alike to the popular observer. Among all there is the rough, plated armor of the back, the dull, monotonous coloration, and always the semi-aquatic habits. From



BROAD-NOSED CROCODILE

A small and savage species from Central Africa.

the standpoint of habits, however, we may draw some sharp definitions. Apparently the largest existing species is the Indian Gaviel, represented in our collection by a nine foot example. This mighty saurian attains a length of at least thirty feet and is alleged to grow larger. Mr. Lorenz Hagenbeck tells the writer that he shot a specimen in the Ganges that was an inch or so over thirty feet long and three feet in diameter at the thickest part of the body. Despite the huge size this species appears to be inoffensive to man.

The second largest of living crocodilians, the Salt Marsh Crocodile, is represented in the Park by a thriving young specimen five feet long. This is a bold reptile and a notorious menace to human life. It is commonly known as the man-eating crocodile and shares a similarly bad reputation with a large species inhabiting the Nile. Notwithstanding its savage reputation, our young example tried to hold its own against the aggressive actions of our Florida crocodiles, but was so vigorously mauled that it lost all its fighting spirit, retreated to the sand-bank and would not go into the water for food.

The distribution of *Crocodilus porosus* is the most extensive of any member of its family. It inhabits the coast swamps of India, Malaysia and northern Australia, even occurring on small isolated islands in vast expanses of the eastern oceans. This may be accounted for

by the bold swimming habits of the species. Specimens are often sighted by vessels when several hundred miles from land.

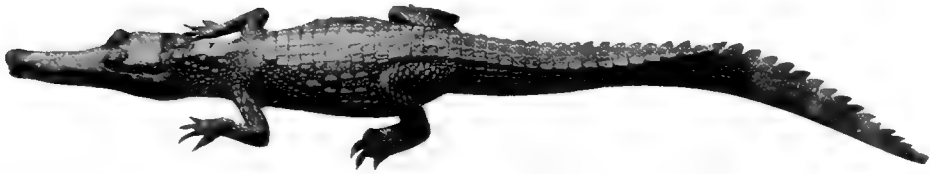
Another of our Old World saurians is the Broad-nosed Crocodile, of West Africa. Here is an illustration of the variability of size in closely related species. This animal grows to a maximum length of eight feet. Its broad, bony head, protruding eyes and generous teeth cause it to appear exceptionally surly which is indeed the case. A three-foot specimen so lacerated the hand of Head-keeper Snyder as to make vigorous surgical treatment quite necessary.

As a rule, captive crocodiles are far more savage than alligators. It was not long ago that the writer was treated to a demonstration of this. It was aboard a big freighter from the East, which had touched at many ports and brought along a miscellaneous collection of wild creatures as a business venture on the captain's part. The writer was escorted into the hold and there in the light of several lanterns was a veritable ark. Pairs of luminous eyes roved in short spaces, showing the cage limits of leopards and other cat animals. Snarls, growls, hisses and stamping of hoofs denoted the presence of many restless forms, crowded in their miserable quarters, where they had spent at least three months. Some of these fretting creatures were behind bars, some in slatted crates, the weaker in bamboo cages, while a few closed boxes gave no signs of life.



INDIAN GAVIAL.

Attains a great length. One shot by Mr. Lorenz Hagenbeck measured thirty feet.



SENEGAL CROCODILE

The slender snout is distinctive among African crocodiles.

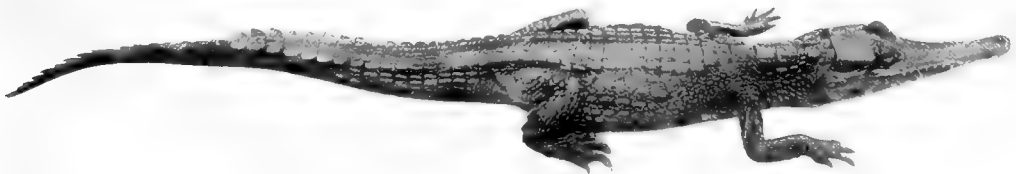
The latter contained the snakes. As the inspection began, two black panthers commenced a vociferous spitting and snarling, but above the voicing of their temper came a steady series of sharp hisses from an elongated crate. The writer was too much occupied at first to pay much attention to the latter, unusual sound. In a dark hold filled with animals, where many of the newcomers are seeking to tear your clothing or inflict more serious damage if possible, it is necessary to wrap your coat tightly about you and dodge many paws thrust through the cage bars in many directions.

The captain had thrown back the cover of a huge case, disclosing a twenty-foot snake colored like an Oriental rug, when the writer again noted the crate whence issued the continuous hisses. The crate was opened. It contained three crocodiles, each about four feet long. The amount of ferocity crowded into those youngsters was amazing. They all but stood on their hind legs in an endeavor to bite. Together with a great part of the collection the little crocodiles were purchased. For a time they refused food—preferring to fight. Strips of raw beef or raw fish thrown into the pool were instantly gripped, when the reptile threw its body into a rotary movement. A stick poked at one of the crocodiles would be

seized and whirled out of the hand unless firmly held.

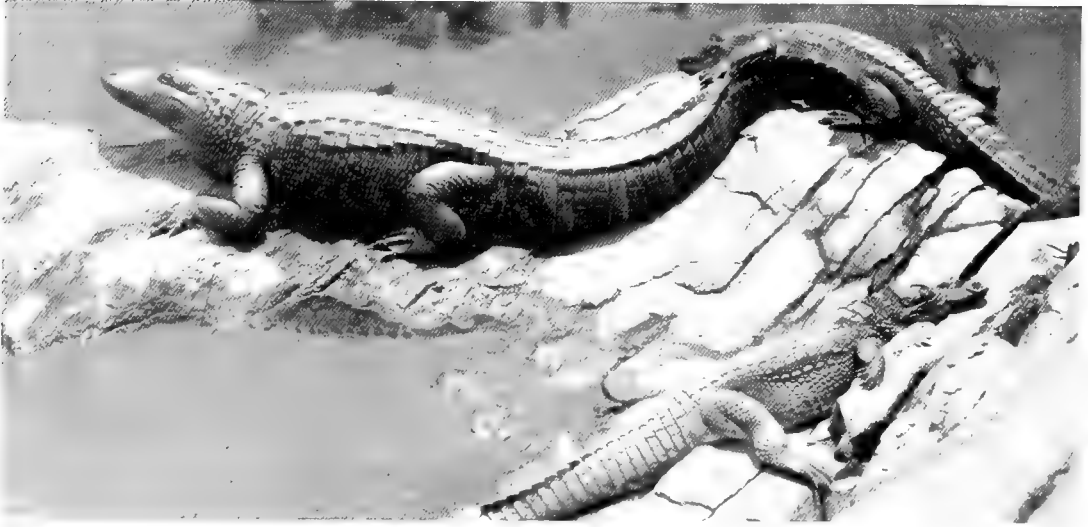
A particularly interesting specimen in our series represents a species known as *Crocodilus intermedius*—the Orinoco Crocodile. Ours is a young example but clearly indicates the extremely slender snout which at once recalls the gavial. The species attains a length of about twelve feet. Older specimens prefer the larger rivers, while the females and young frequent inland lagoons, where, protected by dense tropical growth, the nests are constructed and the young concealed from many enemies.

It is only in the extreme southern portion of the Florida peninsula that a crocodile occurs in any portion of the United States. It represents a species abundant in Mexico and Central America. This freak occurrence was probably caused by the species crossing the Gulf of Mexico, possibly from Yucatan to the Florida Keys. Certain it is that this species is often seen afloat in the Gulf. It literally infests some of the coast swamps of eastern Central America. Quite recently this crocodile has been observed in Cuba, where it grows to a length of twelve feet. Previously the only crocodilian known from that island was a small species, *Crocodilus rhombifer*—reaching a length of about seven feet.



ORINOCO CROCODILE

The extremely slender snout is very similar to the gavial.



ALLIGATOR AND CROCODILE

Both examples are from Florida.

Our series of alligators varies from an eleven-foot giant, whose roar shakes the Reptile House to tiny eight-inch specimens, brought north by tourists. Midway between these two extremes are a number of specimens of all sizes. The most valuable ones are those hatched in the Park in 1900, and in relation to which a table of growth is given in a preceding paragraph.

Three representatives of the Central and South American genus *Caiman*, are in the Reptile House. They are young examples of the Spectacled Caiman (*C. sclerops*), receiving its name because the eyelids are so rough and protruding that they suggest the frame of a pair of spectacles. Most of the caimans have rather a sharp snout, like the crocodiles, but from a structural point of view they are more nearly related to the alligator as the long teeth, the fourth on each side of the lower jaw—the pair of canine teeth—fit into a pit in the upper jaw and are thus concealed when the jaws are closed. With the crocodiles, this pair of teeth fit into a notch of the upper jaw when the mouth is closed and thus are visible like the smaller members of the animal's dentition.

THE FIGHT FOR THE BIRDS OF THE WORLD

THE clause proposed by the New York Zoological Society for the total suppression of all importations of wild birds' plumage (except ostrich plumes) for millinery

purposes is in the new tariff bill, and is now before the United States Senate. Naturally, "the feather trade" is fighting it very vigorously. We hear that 30,000 copies of an appeal to the millinery trade and dry-goods houses have been sent out, asking for help to defeat our measure. In response to that effort, members of Congress are receiving many letters demanding the elimination of our clause and a continuance of the shameless and cruel practice of bird-slaughter for the feather trade.

A very dangerous amendment to our clause has been introduced by Senator Clapp, of Minnesota. Its exact wording is as follows:

"On page 89, line 15, strike out the period and insert the following: 'or to the feathers or plumes of game birds usually killed for food purposes and birds which are killed as pests.'"

If this were to be adopted, it would throw two doors wide open to the slaughter of many hundred species of birds that we are striving to protect. It would mean the extermination of such beautiful pheasants as the impeyan, argus, Reeves, Amherst, and the tragopans; and the condor, all eagles, hawks, owls, crows, jays, herons, egrets, and dozens of other species could easily be killed and imported as "pests"!

The amendment should not be pressed, and it should not be adopted. Acting for the birds that cannot speak for themselves, we are totally opposed to it! We hope that all friends of the birds will oppose that amendment, and

all other amendments! The time to act is NOW! There is not a day to be lost. State your views to your Senators, and to the various members of the Senate Finance Committee, whose names appear below. If that Committee will stand by our clause, it will be passed as it stands!

On May 22 a public hearing was granted all persons desiring to be heard on this subject, by a sub-committee consisting of Senators Johnson (Me.), Hoke Smith (Ga.), and Hughes (New Jersey). The milliners and their attorneys were opposed by E. H. Forbush, Henry Oldys, and W. T. Hornaday. The fight in the Senate will continue without cessation until Paragraph 357 has been accepted and passed. The friends of the birds must not go to sleep, because there is work to be done; and there will be no truce in this war until the President places his signature at the end of the new tariff bill. All our friends in the Senate must be asked to stand fast for the prohibitory clause, exactly as it is.

W. T. H.

The Committee on Finance of the United States Senate is as follows:

Furnifold McL. Simmons, <i>Chairman</i>	
John Sharp Williams	Thomas P. Gore
William J. Stone	Boise Penrose
Charles F. Johnson	Henry Cabot Lodge
Benjamin F. Shively	Porter J. McCumber
Hoke Smith	Reed Smoot
Charles S. Thomas	Jacob H. Gallinger
Ollie M. James	Clarence D. Clark
William Hughes	Robert M. LaFollette

AN AVIAN LANCER

IF you have ever studied the cranes and herons closely, you must have observed two striking characteristics: the ability to assume a pose so mechanically statuesque as to defy the utmost concentration of your vision to detect the slightest tremor, and the swiftness and precision with which the slender beak darts toward an object of attack.

They stalk along the bank of a stream, or through the grass of the paddock, watching for insect life. The slightest movement of any object is instantly observed, and so perfectly has the habit of alertness been developed, that the observance of the object and the arrested action of the bird are exactly syn-

chronous. There is not the faintest perceptible motion. The slender toes may be raised but one inch from the ground, or three inches, or perhaps will be held close to the body; but there they remain until the eye of the observer will be blurred in its search for a possible quiver.

Suddenly the long head is thrust forward as though driven by a spring, with a force so rapid that only the first and last of the motions can be observed, and the luckless grasshopper, frog, or whatever it may be, is transfixed with unerring aim.

Two sarus cranes are quartered on the west side of the Park in an ample enclosure in which a small shelter house has been placed for the comfort of the cranes in wet seasons. A mourning dove having selected the house, as a possible nesting site, flew through the door under the observance of the sponsor for this tale. Just as the dove entered, one of the cranes walked around the house and stopped directly in the doorway in a position to obstruct the entrance, but not afford it a view of the interior.

Evidently this strange form bewildered the dove, for it made a frantic dash for the light and freedom. To gain the coveted freedom necessitated a dangerous flight near the sphinx-like sentinel. The blur of white attracted the crane's eye, and without an instant's hesitation he launched his merciless beak. It was a small target and a difficult one, but to this avian marksman it was as good a mark as the willow wand to Locksley. He struck full centre and the dove was hurled spinning through the air. Fortunately the blow did not touch a vital spot, and before the crane could follow up the vantage, the dove recovered and flew away.

E. R. S.

TEN TONS OF BIRD FEATHERS, BURNED.

APPROXIMATELY 10 tons of feathers plucked four or five years ago from the birds of the Hawaiian and Midway Islands by poachers have just been destroyed by Government scientists, who returned recently from a two months' sojourn at Laysan Island. Since the enormous cargoes of feathers were confiscated by the Federal officials several years ago they have lain in the vaults of the Biological Survey Department in Honolulu awaiting disposition. It was only after the return of the Government scientists from Laysan about a fortnight ago that definite instructions to destroy them was received.

The job proved a big one that kept the party busily engaged about a week, the last bags being consigned to the flames on the beach on Thursday. The lot contained 201 bales, 10 tons by actual weight—*United States Consular Reports, April 21st, 1913.*

 ZOOLOGICAL SOCIETY BULLETIN

Departments:

<i>Mammals</i>	<i>Reptiles</i>
W. T. HORNADAY.	RAYMOND L. DITMARS
<i>Birds</i>	<i>Aquarium</i>
C. WILLIAM BEEBE.	C. H. TOWNSEND.
LEE S. CRANDALL.	RAYMOND C. OSBURN

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ELWIN R. SANBORN, Editor.

VOL. XVI. No. 58.

JULY, 1913

 J. PIERPONT MORGAN

 HUGH DUDLEY AUCHINCLOSS

As the years pass, the inflexible processes of time record upon the pages of our publications their toll of friends who have yielded to the inevitable order of human life, growth and decay.

The men who have helped to make the Society a power in the world are dropping by the wayside, and their places are being filled with the men who will carry the work to future generations.

To those of us who have helped in the planting of the seed and watched it expand into the healthy bloom of success, there is a measure of sadness in the fact that all who have labored so unselfishly may not live on and forever enjoy the fruits that ripen after the first years of trial and tribulation. One moment they spread their hands and under the magnetic touch the wilderness blooms, buildings arise, and then in the kaleidoscopic change of life their forms fade from sight, other hands take up the task and the march goes on apace.

It falls to our lot to record in these pages the passing of two of our staunchest members, J. Pierpont Morgan and Hugh Dudley Auchincloss.

Mr. Auchincloss' devotion to the work of the Society is best understood and appre-

ciated by the men who worked with him. Mr. Morgan let his light so shine before men that the whole world now knows of his many gentle charities that were unheralded and unsung. In honor of the memory of these men, the Executive Committee of the New York Zoological Society, in session April 3, 1913 and May 7, 1913, passed the following resolutions:

Resolved, That the Executive Committee of the Board of Managers of the New York Zoological Society learn with great regret of the decease in Rome, on March 31, 1913, of Mr. J. Pierpont Morgan, a Benefactor of the Society. Mr. Morgan was one of the earliest Founders, and became a Benefactor in December, 1910, and the Society always found in him a discriminating and powerful friend.

Resolved, That the Executive Committee of the Board of Managers of the New York Zoological Society learn with great regret of the death, on the 21st day of April, 1913, of Mr. Hugh Dudley Auchincloss, a Life Member of the Society, and a member of the Board of Managers since 1900. His interest in the welfare of the Society was unremitting, and it is with a deep sense of loss that this record of his death is made upon the minutes. E. R. S.

THE LONDON FEATHER TRADE.

A SCATHING LETTER FROM SIR HARRY JOHNSTON, THE GREAT AFRICAN EXPLORER TO THE MANCHESTER (ENGLAND) *Guardian*. ZOOLOGICAL ORGANIZATIONS SEVERELY AND JUSTLY ARRAIGNED.

To the Editor of the Manchester Guardian:

Sir—I have read the letter from the plumage section of the London Chamber of Commerce which appeared on May 17th in your columns. The arguments employed by all such apologists for this branch of the feather trade (who deprecate interference to stop the destruction of wild birds) are singularly reminiscent of similar pleas a hundred years ago put forward for the retention of the slave trade and the status of slavery. But, like such arguments, they are equally devoid of foundation in economics as well as in moral justification. I have sufficiently answered in the "Times" the objections raised by the chairman of the plumage section of the London Chamber of Commerce to my contention that the destruction of bird life in West and West Central Africa (for the sake of the plumage trade, as well as for other reasons) was acting prejudicially against attempts to control and exterminate the tsetse flies, as well as gadflies, mosquitoes, other harmful insects, and ticks. I will now deal with the other points in Mr. Howell's letter.

I am not aware that "the trade"—by this he means, I suppose, the fourteen firms of feather and bird-skin dealers in the City and East London, the head and forefront of our offending—has ever done anything to promote the domestication of the ostrich, or the rhea. As to the rhea, they and their foreign colleagues and correspondents are striving hard for its extermination in South-east South America and Brazil. They sell the plumes as those of "vultures." (Full particulars of the trade in rhea feathers can be obtained from the secretary of the Royal Society for the Protection of Birds.) And as to "organising protection for egret and paradise birds," this claim is too nauseous. What has been done by the feather trade to "organise protection" for these wonderful types of bird

beauty? One would like to know; and if I found that Satan had really returned to his place as an angel of light and had, like Mr. Walter Rothschild, bought up islands and territories for the saving of wonderful animals, or had solved the problems of how to breed paradise birds in semi-captivity (like Mr. Ingram), or had founded egret farms, or had taken any other practical step towards the preservation from extinction of any of the birds now persecuted for their skins, I should be the first to welcome this as a sign of grace and to hope that in course of time all birds that are worth saving, but yet are coveted for their beauty might be similarly dealt with. But much as I have looked into the question, I have never had revealed to me the slightest attempt on the part of the firm who trade in the skins of birds even to become properly acquainted with the specific names of their victims, the origin of the skins, how and by what means they are procured, much less to move a finger or wag a tongue for the restriction or regulation of this traffic. The fact really is that those who promote this trade have hitherto sinned in the deepest ignorance. They are only the receivers of commodities obtained from the wild parts of the world, and until their attention was called to the subject a few years ago by the splendid insistence and remarkable personal investigations of Mr. James Buckland, Mr. Frank Lemon, and others, they never troubled their heads as to the effect of their trade on bird numbers or on the economics and the moral and material welfare of the world.

But, worst of all, the feather trade has won over to its side some who have indeed fallen from grace—men who in their passion for collecting bird-skins and determining new types and species would, during their own lifetime, put aside all restrictions on the killing of birds and importation of skins sooner than that one variation should escape their diagnosis. It is to the shame of the Zoological Society of London, the British Ornithologists' Union, the Natural History Section of the British Museum, the Victoria University of Manchester and Liverpool (Lancashire is vitally interested in bird preservation because of the cotton crops) that these bodies have taken no corporate part in the active crusade against the devastating trade in bird-skins during the last few years, and that on their silence—the silence of specialists—the Government of the day has been able to rely in its weary postponement of legislation sine die to deal with a matter of world-wide importance to the British Empire.

I would support no measures for bird protection, national or international, which fettered the researches of science; for I believe the pursuit, the acquisition, and the application of knowledge to be the best form of religion; but I maintain that birds might be quite sufficiently protected from the rapacious feather trade without unduly limiting the research material for accredited museums all the world over, or without checking the supply of living specimens to zoological gardens.

It is noteworthy that very few birds required for our food supply are undomesticated or insufficiently protected from extermination. Material-minded man sees to that. It is the insect or fish-eating, non-edible birds of striking or lovely plumage that are being done to death by the feather trade. I have no desire whatever to protect the sparrow (one of the few really mischievous birds) or any type which unduly ravages man's grain or fruit crops. It is the insect-eating or the guano-producing birds of the world that require and merit special protection against a trade which obtains their skins by the hundred thousand for unnecessary portions of human attire or adornment. The bodies of such birds are almost invariably unfit for food, despite the ridiculous contention of Mr. Howell that most of the bright-plumaged birds are killed "by men out of all reach of authority" for food! Can Mr. Howell for one moment suppose that humming-birds, trogons, rollers, bee-

eat, kingfishers, barbets, glossy starlings, paradise birds, lyre birds, orioles, and terns are killed for food? I can only say that there is scarcely a savage that would care to taste the bitter flesh of their poor little bodies. And egrets, white herons? He must have a very low opinion of the intelligence of newspaper readers if he thinks they would believe such a suggestion. Suppress the market for the skins of such birds—only needed for the costume of rich women or the appliances of the obsolescent, time-wasting, and cruel sport of fly-fishing—and the men "out of reach of all authority" will not waste powder and shot on the killing of inedible birds. These last, in their turn, by their increase and multiplication will keep down the insect pests of the world, or, if they are seabirds, replenish the world's stock of guano, increasingly necessary for the enrichment of exhausted soils.—Yours, etc.,

H. H. JOHNSTON.

"LIFE" AS A BIRD PROTECTOR

A clause in the tariff bill now before Congress reads as follows:

Provided, that the importation of aigrettes, egret plumes or "osprey" plumes, and the feathers, quills, heads, wings, tails, skins or parts of skins, of wild birds, either raw or manufactured, and not for scientific or educational purposes, is hereby prohibited; but this provision shall not apply to the feathers or plumes of ostriches, or to the feathers of domestic fowls of any kind.

