

IOWA CONSERVATIONIST

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Perch Family Made Up of Numerous Interesting Members

By E. B. SPEAKER

Superintendent of Fisheries

No group of fishes in Iowa is held in higher esteem than the larger members of the perch family, the walleye pike, yellow perch and sauger. Equally interesting in this group but too small to serve as food are the 16 little darters, many of which are gorgeously colored.

Walleyes are found principally in the larger natural lakes, the boundary rivers, and a number of the major inland streams. They spawn early in April soon after the ice disappears, depositing their eggs aimlessly over rock or gravel bars, after which they return to deeper water, leaving the eggs to develop unattended and the tiny offspring to shift for themselves.

Nature has provided this careless family with the ability to deposit enormous numbers of eggs to compensate for the loss which invariably follows. These losses are caused by a multiple of factors, including abrasive action of wind and sand, predation by fishes and aquatic insects, and disease. The size of the eggs varies considerably in different localities and among individuals. Eggs usually average from 150,000 to 160,000 to the quart and shortly after fertilization double in size.

The incubation period varies in direct relation to the temperature of the water. In Iowa the eggs hatch in about 12 to 20 days. The tiny fish, or fry as they are called, are about 3/16 inches in length. They are transparent and individually are scarcely visible to the eye.

Development is rapid, and by fall the youngsters are from three and a half to six or more inches in length. Normally, they

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American Egrets Build Nests and Rear Young In Rookery Near Sabula



Part of the American egret nests in the Sabula rookery. Several birds may be seen perched in the trees, and two have been caught in mid-air by the cameraman.

Market Hunting of Waterfowl In Early Days--Slaughter

By JACK W. MUSGROVE

Director, State Museum

The glow of the early spring sunset touched with red the wings of waterfowl milling over the lake. As darkness approached the number increased until the sky was filled with the shadowy forms. As they settled with the mass of birds already at rest on the water, the clamor of their voices could be heard for miles. Here, in their favorite resting place, they fed and bathed, and conversed with their fellows.

Long after darkness, as the

duck raft continued to increase in size and number, the indistinct shape of a boat, camouflaged with rushes, glided from the shores. In it were two shadowy forms, one at the bow completing the loading of a large swivel gun, the other manning an oar that pushed the boat silently through the thick vegetation to the open water. Ahead, the raft of waterfowl crowded together still unalarmed, unaware of the approaching doom of many of their numbers.

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Colony Consists of Between 700 and 900 Individuals

By JAMES R. HARLAN

Reprinted From Iowa Bird Life

For at least the second successive year American egrets are known to have made their summer home and successfully raised their young in an Iowa rookery. The colony is located in the Mississippi River bottom in Jackson County about three miles above the town of Sabula and a mile west of the river channel proper.

For a number of years egrets have become increasingly common, after having been almost entirely absent from the state for nearly 20 years. Undoubtedly these egrets were first-year young that had come into the state from southern rookeries to fish, and were not from Iowa nesting birds.

The fact that egrets were nesting on Iowa's Mississippi bottom was brought to the attention of the writer in a casual conversation in the latter part of July 1942, with Conservation Officer Bill Morf, who in the company of Don Edlen had found the colony earlier in the year. At that time they estimated the birds to number 1,500 individuals, including great blue herons. Inasmuch as the birds were no longer in the colony, it was impossible to verify the report or visit the nests that year. However, the nesting observation of Morf and Edlen for 1942 cannot be questioned.

In late June, 1943, in the company of Garfield Harker of Maquoketa, the conservation officer