This provision is fathered and supported by the New York Zoological Society, of which Henry Fairfield Osborn, Madison Grant, and William T. Hornaday are leading officers. It is intended to check the "repulsive and horrifying slaughter of valuable and beautiful birds for the feather trade," and to prevent the extermination, now rapidly proceeding, of these birds.

This immense commercialized wild-bird slaughter that has been going on for years with constantly increasing thoroughness serves no defensible purpose. All the uses of ornament and millinery can be served as well by other means. It must stop pretty soon for lack of birds to kill, but by checking it in time what birds are left may be saved and continue their species.

We hope the clause may pass!

—From *Life*, May 15, 1913

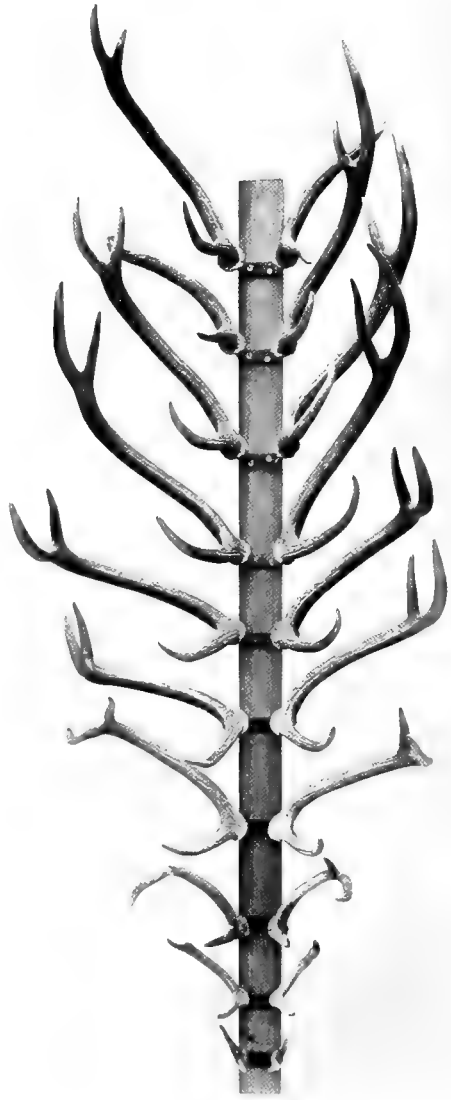
THE SOCIETY'S PROSECTOR

On May 7, 1913, the Executive Committee appointed Dr. George S. Huntington as Prosector of the Society for the utilization of the soft parts of such of the dead animals at the Zoological Park and Aquarium as may be useful to the purposes of the College of Physicians and Surgeons.



POINTS NO REAL INDEX OF AGE

Antlers of a wapiti in second, third, fourth and fifth stages.



SUCCESSIVE STAGES OF ANTLER GROWTH

Rise, progress and decline in the antlers of an Axis Deer.

ANTLERS AND RATTLES

MANY people believe that the age of a rattlesnake can be determined by the number of his rattles, and an equal number estimate the years in the life of a male deer by the number of points on his antlers. As a matter of fact neither theory is correct. The largest rattler may have few rattles and a small one twice the number of the big one. Sometimes the rattles are

broken off by violent contact with rocks or bushes, and the damage repaired by the process of nature at the rate of about three segments each year.

So in the end the calculator is quite as far from the true solution of the problem as in the beginning. At birth the rattlesnake has a tiny button where his rattles are ultimately to be. Therefore at the end of the first year—if he should live—he would be, according to theory, three years old; or perhaps three and

a half, if one considers the button as the nucleus of another rattle. It is quite probable that the rattles increase in number for a certain number of years; remain that number during another period of years, and then degenerate as the snake attains its natural longevity. To prove this would seem impossible, as this snake does not thrive many years in captivity, and in its habitat, even though it strictly employs discretionary tactics, its life history is quite likely to have an abrupt and violent termination in any other than the hands of a scientist, who might have located one specimen with the idea of following out this interesting problem. It is reasonable to suppose that the process of growth and decay is essentially the same with the rattle as are those of the horn and antler growths of the hoofed animals; a period of increase, a period of sustained growth, and a period of degeneration.

The development of the antlers of a male deer presents a less bewildering problem, inasmuch as it is possible to prove beyond doubt that the points on his antlers have no bearing whatsoever on his age. In the first place several species may be reared in captivity with as much certainty as domestic cattle, and therefore the recovery of the shed antlers before they are destroyed either by decay or the teeth of rodents is an assured fact. With such means no other testimony need be presented than the cuts from the photographs of two series of antlers, one from an American wapiti and the other from an axis deer. Both series have been photographed in the order of the successive years of the shedding of the antlers. The wapiti is yet in his prime, while the axis deer has attained that period of life where the degeneration incident to the nearly completed term of longevity has had its corresponding effect upon the antler development.

The first antlers of the wapiti bear eight points, which, according to the popular theory, gives him the age of eight years. In reality, as he was born in June, 1906, at the time this first pair of antlers had attained their maximum size—in September, 1907—he was exactly 17 months old. Although the antlers of the wapiti are somewhat battered and broken, in this case it is not degeneration incident to old age, but a result of the natural inclination of the animal to reduce fences, trees and all stationary obstacles to a state of utter uselessness.

The series of axis deer antlers is shown to illustrate the years during which the antlers increased in size, the period of sustained growth and the degeneration due to advanced age. Both animals were born in the Park. The elk was seven years old in June, 1913, and the axis deer eleven years old in March of the same year. E. R. S.

MILLINERS WIN SENATE FINANCE COMMITTEE

The feather trade has captured the majority members of the Senate Committee on Finance! On June 17 that committee agreed on an amendment which, if it prevails will greatly damage the measure in the new tariff bill intended to prohibit the importation of wild birds' plumage for milliner's use, which passed the House unanimously.

The amendment demanded by the feather trade provides for the use of the plumage of all foreign species of birds killed for food, as "game", and all the birds that could be killed as "pests", and would, if adopted, *permit the use of the plumage of 2342 species of birds!* The fight will now be carried to the Democratic caucus, and the floor of the Senate.

NEW MEMBERS.

(APRIL 3, 1913—JUNE 24, 1913.)

Life Members.

J. Sanford Barnes, Jr.,	Mrs. Clarence M. Hyde,
Temple Bowdoin,	Adrian Iselin, Jr.,
Miss Emily Buch,	Arthur Curtiss James,
George William Burleigh,	Otto H. Kahn,
Winthrop Burr,	Alfred E. Marling,
Richard A. Canfield,	Ogden L. Mills,
Frederic E. Church,	Lewis Rutherford Morris,
George Crawford Clark, Jr.,	Clarence Porter,
Louis John DeMilhau,	Fairfield Osborn Sanger,
J. Henry Dick,	Evander B. Schley,
C. Temple Emmet,	Malcolm Douglas Sloane,
Mrs. Wm. B. Osgood Field,	Wm. Rhinelanders Stewart,
Miss S. Grace Fraser,	Jr.,
Mrs. F. G. Goodridge,	Alfred G. Vanderbilt,
DeForest Grant,	John Jay White, Jr.,
Pierpont Morgan Hamilton,	Cornelius Vanderbilt
F. C. Havemeyer,	Whitney,
Miss Margaret Hoe,	Clark Williams.

Annual Members.

Mrs. J. Muhlenberg Bailey,	Richard McCall,
Mrs. L. P. Bayne,	Frederic C. Mills,
Miss E. Mabel Clark,	Adolph S. Ochs,
Nicholas E. Crosby,	Dudley Olcott,
George E. Dadmun,	Mrs. Adolph J. Outerbridge,
Miss Frances Abbey Dallett,	Junius Parker,
Otto L. Dommerich,	Dr. Charles B. Penrose,
Mrs. W. B. Dinsmore,	H. L. Pratt,
Mrs. Stuart Duncan,	Ogden Mills Reid,
Edward B. Finch,	Mrs. Elliott F. Shepard,
Frederick T. Fleitmann,	Mrs. Edward W. Sparrow,
Henry S. Fleming,	Mrs. John J. Staples,
Mrs. George S. Graham,	Paul Eve Stevenson, Jr.,
Mrs. Ferdinand Hermann,	James Stokes,
William B. Isham,	Mrs. R. B. Suckley,
George T. H. Konig,	Henry Francis Tuzo,
Mrs. Richard P. Lounsbery,	S. H. Vandergrift,
C. H. Ludington,	J. S. Woodhouse Company
W. Markham,	Miss Ethel Zabriskie.

Rev. William Hude Neilson, D.D.



ALBINO INDIAN PEACOCK

NOTES FROM THE BIRD DEPARTMENT

By LEE S. CRANDALL

Albino Birds.—Freaks of all sorts seem to have a peculiar fascination for the man in the street, but in the Zoological Park abnormalities have always been excluded as being out of place among a collection such as ours. Albinoes, however, are too beautiful to be kept under the ban and the Park possesses an unusual number just at present. Among the birds, there are the white peafowl, turtle doves, and Java sparrows, all representing domestic varieties, and true wild albinoistic specimens of two species—the European jackdaw and the American crow.

White crows are so rare as to have become proverbial; few, indeed, have seen one. Our specimen is not pure white, having the face and some of the primaries infused with black. It came to the Park on January 8, 1913, the gift of Mr. Frank Hart of Doylestown, Pa. During the spring of 1912 a passerby noticed a great commotion among a group of crows. On investigation, the cause of the excitement was found to be a callow nestling, nearly pure white. The wretched bird was being mobbed by the normally-colored birds and would doubtless have been killed but for the timely interference. The crow was taken home and nursed, and now has a place in the Society's collections.

White jackdaws of remarkable purity of color have been met with in small numbers yearly among the bird dealers, but in the fall of 1912, so many were imported that the curiosity of the writer was aroused concerning

their origin. Through the courtesy of Mr. Louis Ruhe, a statement was received from a dealer in Austria, which seems to clear up the mystery. His account is translated as follows:

Regarding the white jackdaw, I beg to say that they are wild birds taken out of the nests while very young and fed up by hand. They come from Moravia, out of the neighborhood of Eibenschitz, where the state roads are planted with enormously high pyramidal poplars, in which are found very old colonies of the daws. The daws habitually build their nests in cavities, but as it would be impossible for so many of them to find holes, they have adapted themselves and brood in open nests. The farmer boys at the time when young birds are present, climb the poplars and select birds that are white or marked with white, carry them home, and bring them to market for sale, after bringing them up by hand.

The size of the catch varies greatly from year to year, the greatest number caught in one year being 110, which was some time ago, but 30 or 40 is the average yearly number, and even this number is found nowhere else. The cause of this seems to lie in inbreeding, as undoubtedly the whole colony originated from a few pairs.

That these colonies have existed since time immemorial is shown by the name of a village nearby, the name of which in Bohemian is Crow Village; the jackdaw being classed with other crows in this neighborhood, the name of the village would indicate that it received its name from the rookeries. Many museums have inquired regarding the original source of the birds, which leads me to believe that white jackdaws must be extremely rare, as all inquiries, no matter by whom made, usually come to us from Vienna.

The birds are pure albinoes, the feathers coming in white after the moult, and red eyes which are found, for instance in white black birds, are never found. Oftentimes white birds are seen to fly from nests which cannot be reached, but these disappear in a short time without being shot off, and it appears that the supposition that such birds are killed by the others is correct. This is all that is worthy of notice.

Breeding Birds.—The breeding season of 1912 was a fairly successful one and several species were reared which previously had not been bred in the Zoological Park. The list



BLACK-NECKED SCREAMER

of young is as follows: four cereopsis geese, nine Canada geese, seventeen wood ducks, three white call ducks, one herring gull, two white ibises.

There were also a large number of mallard ducks and several Barbary turtle doves, but as these birds are at liberty an accurate account of them cannot be kept.

The cereopsis geese are now in full adult plumage and are the first to be reared in this country. It is not possible as yet to distinguish the sexes, and the birds show no signs of pairing off, so it seems probable that this species, like many other geese, does not breed in its second summer.

We are particularly pleased with our success in rearing wood ducks, as the readiness with which they breed in captivity will certainly save them from the extinction which threatens this species in the wild state. We are making special efforts to do even better in 1913.

The herring gull was allowed to grow with wings unpinioned, in hopes that it might remain in the Park. As soon as it was able to fly, however, it immediately forsook its parents and drifted off with passing birds of its kind. Herring gulls were fairly abundant in the Park during the past winter and with the night herons, added a touch of life most welcome during the cold weather.

The Screamers.—A curious group in many ways, the screamers are especially so in the original manner in which they carry their spurs. One is accustomed to seeing such developments on the legs of game-birds, even to the number of three or four on each limb, and this is so universal that it creates no comment. But the tarsus of the screamer is

quite innocent of horny excrescences of any kind. The casual observer is surprised, therefore, to find that these birds are well able to defend themselves with two very strong and sharp spurs which they carry at the bend of each wrist and with which they are able to produce a really dangerous wound.

The foregoing applies to the crested screamer and to the black-necked screamer. The horned screamer is not content with even these eccentricities, and goes his congeners one better by carrying a very long and curved horn on his forehead.

The crested screamer is to be found in almost every zoological collection of note, but both of the other species which go to form this ancient group are very uncommon. No European zoological garden possessed a specimen of the black-necked screamer in the fall of 1912, and the only horned screamer noted by the writer was one exhibited at Hamburg. The New York Zoological Society, therefore, enjoys the distinction of possessing what is probably the only complete series of screamers now in captivity.

Hooded Cranes.—To any collection of living birds cranes are a most desirable addition, because of their extreme hardiness and longevity, and high value as exhibition birds. The collection of cranes in the Zoological Park is a particularly rich one, and was recently enhanced by the arrival of a pair of the rare hooded crane. This is a small species, of about the size and general coloration of the sand hill crane, but differs in having the entire head and upper neck pure white. It breeds in southern Siberia, passing the winter in China and southern Japan. Although once reported as extremely abundant in many parts of its



HORNED SCREAMER



OCCELLATED TURKEY

range, of late years little has been heard of it and many considered the species extinct. A sensation was caused, therefore, when the agent of an enterprising London dealer succeeded, some two or three years ago, in capturing several pairs of these birds, and in transporting them safely to London, where they were quickly sold at very high prices. A little later the collectors of the late Carl Hagenbeck secured a few specimens, which were exhibited for some time at Stellingen. It was from this lot that the Zoological Society secured the present pair, at a price considerably less than half that asked for the original arrivals.

The Great Bustard.—Of the several species of birds which have been extirpated from the fauna of Great Britain, the finest is undoubtedly the great bustard. Once abundant on the open downs of England and Ireland, this bird is now seen there only as an occasional straggler from the Continent, where it is still fairly abundant in the southern countries. The prime factor in the local decadence of this species was undoubtedly the introduction of improved agricultural implements early in the 19th century. This led to the development of the open waste country, which had formed the home of the bustards, and their decrease was so rapid that the race seems to have disappeared entirely with the death of two females which were killed in Norfolk in 1838.

Although the bustard family is a fairly large one, no species was ever represented in the Society's collection before the arrival of a pair of great bustards in October, 1912. Unfortunately, the male succumbed very shortly and proved to have been in an ad-

vanced stage of tuberculosis. The female, however, is now in the very best of health and condition, and, although the species is a most delicate one, we have every reason to hope that the great bustard will be included in our collection for some time to come.

A Rare Turkey.—Among the rarest of all our birds, the ocellated turkey of Yucatan remains in perfect condition. A local irritation of the ducts of the eyes and nostrils gives rise to periodic symptoms that have caused us much anxiety but seem to have no serious result. For a large bird and a member of a family whose members are usually very hardy, the extreme delicacy of this species is difficult of comprehension. It is probable that our specimen is the only female in captivity. A splendid male is living in the Zoological Gardens of London, but two females that formed his consort at the time of the visit of the writer in the fall of 1912 have since succumbed.

OUR NIGHT HERON COLONY

FOR many years, probably long before the conception of the Zoological Park, black-crowned night herons have been more or less numerous throughout the north-eastern portion of New York City. Attracted by the plentiful supply of minnows furnished by the many fresh water ponds and brooks and the tide-water streams and marshes near the Sound, the birds have refused to leave in spite of the rapid development of this section of the city. But there is no doubt that, of late, nesting has been a precarious business with them, for there is hardly a tree for miles with-



GREAT BUSTARD

out the boundaries of the Zoological Park, where they could perform undisturbed their domestic duties. In consequence, their numbers were becoming much reduced, but since the establishment of the Park, a few birds have spent the summers with us, nesting in the tall trees behind the Beaver Pond, and taking toll from the small fishes with which it abounds.

Late in 1910, we gladly accepted an offer of as many night herons as we cared to have, from the colony in the National Zoological Park at Washington. On February 11, 1911, ten birds reached us—all fully adult and in perfect plumage. They were kept in the Aquatic Bird House until the first of May, and then were liberated on one of the islands in Lake Agassiz, the right primaries of each being clipped to prevent its flying. We found, however, that if the birds were disturbed, they did not hesitate to take to the water, in which they swam with as much apparent ease as any duck. It must have been more difficult than it seemed, however, for after reaching what they considered to be a safe distance from the threatened danger, they rested quietly, returning to the island as soon as their fears were allayed.

The birds were fed daily and soon became quite tame. They did not breed, however, and when they acquired full wings at the autumnal moult, we anticipated the end of our heron colony. But much to our surprise they made no attempt to leave the lake and were always to be found perched upon the trees along the shore. Their daily feeding was continued and as cold weather approached they were joined by a great number of others, mostly immature, which doubtless were attracted by the plentiful food, so easily obtained. These birds remained throughout the winter, twenty-four being the largest number seen at one time.

With the coming of spring, most of the herons departed to other breeding grounds. Those that remained became very tame, frequenting the enclosures of gulls and storks, hoping to filch stray bits from the food pans. Although no nests were observed, it seems most probable that some of these birds bred.

In the fall of 1912, out-lying herons returned in even greater numbers, over forty appearing each afternoon to share the chopped fish prepared for them. Of this number, no doubt some, at least, will remain to nest on Lake Agassiz this summer, so the permanency of our heron colony seems assured. L. S. C.

MALFORMED ANTLERS

OF the many curiosities of animal life if it may be so termed—none is more interesting than the development of the antlers of male deer. To the majority it is a myth, and deservedly so, since the casual visitor to any park or garden has only fragmentary opportunities of observing this mushroom-like change. He may see the animal without antlers; perhaps in the first stages of the growth, or in the last stages when the antlers are great, thick, brown clubs like the hairy stalks of a sprouting fern, or, fully grown, with the velvet hanging in strips from the hard, white, bony structure. His interest in the matter ceases there, or he may suspect that it is the proper time for the animal to have his antlers, without burdening his mind over a problem in which he has no immediate concern. It is not our purpose, however, to demonstrate to the readers of the BULLETIN a fact with which they are probably all conversant, but to illustrate pictorially a peculiar phase of development that sometimes occurs during the process of antler growth.

Rarely, if ever, are both beams of any antlers equal in size; but they are sufficiently so to present a pleasing effect of symmetry. A striking exception is the caribou, which nearly always has a palmated brow tine on one beam. As this formation is practically the same with all specimens of many species of the caribou, it cannot be termed malformed, but rather a highly specialized growth through evolutionary processes.

Even more interesting perhaps than the normal development is the freakishness of the growth at times. One season the animal will have graceful and symmetrical antlers, and the next, one beam will be so distorted as to bear more the appearance of a battered branch of a tree than the antler of a deer.

The reason for the first year's deformity is not perplexing. Usually it is due to an injury received in the first stages, just as the antler is commencing to round out over the skull. As the males are exceedingly timid at that period, they will plunge blindly in any direction under the stress of their highly keyed nervous organism, and if the antler is bruised by chance, the abnormal development will manifest itself in the course of a week. A slight injury will not always change the form of the antler, but if the injury is received after the antler has grown eight or ten inches, it usually retards the growth so that the fully matured antlers are very perceptibly different

from the standard form. The greatest abnormality seems to be produced when the injury occurs near the skull. The beam affected is shorter and the brow tine twists entirely out of line, sometimes drooping down over the skull, and bears at the point where it branches from the beam a number of protuberances; probably several of the points that should have taken their place farther up the beam had the development been true to form.

The development proceeds in normal fashion physiologically, but a pathogenic condition results. The same amount of vitality is expended by the animal to produce this distorted growth as though it had developed normally. The animal bears these antlers, which are structurally imperfect but in substance sound, through the regular period, when he drops them as in other years. Considering the relation of the antlers to the body of the deer, inasmuch as it seems nearly like a parasitic growth and has no guiding form such as the bony core that determines the direction of growth of the horns of the bovines, sheep, etc., one would very naturally expect the injury of one season not to influence the growth beyond one year. If the bony core of a cow's horn is deflected there is no more mystery in the horn deflecting in the same direction than there is in bending a small twig on a tree, fastening it, and then expecting it to ultimately curve as it is trained.

That amphibian paradox, the axolotl, may lose its legs and in a few months be the happy possessor of four new ones equally serviceable and structurally perfect. Why should not the male deer develop a new set of antlers, structurally perfect? But he does not. Why should not the antlers grow true to the form of thousands of years of true formed sires, and not be influenced by the injury of the season before? Evolution is not marked by such radical measures as this, a change of form in a single night. The renewal of the legs of the axolotl is infinitely more complex, for in this case we have the arm, fore-arm, and the four digits. To see the small stub grow, day by day, slowly developing into an arm, a joint, a fore-arm, the wrist and the fingers or claws, is positively uncanny. There is no distortion, and the completed arm or leg is as perfect as its predecessor.

The antler is detached close to the skull, and the point of separation projects but slightly above the bony structure of the head. The injury to the new antler has no influence upon, nor can it be influenced by this bony



REMARKABLE COLLECTION OF DEFORMED ANTLERS
OF WHITE-TAILED DEER

All from the same locality, in Texas.

LADIES' AND MEMBERS' DAYS

THE annual functions of the Ladies' Auxiliary of the Society and Members' Day were observed early in May. Of the latter there is little to be said, for despite the fact of most propitious weather, the members responded most grudgingly. Many visitors gathered about the Administration Building where Shannon's 23rd Regiment Band played the entire afternoon, but of this number very few were members of the Society.

The Ladies' Auxiliary with its usual energy and ingenuity, gathered an appreciative coterie of friends. The Administration Building, where the ladies held their regular reception, assumed an activity to which it has heretofore been an entire stranger. Baird Court sparkled with a brilliant throng of handsomely gowned women; a kaleidoscopic change of color against a background of stately buildings and greensward. The Concourse wastaxed to the utmost to provide room for the motors and carriages that crowded the drive and overflowed into Pelham Parkway. Refreshments were served, and throughout the afternoon, the military band from the United States Army post at Governor's Island, played a well chosen program. The attendance, estimated to be over 600, proved the success of the reception. E. R. S.



PERSISTENT ASYMMETRY IN THE ANTLERS OF AN AXIS DEER IN THE ZOOLOGICAL PARK.

process, which is only the fountain of supply to the growing antler.

The accompanying picture is taken from a photograph of several years' growths of an axis deer that was born in the Park. For several seasons the antlers preserved their normal form, but an injury to them later on developed this strange abnormal growth. It does not demonstrate the reason, but unquestionably bears out the contention that there is a recurrence of the distortion year after year, even though there was but one original injury. It is not a problem of great import, but it is interesting to those who may have noted it.

E. R. S.

FORAGING SQUIRRELS

THE suggestion has been made to visitors in the city parks not to feed the gray squirrels. In other words, the squirrel is ordered to forage on his own account. The gray squirrel will provide his own food, for the self-preservation law is as inherent in this interesting little fellow as it is in man, but he must have some place to find it.

In the spring he is an inveterate hunter, for then the buds are tender and juicy and most delicious to a squirrel's palate. When the buds are changed to leaves and flowers, he descends from his arboreal hunt and digs into the ground for roots. He is not averse to eating slender shoots of all bulbous plants, and in the Zoological Park the gray squirrels have established an unbeatable record for uncovering crocus bulbs faster than a small army of gardeners could plant them. At this moment they are still holding the fort, waiting for any other gardeners who may wish to contest this claim.



ROCKY MOUNTAIN SHEEP

But after all is said, the squirrel is essentially a gnawer, and the hard shelled nuts are as necessary to his diet as the bark of the poplar and the birch to the beaver. There are the long, chisel-like incisors that need honing and sharpening, and grow out of alignment unless they have something to work upon as nature has decreed that they should. He is a friendly little chap and those that circumstance have brought into contact with man seem to look to man for help when other sources fail. And why not? As long as he enlivens the park forests with his pert and sprightly little ways, pursues the even tenor of his existence with malice toward none and a bountiful affection for every hand that is extended to him in comradely fashion—provided it holds something to eat—then let him be fed. He is not nearly so hardy as his fur coat would lead one to believe. Imprison him in a cage without room to exercise on a cold winter day, or even a mild winter day, and he will succumb in a few hours. He is not the worker that the red squirrel is, and this is especially so when he has fallen into easy

ways by depending on man for food. He does not lay up a store of food for winter, and comes out of his nest of leaves only as he feels the need of more fuel to keep the vital spark glowing.

If he has food to spare, especially food that is not perishable, he will bury it in the ground, and long after the snow has covered it will walk with unerring instinct directly over the place and dig through the white blanket and find it. In the wilderness he has a different method of procedure; but city life has driven that from his category of ways and means. Here we have taught him otherwise, and the ways and means are left solely in man's hands. We have learned in the Park, where there is an abundance for all wild furred and feathered creatures, that the squirrels would be in pitiable condition in the winter without help; and we help them by scattering corn on the cob throughout the woods. It is a trivial matter to concern one's self about the squirrels, but it requires scarcely an iota of the concern to provide them with the bit that they need. E.R.S.

GENERAL INFORMATION

MEMBERSHIP IN THE ZOOLOGICAL SOCIETY.

Membership in the Zoological Society is open to all interested in the objects of the organization, who desire to contribute toward its support.

The cost of Annual Membership is \$10 per year, which entitles the holder to admission to the Zoological Park on all pay days, when he may see the collections to the best advantage. Members are entitled to the Annual Reports, bi-monthly Bulletins, Zoologica, privileges of the Administration Building, all lectures and special exhibitions, and ten complimentary tickets to the Zoological Park for distribution.

Any Annual Member may become a Life Member by the payment of \$200. A subscriber of \$1,000 becomes a Patron; \$2,500, an Associate Founder; \$5,000, a Founder; \$10,000, a Founder in Perpetuity, and \$25,000, a Benefactor.

Applications for membership may be given to the Chief Clerk, in the Zoological Park; C. H. Townsend, N. Y. Aquarium, Battery Park, New York City, or forwarded to the General Secretary, No. 11 Wall Street, New York City.

ZOOLOGICAL PARK.

The Zoological Park is open every day in the year, free, except Monday and Thursday of each week, when admission is charged. Should either of these days fall on a holiday no admission fee is charged. From May 1 to November 1, the opening and closing hours are from 9 o'clock A. M. until one-half hour before sunset. From November 1 to May 1, the opening and closing hours are from 10 o'clock A. M. until one-half hour before sunset.

NEW YORK AQUARIUM.

The Aquarium is open every day in the year: April 15 to October 15, from 9 o'clock A. M. to 5 o'clock P. M.; October 16 to April 14, from 10 o'clock A. M. to 4 o'clock P. M. No admission is charged.

PUBLICATIONS.

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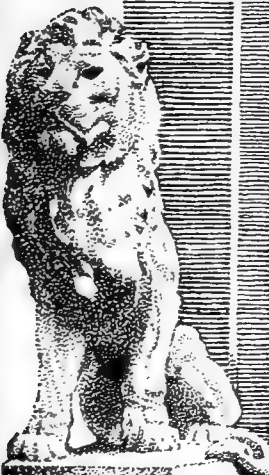
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A CASE OF BRONCHO-PNEUMONIA
Searching with the stethoscope through the chest jacket for involved areas in the lungs of a chimpanzee suffering with pneumonia.

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ANIMAL INVALIDS

By ELWIN R. SANBORN

AN old homeopathic practitioner who was called the second time to deal with a simple case, replied to the mother's words, "Doctor this prescription has failed to relieve," with, "Well, well, we'll have to guess again!"

To what measures then must a doctor be obliged to resort, when he deals with animal patients that inflexible circumstance has deprived of any power of expression to give him the slightest clue.

Under such conditions medical science is reduced to judgment upon rather restricted lines.

Naturally, certain types of animals do not yield graciously either to examination or to treatment, while some are far more satisfactory patients than the human.

If force must be used, the reflex action, the inevitable aftermath of undue nervous excitement, together with any malady from which the patient may be suffering, render the task most complicated.

Occasionally, powerful and active animals are taken in hand with very slight trouble and accept such future treatment as the case requires, in a way that implies that the patient realizes the benefit of the aid it is receiving.

A good example of intelligent submission to treatment was the case of a llama afflicted with an abscess on the jaw—a common malady among hoofed animals.

It was necessary to throw the animal, empty the pus cavity and pack the wound with

gauze; none of which operations is at all pleasant. After the first, incipient excitement, the patient abandoned itself to the various stages of the operation without a struggle, and each successive time, thereafter, that the wound required repacking, the llama stood quietly and permitted the doctor to approach and perform the work, offering no resistance whatever and not attempting to walk away until the wound was dressed.

A human patient anticipates a surgeon's visit for similar treatment with all of the emotions, except joy.

A piece of bone, jammed between the molars of a Bengal tiger, transformed a fairly tractable cat from a condition of docility into maddened frenzy. She raged around the compartment and clawed and tore at the offending bone in her endeavors to remove it. With the greatest difficulty, she was enticed into the mechanical shifting car and carried to the lighted area-way at the south end of the Lion House. In the interval of time that this procedure required, her fury was intensified beyond description. The long leg muscles were twitching spasmodically and her eyes glowed like opals as she charged and struck the sides of the cage.

Drawing her head to the bars was a hazardous move, but it was skilfully accomplished with a noose about her shoulders. A pair of long forceps were then thrust into the cage and the end of the bone firmly gripped. Up to this moment she had regarded every move as



APPLYING THE CHEST JACKET
A case of broncho-pneumonia.

persecution, but the forceps no sooner touched the tormenting object, than she relaxed completely and the bone was removed with ridiculous ease. She abandoned herself absolutely to the joy of the release from her misery, lay quietly on the floor of the car while the rope was slipped over her head and when the car was rolled back to her quarters, walked out placidly and stretched herself on the floor, perfectly at ease.

These are exceptional cases: the majority of the hoofed animals struggle desperately if confinement is attempted, and all of the cats are extremely savage when sick, and resent interference with correspondingly increased vigor.

To overpower a large animal is a problem that presents more difficulty. If it is a quadruped with long, thin, fragile legs, there is great danger of fracturing some delicate bone. Should it be necessary to capture any of the deer to treat a fractured leg, the method of procedure becomes of necessity a most trying one. The doctor is then confronted with the possible after effect upon the high strung nervous organism, and such added in-

jury to the already wounded member as might eventually render the case hopeless.

In this respect the doctor of human medicine has a decided advantage: the nearly complete submission of his patient, already dazed from shock. Once the animal is in hand, the reduction of the fracture and its encasement in a plaster-of-paris splint is speedily accomplished. Usually the recovery is rapid, since the animal experiences no brain impulse other than the sense of pain.

After the preliminary shock, the patient treats the situation with stoical submission and that is the end of the matter.

Each keeper unconsciously learns the temperament of his charges, and as these various necessities occur, his skill and knowledge in a great measure have an important bearing upon the preliminary work. It would astonish the layman to observe the quiet ease and the despatch with which these cases are handled.

Deer are crated and shipped in great numbers yearly, and ninety-nine per cent of them leave the Zoological Park without a scratch; and our deer have sufficient liberty to cause an abundance of trouble in any but skilful hands.

Should the animal which needs the doctor's attention be large and capable of exerting strong, physical opposition, even though of placid disposition, delicacy of handling is out of the question. Even if the patient is docile, any attempt to place it in a position other than the one it chooses to assume is



A CHIMPANZEE DENTAL PATIENT
The great apes submit to this trying operation without protest.



INHALING MEDICATED STEAM
Broncho-pneumonia patient.

difficult. The animal apparently recognizes the difference between a friendly caress of its keeper and the intentions of a group of half a dozen men about its sides.

As long as the party assemble under easy observation and attempt no flanking movements, all is serene. But if by a pre-arranged plan, the keeper steps cautiously to the animal's head to engage its attention, and the intrepid helpers make a quiet rush to carry out their part of the contract, the whole energy of the animal is concentrated in one mighty effort to dislodge its fancied tormentors.

The party is scattered like chaff and in the confusion that usually attends the first sally, the prospective patient backs into a corner and calmly awaits the next move.

On several occasions, in her younger days the African rhinoceros Victoria required medical attention for an abscess that had developed on the left jaw. She was astonishingly mild tempered, but displayed energy and activity out of all proportion to the estimate of her strength.

In the early stages of development of the growth, she yielded readily to the surgeon's knife and subsequent dressings. Several operations at infrequent intervals reduced the swelling, but did not arrest completely its progress, although a perfect cure seemed to be effected each time.

A further recurrence of the trouble convinced the doctor that a more thorough operation was necessary. Elaborate preparations for the operation were made and a force of men was assembled to aid the surgeons and their assistants.

It was the first attempt that had been made to secure the animal, and we have never ceased to rejoice in the fact that it was and has been the only one.

Seven veterinary surgeons, a professional anesthetizer, a dozen keepers, ropes, patent hobbles, mattresses, pails, cotton, a varied assortment of surgical instruments and appliances and two and one half pounds of chloroform and ether were arrayed on one side, and nine-hundred pounds of rhino on the other. Victoria fought a noble fight that morning, with malice toward none, and emerged from the anesthesia groggy but triumphant. Had it been possible, without the slightest doubt she would have returned thanks that the operation was a complete success.

It is a matter of wonder sometimes to compare the class of accident and the type of patient. Agility, grace in the most direct antithesis of awkwardness, and cleverness of acrobatic excellence, characterize the move-



CHIMPANZEE BETTY WITH FRACTURED HIP
She made no attempt to disturb the bandage until the fracture had healed.



OPERATING FOR AN ABSCESS

In this case the patient did not submit cheerfully.



LYNX WITH FRACTURED LEG

It was necessary to use an anesthetic to control the animal.

ments of the great apes. Adroit grasping, either by hand or foot, hand over hand climbing of ropes and girders, or deft swinging from a trapeze are accomplished with ease and abandon by these little men of the woods. In a class of their own for dexterity, they are unexcelled and practically unequalled. But broken bones and bruises are not infrequent.

Betty, one of the largest chimpanzees, has just recovered from a fractured hip, and so awkwardly was this effected as to excite amazement. In attempting to climb a short ladder to the sleeping box, her left leg slipped between the steps at the top, whereupon she promptly toppled over and snapped the bone at the articulation. It was merely a "green-tree" fracture; but it needed a plaster-of-paris support and three weeks in the hospital.

Betty deserves a better fate. She is by far too good a patient to compel the doctor to devote all his time to her, by gracefully recovering from one malady only to acquire another.

Dick, another chimpanzee, has fallen from the roof and into the habit of fracturing bones. Every now and then Dick is trussed up like a Thanksgiving turkey so that a leg or an arm may have a respite. All the great apes are utterly passive under treatment. Dick is jubilant, sometimes boisterous and belligerent. Sickness does not pall on him, it is a safety-valve for his activity.

Several of the orangs have broken arms and legs at various times, all of which have healed satisfactorily. The great anthropoids are in many ways perfect subjects under the

doctor's care. They yield obediently and without protest to any operation or treatment. Their low-keyed but well-balanced nervous organism preserves a perfect pathological control of the vital organs. This is more apparent in the sluggish orangs than the active chimpanzees. If they cannot convey to their attendant by definite communication an understanding of the need of submission to aid, their instinctive method of expression comes uncannily near it.

The treatment of fractures is not as complex however, as the care required in many of the delicate ailments which seem almost like a habit with the orangs and chimpanzees. They are almost invariably wheezing and coughing after a drafty Sunday. If the temperature falls to a degree where it is necessary to heat the building, the opening and closing of doors by the throngs of visitors has an immediate effect upon the delicate membranes of the nose and throat.

A houseful of children could not cause more turmoil than our family of nine great apes. Monday morning finds the doctor's office assailed with, "Dick is coughing," "Susie is sneezing," "Baldy doesn't seem as lively as usual this morning," and "Betty is hanging on to the steam pipes in her quarters and is wheezing like a grampus." Noses will have to be greased; chests rubbed with camphorated oil, cough medicine administered and blankets produced. Then for two or three days there will be mournful little bundles of blanketed "chimps" and "orangs" with solemn faces and bleary eyes sitting around

impressing us with unmistakable signs that they regard this world as a sad place.

Occasionally an ape fails to become chipper and lively after such a spell. He mopes and refuses to eat—two bad signs. The stethoscope transmits the sound of a poorly working pair of lungs to the doctor's keen ears, and he settles down to a siege of pneumonia.

The keeper's quarters are transformed into a hospital ward and poor Baldy, Betty or whichever one it may be, is swathed in chest jackets filled with nasty medicine, and is made to inhale steam from a bubbling vaporizer.

No human patient ever submits as gracefully and cheerfully to the care of a doctor as these anthropoids invariably do. They lie passively in their cots and accept the doses with a resignation that is almost beatific. Even that dose—the horror of childhood, middle age or manhood—castor-oil, is swallowed to the bottom of the glass, and cod-liver-oil is nectar. We have carried many cases of pneumonia through successfully. In fact, there have been no fatalities from the disease, one of the most dreaded in the practice of medicine.

Without exaggeration, the great apes are perfect patients under any circumstances, and of course this is a great aid to the doctor's judgment.

The patient is primarily a delicately working machine, upon which is not brought to bear the influence of a highly sensitive nervous structure. There are no moods to combat and produce complex conditions, except a lethargic state. Extreme passivity, very similar to that of an ailing child, usually occurs; but without the handicap of psychosensorial impulses. This condition is sometimes disturbing and accurate diagnosis difficult.

The change from the stage of abject indifference to convalescence is very pronounced. The patient becomes interested in life and the release from the bondage of sickness is manifested by redoubled vigor and exuberant activity.

All time is play time to these interesting apes, and an abundance of attention, fresh air and good food puts them in condition thoroughly to make use of it.

Close and long association with wild animals establishes a doctor on a basis of better understanding with his charges, and conditions which in the beginning were complex, are now handled with greater ease.

Our sanitary system has been established and worked out upon so systematic a basis,

that although we fear epidemics, we do not dread them. Protracted periods of excessive temperature, either hot or cold are dangerous; faulty food products, or parasites and bacilli in the hay and grain might pass through enmasked, but vigilance strips them of their disguise in short order. Each succeeding year witnesses such a shortening of the step from pathological to normal conditions in arresting the progress of epidemics, that we are in danger of saying of our collections, what is told of the inhabitants of a certain island off our coast, that they do not perish from disease, but die of old age.

Baby Beavers.—We are positive that there are several new beavers in the Beaver Pond, but we are not certain of the number. The reports that the young beavers have been seen are numerous, but the various counts do not agree. At any rate the beavers are there, and we may add for our readers' assurance they were born there, and it is the first event of its kind in the beaver family in the Zoological Park.

Our beaver colony is both prosperous and busy. Hostilities between the genus *castor* and the genus *homo* have been revived, and the battle at the dam is bitterly waged.

Every night the beavers plug the outlet-drain and fill the gap in the dam which the keeper has opened in the morning, and the perfect balance of labor that thus far has been maintained makes the situation as doubtful as the Mexican problem.

AN AMERICAN COLLECTION OF FOREIGN BIRDS

By LEE S. CRANDALL

Assistant Curator of Birds

IN avicultural matters, Europe has always been pre-eminent. For many years, Germany formed the center for the dissemination of practical knowledge, and her amateurs were numerous and progressive. Of late years, however, England has come to assume the leading position, and there is no doubt that the aviculturists of that country form the most keen and enthusiastic group which ever has existed.

This cult is sufficiently strong for the support of two societies, each of which issues a magazine of a high degree of excellence, to say nothing of numerous smaller periodicals devoted to the interests of the canary. Every effort is made to determine the requirements of



OUT DOOR AVIARY OF MR. KENYON V. PAINTER, CLEVELAND, OHIO.
Section No. 1

newly imported species, and time and expense form no obstacle in this pursuit. There is the keenest possible rivalry over the first breeding of each species, and a medal is awarded by the societies to the member first recording this happy event, together with certain data, which are of great scientific value.

America has been slow to develop interest in foreign bird keeping, but there is no doubt that it is now awakening to the many possibilities of this fascinating pursuit. More rare and unusual birds are being imported than ever before, and it seems probable that in a few years the aviary will be an adjunct of many well-appointed country homes.

Even now a few amateur aviculturists are seriously interested in the subject, and one of the foremost of these is Kenyon V. Painter of Cleveland, Ohio. Mr. Painter's aviaries are an excellent example of what can be done in private enterprises of the sort, in which the exhibition value to the public needs no consideration. Everything possible has been done for the comfort of the birds, and their remarkably good condition and perfect confidence in the occasional visitors that enter the enclosures is evidence that the plans were well thought out. An effort has been made to avoid all common birds, with the result that this collection probably contains more rarities than are in the possession of any other American amateur. Several species could hardly be duplicated in any other collection in existence.

Mr. Painter takes the greatest delight in securing his own specimens, when visiting

foreign countries, and most of the rarities in his aviaries have accompanied him on his return from these trips. Thus many species have been acquired which never appear through the ordinary channels of the bird market.