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Egrets

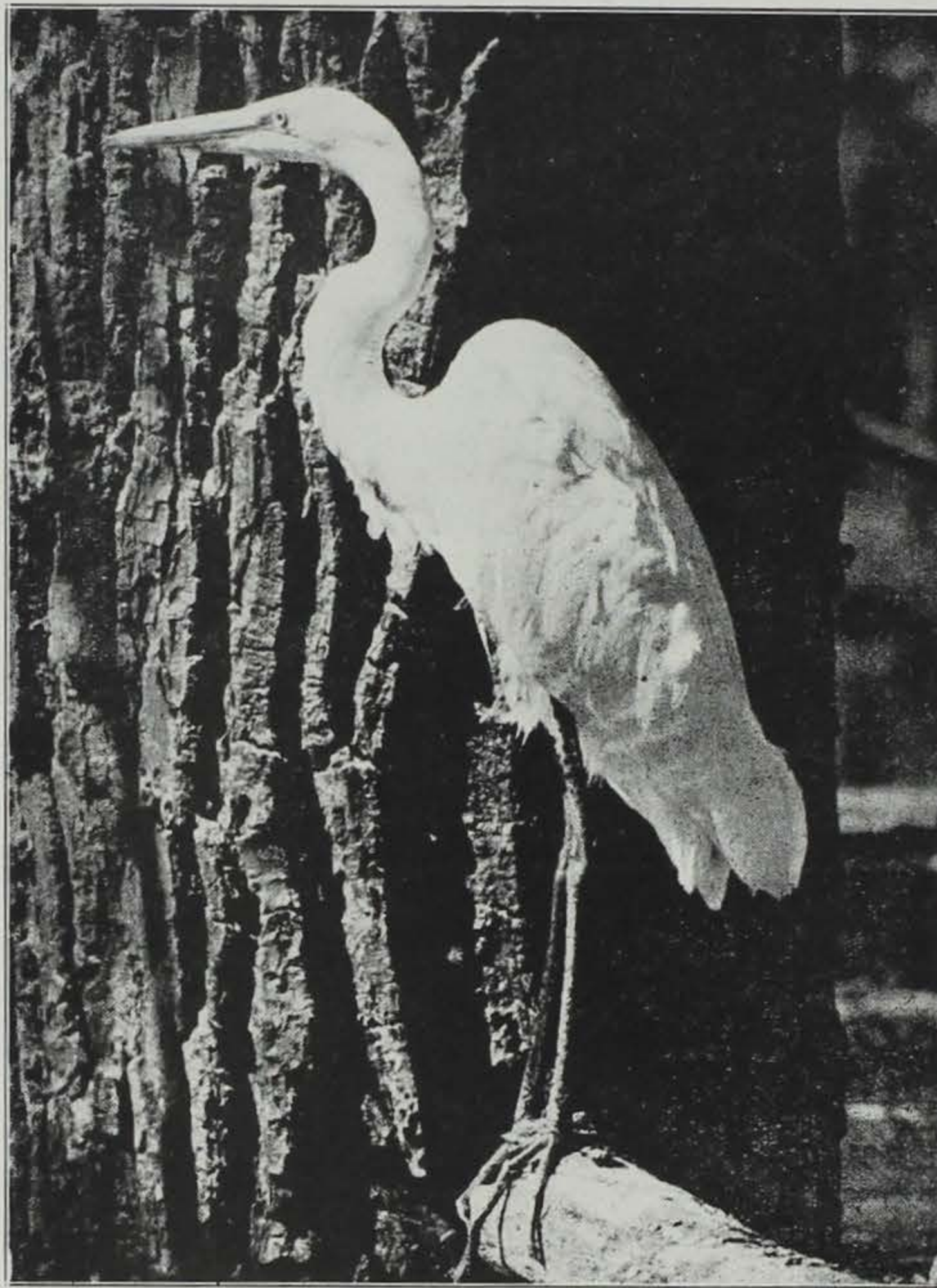
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in charge of Jackson County, the author searched the river bottoms for the colony. The river was about five feet above normal stage, and many of the landmarks needed to guide a party into the almost impenetrable bottoms were missing. Although numerous American egrets were observed in flight in the area, the nests could not be found. Harker later found the colony and directed Mrs. H. R. Peasley, E. B. Speaker and Bruce Stiles to the site.

The author on July 30, 1943, in the company of Conservation Officer Bill Morf, Register & Tribune feature writer George Shane, and Register photographer Herb Schwartz, visited the rookery. The trip was made by motor boat from Sabula.

To visualize this unusual rookery, it is necessary to have a mental picture of these bottoms. The flat, timbered flood plain through which flows the Father of Waters

This Clumsy Kid Fell Out of Bed



An American egret, almost fully grown, that tumbled out of its nest high up in a dead cottonwood.
—Photo by Herb Schwartz.

is some five miles wide at this point.

Prior to the establishment of the nine-foot channel, the bottom was intersected by numerous "chutes", small streams of running water which break away from the parent river upstream and wind through the lowlands, occasionally flattening out into "lakes", then winding across the flood plain as fancy dictates to rejoin the Mississippi farther downstream.