The main building, which is one hundred feet long by thirty feet wide, is built of concrete, with a floor of red tile. One-half of the width of the floor space is devoted to the accommodation of visitors, the remainder being divided into five cages, each twenty feet in length. These enclosures are heated from pipes laid under the floor and are well lighted by means of skylights. Each compartment has a corresponding out-door fly, twenty by fourteen, with the exception of the center one, which is connected with a low-domed flying-cage, about fifty feet in diameter. This cage, like all of the others, is well sodded, and provided with an abundance of small trees and shrubs, while two rustic benches greatly increase the possibilities of enjoyment by the visitor.

At the left of the main building is a wing, divided into eight cages, each with a small fly attached. Here are kept pairs of various birds which show indications of a willingness to breed.

Of the four cages in the main house, the first contained, among others, racket-tailed and white-bellied drongos, two Aracari toucans, a female spot-billed tucanet and rufous-backed shrike.

The next is devoted to a variety of small birds, many of them of great interest. Among them were a Nilgiri thrush, a male Japanese



OUT-DOOR AVIARY OF MR. KENYON V. PAINTER, CLEVELAND, OHIO.
Section No. 2

robin, a Blyth myna, two black-winged mynas, a mandarin myna, a black-headed yellow bulbul, a white-browed wood swallow, bred in 1912, and a golden-fronted barbet.

Cage number three contained a number of rarities, the most unusual being two ruddy crakes. These little Japanese rails are dark olive green above and rich chestnut below, the legs being bright red. There were also a pair of gray buntings, a yellow-browed bunting, a female Korean robin, a verditer flycatcher, and a beautiful albino Japanese sparrow.

In the last enclosure were a Japanese blue flycatcher, a large number of yellow-winged sugar-birds, a Cuban banana tanager which has lived in the collection more than four years, and a Kamchatka wagtail.

The large flying cage contained a great assortment of uncommon birds, all delightfully tame. Among them were a lovely green fruit pigeon, a brown-headed parrot, a perfectly fearless pair of red-billed pigeons, several white-crested touracos, a yellow-backed lory, and a gray drongo.

At the right of the main building, extending outward as a wing, is a flight cage about seventy-two feet long, which is occupied by a pair of common trumpeters, a long-tailed glossy starling, a Yucatan jay, and a green hunting crow.

A partially sunken lawn behind the wall at the rear of this extension has been enclosed to form an aviary about eighty by fifty feet. The most important occupants were a pair of

white-browed wood swallows, which were still busily feeding two lusty youngsters, already strong on the wing. A bare-throated francolin was incubating in a pile of hay in a corner. The aviary contained a variety of game and shore birds, including a dusky francolin, Bonham rock partridges, Curacao crested quail, dunlins, European curlew, moor hens, and cayenne wood rails.

In front of the aviary is an enclosed lawn of about half an acre, including an ornamental pond. Here are quartered a group of the larger ornamental birds. The most interesting was a fine West African crowned crane, mated with a female of the common species. There were also white-necked, Manchurian and demoiselle cranes, a black stork, and mitred guinea fowl.

The entire collection is cared for by a very intelligent Italian woman, and the uniformly perfect condition of her charges attests her skill in handling them.

Walrus and Sea-Lion.—While the Sea-Lion Pool in Baird Court is out of commission, its solitary occupant has been transferred to the crocodiles' summer pool, where he enjoys the luxury of a salt bath as nearly similar to his native ocean as Curator Ditmars can make it. The young walrus, who has lived in single blessedness so long in the south end of the pool has received this intrusion with suspicion, and it has required several weeks of intimacy for him to become reconciled to his keeper assuming charge of his pinniped relative.

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ELWIN R. SANBORN, Editor.

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OUR DEFENSE OF THE BIRDS OF THE WORLD

The destruction of wild life has progressed so far that now the prevention of slaughter has been lifted off the low level of expediency, and set on high as a cause involving individual and national honor. The slaughterer is no longer regarded as a gentleman. He is now classed with other monsters of cruelty. The saving of wild life has now become a cause of common humanity: and it is a waste of time to regard it otherwise.

During the past ten years, the United States Senate has splendidly responded to every reasonable appeal that has been made to it in behalf of wild life. The passage of the Weeks-McLean law for the saving of migratory birds gave joy to ninety million of people. Many times during the past five years, in print and from the platform we have assured the friends of wild life that they may with absolute confidence rely upon the Congress of the United States to do its whole duty in the saving of the imperiled birds and beasts. We believed that as sincerely as we believe the Sermon on the Mount.

In view of all this, it is natural that the present attitude of the Senate Finance Committee and the Senate majority should now cause in the breasts of all bird-lovers a feeling of regret quite akin to pain. The open, persistent and sweeping espousal of the cause of "the feather trade"—slaughterers of the innocents for gain—came to the friends of birds as a stunning surprise. It is so *unlike* the United States Senate! By nature and by education, a United States Senator has no more sympathy with the slaughter of millions of birds for profit and vanity than he has with the slave trade or the rubber atrocities. To say that we have no duty in this matter toward any birds outside our own national boundaries is preposterous.

Can it be possible that the Senate of the United States, the highest legislative body in this great nation, the arbiter of national ethics and the creator of standards, will to the end continue to champion the sordid cause of the feather dealers, and the bloody campaign of the South American and East Indian savages who are mercilessly pursuing the birds? Can it be possible that the democratic majority will to the end ignore the humanitarian demands of the American press and people? Can it be possible that that majority will to the end ignore the promptings of its own standards of ethics, ignore the dictates of humanity and the insistent appeal of the press *and its own constituents*? We have been told that uncountable thousands of letters of appeal and remonstrance have been sent to Senators by the very best of the men and women whom they are representing in Washington. One Senator says that he has received between 500 and 600 bird letters: and it is safe to assert that not one of them voiced a selfish demand or thought.

At this moment the defenders of the birds believe that they have on their side, in the Senate, a good majority—*provided* there could be a full debate and a free vote. Naturally, we object to having 20 democratic Senators of humane instincts and right desires in this matter, bound by a rule of the caucus to vote contrary to their own views, and against our cause. We object to being beaten in the Senate by a minority of the members of that body while the majority is really on the side of the birds.

A majority vote of the caucus has decided that the entire 49 democratic Senators shall comply with the demands of the feather trade—except as to one trifling item. The great force thus designed and perfected, now can—if it chooses—roll on its way through the Senate, in spite of the protests of all the United States except the feather trade and a few milliners. Today the question is: Will the United States Senate continue to the end to stand on the record it has made (up to date) as the champion of the plume-hunters and other savages who slaughter wild birds for the cash profit and the vanity of less than one per cent. of the American people?

We are very glad to say that the present indications are that it will not. There are signs which indicate that the views of the democratic leaders in the Senate are undergoing a change, and we have reason to hope that ere long the Senate amendment will voluntarily be withdrawn. W. T. H.

AN OLD CONDOR.

As the result of a general organic breakdown, our old South American condor died on February 26, 1913, after having lived for nearly fourteen years in the Zoological Park. With his passing the bird collection lost its oldest member. A purchase from the late Carl Hagenbeck, this condor reached the Zoological Park on March 30, 1899, and even at that time was in full adult plumage. As undoubtedly several years are required for reaching the fully matured stage, the age of this bird may fairly be considered to have been a ripe one.

Among the birds, the palm for longevity must now be awarded to the female griffon vulture, which reached us on August 23, 1902, and has thus lived in the Park for nearly eleven years. This bird is in excellent condition. She lays eggs and broods them each spring without result, and it is hoped she will exceed the record of the condor. L. S. C.

ANT HILLS OF BIRD SHOT.

The remarkable adventures of Munchausen become commonplace by comparison with those of the ant, for the feats of this hard headed, iron jawed, persistent insect are without end.

No task is so formidable that the ant will not attempt it; no obstacle is too large for it to surmount, and no journey is of such length that it will not pursue it to its consummation. Optimism and ant energy are synonymous.

Nature has distributed it in all parts of the world, suiting it to all sorts and conditions of things, but it is barely possible that in many localities this generous provision is viewed with some suspicion.

If as a housewife you have opened the cupboard doors and noticed the decorations on the clean white papers, apparently in red lead pencil, only to discover that the pencil marks were moving, you have had a practical demonstration of the justice of this suspicion.

One end of this waving mark is inextricably entrenched in every quarter-inch section of the sugar box, and from that point the narrow ribbon of restless energy passes over the floor, through invisible crevices and across the lawn, a measure of distance that would require nights and days of activity of the ants to overcome.

In the valleys beneath the foothills of the Wichita Mountains, the ants use a material

for the construction of their dwellings peculiar to that locality. By the interminable processes of time, the mountains have gradually yielded to erosion, and the tiny particles, loosened by alternate freezings and thawings in the winter, are washed down by storms or blown about by furious winds into the valleys below. These pebbles form the greater portion of the mounds.

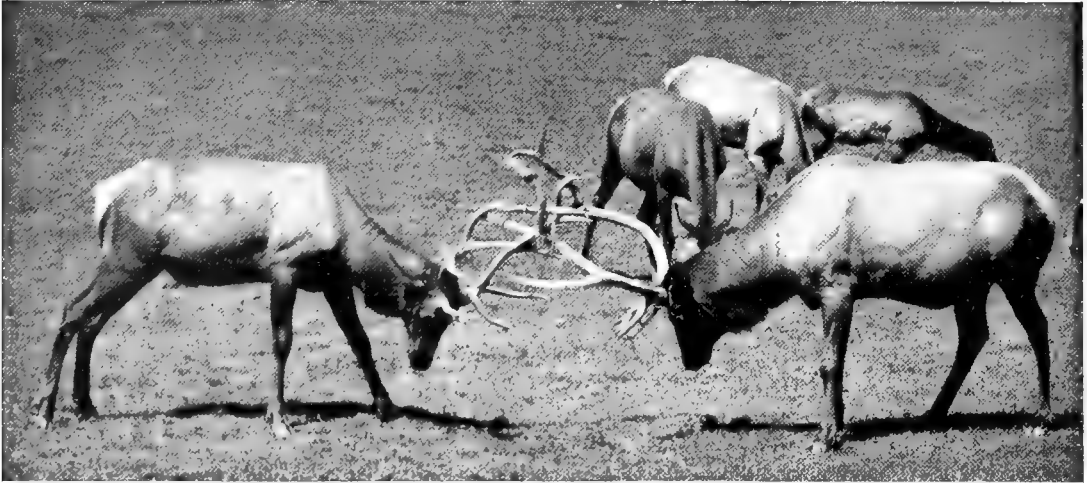
The mounds that are thrown up in the process of home building vary from eighteen inches to three and four feet in diameter and rise above the surface of the ground, in maximum, about twelve inches. Whether in the course of the work, the substance for the mound is taken out of the ground is not material; it is sufficient to say that it is there. Viewed from a distance, the particles appeared to be mud balls, but on closer inspection it was ascertained that they were granite pebbles.

Some idea of the immensity of the task may be formed when the size of the mound is taken into consideration and also the duration of time that it must have required to carry the several bushels of material to the mound and distribute it. Some of the particles are at least one-quarter, if not a third of the size of the ants, and would represent an astonishing proportional weight.

Unfortunately when these nests were seen, the winter had buried the ants in deep repose, so that no means were offered of watching the struggle of construction, and the evidence only, without ocular proof of the actual processes of the work, existed.

Near Lawton, Oklahoma, the sportsmen of that town have established a shooting range, where in closed seasons they indulge in the pastime of breaking clay pigeons. At the end of the range a great many of these mound-building ants had established colonies, and naturally some of the spent shot dropped in that vicinity.

These mounds increased in size and finally became so conspicuous as to attract the attention of the more inquisitive sportsmen. Upon investigation, it was learned that the ants in gathering the round, granite pebbles for their mounds had also carried a great quantity of shot which had fallen to the ground and mingled with tiny particles of stone. More than fifty pounds of shot were taken from the mounds, and it was declared upon the honor of the relator of the story that this was an absolute fact. E. R. S.



A FRIENDLY STRUGGLE IN THE ELK RANGE
Stanley II at the left and Stanley I at the right.

STANLEY.

THE animals of the Zoological Park live their allotted lives and die, as does man in his sphere.

For the shabbiest of sentimental purposes we mourn the loss of a human acquaintance, but for conventional reasons we are obliged to dismiss from our minds the death of a dumb animal as only a passing circumstance.

Many of the finer attributes with which man masks his outward self, in violent contradiction of the true working of his mind, are part of the every-day life of the higher type of wild animals, and this without simulation.

It would be sheer idiocy to weigh in the balance of comparison, the mental capacity of the man and animal, and ascribe equally to the animal the delicate impulses of the human mind. And yet they are alike in many ways, the difference being one of degree rather than of kind. The animal is restricted in his sphere and is but a spoke in the great wheel of evolution, but in so far as the needs of his daily life are concerned, he lives a truer and more honest one than a great percentage of the human race.

Evolution has been a mighty factor in dissipating the theory that some infinite power launched the human race on the road to destiny from a handful of clay; but to what power do we ascribe the impulses of the courting, the breeding and birth of the young of the wild animal. In this function the female deer is actuated by as divine a sense as the human mother.

On July 19, 1913, we lost a bull elk—in middle life—from apoplexy, a rare malady

among animals, but common among full-blooded men.

Captured in 1901 in the Stanley Basin, Idaho, the young animal arrived in the Park at about the latter half of the first year of his life.

From the moment that he staggered weakly out of the crate and stared with his steady brown eyes at his keeper, an attachment was formed between them that was both amusing and profound in its varying moods.

There was enough of the Irish fighting blood in Keeper Quinn to observe and appreciate the good breeding of this true son of the wilderness who from some association with mankind in turn accepted him as his natural benefactor.

From that day Stanley and Quinn waged a continuous struggle, which varied in its intensity from cajolery and pampering on Quinn's part, to sheer bulldozing and many sharp attacks on Stanley's.

He developed rapidly, and during his early years permitted many familiarities from his keeper, but as he began to realize his power and the strength of his antlers, there were constant turmoil and trouble around the Elk House, with many narrow escapes for Quinn.

When he attained his full development, it was impossible to restrain him except by the strongest devices, and he applied his powerful antlers to fences and architecture with tireless energy and destructive consequences.

At times in the early rutting season, he was confined in a small corral at the Elk House,



Charging his keeper through the fence.



Submitting to the keeper's curry-comb and brush.

TWO PHASES OF STANLEY'S TEMPER

and it required unremitting care to keep the enclosure in a condition that would hold him safe.

His début with the herd was marked by royal combats with the Gould and Whitney bulls, but as he had never known a master, a few seasons made him the unquestioned leader.

As a fighting machine he was irresistible; his courage was indomitable and when thoroughly aroused his anger was superb.

When the herd was brought up to the shelter house at night, it required considerable strategy to open the gates and escape from the yards before Stanley might rush through; and at all times it was necessary for two men to handle the situation; one to entice him along the dividing fence and the other to open the gate. Occasionally Stanley prevented the plan's successful accomplishment, and through such a circumstance Quinn nearly lost his life.

As soon as the keeper appeared in the yard, the herd would rush to the gate, and to open it with Stanley in the foreground was very hazardous. The second keeper would then attract the bull's attention and lead him along the fence, with Stanley making furious charges at him through the wires. When a safe distance was gained, the gate was thrown open, the herd rushed through and both men escaped as best they could.

Upon the occasion of Quinn's narrow escape, the same procedure was carried out. Stanley was enticed away, fighting the man through the fence, and when the favorable moment arrived, Quinn opened the gate.

Miscalculating the distance, Quinn acted too quickly. Stanley turned like a flash, and before Quinn, who instantly realized his error, had run ten feet, the elk was upon him. Catching the man upon his antlers, he gave him a furious toss that stretched him flat upon the ground.

A fleeting glimpse of the second keeper turned the elk from Quinn to his other foe. Leaving Quinn to scramble to his feet the elk rushed toward the other keeper who, having ample time and realizing his peril, speedily climbed the fence and escaped.

Finding that both men were out of his reach, Stanley turned to the shelter house, where the carpenters were preparing to shingle the building, and completely demolished the scaffolding that they had erected. His wrath having been appeased, he walked leisurely into the corral where his companions were quietly feeding.

If the bull had not followed the assisting keeper, Quinn surely would have met a violent death; as it was he was severely bruised and felt the effects of the attack for many days.

Despite Stanley's relentless animosity, Quinn regarded his endless attempts upon his life with complacency, and his admiration for his charge never varied. He was tireless in his attention, and the elk's splendid condition was in great measure due to his care.

In a measure the regret that is felt for Stanley's loss, is compensated by some of the offspring that he has left behind. They are the best bred elk that we have reared from any stock that has as yet come to our collections, and in Stanley II we have almost an exact counterpart of Stanley I. E. R. S.



PELICANS NESTING AMID COSMOPOLITAN SURROUNDINGS
Two pairs of brown pelicans nested in the Flying Cage and one pair successfully incubated their solitary egg.



YOUNG BROWN PELICAN HATCHED IN THE FLYING CAGE

Bezzing one of the parent birds for food.

A family conference: Which one shall furnish the dinner?

ITEMS OF INTEREST.

By ELWIN R. SANBORN

The Oldest Inhabitants.—Every community harbors some individual, honored for his years; a patriarch whose tongue is unbridled.

Irving's poetic imagination made of his famous character Rip Van Winkle, a vagabond philosopher, which Rip's years of absence served to transform into gentle veneration. It is a lenient toleration granted to active and omnipresent old age, rather than to the fancied wisdom of the individual.

Unfortunately we cannot record individuals of divine wisdom, but we can point with pardonable pride to many old inhabitants—old in the sense that several have dwelt in the Park since the opening day.

As far as we know an alligator now living in the Reptile House, and which was in Curator Ditmar's collection seven years before the opening of the Park, is the oldest inhabitant. Some of the old members of the collection, in chronological order of their date of entrance to the Park, are:—

American Bison, bull and cow	October	1, 1899
American Wapiti, doe	October	11, 1899
Alaskan Brown Bear, male and female	October	13, 1899
Silver Tip Grizzly, female	October	14, 1899
European Red Deer, doe	January	3, 1900
Axis Deer, buck	September	12, 1901
East African Baboon, male	September	12, 1901
Long Armed Baboon, male	September	12, 1901
Alaskan Brown Bear, "Admiral," male	September	14, 1901
Russian Brown Bear, "Cache," female	November	25, 1901
Mandrill, male	November	25, 1901
Jaguar, "Senor Lopez," male	May	15, 1902
Barbary Lion, "Sultan," male	October	17, 1902
Red River Hog, female	October	17, 1902

Destructive Macaws.—Although the mandibles of the order *Psittaci* are respected intuitively, few humans have any idea of the great

power of these formidable beaks. The bite of even the smaller of this order is an unforgettable experience, and the macaws, the large gray, and many species of the green parrots inflict terrible wounds. The lower jaw is an impressive example of one of the forms of the lever and is limited in the extent of destructive ability only by the size of the bird.

We have learned that the macaws can hardly be daunted by any obstacle which they determine to remove or take apart. If they set about the task, their perseverance is worthy of admiration and the destruction is complete in every detail.

When the large Bird House was built, special cages were made for the macaws and parrots in Parrots' Hall. The netting enclosing these cages was sufficiently strong to imprison securely a large monkey or even some of the smaller cats.

By steady application, the macaws cut out sections of this netting two and three feet long and from eight to twelve inches wide, affording an easy passage from one compartment to the next. To cut this netting, a workman is obliged to use heavy, steel cutting pliers and considerable force. The netting was replaced with heavier material and thus far has resisted successfully all attacks upon it.

Conceited Peafowl.—Peacocks and some men are alike in one respect,—they cannot determine accurately between admiration and ridicule. Under observation a vain man expands with visible pride, oblivious of the fact that the observer may be secretly amused because he has a smudge of black on his face or has left his house in a rush and forgotten



RHODODENDRONS IN BIRD VALLEY

The rhododendrons bloomed most luxuriantly during the season of 1913.

his tie; and the peacock will throw a threadbare tail into view, that is nothing short of a caricature of its former beauty, to the humblest observer that loiters near.

The peacock has his day in proper season, for then he is the observed of all observers, but alas "how are the mighty fallen" when this gay Lothario imagines that he can dazzle a wandering flock of guinea-fowl, after the inexorable law of nature has shorn him of his glory.

A number of guinea-fowl, as indifferent to all worldly affairs and as busy as only guinea-fowl can be, were darting about the rectangle of lawn fronting the Elephant House a few mornings ago, intent only upon filling their crops. To the guinea-fowl there can be ascribed no other aim, for to them the axiom "all is not gold that glitters" is even ephemeral.

In among them strode a peacock, a swaggering "Jingle" of tattered elegance and jaunty impudence.

Bigoted ancestral pride urged him to attempt a conquest. Against his rustling coverts the peacock raised the remnants of his tattered tail, two lone plumes, one perfect feather jutting out at an abrupt angle while

the other, battered and broken, drooped forlornly over his back. The guinea-fowl disappeared like a flock of quail.

Feathered Weather Prophets.—Warden Rush of the Wichita National Forest is a keen and original naturalist. A life spent in the wilderness has given him a wonderful knowledge of the furred and feathered creatures, which he applies in various useful ways.

It is quite a well known fact that many birds and animals, by some divine instinct, protect themselves from storms and betray changes of weather some time in advance.

When Mr. Rush announced that a storm was brewing, and in twenty-four hours we would be in the midst of darkened skies and piercing winds, I wondered what the prediction was based on.

When I sought the source of his prophetic information, he declared that the owls told him. This I accepted with a grain of salt, until one evening as we were riding together, he remarked, "Well, we're going to have a storm." My manner was skeptical, for the existing conditions indicated anything but storms. "You don't believe it do you? Just stop your horse and keep your ears wide open," he said. "Do you hear that owl?"



OLD FASHIONED FLOWER GARDEN
Planting at the Eagle and Vulture Aviary.

Up through the canyon floated the weird call of a great-horned owl. "That means a storm, sure," he declared. It did, and the sign never failed. When we heard the great-horned owl hooting before the sun had set, the storm followed invariably.

Burrowing Lizards.—When the lizards are turned out of winter quarters into the adjoining summer yard, their first few days are devoted to basking in the sun or exploring every corner in the exhilaration of release from close confinement.

As soon as they have grown familiar with the yard, many of the large iguanas make burrows in the sand. These burrows are often quite deep, and afford a safe retreat during the heated summer days. The occupants emerge only as they require food and then return to their caves. As the nights grow cool, the occupants of the burrows become sluggish and retreat to greater depths. When it is time to round-up the lizards and return them to their winter quarters, the keepers are obliged to dig out the burrowers. This they find somewhat difficult, for the iguanas are obliged gradually to extend the depth of their caves in order to evade the men, and often the occupants are found three feet from

the opening; and if by chance they have burrowed under a rock formation, they are brought to the light only by much labor.

An Orphan White-Tail.—Once in a while we are obliged to foster some helpless infant when the weakened mother has died in giving birth to it.

In many cases our efforts fail, for we cannot give to the milk that we use the nourishing quality of the natural mother's. This is especially true of many of our native deer and sheep, some of the great cats, and the bears. If a mother bear or cat deserts her offspring at birth, it seems useless to attempt to rear them. It does not seem to be so much the lack of proper food, as the physical care and the warmth which their savage mothers furnish immediately after birth.

If the mothers suckle their young for a few weeks, the foster nursing is usually successful; but should the young be deserted at once, their chance of living is very slight.

Just now we are caring for a little white-tailed fawn—a female—picked up in one of the adjacent country roads. The tiny deer takes most kindly to the bottle and thus far is making a good fight for life. Fortunately



ORPHAN WHITE-TAILED FAWN

she had been suckled by her mother, and had gained sufficient strength to stagger around upon her own feet. Probably the mother was frightened and temporarily deserted her charge, and before she could return, the fawn had been found by the motor party that presented it to the Park.

The Wily Adjutant.—The adjutant is a solemn bird, with a most funereal air. He envelops himself in an atmosphere of sublime indifference and sanctimonious innocence, and so artfully is the pose assumed, that all the virtues—except beauty—are accorded him. He is a caricature of our own wood ibis, which is the last word in all that is grotesque. His tastes are not epicurean for “all is fish that cometh to net;” and if his companions step over the dead line which lies just without the range of his ever ready beak, they speedily learn that his temper is as uncertain as that of a gouty patient.

Feeding time, perforce, is a solitary meal, for if several approach the feed-pan together, the affair resolves itself into a scene of domestic turmoil.

The food is scattered and by hasty gobbling each gets a portion, and beats a hasty retreat to digest it under peaceful conditions. Fletchering is beyond the desire or even the comprehension of the adjutant.

Occasionally a sparrow or squirrel ventures to nibble around the pan under the surveillance of its solitary guardian. If they are agile, no harm befalls them, but should they venture within striking distance, they are lost.

Passing the Crane Paddock, I observed an adjutant, with his head drawn down between

his wings, silently digesting one of those hasty meals, while a dozen chattering sparrows hovered around the pan. A gray squirrel in an oak nearby, gathering courage from the temerity of the feathered robbers, whisked briskly down the trunk of the oak, and with true sciuroidean caution, jumped intermittently toward the pan.

The stolid adjutant affected an entire indifference to this proceeding and the squirrel gained confidence with every jump. “Why this is a stump; it can’t hurt me,” he seemed to be saying, and with one hasty leap he was in the pan and the enemy’s country.

Abandoning himself to the business at hand he lost all thought of possible danger. The statuesque adjutant deigned then to fix his gaze on the busy scavengers. Very slowly and as silently as the softest zephyr, he unlimbered his awkward neck and head. So rapid was the movement that followed, that I was not aware of its object until the squirrel was thrown into the air as a terrier would throw a rat. The furry body had scarcely reached the ground before the merciless beak had once more struck another savage blow, breaking the little animal’s spine and killing him instantly. The adjutant then leisurely gave the body a toss, caught it in his capacious maw, and settled down for further cogitation.

Hunting Jack-rabbits.—Are there any four footed creatures in the world that for a short distances can equal the speed of the jack-rabbit of our western prairies? If Jack might be induced to make a straightaway race with the best greyhound that could be produced, and do his level best, it would be safe to wager your money on the rabbit. When urged on by the terror of being caught, he appears to be a moving gray streak. Hunting jack-rabbits with horses and hounds is a favorite sport with the officers at Fort Sill, Oklahoma, for garrison life in the southwest is not productive of much excitement.

The grayhounds scatter over the prairie until a rabbit is started from a clump of grass, and then the chase begins. The hounds gradually drop into single file, led by one particularly fast, and settle down for a stern chase, and sometimes a long chase.

For a short distance the quarry leaves the yelping pack hopelessly behind. But as his fright increases and his lung power grows perceptibly less, he is obliged to resort to other tactics, and it is right there that he is undone.

As the chase closes in until the leading hound nearly grasps the twinkling legs of the rabbit, Jack makes an abrupt turn and is off at right angles, with an astonishing burst of speed.

The leaders of the pack sail by, straight on for perhaps fifty yards before they can check their speed or really grasp the fact that they are now leaving, and not pursuing, the crafty rabbit. Not so the trailers. The instant that they see the rabbit make the abrupt turn at right angles to the line which they have been following, they swerve to the side without checking their speed, and before bunny can realize that he and his enemies now are both running toward the same point, a long, lean, gray nose has tossed him high in the air and the chase halts until another rabbit is found.

Locked Antlers.—In the Heads and Horns Collections of the Zoological Park, there are three sets of locked antlers—moose, caribou and mule deer. Without authentic narrative of any of the three, a little imagination can conjure tales of the fearful struggles that trapped them with their own weapons.

For the information of any of the readers of the Bulletin who may not know the meaning of the term, locked antlers, we may explain that they are the result of a head-on charge of two male deer, by which the prongs of the antlers becomes so firmly interlaced that it is impossible for the animals to pull them apart.

Under these conditions the result is inevitably the death of both, and death in the most terrifying form,—days of starvation and thirst, unless some predatory animal makes an end of their suffering. Imagine the furious charge of these two bull moose; the terrific blows of the heavy antlers, that tore and gouged their flesh; the hours of heart breaking struggle until a chance blow firmly locked their heads in an unyielding grip.

One weakening faster than his adversary sinks to his knees; then crumples helplessly on the ground, never to rise again. The other stands with feet outspread, his beating heart pumping the blood through his surcharged lungs until his trembling limbs refuse longer to bear the strain and he, too, is soon stretched upon the ground.

The story of the moose antlers, is related by an Indian hunter who told of finding the two animals at the end of their combat. One was down and the other weakening fast. In hope of saving one, he shot the moose already down and made every effort to separate the



LOCKED CARIBOU ANTLETS

antlers. Finding that this was impossible, he was obliged to shoot the other to relieve him from his misery.

We have since tried to separate the antlers, and even though the locking is not intricate, they seem fastened beyond the point of parting, and they have resisted every effort.

It is unusual to find moose antlers fastened together, for the character of their growth affords little chance of such an accident. The caribou, and mule deer antlers could very easily have become locked, because of the numerous projections, and the sharp curving of the beams.

Golden Eagles Hunting.—The worst enemies of the ducks of the Wichita Reserve, are the golden eagles. They pursue the water-fowl wintering on the range, persistently.

The eagles frustrated so many of our attempts to get pictures, that Mr. Rush and I were obliged to lay aside the camera and watch their manoeuvres. We were afforded a good opportunity of studying the preliminary tactics in the blind from which we made the photographs that appeared in Bulletin No. 57.

On this particular morning, six golden eagles were perched in the trees on the creek bank—two adult birds and four in immature plumage. After the light of day increased in



LOCKED MOOSE ANTLERS



LOCKED MULE DEER ANTLERS

volume and had penetrated the creek bottom, the ducks sought refuge in the water. They seemed to be aware that in this manner they might be safe from attack. But the eagles had developed a plan that provided them with ducks whenever they needed them; and they pursued it without wetting either their feet or feathers.

Selecting a point of vantage in some tree below the blind, one of the adult birds would swoop swiftly down and fly lazily just above the surface of the water the entire length of the pool a distance, perhaps, of a quarter of a mile.

The confusion of the ducks was tremendous. They spread out toward the banks in jumbled masses, leaving a long stretch of open water in the wake of the flying bird. Some dived, and others scrambled out into the bushes on either side. This performance was repeated by the eagles several times in succession and then the alarmed water-fowl were allowed to settle down unmolested.

As the eagles never attempted to make a strike while flying over the water, we concluded that there must be a sequel to the water-way flight. Leaving the blind, we crept through the bushes on the creek bank and there learned the consummation of their plan.

As long as the eagles perched in the trees, the ducks gave them not the slightest attention. When they ran out on to the banks, the eagles were lost to sight and the confidence of the ducks returned. Forgetting their recent fright, they scattered through the bushes feeding on the small clumps of grass or tender shoots that grew in the sheltered places.

The crafty hunters then watching for a favorable opportunity could swoop down through the branches, pick out an unsuspecting duck and have no fear of a wetting.

From the masses of feathers lying about we concluded that the eagles were quite successful.

Our Wild Quail.—The stray flock of quail that appeared over a year ago in the Park—in several places—has reappeared again this summer.

On several mornings and evenings they have been heard calling up and down the plantation west of the Red Deer Range, but they are still very shy.

An Odd Stork.—Every one doubtless thinks of a stork as being possessed of long legs. This is a characteristic shared by many other species of widely diverse families, but the black-necked stork is certainly one of the most remarkable of birds in this respect, at least. Only the flamingo is able to approach it in comparative length of limb, and as the stork is considerably larger, the peculiarity is the more emphasized. As with many other wading birds, the bare scales of the tarsus are continued on most of the next joint. This, of course, is a great advantage in wading, as the scales permit the slim legs to slip through the water much more easily than if they were covered with draggled feathers, besides increasing the comfort of the wader.

This is by no means a common bird in collections, and we are rather proud of our fine specimen, which has been in the Park since September 22, 1911. L. S. C.

GENERAL INFORMATION

MEMBERSHIP IN THE ZOOLOGICAL SOCIETY.

Membership in the Zoological Society is open to all interested in the objects of the organization, who desire to contribute toward its support.

The cost of Annual Membership is \$10 per year, which entitles the holder to admission to the Zoological Park on all pay days, when he may see the collections to the best advantage. Members are entitled to the Annual Reports, bi-monthly Bulletins, *Zoologica*, privileges of the Administration Building, all lectures and special exhibitions, and ten complimentary tickets to the Zoological Park for distribution.

Any Annual Member may become a Life Member by the payment of \$200. A subscriber of \$1,000 becomes a Patron; \$2,500, an Associate Founder; \$5,000, a Founder; \$10,000, a Founder in Perpetuity, and \$25,000, a Benefactor.

Applications for membership may be given to the Chief Clerk, in the Zoological Park; C. H. Townsend, N. Y. Aquarium, Battery Park, New York City, or forwarded to the General Secretary, No. 11 Wall Street, New York City.

ZOOLOGICAL PARK.

The Zoological Park is open every day in the year, free, except Monday and Thursday of each week, when admission is charged. Should either of these days fall on a holiday no admission fee is charged. From May 1 to November 1, the opening and closing hours are from 9 o'clock A. M. until one-half hour before sunset. From November 1 to May 1, the opening and closing hours are from 10 o'clock A. M. until one-half hour before sunset.

NEW YORK AQUARIUM.

The Aquarium is open every day in the year: April 15 to October 15, from 9 o'clock A. M. to 5 o'clock P. M.; October 16 to April 14, from 10 o'clock A. M. to 4 o'clock P. M. No admission is charged.

PUBLICATIONS.

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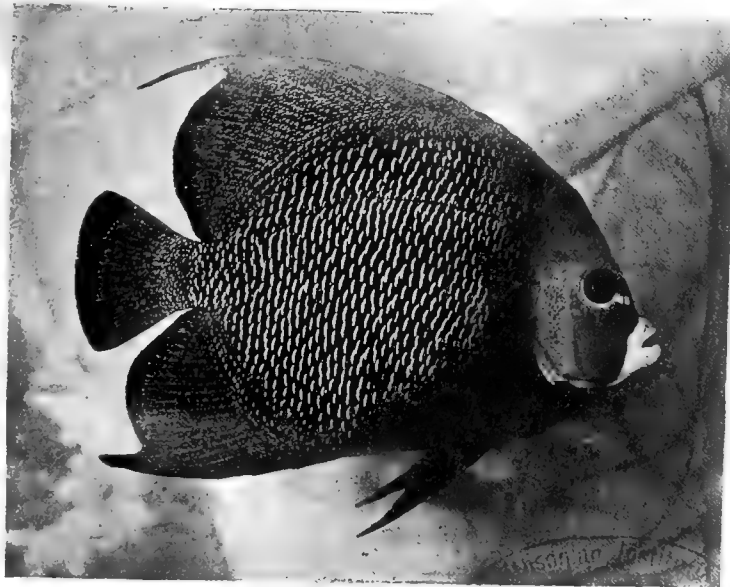
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Publications and Post Cards of the Aquarium may be obtained by writing C. H. Townsend, Director, Battery Park, New York City.



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ZOOLOGICAL SOCIETY BULLETIN

AQUARIUM NUMBER

Written throughout by C. H. TOWNSEND, Director.

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The photographs of porpoises reproduced in this BULLETIN were furnished by Mr. Joseph K. Nye, of New Bedford, Mass., lobster, crayfishes and turtles by Dr. R. C. Osburn and most of the fishes by Mr. E. R. Sanborn.



A TANK OF GANNOIDS—GAR AND STURGEON
Photograph made at the New York Aquarium by Elwin R. Sanborn

ZOOLOGICAL SOCIETY BULLETIN

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THE PORPOISE IN CAPTIVITY

THE Bottle-nosed Porpoise received from Cape Hatteras on April 25, lived in the large pool at the Aquarium for two and a half months, when it died from injuries received at the time of its capture. We are firmly of the opinion that had our instructions been carried out, this animal and the five others captured with it, would be alive today and a constant source of interest to visitors in the Aquarium.

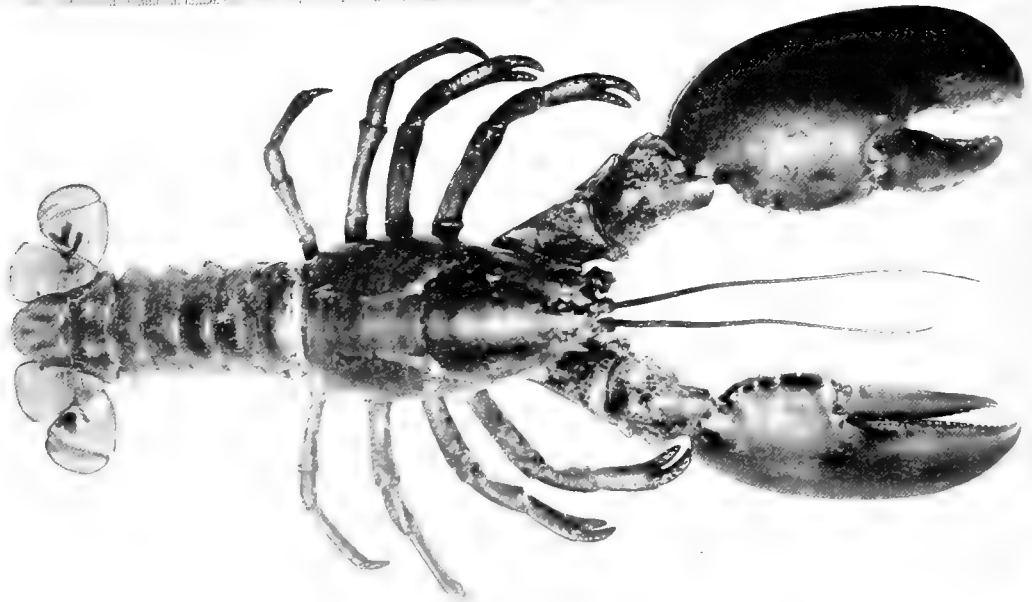
The Director left New York on receipt of a telegram that the porpoises were beached. On arrival he found that contrary to instructions they had been left out of water two days, and four of them had died. The two exhausted survivors were immediately placed in a large tank, where they soon revived. Like those which had already died, both were covered with great blisters as a result of heating while out of water. One died the day after arrival in New York, while the other began to feed and soon became lively. Its blisters did not heal, however, but developed into sores which it could not survive.

The porpoise was always active, swimming day and night about the pool, which is thirty feet in diameter. It seized the live fishes thrown to it as soon as they struck the water, seldom making a miss. It soon learned to eat dead fish of any kind available.

Judging from the ease with which the porpoise can be shipped in tanks of water, and the comparatively long life of our badly injured specimen, there is reason to believe that it can endure captivity if properly treated.

We are now prepared to try again as soon as the Hatteras porpoise fishery resumes operations. It is needless to say that future specimens will be personally conducted from the moment of their capture and placed in tanks of water where their temperature can be kept normal. Transportation and feeding in captivity apparently present no difficulties.

The specimens secured for the Aquarium were presented by Mr. Joseph K. Nye of New Bedford, the proprietor of the porpoise fishery at Hatteras. They were transported to the Aquarium by the New York Zoological Society. The only species of porpoise taken at Hatteras is *Tursiops tursio*. It is valuable for oil and leather. The oil derived from the head is especially valuable, being worth \$20.00 a gallon refined. It is used chiefly for watches and other delicate mechanisms. Porpoise hide is used for shoe strings, pocket books, hand bags and other light leather articles. Several hundred porpoises are taken annually from October to April. The greatest number taken in one year was one thousand. Porpoises are taken at Hatteras with large seines which are quietly drawn around them as they pass along shore in large or small bands just outside the surf. The haul lines are then brought ashore and the net beached. During the season porpoises move along shore every day, and the hunters go out whenever the surf is low enough for the safe and efficient handling of the boats. The largest animals taken do not exceed twelve feet, and porpoises of that length are unusual. Our specimen was seven feet, eight inches long and weighed two hundred and eleven pounds at death.



LOBSTER. 38 INCHES LONG, WEIGHING 21 POUNDS
Taken at Scotland Lightship, off the entrance to New York Harbor, 1913

GIANT LOBSTER

ANOTHER giant lobster, the fourth in the history of the Aquarium, was received September 13th. It was taken near Scotland Lightship off the entrance to New York harbor and came up entangled in a lobster pot line, being too large to enter the pot.

This specimen was a male, thirty-eight inches long and weighed twenty-one pounds. In the accompanying photograph the claws have been spread apart sufficiently to make its length no greater than the yardstick beside it.

Like the other extra large specimens received at various times, it had been kept out of water too long for its health, and did not live more than a few days when placed in an exhibition tank.

The largest known specimen of the American lobster so far recorded, was a thirty-four pounder, nearly twenty-four inches long. It is now in the American Museum of Natural History in New York. It was taken off Atlantic Highlands, New Jersey, in 1897 and was first exhibited in the New York Aquarium.

For an account of other large lobsters exhibited at the Aquarium from time to time, see this BULLETIN for April, 1908. Also "Natural History of the Lobster," Herrick, Bulletin U. S. Bureau of Fisheries, 1909.

The specimen received September 13th, 1913, thirty-eight inches long, exceeds in length the above, or in fact any known specimen. Following are its dimensions in detail. Crushing claw, length $12\frac{1}{2}$ inches; girth, of same, $16\frac{3}{4}$ inches; length of carapace, $9\frac{1}{2}$ inches, total length 38 inches, weight 21 pounds.

THE SCARCITY OF LITERATURE ON THE HABITS OF FISHES

THE habits of fishes have not been studied as thoroughly as have the habits of birds, mammals and other vertebrated animals. Books on fishes appear to be largely of two classes; those written by anglers, relating chiefly to methods employed in the capture of the fish and those written by the systematic naturalist, dealing chiefly with matters of classification and distribution. In neither class of books are the habits of fishes usually considered in more



PORPOISES IN THE NETS, HATTERAS, N. C.

than a cursory manner. There are of course some very satisfactory life histories of certain common species, especially those inhabiting the fresh waters.

A good book on the habits of fishes, based on patient personal study is still a desideratum. The Smithsonian Institution has published several excellent papers, largely compilations, during recent years, and there is much of value in the Bulletins of the U. S. Bureau of Fisheries, especially on the Pacific Salmon and other species of commercial importance. After studying a considerable number of standard works on the fishes, one cannot fail to be impressed with the fact that the fish has been dealt with in a general way; its species, distribution, seasonal movements, methods of capture and market value. Perhaps in no other class of animals will the natural history statements be found to contain so much quoting from other authorities and so little based on the author's personal observation out of doors. This, is of course, due largely to the fact that the fish lives under water where its manner of living cannot be observed as readily as in the case of land creatures. They do not come about the gardens and fields, but must be searched for and observed under serious difficulties.