With the building of the dams and the resultant water level raise, this intertwining system of "chutes" and "lakes" was greatly complicated and deepened. As a consequence of the deeper water, thousands of great trees were drowned, and their naked skeletons now give a ghostliness to the area rivaling the famous cypress swamps and everglades.

To add to the distressfulness of the bottom, the most common living vegetation other than trees growing on the wet emergent land patches between "chutes" is poison ivy, both vining and as a low-growing bush. The latter is in such profusion as to appear as a luxuriant cultivated crop among

the trees. It is in this eerie vastness that the egrets chose their housekeeping sites and built their rookery.

The nests are built in a cluster of giant dead cottonwood trees, for the most part standing in the shallow waters of one of the new "lakes".

As our party stepped out of the boat onto a narrow strip of wet ground that separated us some 200 feet from the edge of the rookery, the hollow, discordant clamor of the young birds added to the impression that we were about to enter inferno. Pushing on through the screen of poison ivy and low-growing trees to the margin of the tree-filled "lake", the panorama of the nest-loaded dead cottonwoods against the deep blue above appeared with a startlingness compared to a slide flashed on the screen. High overhead hundreds of the abysmal inhabitants were silhouetted against the sky. The fetid stench of decaying fish hung heavily on the air. As the birds noticed us, their weird clamor briefly increased in intensity and pitch. Many of the adult birds, like ghosts, left on unhurried wings.

We were immediately aware of splashes in the water underneath the nest trees. We assumed that these were droppings from the young birds; however, the writer investigated and found heavy masses of regurgitated, partially digested fish. In one particular instance the pellet consisted of three partially digested carp about 3½ inches long and one green sunfish a little smaller. In all the pellets subsequently examined carp was the principal component.

There were more than 50 nests on the ground or in the water under the trees. Some appeared to have been blown from the trees, but the majority were still attached to the dead limbs in which they were originally placed many feet above and had come down almost intact. There were no egg fragments or remains of young in the vicinity, possibly because of the numerous raccoon that frequent the area.

It was estimated that the colony contained some 250 intact egret nests. This figure was arrived at by counting the nests in about one-third of the area. The nesting area itself was made up of some 40 trees covering approximately two acres. The nests were placed for the most part in exceedingly tall trees, with the lowest nests being approximately 50 feet from the ground, some being in the tiptops more than 80 feet.

Although the young were about ready to leave the nests, more than 50 per cent were still occupied with from two to four young. It is the author's observation that more than 60 per cent of the live nests were occupied by American egrets, the remainder by great blue herons. No other nesting birds were observed; however, Speaker identified two nests of the black-crowned night heron the week before.

The author estimates that the probable number of American egrets in this group is from 700 to 900 individuals.

While our party was taking photographs, the birds were greatly agitated and continued to regurgitate fish remains, the later pellets being more nearly digested than the ones first expelled. One almost fully grown young egret, with slapstick grotesqueness, lost its balance and with a few timid wing flaps sailed downward, catching a branch of a low tree, from which it hung suspended head downward for several seconds before dropping to the mud below. The bird was captured without much effort and required to pose for closeup photographs. It made several vicious strikes with its beak, and after a short period of captivity was released. It ran a distance along shore, then waded out into the lake and sat quietly on a floating log.

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Egrets

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A most interesting feature was the presence of large numbers of shed plumes. The author picked up more than a hundred plumes in a small area, many of which had fallen on the water when the river was high and had drifted with the slow current to the lower edge of the lake, where they hung suspended on the branches and bark of young trees and poison ivy bushes. Hundreds more could have been collected.

Hornaday, in "Our Vanishing Wildlife", quotes Mr. T. J. Ashe of Key West, Florida: "I have seen many molted and dropped feathers from wild plume birds, and I have never seen a molted or dropped feather that was fit for anything."