Since the keeping of fishes in aquaria became common many important facts have been recorded,

but observations on the animal in captivity can manifestly deal with but little of its real life.

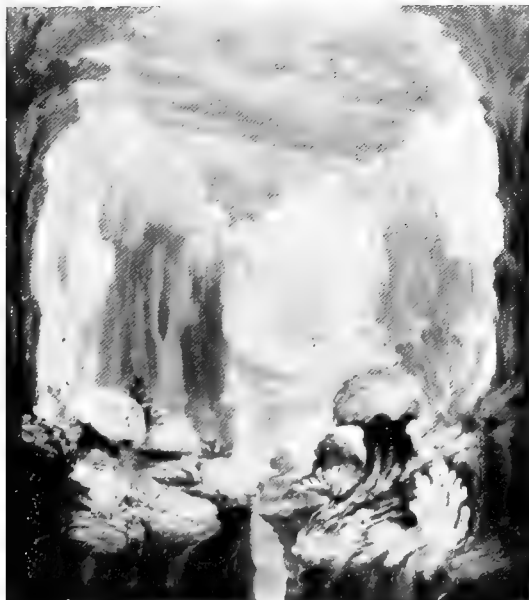
A careful observer, by long continued peering into the natural habitat of the fish, lying in uncomfortable positions on the bank of the stream or staring through a water glass over the side of a boat, should be able to learn things about the fishes which cannot be found in any book. For many important facts relating to

the senses of fishes, we are indebted to the modern marine biological laboratory and facts based on scientific experiment relative to the fishes' powers of hearing and memory, its colors, sleep, electrical and poisonous properties, the sounds it makes and so on, are slowly being brought to light. These are based on painstaking laboratory work involving observations under different conditions and accompanied by more or less experiment and use of apparatus.

There are innumerable "lists of species" of fishes which have been found in certain localities by local observers, and from such we frequently obtain new data for range and distribution. There are innumerable observers devoting themselves to the habits of birds and mammals and many of them are doing wonderful work with the camera. The modern camera is, in fact, giving us a new



PORPOISES ON THE BEACH AT HATTERAS



A SUBMARINE LANDSCAPE AT TAHITI
Painted by Z. H. Pritchard

ornithology, but the camera cannot readily be brought to bear on the denizens of the waters.

The naturalist who can devote himself to the observation of the ways of fishes, especially among marine species, will find a fascinating field and contribute new facts to Science.

SUBMARINE PAINTING FOR THE AQUARIUM

IN THE effort to construct backgrounds in the tanks at the Aquarium, as natural settings for living exhibits, we have tried rock-work with more or less success. Something new is now being tried in the way of painted scenery, and it is a matter for congratulation that we have the co-operation of Mr. Z. H. Pritchard who has devoted himself to submarine subjects. One of his paintings now adorns the back of a tank of tropical fishes. It was painted from studies and observations made among the coral reefs of Tahiti and is a faithful representation of what Mr. Pritchard saw while under water in a diving suit. The painting is not, of course, immersed in water, but is in a dry, glass-protected space at the back. This treatment of the exhibition tank, while not ideal, is still very interesting. In a larger and deeper

tank it may be possible to place a larger painting with excellent effect.

Mr. Pritchard has not only presented the painting already installed, but has promised another when a larger tank can be made ready. The idea is suggestive. If, for instance, we possessed a tank of Nile fishes, a background showing the half submerged temple of Philae would be appropriate.

The tone of the picture now in place is bluish. It may be that greenish or brownish tones would be better. The greatest present difficulty is to arrange the rock-work cemented to the sides of the tank in such a manner that it will not stand in marked contrast to the painted background.

Mr. Pritchard's recent exhibition in New York consisted entirely of paintings of the submarine world, and were all based on studies made during his sub-aqueous excursions around the borders of coral reefs. Judging from similar personal experiences among the reefs, the writer testifies to the fidelity of the artist's portrayals of what he has seen.

L'HIRONDELLE

THE DEEP SEA EXPLORING SHIP OF THE PRINCE
OF MONACO

EARLY in September the Prince of Monaco arrived in New York on his deep-sea exploring steamship, *L'Hirondelle*. The scientific staff of the vessel visited the Aquarium and later invited officers of the Aquarium, the American Museum of Natural History, and the Zoological Park to inspect the biological laboratories on board the ship. On September 20 the vessel sailed for Monaco.

L'Hirondelle is the fourth vessel built by the Prince for deep-sea investigations during the past thirty years, and his oceanographic publications now number thirty or forty quarto volumes all splendidly illustrated.

This vessel has a deep-sea exploration equipment similar in many respects to that of the U. S. Fisheries Steamship "*Albatross*," but is a little larger, being of about seventeen hundred tons. The space devoted to scientific work is not so large as that on board the American ship and the vessel does not carry so large a scientific staff. The officers' quarters are handsomely furnished; those of the Prince being altogether luxurious.

The scientific staff expressed special interest in the marine exhibits at the Aquarium and



L'HIRONDELLE
Deep Sea Exploring Ship of the Prince of Monaco

were presented with numerous specimens for the aquarium attached to the Oceanographic Museum recently established at Monaco by the Prince. The large American horseshoe crab (*Limulus*) which is not found in Europe and which has the distinction of being the nearest living relative of the extinct trilobites, was of especial interest. The Director of the Aquarium sent two dozen living *Limulus* aboard L'Hirondelle where Dr. Richard, the Director of the Scientific Staff, placed them in large bath tubs filled with sea water as the safest means of conveying them to Monaco.

DOMESTICATED REINDEER IN ALASKA

IT IS twenty-one years since the first lot of tame reindeer was carried on the United States revenue cutter "Bear" from Siberia across Bering Strait and landed in Alaska. Other importations under government supervision followed for a few years, until twelve hundred reindeer had been placed among the Eskimo of our northern territory. They thrived and multiplied and today we have over thirty-eight thousand domesticated reindeer located in fifty-four different places, not including twenty-four thousand which have been used for food, or

lost through accident. Of this number twenty-four thousand are in the hands of native Eskimo, who under the direction of the government Reindeer Service and the Protestant and Catholic mission stations cooperating with it, have been taught the art of herding animals useful for food, clothing and transportation.

The total cost of importing the original deer, and the maintenance of the small Reindeer Service during these twenty years has been \$292,000 in government appropriations. This does not include the funds generously subscribed by churches and public spirited citizens in aid of the original importations of reindeer.

The Department of the Interior valued the stock of domesticated reindeer in northern Alaska in 1912 at nearly one million dollars and reported the income derived from it in 1912 at \$44,885. These figures are exclusive of the value of meat and hides used by the natives themselves.

This splendid governmental and missionary enterprise is destined to make the natives of Arctic Alaska rich in flocks and herds. They were formerly dependent to a considerable extent upon the steadily diminishing herds of American wild caribou.

At the start it encountered the opposition of interests based more or less on the exploitation of the native residents, and has been carried along in the face of criticism from various sources.



SIBERIAN DOMESTICATED REINDEER
Photographed in Alaska in 1892 by C. H. Townsend

The present writer has been keenly interested in the introduction of the domesticated reindeer from its beginning, being personally familiar with the manner of life of the Eskimo in the Bering Strait region. Living in Alaska in summer and spending the winter months in Washington during most of the period when reindeer were being introduced, he was in a position to keep in touch with men in the field and to warmly commend the enterprise to both congressmen and churchmen at home. The late Dr. Jackson, then agent of education in Alaska, largely through his personal efforts, supported by a few churchmen and public officials who never lost faith in the plan to lift the Eskimo to at least the level of the Laplander, carried the work along from year to year in spite of much opposition. The whole story, discouragements and all, would be well worth the telling in much more space than that afforded by this BULLETIN.

THE CURIOUS RELATIONSHIP OF THE FRESH-WATER MUSSEL TO FISHES

A NEW and interesting work in aquiculture is now being carried on in the Mississippi valley under the direction of the United States Bureau of Fisheries. It is based upon the fact that the propagation of the mussel is dependent upon the presence of fishes to which the young mussels may attach themselves as parasites until they are old enough to form shells and begin an independent existence.

The large heavy-shelled mussels of this region have been gathered in such numbers for the manufacture of pearl buttons and also for the valuable pearls they sometimes contain that the supply is being exhausted and the important industry dependent upon the mussel is in danger of being broken up.

It has become necessary to undertake the artificial propagation of the mussel, and restock the depleted waters of the Mississippi and its tributaries. Preliminary investigation led to the establishment of a biological laboratory at Fairport, Iowa, near the center of the pearl button industry, where exhaustive studies and experiments could be carried on. Recent investigations have shown that many of the numerous species of mussels are dependent upon certain kinds of fishes as temporary hosts for their young. The biologists now at work have demonstrated the actual requirements in many cases. This is

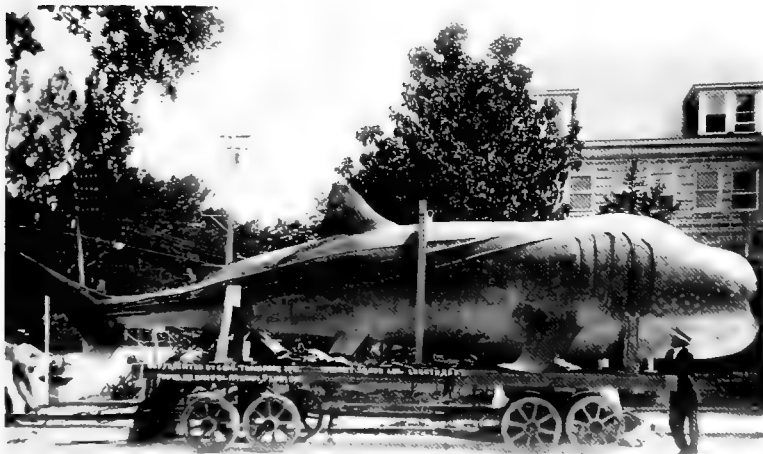
done by confining various species of fishes in receptacles containing different species of spawning mussels, after which they are subjected to minute examination.

The right species of fish must be found for each species or genus of mussel, in order to get profitable results. Young mussels attach chiefly to the gills of fishes, and in some species to the fins, during this early and critical period of their lives. It is now practically certain that all mussel spawn which fails to find a suitable fish host, sinks to the bottom and dies. The young mussels are in fact temporarily provided with minute hooks for attachment and are soon enveloped in the external epithelium of the fish, where they remain encysted until the shell begins to form and they can safely drop off.

All fishes are not equally susceptible to these temporary mollusk parasites. Some receive very few, others shed them too soon, while others die as a result of carrying too many. Practical work has already commenced at the government hatchery, and large numbers of fishes, "infected" as it is called, with young mussels, are liberated to stock the public waters, as their "parasites" develop and fall off. The "planting" of the mussels is therefore left to the fishes. It is even possible to send mussel-bearing fishes to waters outside the Mississippi system and thus introduce good shell-bearing species elsewhere. This has in fact actually been done in the upper Potomac River. There is every reason to believe that practical mussel culture is now at hand and that valuable pearl-shell and pearl-bearing mussels may be established in various parts of the country.

Years ago the methods of artificial fertilization of the eggs of many kinds of fishes were worked out, with the result that today, hundreds of fish culturists in the service of the federal government and the states, are planting fishes by the millions. The benefits, great as they are, would be still greater were our streams not polluted by sewage and the fish-destroying wastes of all kinds of manufacturing establishments.

Scientific investigations following the depletion of the valuable sponge fisheries of Florida, have led to means of artificial sponge propagation. Great progress has lately been made in the artificial rearing of lobsters. All of these achievements in aquiculture are the result of biological inquiry with definite ends in view.

WHALE SHARK (*Rhincodon typus*) FLORIDA

THE WHALE SHARK

IN THIS issue of the BULLETIN are two pictures of the largest of all fishes, the Whale Shark (*Rhincodon typus*), which is said to reach sixty feet, and is definitely known to exceed fifty feet in length. A specimen actually measured in the Indian Ocean was more than forty-five feet long.

Our photographs represent a shark, which as mounted, is forty-five feet long. Its mouth, as one picture shows, is large enough to accommodate a man presumably of the size of Jonah. We have no information as to the size of its throat, which may or may not be so large, as the animal, like its relative the great basking shark, feeds chiefly upon minute surface life and is quite harmless to man. Among existing creatures it comes next to the greater whales in size.

It was captured on June 1, 1912, near Knight's Key, Florida, by Captain Charles Thompson, who presented the picture of the mounted specimen when he called at the Aquarium. It was exhibited for a short time in New York and was later taken to Atlantic City.

This is the second recorded instance of the appearance of this shark in Florida waters, although it has long been known from such widely separated regions as the Indian Ocean, Bay of Panama, Gulf of California and the coast of Japan. It was first described by Dr. Andrew Smith in 1829, from a specimen taken at the Cape of Good Hope.

Like the great basking shark its teeth are small and quite useless for offensive purposes; in this species they are very numerous but

extremely minute. It is quite different in appearance from most other sharks, having a blunt head with the mouth placed well forward instead of underneath the head as is usually the case. The eyes are small and are placed low, near the corner of the mouth. The gill slits are unusually large. This species is covered with round white spots, most numerous on the head.

An interesting account of the Whale Shark by B. A. Bean, will be found in Smithsonian Miscellaneous Collections, Vol. 48,

1905. As observed in various parts of the world, it is sluggish and in no way dangerous. Its large size alone renders it difficult to capture. Captain Thompson's specimen was



WHALE SHARK, FLORIDA, 1913

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ELWIN R. SANBORN, Editor.

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NOVEMBER, 1913

killed after much use of the harpoon and the firing-of innumerable bullets. An ordinary whaling ship, of course, would have disposed of it in short order.

The smaller photograph was kindly furnished by Mr. Joseph N. Beck of Long Key, Florida.

DESTRUCTION OF FISHES BY ALGÆ

It is well known fact that in midsummer there are often great losses of fish life in small lakes and ponds. This is due to the presence of microscopic algæ, which gradually become so abundant as to discolor the water. During the time when the temperature of the water is highest, generally in August, this minute plant life reaches its maturity and this period is often followed by the death of fishes in large numbers.

The algæ are of several genera and thrive best in still waters. When abundant they give the water a greenish tone which intensifies as the summer advances. When the plant cells mature the water becomes foul through the exhaustion of its oxygen and fish life is endangered. The odor from the ponds caused by decaying algæ, may be so bad as to be noticeable some distance away. When this happens in reservoirs the water may become almost unfit for use.

Artificial ponds of shallow depth and little flow of water are particularly susceptible to discoloration by algæ in summer. This is especially true of foul ponds where there may be considerable decaying vegetable matter upon the bottom. When small lakes, ponds and reservoirs are at the height of discoloration on account of algæ, they are commonly said to be "blooming" or "working." The

rapid and often serious destruction of fish life in connection with this condition of the water is of common occurrence. In Weequahic Lake in one of the parks of Newark, N. J., a few years ago, fishes of several species died and were washed ashore by the cartload. This artificial lake being simply a flooded marsh was especially adapted to the development of algæ, the matted plant life of the marsh having been left to decay when it was submerged.

The Commissioner of Parks of New York informed the writer of a great loss of fish life in August in the Central Park lake known as Harlem Meer. There is but little flow of water in the park lakes of New York City and they are all subject to discoloration by algæ in summer. A strong flow in any of them would soon improve conditions and the same is true of the Newark lake referred to.

The development of algæ can be controlled by the use of copper sulphate without injury to fish life, and the Commissioner has been advised to begin checking it early in July, and to remove by any means possible, the excessive growth of the coarser water plants with which these lakes abound.

THE SEA TURTLE IN THE COURTS

The suit brought by the Humane Society in New York City some months ago against a local shipper of sea turtles on a charge of cruelty to animals, was dismissed by the judge, the jury having failed to agree. It was a test case and there were numerous witnesses on both sides, among them the director of the Aquarium. The substance of Dr. Townsend's testimony was as follows:

The marine turtle industry in the eastern states amounts to something like \$150,000 annually. It is therefore an important business and yields a large supply of highly desirable sea food. It is necessary that the animals captured in tropical waters be brought into the northern markets alive and in good condition. That they are in good condition after shipment is proved by the fact that when placed in the floating cars of the New York importers they begin feeding at once; also by the fact that very large and heavy turtles thus secured for the New York Aquarium many years ago, when the methods of shipment were not so careful as they are at present, arrived in good condition,

began to feed at once and are still living and thriving. One of them weighs four hundred pounds.

As to puncturing the cartilaginous tips of the flippers and tying them, that is done by the fishermen to restrain their instinctive struggling which ceases only with exhaustion. The same results might possibly be obtained by bandaging with burlap, but that is beyond the control of our laws. The turtles are now released during transportation on shipboard, and are not confined by tying while being handled in this country.

As to carrying them on their backs: this appears to be the only way in which they can be carried satisfactorily. We have experimented in the attempt to carry them right side up, but they have always died on the second day of the voyage from suffocation.

The plastron, or lower shell of the sea turtle, is not sufficiently rigid to bear the great weight of the body without pressure on the lungs, and the animals suffocate because they are unable to breathe in such a position. The carapace or upper shell is very strong and not supplied with nerves in its outer part. To carry them on their backs can mean only a measure of discomfort, and produces no injury, as is proved by the fact that the turtles arrive in good condition. It has also proved impracticable to ship the turtles in tanks, as the injuries produced by the incessant movement of the turtles during such shipment are far greater even than those produced by stowing them on their backs and securing the flippers. The use of tanks for a shipment of large turtles would greatly increase the cost of handling.

In regard to the general sensitiveness of the turtle, it must be borne in mind that the turtle is a cold-blooded reptile of a very sluggish nature, and that the central nervous system is of a very low organization. They can have no appreciation of their condition, probably feel no acute pain, even by the piercing of the cartilaginous tips of the flippers, such as would be felt by a more highly organized animal under similar conditions.

If it were possible to find a more comfortable way of shipment that was at the same time practicable, it would be, of course, desirable. I am of the opinion that the present methods of shipment of turtles produce a less amount of injury and discomfort than the ordinary methods of shipping cattle and other more highly organized live stock.

While it could scarcely be denied that large sea turtles suffer some discomfort during shipment, it can hardly be of serious extent, certainly not enough to warrant the breaking up of a well organized industry and the cutting off of an important source of food.

I have had considerable experience with sea turtles in shipping and caring for them at the Aquarium, and have assisted in the capture of hundreds in the Caribbean Sea and the Pacific Ocean. It is quite certain that they cannot profitably be shipped except upon their backs. Their flippers need not be tied tight enough to cause discomfort, and their heads should be cushioned.

While in entire sympathy with the work of the Humane Society, I am not of the opinion that the methods employed in the shipment of turtles involve any serious degree of cruelty. The Zoological Society requires of those in its service careful consideration of the rights of animals, and humane treatment of all creatures living in captivity at the Zoological Park and the Aquarium.

A LONG-LIVED FISH

In June the Aquarium lost its last surviving specimen of a group of fifty-two striped bass (*Roccus lineatus*) which have been on exhibition ever since the Aquarium was opened to the public in 1896. It had a length of three feet and a weight of twenty pounds and had been in the Aquarium a little over nineteen years. As the original fifty-two specimens were recorded as four-year-olds when the Aquarium was first opened, we may safely state the age of this specimen as twenty-one years. The basses in this particular collection lived well and did not begin to die off until about twelve years ago, since which time they have slowly disappeared. The above record has probably never been excelled by any species of fish for length of life in an aquarium.

While it is known that the striped bass has attained a weight of as much as one hundred pounds, and has often exceeded fifty pounds, none of those kept from ten to twenty years in the Aquarium ever exceeded twenty pounds in weight, and ceased growing several years ago. The reason for this is not known, but it may be assumed that the species cannot reach its full development in captivity where variety of food and freedom of movement are necessarily restricted.

The specimen has been sent to the American Museum of Natural History.

HAWAIIAN SEAL (*Monachus schauinslandi*) LAYSAN ISLAND

A RARE SEAL

MESSRS. A. L. C. Atkinson and W. A. Bryan of Honolulu have sent to the Director of the Aquarium the following interesting notes relating to a species of seal which is known only from a chain of low, uninhabited, coral reefs lying some hundreds of miles northwest of the Hawaiian Islands.

This seal which was only made known to science in 1905, belongs to the same genus as the two sub-tropical species of seals inhabiting the West Indies and the Mediterranean. It has been named *Monachus schauinslandi*. There are no specimens of it in museums except the skull taken to Germany by Dr. Schauinsland, and possibly some specimens in the Rothschild collection in England. Anything relating to it is, therefore, of interest to naturalists.

Mr. Atkinson writes as follows:—"I have had a talk with a bird hunter who lived several years on Laysan Island and who is now in Honolulu. He saw only a few hair seals around Laysan Island and shot about seven of them for oil. They are rather hard to see in the water and one not used to them would scarcely notice their presence. They lie far out on the reefs and look like small logs. He never saw any young ones at Laysan, but was told by Captain Freeth who worked guano there that he had seen two young hair seals. He is of the opinion that

they never entirely desert the island. He was told by Japanese fishermen that such seals abounded at Pearl and Hermes Reef which lies at the western end of this chain of islands. Captain Walker and family and the crew of his vessel were wrecked on Midway Island of the same chain for fourteen months, but they saw no seals during that time. Seals have been reported from Ocean Island in the same region.