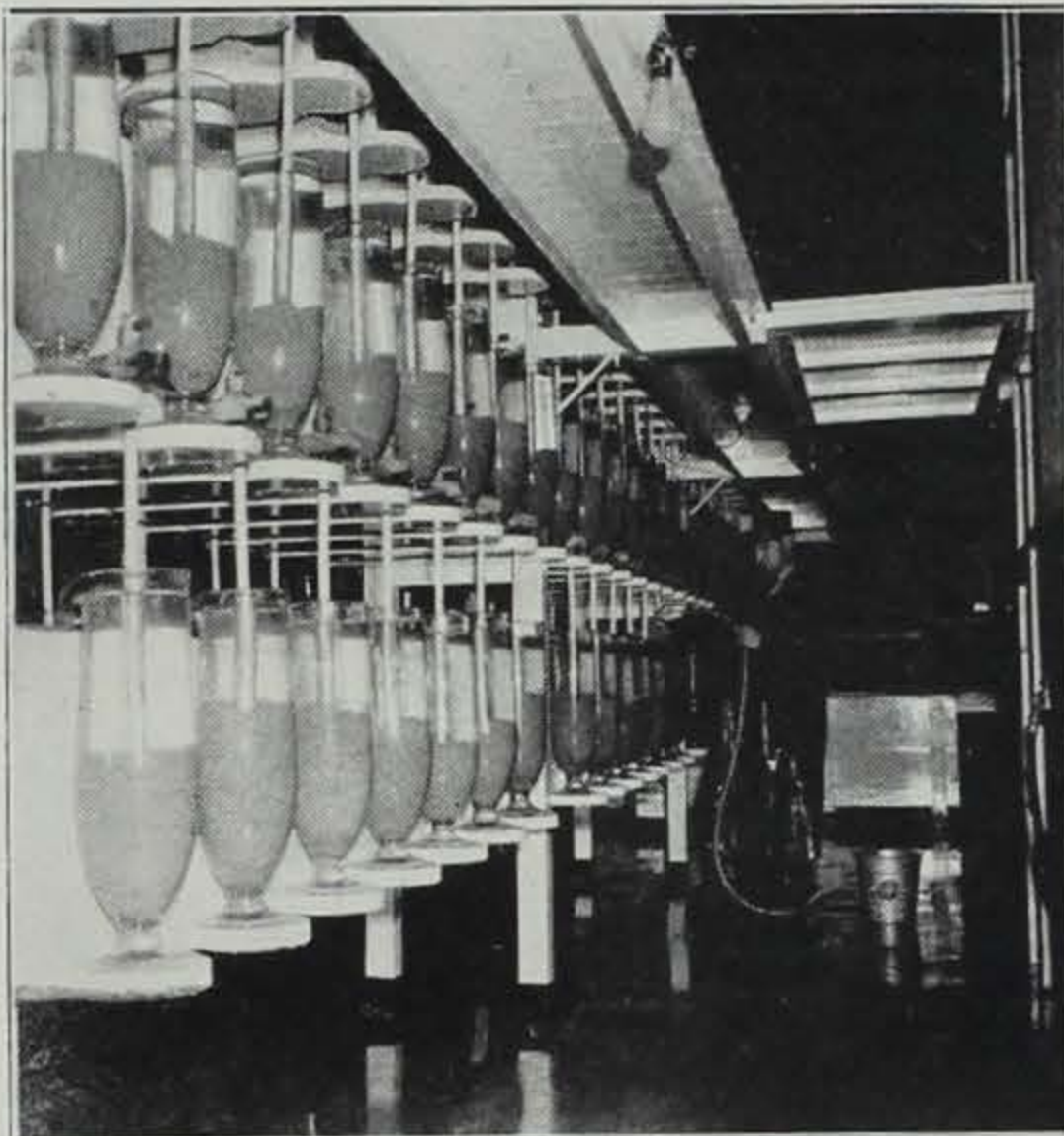
Hornaday also quotes Arthur T. Wayne of Mount Pleasant, South Carolina: "It is utterly impossible to get 50 egret plumes from any colony of breeding birds without shooting the birds. Last spring I went twice a week to a breeding colony of American and snowy egrets from early in April until June 8. In spite of the fact that I covered miles of territory in a boat, I picked up but two American egret plumes . . ."

In the same book it is stated that the accounts of feather collectors picking up large numbers of plumes were preposterous and that such shed feathers were of very minor value. It is undoubtedly true that in feather trade times the birds were killed for commercial plumes; however, of the more than a hundred the writer picked up, perhaps a third of them could not be distinguished from plumes that had been taken from an adult bird in full breeding plumage that had been seized by conservation authorities.

Plumes that had dropped on the muddy ground soon disintegrated. Of a number that were found even the quill was of a consistency of wet chalk or soap and could not be picked up.

Although local observers believe that the snowy egret nests in this area, no nests were found and no observations made of this bird. With careful search not a single plume identifiable as the snowy was found. It is the author's belief that these observations are erroneous, although probably several sight records have been made of immature little blue herons.

It is the writer's opinion that it would be unwise to encourage visitors to this colony. Occasional visitors might not be harmful, but constant interruption of the normal routine probably would be. Nesting birds are nervous. This fact, plus the nervous regurgitation of food by the young, especially during a period of food shortage, might be of sufficient importance to the birds to cause abandonment of the nesting site.



These battery jars of walleye pike eggs at the Spirit Lake hatchery each contain some 250,000 walleye pike eggs. During the 1943 season 54,000,000 walleye pike were hatched at this unit alone.

Perch Family

(Continued from Page One)

do not reach the legal size of 12 inches until the end of the third summer, although individuals may attain legal length at the end of the second year. Some legal-sized fishes of the second year class are thus taken by hook and line before they reach sexual maturity the third year.

Like most fishes, the young of the walleye subsist chiefly on minute aquatic animal life, including Daphnia, rotifers, midge-fly larvae, etc. After attaining a length of two and a half to three inches, they consume a considerable quantity of small minnows. Adult walleyes are considered piscivorous and feed largely on minnows and the young of other fishes; however, they consume tremendous numbers of insects, particularly when the mayfly and caddis fly hatches occur.

Walleye pike are taken by anglers throughout the entire season but yield the best creels in May, June, and the fall months. The time-honored system of trolling a spinner-minnow combination a few inches off the bottom is still productive. Many anglers cast from shore or from a boat near shore. This is usually done in the evening and frequently throughout the night. Metal spoons of the daredevil type fitted with a streamer fly or pork rind or both, spinner-fly combinations, and a large variety of small wood plugs are used. Experts in this type of fishing exhibit extraordinary catches in the lakes and the larger streams of the state. Walleyes have been taken weighing as much as 10 or 11 pounds from Iowa waters.

The sauger, a species closely related to the walleye, is found almost exclusively in the Mississippi River and the lower reaches of its tributaries. A few are taken from the Missouri River and its adjacent waters. It is smaller than the walleye, but its

habits are very similar. It is considered an excellent food fish.

The yellow perch, also called the ring-perch and raccoon perch, lives by preference in the shallow, weedy areas. They are sometimes found in our larger streams but are rarely abundant anywhere except in the lakes. They are considered by many as the finest fresh water food fish in America.

Like the walleye, perch spawn early in the spring. Their eggs are contained in a long, jelly-like ribbon which is usually draped under water over aquatic vegetation or brush when it is available. Shortly after fertilization, these ribbons become many times larger than the fish which laid them, often reaching a length of two or three feet and a width of several inches. This expansion or bloating of the ribbons or jelly-like masses which contain the eggs is called the "water hardening process". Although the eggs increase in diameter, they do not expand in proportion to the ribbons. The diameter of the egg itself is 1/13 inch and there are approximately 28,000 to a quart.

The average length of adult perch in Iowa is from 10 to 14 inches. Most of them reach the legal size of seven inches at the end of the second summer, and their growth rate is relatively slow thereafter. Probably most of our perch reproduce in the third spring.

The diet of the yellow perch is extremely variable. They subsist largely on a great variety of insects and insect larvae, minnows, small fish, crayfish, and snails. Following the spawning season in the early spring and again in the fall, they are taken in large numbers by anglers. All manner of baits are used, but small live minnows are usually most productive.

The outstanding characters which differentiate the walleye

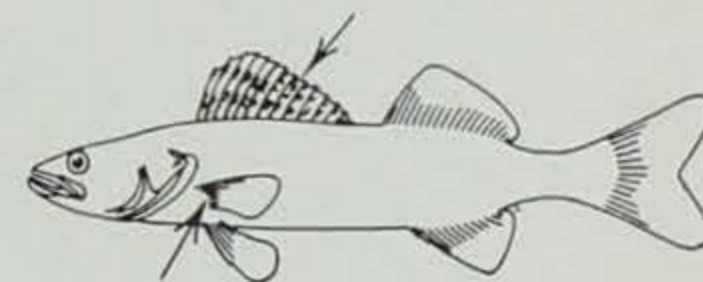
from the sauger are simple, and anyone can identify them at a glance from the drawings below, which are furnished through the courtesy of Dr. Louis A. Krumholz, Institute for Fisheries Research, Ann Arbor, Michigan.