"The larger photograph was made by Mr. J. J. Williams who visited Laysan in 1893. Mr. Williams reports that similar seals were seen at French Frigate Shoals, and that he heard of an expedition killing sixty or seventy on Laysan. At the former place there were both adults and young. The smaller photograph was brought back from Pearl and Hermes reef by Governor Frear in January, 1913, at which place about thirty-five seals were observed. A baby seal was born the day that Governor Frear was there, and the animals were all so fearless that they could be readily handled."

Mr. Bryan writes:

"At different times, but especially in 1859, sealing expeditions were made to the small low islands northwest of the larger Hawaiian Islands. In that year the "Gambia" returned to Honolulu with fifteen hundred skins and two hundred and forty barrels of seal oil. This furnishes us with a record as to the former abundance of the seal (*Monachus*) in



HAWAIIAN SEAL (*Monachus schauinslandi*)
Pearl and Hermes Reef

the Hawaiian group. In recent years they have been far from abundant, but a few have been reported from Laysan, Lisiansky, Pearl and Hermes Reef and occasionally from Midway Island. In 1912 the U. S. S. Thetis brought back a seal skin from Pearl and Hermes, which was presented to the Bishop Museum in Honolulu. It is possible that if not interfered with these seals may increase in numbers. Seals have never been reported from any of the small islands to the south, east and west of Hawaii. Pearl and Hermes Reef seem to have been the place where they were most abundant. A stray specimen has been recorded from the coast of Hawaii. One correspondent states that 'a few seals came ashore at Laysan during the winter months. As both of my visits to Laysan were in April, that may account for the fact that we did not see any.'

Some years ago these islands were actively exploited by Japanese bird hunters and such numbers of sea birds were killed for their feathers that they were almost depopulated of bird life. In 1909 President Roosevelt set aside all of this chain of islands and reefs as a preserve and breeding ground for native birds and it is now known as the Hawaiian Islands Reservation. Interesting government reports have been made on the remarkable bird life which is to be seen there, but they are lacking in information on seal life, probably because the expeditions confined their attention to the more accessible islands where birds are numerous, and overlooked the low reefs occupied by the seals and where navigation is dangerous.

The West Indian species of *Monachus* was formerly exhibited at the New York Aquar-

ium. An illustrated account of it will be found in the BULLETIN for March, 1910.

The two Atlantic species are approaching extinction, but there is hope for the preservation of the Pacific species.

WORMS AND TOADS AFTER HEAVY RAINS

THE Aquarium as a public museum gets its full share of inquiries from the public on points in natural history. The following letter was sent by the Director to a young lady who wished to know if there was any truth in the statement that toads and earthworms were sometimes "rained down."

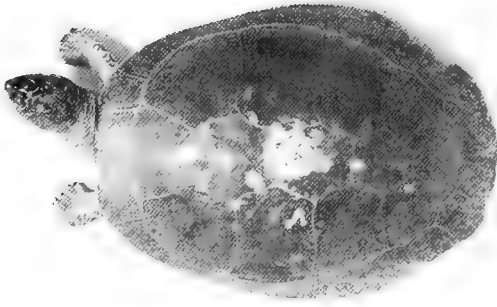
"The earthworm exists everywhere in cultivated ground and lawns in abundance. Heavy rains flood their burrows and make them uncomfortable, so they get out. They go back when the ground dries. Anglers sometimes get worms without digging, by emptying a tub of water somewhere in the garden.

"Toads, which are dry land animals, lay their eggs in water just as frogs do. You can easily tell the toad spawn which is laid in strings, from the frog spawn which is laid in masses. Toad eggs hatch into long-tailed tadpoles just as frog's eggs do, and stay in water just as long. Early in summer they change into tiny toads as their gills and tails are absorbed and lungs and legs are developed.

"They abandon the water life on cool nights, and as long as they remain tender baby toads, have to hide away from daytime heat and dryness. A long dry spell forces them to remain under sidewalks, woodpiles, buildings, rubbish, leaves, and other cool and damp places to keep alive. But they don't enjoy it, so when there is a downpour they all come out at once, hungry and eager for a wetting, and go hopping everywhere.

"I once saw this happen near the Monument in Washington after a dry spell following the tadpole hatching in June. All of the baby toads that had been coming out of the ponds every night and hiding away, suddenly appeared in such numbers during a rainstorm that it was almost impossible to avoid treading upon them.

"When folks tell you that toads rain down, advise them to read up on natural history. There is no excuse for ignorance on such simple matters."

AMAZON TURTLE (*Podocnemis expansa*)

INTERESTING AMAZON TURTLES

A FEW months ago the Aquarium received several specimens of the Mata-mata or Bearded Turtle (*Chelys fimbriata*), and the "Arrau" (*Podocnemis expansa*), inhabiting the rivers of Brazil.

There is no rougher-shelled turtle than the Mata-mata. The plates forming the top shell are exceedingly rough and ridged. As a whole the carapace is suggestive of a small relief map of a rugged and mountainous country with three main ranges, a portion of each plate forming a little rugged peak. The entire upper surface of the animal, including head and legs, is brownish, looking as though it had taken its tone from the mud of the river bottom. The lower shell is much lighter and the under surfaces of the legs are yellowish, the lower part of the neck being pinkish with four faint black lines extending from the head to the body. The neck is very broad and heavy, and is folded back sideways, filling the entire space between the two shells in front of the legs, while the head is short and greatly flattened. The very small eyes are placed unusually far forward, and the small nostrils are at the end of a long and soft tubular snout. The head and neck are longer than the top shell.

There are curious semi-lunar scales on the outer portions of the legs. The jaws are decidedly light, but there is a good-sized mouth behind them. Its name, *fimbriata*, is derived from the numerous fleshy wattles of the head and neck. It is apparently a sluggish and inoffensive animal, probably depending upon the motion of its fimbriæ to attract its prey. The Mata-mata has no near turtle relatives and occupies a genus and species by itself. The largest specimen

has a top shell 15 inches long, but the species is said to reach a total length of three feet.

The other Amazon turtle (*Podocnemis expansa*) reaches a still larger size, its top shell being sometimes three feet long. The largest Aquarium specimen has a top shell twenty-three inches long.

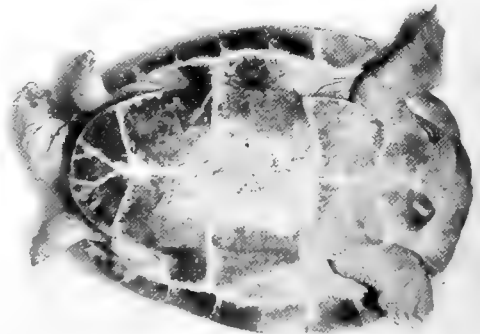
This turtle is an important article of food on the Amazon. The natives catch it in great numbers and have small ponds in which they are held for food during the wet months when they are not readily obtainable.

Its eggs, used largely for making oil, are collected literally by the million and are obtained by digging in the sand banks where the turtles go to deposit them at night. The turtles are taken chiefly with the net and by shooting with bow and arrow. Like the Mata-mata, the great turtle has a neck which folds back sideways.

All the Amazon turtles were obtained through the courtesy of the Booth Steamship Company, whose vessels, sailing from New York, ascend the Amazon to Iquitos in Peru.

As far as known these two species of turtles have not hitherto been exhibited alive in this country, except in the case of the Mata-mata at the New York Zoological Park.

European Specimens.—Dr. Cecil French of Washington recently took to Europe a number of fishes, reptiles and invertebrates from the Aquarium to be exchanged for such exotic species as may be available. The Aquarium is desirous of obtaining lung fishes, walking fishes and foreign aquatic reptiles and batrachians.

AMAZON TURTLE (*Podocnemis expansa*)
Lower surface

MATA-MATA TURTLE (*Chelus fimbriata*). AMAZON RIVER

THE PRIVATE FISH POND—A NEGLECTED RESOURCE*

THE possibilities of small fish ponds as sources of food for the people have received little consideration in this country and the actual breeding and maturing of fishes in such ponds is an art which we have yet to put in practice. While certain foreign countries have long profited by the art of private fish culture, and have furnished notable examples, our own facilities for this industry have been neglected. It is probable that our resources in this respect are greater than those of other countries, as the United States already lays claim to the most extensive fish cultural operations carried on in the world and nowhere is there so large a body of professional fish culturists as that connected with our national and state fishery commissions.

In these times when the value of running streams for water power is being widely considered, the possessors of brooks, springs and small lakes should be awakened to the value of their home resources for water farming.

It is gratifying to note that trout culture in the hands of the private citizen is making some progress in the New England states and the advertisements of successful trout raisers may today be found in American journals devoted to fish and game. Trout culture is, however, a branch of the work which requires special conditions, such as purity of water, comparatively low tempera-

ture, the construction of buildings and artificial fertilization. The possibilities for the private or commercial culture of many kinds of fishes, which are more widely distributed than the trouts and can be cultivated by simpler methods, should receive serious consideration. North America is abundantly supplied with hardy fishes which are available for this purpose. There are no serious difficulties in the way of obtaining them for breeding and under cultivation they

would yield a food supply which would supplement to an important degree that derived from the public fisheries.

In Europe the cultivation of carp is carried on extensively. This fish is now abundant in American waters, and, while not comparable to many of our native species, already contributes annually many millions of pounds to our market supply. Despised by many, it is, nevertheless, marketed more profitably each year in most of our large cities and there is no doubt that the carp is destined to supply a considerable amount of our fish food. The methods of carp culture as practiced in Europe have been frequently published in this country and are available for use. It is unquestionably the easiest of all fishes to raise, and it is only necessary to turn to the weekly New York market reports for assurance as to its money value and extensive use. But it is our native fishes which I wish to consider especially in this connection, as many of them have been proved available for cultivation and are more acceptable as food to our people than the carp. Among them may be mentioned the various species of basses, perches, sunfishes and catfishes, which are well distributed in our eastern states, and there are other species inhabiting our western and southern states which are also available for pond culture.

Many persons have undertaken the raising of fishes, but their efforts have been limited to the mere stocking of natural ponds. Comparatively few have realized the necessity of proper equipment and actual cultivation, which involves the complete control of the

*Extract from a paper by C. H. Townsend, read before the American Fisheries Society, September 8, 1913.

water and of the fishes contained therein. Very little can be accomplished with a single natural pond; it is necessary to have several artificial ponds which can be readily controlled, while the various operations of pond culture require frequent attention and considerable actual labor.

The requirements for the successful management of several kinds of pond fishes have already been worked out at public fish hatcheries and there is more or less official information on the subject. Success in private fish culture is possible and considerable fish food may be produced with the same amount of labor and intelligent effort that is necessary for the raising of fowls. There has been much agitation over the high cost of living and it is time to consider what the individual citizen can do in the way of assisting in the production of fish food.

In some of the countries of Central Europe the cultivation of fishes in private waters has been going on for centuries. In Austria and Germany fish farming as it is often called is a common industry. While it is much practiced by small land owners, there are many large estates which maintain hundreds of ponds in active cultivation. Much of this private fish culture is based on the various forms of the carp, but other European fishes are also cultivated for sale, such as the tench, ide, rudd, bream, perch and pike. Some European fish culturists are now raising American basses and perches. There are many villages in Austria where fish ponds are maintained at the expense of the community. In view of these facts, it is remarkable that immigrants from Europe have neglected to practice their ancient art of pond culture in this country.

Aside from commercial trout raising, which is practiced to a limited extent, we have nothing of such pond culture in America. Our numerous fish hatcheries maintained under the direction of state commissions are devoted almost entirely to the stocking of public waters with young fishes. A few of our state commissions are making efforts in pond culture for the benefit of farming communities, notably in Kansas, and it will be interesting to observe what progress can be made. Perhaps the vast natural yield from our coast, lake and river fisheries is responsible for the lack of private effort.

Our fish supply in general is large and well distributed, but we could consume a much

greater quantity, especially in view of the fact that in some sections the natural supply is being depleted by over fishing and the pollution of waters. There are many sections of the country inadequately supplied with fish food which could be produced locally by pond cultivation and such supplies would find convenient home markets.

It is possible for the private citizen to obtain pond fishes for breeding purposes but he needs assistance and direction. Object lessons on approved methods of fish culture could be obtained by visiting public hatcheries, but this he is not likely to undertake. It would be advantageous to the country if state fish commissions generally could supply the coarser fishes for cultivation in private waters, and furnish the public free information as to the methods to be followed.

Having practiced wholesale methods for two or three decades, we should now consider whether we might not profit by a little less fish hatching and a little more fish raising. The time has come for American fish culturists to simplify their art and teach it to the people, for they can surely help in the production of fish food.

THE SUMMER AT THE AQUARIUM

The past summer has been an uneventful one at the Aquarium. Although the exhibits have been as large and varied as usual, and the attendance a little in excess of the average, there is nothing striking to record. Perhaps normal, healthy conditions should be regarded as satisfactory, when the limitations of growth imposed by a building of limited capacity are taken into consideration. The Aquarium may vary its exhibits to some extent, but can not possibly increase them in the present building. Changes were made in the exhibits from time to time. Among the species new to our collection or exhibited at rare intervals, may be mentioned the Amazon turtles and the Florida and Bermuda fishes illustrated in this Bulletin.

Early in October additions were made to the collection of tropical fishes, Mr. Chapman Grant having obtained at Key West 175 specimens representing 35 species.

Attendance.—The attendance at the Aquarium from January 1st to October 1st was 1,710,287.

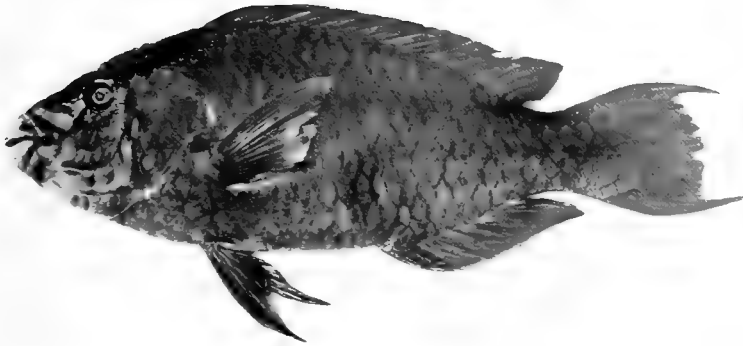
The annual proceedings of this Society now constitute an important series of volumes on fishery subjects and the membership of the Society numbers about seven hundred.

New Crayfishes.—Mr. Dwight Lydell of the Michigan Fish Commission has recently presented to the Aquarium a large collection of crayfishes from Michigan containing species which have not been previously exhibited here.

Rare Parrot-Fish.—For several months the Aquarium had a specimen of

the large blue parrot-fish (*Pseudoscarus plumbeus*), which died recently and was sent to the Museum of Natural History. This species was described by Dr. Bean in 1912 from three specimens taken at the Bermuda Islands by Mr. Mowbray, Director of the Boston Aquarium. It had not previously been known to naturalists and has not been seen since then until the Aquarium specimen was taken at Key West, Florida.

This fish, the fourth one known, was much larger than those from Bermuda, and was strikingly handsome. Parrot fishes do not live many months in captivity for the reason that it is difficult to provide them with the

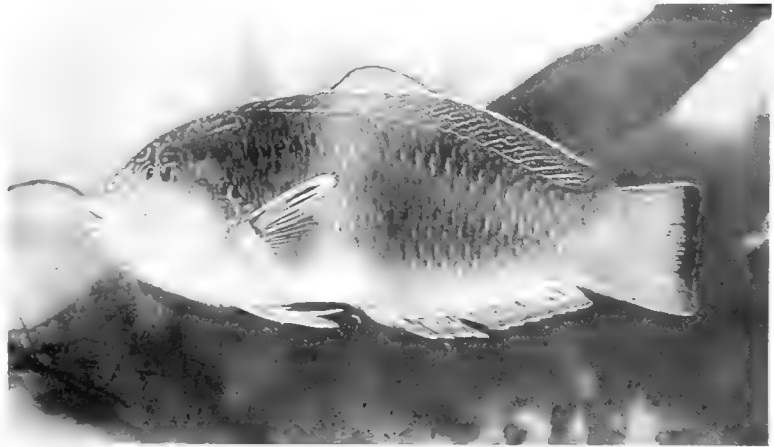


BLUE PARROT FISH (*Pseudoscarus plumbeus*)

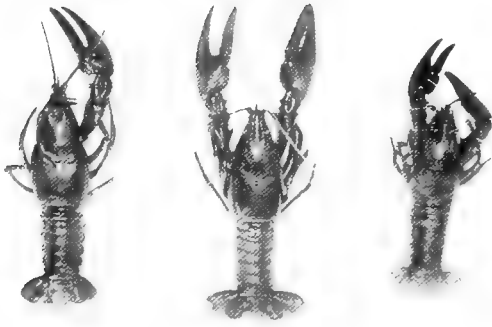
NOTES OF INTEREST

A Royal Visitor.—The Grand Duke Alexander of Russia who recently visited New York told the newspaper reporters that "The New York Aquarium has the most wonderful collection in the world."

Fisheries Society Meeting.—The American Fisheries Society held its Forty-third Annual Meeting in Boston, September 8-11, under the presidency of Dr. Townsend, Director of the New York Aquarium. The four days' sessions were occupied chiefly in the reading and discussion of papers relating to fish culture, commercial fisheries, marine biology and oceanography. Among those who presented papers for discussions on these subjects were: Dr. H. M. Smith, United States Commissioner of Fisheries; Professor Dyche of the University of Kansas; Professor Reighard of the University of Michigan; Professor Field of Clark University; Professor Ward of Indiana University; Professor Parker of Harvard University; Dr. Townsend and Professor Prince, Commissioner of Fisheries of Canada. Dr. Raymond C. Osburn of the New York Aquarium was elected Recording Secretary.



PUDDING WIFE (*Iridia radiatus*), FLORIDA



CRAYFISHES

The larger from Michigan, the smaller from New York

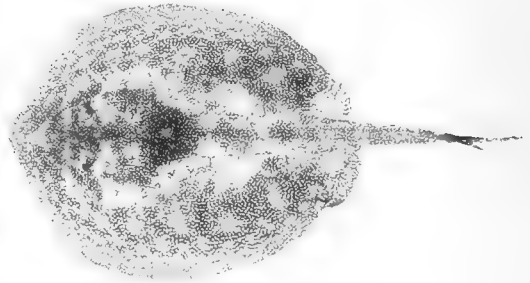
foods they are accustomed to find among the coral reefs.

Round Sting-Ray.—The Aquarium has for several months had a specimen of the Round Sting-ray (*Urolophus jamaicensis*), common in the West Indies, but hitherto known on the coast of the United States from a single small specimen. As no figure of it has apparently ever been published, the cut in this BULLETIN will be of interest to ichthyologists. The photograph was made in the Aquarium by Dr. R. C. Osburn.

The Letters of a Great Scientist.—Through the kindness of the author, Mr. G. R. Agassiz, we have received a copy of the recently issued "Letters and Recollections of Alexander Agassiz."

It was our good fortune to be attached to the U. S. S. Albatross during the deep-sea investigations made in the South Pacific under the personal direction of this distinguished oceanographer. On one of these voyages the Albatross succeeded in making the deepest haul of the dredge ever made by any vessel; south of the Tonga Islands the dredge brought up animal life and bottom specimens from a depth of 4,173 fathoms or more than four and a half miles. On the same voyage the Albatross made a sounding of 4,813 fathoms or nearly five and a half miles. Many of the letters relate to the work of Agassiz in the ship's laboratory, or on the coral reefs of Polynesia. They were addressed to men of science in many countries and to personal friends.

One of them deals with his visit to another celebrated oceanographer, the Prince of Monaco, who recently visited New York in his own deep-sea exploring ship.



ROUND STING-RAY (*Urolophus jamaicensis*)
Photo by R. C. Osburn

As a whole they reveal the intense interest of a scientist who worked without cessation and with amazing success to the very end of a long life, always drawing freely upon his own great fortune in the furtherance of the ends of science.

HATCHING GRAYLING AT THE AQUARIUM

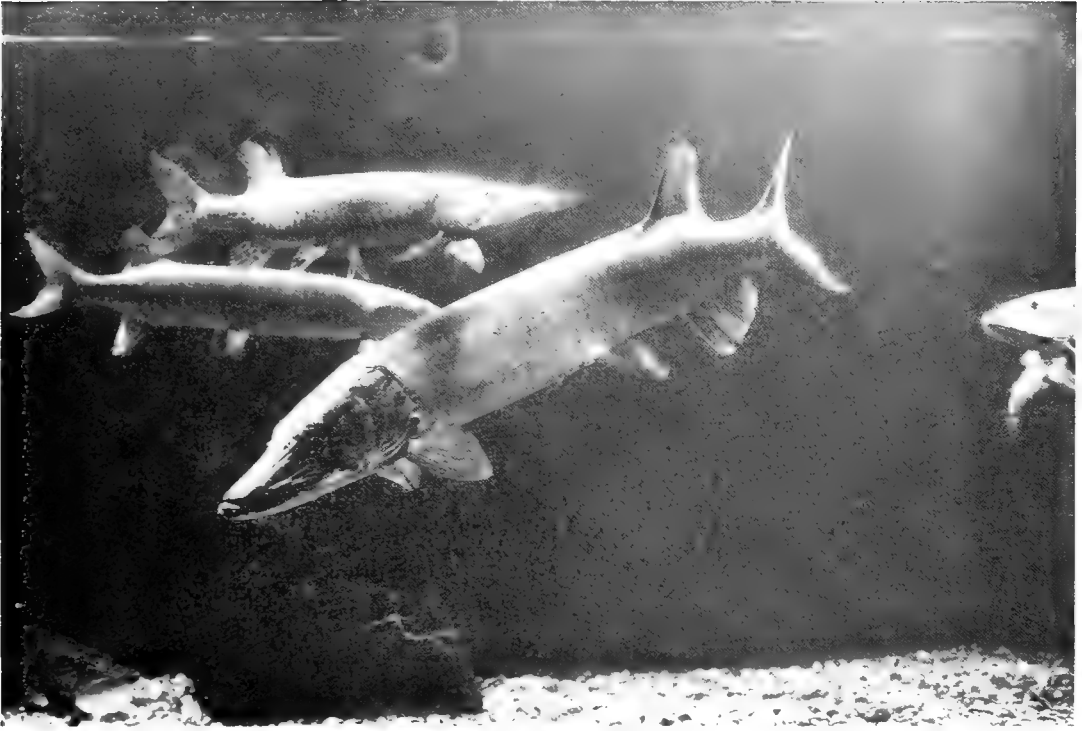
ONE of the gallery tanks at the Aquarium contains several hundred Montana Grayling, the largest measuring about five inches and all growing rapidly.

The eggs were taken at the Bozeman Hatchery by the U. S. Bureau of Fisheries. They were received at the Aquarium May 6th and were all hatched by May 17th.

These fishes would doubtless have grown faster in the space afforded by a fish-hatchery rearing pond, but their present size and condition is excellent, considering the limitations of an exhibition tank and the fact that they have had none of the varied insect and other live food to be found in ponds. They have little of the beauty of grayling taken from their cold native streams, but it is nevertheless interesting that we have been able to hatch and rear them in refrigerated Croton water on a diet no more varied than minced beef heart and liver.

The grayling is essentially a fish of the cold and clear streams of the North and does not naturally inhabit United States waters except in Montana and Northern Michigan. Its range in our waters is being extended somewhat by introduction.

The grayling is the equal of the trout in food and game qualities. The writer has caught specimens a foot long, above the

MUSKALLUNGE (*Lucius Masquinongy*)

Arctic Circle in Alaska, and they grow still larger. With salmon, pike, yellow spotted trout and whitefish fresh from the icy Kowak River, our explorers turned to the grayling as the finest of all the fishes brought into camp. We used to see them in good sized schools in the Arctic streams and they had none of the wildness of trout, but lingered in the shallow water in full sight of the anglers.

The Government hatchery at Bozeman has been in operation since 1891, and many millions have been placed in suitable northern waters. There are three kinds of grayling in North America; the Arctic species is *Thymallus signifer*, the Michigan fish *T. tricolor*, and the western form *T. Montanus*. It is no longer common in Michigan, but may be re-established by artificial propagation.

The two southern forms are geographically isolated from the northern, and are doubtless remnants from the post-Glacial range of the northern species.

The grayling of England and Northern Europe (*Thymallus vulgaris*) was known to Isaac Walton, who says "Some think that

he feeds on water thyme, and smells of it." To this belief the fish evidently owes its name *Thymallus*.

Our graylings spawn in April and May, the eggs hatch in from nine to seventeen days at temperatures of 50 to 60 degrees, and the yolk sac is absorbed in eight or ten days, when the young fishes rise from the bottom of the hatching troughs and begin to feed. The number of eggs deposited varies from three thousand to four thousand.

Many of the eggs received from Bozeman failed to hatch, doubtless owing to the fact that they were treated like trout eggs and placed in hatching troughs. Had they been placed in glass hatching jars, as is done at Bozeman, and kept in motion by water admitted from below, we might have hatched a larger proportion of the eggs received.

The Aquarium has at present nearly one thousand tropical fishes representing about one hundred different species. They make an exhibition of life from the coral reefs that is full of color and movement.



SEA HORSES IN THE NEW YORK AQUARIUM

Fishes in Central Park.—The following species of fishes have been found by the Aquarium collector to be abundant in the lakes of Central Park: goldfish, carp, common roach, pearl roach, yellow perch, sunfish, catfish and fresh-water killifish.

A FINE HERD OF SEA HORSES

THIS has been a good season for sea horses on the marine ranges and the Aquarium has three hundred of them rounded up in the corral at the Battery.

The most of them came from Long Island, Sandy Hook and the neighborhood of Atlantic

City. A small unbranded bunch was roped at Gravesend Bay.

The Aquarium stockman is now getting in forage from the beaches, for the sea horse won't eat anything he doesn't like. Just at this season it is not difficult to supply fresh food, but when winter sets in the forage question gets serious. Along toward Spring when it is actually scarce, the sea horses begin to show their ribs and some of them don't pull through the winter when beaches are bare.

For the benefit of those unacquainted with the breed, it may be stated that it is known as Hippocampus. It loves to browse among sea weed. It has a tail that can be used like that of a monkey but it is always recognizable by its horse-like head.

This is all the information regarding the sea horse that will be given out at present, but the public will be admitted without charge and the stockmen are ready to answer questions.

THE NEW MODEL

The attention of members of the Zoological Society is called to a beautiful model now on exhibition at the Museum of Natural History which bears the following inscription:

MODEL OF THE PROPOSED ENLARGEMENT OF
THE NEW YORK AQUARIUM
PREPARED IN 1912 UNDER THE DIRECTION
OF THE
NEW YORK ZOOLOGICAL SOCIETY
By J STEWART BARNEY ARCHITECT

ZOOLOGICAL SOCIETY BULLETIN

WILD LIFE PROTECTION SUPPLEMENT

VOL. XVI

NOVEMBER, 1913

No. 60

A GREAT VICTORY FOR THE BIRDS

CONGRESS BARS OUT OF THE UNITED STATES
ALL IMPORTATIONS OF WILD BIRDS' PLUMAGE

THE United States Senate has elected to preserve unbroken its record in the conservation of wild life. After a prolonged and very strenuous struggle with the feather trade, the friends of the birds, both in and out of Congress, have won a complete victory. On September 2, the Senate democratic caucus voted to withdraw the amendment it previously adopted to the bird-protecting clause of the tariff bill, and restore that measure as it was written into the tariff bill by the House Committee on Ways and Means. Inasmuch as there is no probability that this action ever will be reversed, the war with "the feather trade" may be accounted as terminated, in a sweeping victory for the birds of the world.

On September 3, the *Washington Post* contained the following account of the proceedings in the meeting of the Senate Democratic caucus on the night of Oct. 2:

For five hours last night Democratic senators fought out the question of whether or not the plumage of wild birds should be permitted to be imported into the United States. The Senate committee had agreed to a modification of the drastic prohibition of the House. This modification was denounced by the Audubon Society and other lovers of birds, anxious to stop their slaughter, as tending to make the House provision absolutely ineffective.

The fight for the House provisions was led by Senators Lane and Chamberlain, of Oregon. The caucus finally decided to stand by the committee. The two Oregon senators bolted, and others supported them. Party managers then found the spirit of insurgency too strong, and the House paragraph was adopted. This absolutely prohibits the importation of the plumage of wild birds except for scientific and educational purposes.

The action taken by the caucus affords reasons for profound congratulation. Heretofore no party lines ever have been drawn

in Congress against birds, or other forms of wild life; and the prospect that the wreck of the bird-protecting clause might or might not be patched up in the conference committee, at the Senate's expense, gave the bird protectors a feeling of genuine sorrow. It seemed deplorable that the Senate should, for even one month, assume a position of friendliness to bird slaughter, and draw party lines against the birds.

But the ship of state has righted itself, and once more rests on an even keel. The new tariff bill will prohibit the importation of wild birds' plumage for commercial purposes, no matter from what country they come, and will totally abolish in the United States and all its territorial possessions the odious and cruel traffic in the skins and feathers of slaughtered wild birds. The news of the action of the Senate will give joy to millions of people, all over the world, who now are thinking very hard on the subject of bird-destruction.

The friends of the birds will be deeply grateful to Senator George P. McLean, who ably championed their cause in the Senate; to Senators Chamberlain and Lane of Oregon, who through their bold and aggressive stand in the great caucus fight of September 2, literally snatched a victory out of the jaws of defeat; to Senator James A. O'Gorman who took a position on the right side at a most critical moment, and to Senators Hitchcock, John Sharp Williams, Gore, Bryan, Bacon, Shiveley, and other democratic Senators who were in a position to make their influence felt.

LEST WE FORGET.



A VICTIM OF THE FEATHER TRADE, AND ITS PRICE.

THIS AMERICAN HUMMINGBIRD was sold at the August auction of the London feather trade, 1912, for *two cents*, along with 1,599 others like it at the same price. At the first three of the quarterly London sales of 1912 the following bird skins were sold: 129,168 Egrets, 18,598 Herons, 20,698 Bird-of-Paradise, 41,090 Hummingbirds, 9,464 Eagles, Condors, etc., 9,472 Other Birds. Total 228,490.

Will the Democratic Majority in the United States Senate find a way to maintain this slaughter for the enrichment of the importing feather dealers of New York? *It does not affect the retail millinery trade.* Ask your wife and your Lag, too, whether they wish this commercial slaughter of the innocents to be continued by the defeat of the Underwood clause in the tariff bill. Section 357.

AN EFFECTIVE AID TO THE CAMPAIGN

Hummingbird skins were mounted thus on cards and mailed to all members of the United States Senate.

The campaign was inaugurated and managed throughout by the New York Zoological Society and National Association of Audubon Societies. Immediately it attracted the vigorous support of National and State Federations of Women's Clubs, the State Audubon Societies, many patriotic societies of women, the Women's League for Animals, and a host of other organizations and free-lance leaders. The press of the country at large supported the campaign with vigor and enthusiasm, and some of the strongest editorials were published in cities and towns far from the storm centre.

The number of personal letters written to members of Congress during this campaign was enormous. It is estimated that 100,000 would be under rather than above the mark. The women of America seized upon this campaign as their one golden opportunity to square themselves on the bird-millinery question, and put a final quietus on the traffic they had long abhorred. The traffic was swept out of the country on a tidal wave of indignant protest that was irresistible.

To all those who helped to carry through this campaign to a victorious finish, much credit is due for having won the first great victory ever scored for the birds of the world. The United States now stands on the highest plane ever occupied by any nation—in a class by itself. The effect of our example will be felt all around the world, and in every land where birds are to-day unprotected from the gun, the snare and the blowpipe of the cruel hunters of the feather trade. Now the word of the leaders is: "On to London, Paris and Berlin!"

NOTICE!

KILLING OF QUAIL PROHIBITED

"There shall be no open season for quail before October 1st, 1918."

(Conservation Law, Section 214, Sub. Division I, as amended by the Laws of 1913)

PENALTIES

\$60.00 Fine, and an additional penalty of \$25 for each quail Taken or Possessed.

Report any violations to your STATE GAME PROTECTOR, or to the CONSERVATION COMMISSION, Albany, N. Y.

END OF A THREE YEARS' CAMPAIGN TO SAVE THE QUAIL OF THE STATE OF NEW YORK
Facsimile of 1090 notices printed on linen and distributed by the Camp-Fire Club of America

CONGRATULATORY VOTE AND MEMORANDUM

FROM THE SOCIÉTÉ PROTECTRICE DES ANIMAUX DE PARIS, (SOCIETY FOR THE PROTECTION OF ANIMALS), REGARDING THE ENACTMENT BY CONGRESS OF A LAW FOR THE EXCLUSION FROM THE UNITED STATES AND ITS DEPENDENCIES OF IMPORTATIONS OF WILD BIRDS' PLUMAGE FOR MILLINERY PURPOSES.

ASNIERES, SEINE, FRANCE, (Translation.)
September 18, 1913.

At the monthly meeting of the Society for the Protection of Animals of Paris, held on September 18th, 1913, Mons. A. F. Dupont read to the Society letters received by him from Mr. William T. Hornaday, Director of the New York Zoological Park. The Society listened to the statement made by Mr. Dupont of the energetic campaign prosecuted in the United States throughout the past six months, which ended on September 3d in a complete victory for the Protective Societies. In this campaign those Societies obtained from the American Senate the prohibition of the importation of wild birds' plumage, and the abolition of the traffic in feathers and skins of slaughtered wild birds, throughout the United States.

The Society requested the President to express its great satisfaction to the members of the Protective Societies for this great victory, and convey its heartfelt congratulations to the chief promoters of this world-wide success, i.e.:—

First.—To the New York Zoological Society and Dr. William T. Hornaday.

Second.—To the National Association of Audubon Societies and Mr. T. Gilbert Pearson.

Third.—To the New York Women's League for Animals.

Fourth.—To the American Humane Association.

Fifth.—To the Senators who by main force snatched the victory from defeat, particularly as follows:—

Senator George P. McLean;
 Senator George E. Chamberlain;
 Senator Harry Lane;
 Senator James A. O'Gorman;
 Senator Gilbert M. Hitchcock;
 Senator John Sharp Williams;
 Senator Thomas P. Gore;
 Senator Nathan P. Bryan;
 Senator Augustus O. Bacon;
 Senator Benjamin F. Shiveley;

The meeting hears the call made upon France by Dr. Hornaday for similar action, and relies upon the Paris Society for the Protection of Animals to begin at once a campaign to secure in France the same victory.

The meeting sends to the National Congress of the American Humane Association, to be held at Rochester, New York, on October 13th an expression of its fraternal sympathy, and its hope that new victories may crown the labor of the Congress.

Action proposed, supported and obtained by

A. F. DUPONT,
 Corresponding Member
 of the American Association.

A LETTER FROM THE ROYAL SOCIETY FOR THE PROTECTION OF BIRDS

HILLCREST, REDHILL, SURREY.
 22 Sept., 1913.

Dear Dr. Hornaday:

I cannot tell you how full of joy we are on account of your splendid victory. It has heartened us in a way in which we have never been heartened before.

I am glad if even the introduction of the Hobhouse Bill helped you a little bit. The passing of your Clause in the Tariff Bill will be of immense value to us.

We are hoping for the best, but even Government Bills often get shelved, unless there is strong personal feeling in favor of them in Parliament, or wide public opinion on their side in the country.

To awaken the people of this country to any sort of enthusiasm on behalf of birds is a superhuman task; but dogged perseverance will sometimes accomplish wonders, even if the persevering ones are but few in number,—and herein lies our strength.

How you managed to inspire thousands with real flaming enthusiasm on behalf of birds is to us incomprehensible. In this country it could not be done.

Please accept our most hearty congratulations for what you have done for the birds of the world, and for the birds of all the Ages to come. A copy of our autumn number of *Bird Notes and News* will shortly reach you, and we hope that you will like it.

Very sincerely yours,
 MARGARETTA L. LEMON.

A NEW CAMPAIGN IN GERMANY

Encouraged by the success of the anti-plumage law in the United States, the bird-protectors of Germany are now actively planning an immediate renewal of their war on the feather trade. The subject is by no means new in Germany, and we are glad that our success has afforded substantial encouragement to our co-workers in Germany and elsewhere.

The following letter, from the leading Society for bird protection in Germany, tells its own story.

W. T. H.

Bund für Vogelschutz,
 Stuttgart,
 Jägerstrasse 34.

September 30, 1913.

Dr. William T. Hornaday,
 New York Zoological Park.

SIR:

We beg to express our thanks for your answer to our telegram and for the press bulletin you kindly sent us, and our hearty congratulations on the glorious victory you have won. We do hope that the effect of it will be felt all over the world, and that Germany, too will stop the feather trade. We are very sorry that it was Germany that opposed the clause. Professor Schillings is endeavoring to procure an audience with the Reichskanzler, in which we hope that he will succeed.

At the annual meeting of the Society for Medical and Scientific Research at Vienna

ZOOLOGICAL SOCIETY BULLETIN SUPPLEMENT

(Versammlung Deutscher Aerzte und Naturforscher,—the most important scientific society of Germany) a resolution was passed asking the government to bring in a bill prohibiting the importation of the feathers of wild birds, following the precedent of the United States.

It might interest you that the government of the German colony of Samoa has issued

a law prohibiting the killing and catching of nearly all wild Birds of Samoa except 7 species. But these measures will not be of much use as long as we have no law prohibiting importations to the home-country.

Yours truly,

L. HÄHNLE,

President of the "Bund für Vogelschutz," Stuttgart,

CONTRIBUTORS TO THE WILD LIFE PROTECTION FUND

Felix M. Warburg	\$100.	Charles Wisner	10.
Jonathan Thorne	100.	Louis J. Boury	10.
G. S. Bowdoin	100.	Ralph L. Cutter	10.
W. A. Wadsworth	100.	F. Colt Johnson	10.
Charles Deering	50.	Bryant Walker	10.
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Mrs. Herbert L. Satterlee	25.	Maud Foster, (Miss)	10.
Geo. H. Diehl	20.	John D. Hage	5.
Miss Emily Redmond	20.	Augustus L. Hyde	5.
Wm. L. Porter	20.	Henry F. Walker	5.
Daniel E. Moran	20.	W. T. Rasmus	5.
Mrs. Henry K. Pourroy	20.	F. O. Spedden	5.
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Mrs. George W. Thacher	10.	Mrs. Edward W. Sparrow	5.
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Paul Tuckerman	10.	J. C. Smillie	5.
Mrs. Richard M. Hoc	10.	Damel C. French	5.
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J. Langeloth	10.	George D. Barron	4.
C. T. Church	10.	S. Dana Kittredge	2.50
H. I. Judson	10.	Frank Gross	2.
Miss J. R. Cathcart	10.	S. W. Childs	2.
Gerard H. Huntman	10.		
Mrs. P. Hackley Barhydt	10.		
William H. Rockwood	10.		
		Total	\$1,880.50

GENERAL INFORMATION

MEMBERSHIP IN THE ZOOLOGICAL SOCIETY.

Membership in the Zoological Society is open to all interested in the objects of the organization, who desire to contribute toward its support.

The cost of Annual Membership is \$10 per year, which entitles the holder to admission to the Zoological Park on all pay days, when he may see the collections to the best advantage. Members are entitled to the Annual Reports, bi-monthly Bulletins, *Zoologica*, privileges of the Administration Building, all lectures and special exhibitions, and ten complimentary tickets to the Zoological Park for distribution.

Any Annual Member may become a Life Member by the payment of \$200. A subscriber of \$1,000 becomes a Patron; \$2,500, an Associate Founder; \$5,000, a Founder; \$10,000, a Founder in Perpetuity, and \$25,000, a Benefactor.

ZOOLOGICAL PARK.

The Zoological Park is open every day in the year, free, except Monday and Thursday of each week, when admission is charged. Should either of these days fall on a holiday no admission fee is charged. From May 1 to November 1, the opening and closing hours are from 9 o'clock A. M. until one-half hour before sunset. From November 1 to May 1, the opening and closing hours are from 10 o'clock A. M. until one-half hour before sunset.

Applications for membership may be given to the Chief Clerk, in the Zoological Park; C. H. Townsend, N. Y. Aquarium, Battery Park, New York City, or forwarded to the General Secretary, No. 11 Wall Street, New York City.

NEW YORK AQUARIUM.

The Aquarium is open every day in the year: April 15 to October 15, from 9 o'clock A. M. to 5 o'clock P. M.; October 16 to April 14, from 10 o'clock A. M. to 4 o'clock P. M. No admission is charged.

PUBLICATIONS

<p>Annual Report No. 1.....Paper \$.40</p> <p> " " 2....." .75</p> <p> " " 3 and 4, each. " .40</p> <p> " " 5 " 6 " " .75</p> <p> " " 7 " 8 " " 1.00</p> <p> " " 9 " 10 " " 1.25</p> <p> " " 11, 12, 13, 14, 15, 16, 17, each....." 1.00</p> <p>Our Vanishing Wild Life (Hornaday) postpaid....." 1.65</p> <p>Destruction of Our Birds and Mammals (Hornaday)....." .15</p> <p>Notes on Mountain Sheep of North America (Hornaday)...." .40</p> <p>The Caribou (Grant)....." .40</p> <p>The Origin and Relationship of the Large Mammals of North America (Grant)....." 1.00</p> <p>The Rocky Mountain Goat (Grant)....." 1.00</p> <p>Zoologica Vol. 1. Nos. 1-11 inclusive, set....." 2.30</p>	<p>Sea-Shore Life (Mayer).....Cloth 1.20</p> <p>The National Collection of Heads & Horns (Hornaday) Large Quarto. Parts 1 and 2, each... Paper 1.00</p> <p>Bulletin Nos. 1 and 6.....Out of Print</p> <p>Bulletins—Bi-monthly.....20c, each; Yearly by Mail 1.00</p> <p>Bulletin Nos. 5 to 23 inclusive Set, cloth bound,.... 5.00</p> <p>Official Guide to the New York Zoological Park (Hornaday)......25</p> <p><i>Souvenir Books:</i> Series No. 2, 36 pages, 5½ x 7½ inches, 33 full page illustrations in colors. Price, 25c.; postage 3c.</p> <p>Series No. 3, 48 pages, 7x9 inches, 73 illustrations from four color plates. Price 50c., postage 3c.</p> <p><i>Souvenir Postal Cards:</i> Series of 72 subjects in colors, sold in sets of 24 cards, assorted subjects, for 25 cents; postage 2 cents per set.</p> <p><i>Photogravures:</i> Series of 12 subjects in sepla. Animals and views in the Zoological Park. Sold in sets of 2 subjects. Price 25 cents per set; sent postpaid.</p>
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Publications for sale at the Zoological Park and at the New York Aquarium.





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