There is a large black blotch near the base of the posterior dorsal spines of the walleye. The cheeks are usually sparsely scaled, and there are 20 to 22 rays in the soft dorsal fin.



Walleye Pike

The entire spinous dorsal fin of the sauger is covered with clear-cut black spots. The cheeks are usually closely scaled and there are 17 to 19 rays in the soft dorsal fin.



Sauger

The yellow perch can be distinguished from the walleye and sauger by the absence of enlarged canine teeth and by the prominent vertical dark bars on the side of the fish. The body is moderately compressed and not subcylindrical as in the case of the other two species.

The plates of the perch and the darters in this article are reproduced by permission of the Illinois Natural History Survey.



Perch

To date 16 darters, including the log perch, have been reported from Iowa. They are extremely interesting little fishes, graceful in form and often brilliantly colored. Aside from the log perch, which reaches the length of six inches or more, the other darters seldom exceed two and a half or three inches. The name darter comes from *Boleosoma*, meaning dart-body, the technical name of one of the early genera described.



Johnny Darter

They swim by quick dashes in the swift current of rocky streams, starting with a great speed as if shot from a bow, and stopping with equal suddenness. Some are capable of partially burying themselves in the sand, an added feature of protection in their hazardous environment. Al-

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Perch Family

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though many of the darters are found in comparatively swift streams, several species are known to prefer quiet weed beds of lakes and open sand bars of large rivers. The group, which is restricted to eastern North America, is little known to most anglers, and when occasionally taken in minnow nets are usually referred to collectively as "sand darts".

The breeding habits of many darters are not known. Some of the darters take care of their eggs during the incubation period while others, like their larger cousins, the walleye and sauger, deposit the eggs at random and do not attend them. Some lay comparatively few eggs, while others lay as many as 3,000. Most of them breed in April and May, at which time the males are most brilliantly colored.

Space will not permit a complete description of all of the darters in this article, but a brief description and a few illustrations are given for some of the typical ones.

For our purpose, darters may be classified into four general groups: those living in (1) riffles, (2) weed beds, (3) large waters; and (4) the less specialized type. The first group lives almost entirely in the rocks and riffles of relatively swift streams. They include the striped fantail, orangethroat, northern rainbow, slenderhead, and gilt darters. The second group lives primarily in weed beds and large quiet waters of lakes and a few of the larger streams. This group includes the scaly Johnny, northern least, Iowa, and mud darters. The third group are usually found in large waters such as the Mississippi River and lower reaches of its tributaries. It includes the northern sand, crystal, and channel darters. The fourth group includes the less specialized types, including the eastern Johnny, log perch, and blackside. They are widely distributed in Iowa and may be found in many different localities. The eastern Johnny darter is found in both swift and quiet waters of the large and small streams. It is the most abundant darter in the state. The log perch, although confined principally to lakes and eastern rivers of considerable size, is also found in some of the smaller streams. The blackside darter is commonly found in both pools and riffles of the streams. It is widely distributed in Iowa.

The fantail darter is perhaps the most common of the riffle species in the state. It attains the length of from two to two and a half inches, and the body is rather slender and somewhat compressed. The jaw projects strongly and the spinous dorsal

fin is notably lower than the soft portion. Heavy fleshy nobs are formed on the tips of the dorsal fin spines on the adult males. They inhabit shallow rock riffles, where they lead an active predatory life. Their food consists of caddis-worms and other insect larvae. The breeding habits of this little fish are quite unique. They spawn in the swift water of rock riffles in April or early May. The eggs, which are adhesive, are deposited by the female on the underside of rocks. After fertilization the male drives the female away and guards the nest until incubation has been completed. He keeps the eggs free of sediment by briskly rubbing them with the nobby portion of the dorsal fin.



Fantail Darter



Rainbow Darter

The Iowa darter is typical of this group and lives in dense weed beds. Like many of this type, it is brilliantly colored. It attains a length of about two inches. The color of the sides and upper parts of the body is light green, finely blotched with darker green. There are from nine to 11 clove-brown bars on the sides extending along the lateral line with squarish blotches of rusty red alternating with the bars. The belly is greenish yellow to white. In late summer and fall the coloration is much less brilliant than it is in the spring during the breeding season. It was named Iowa darter because the first specimen was taken in this state.



Iowa Darter



Mud Darter

The northern sand darter is one of the most common species of its group. It attains a length of about two and a half inches and is very slender and cylindrical. The color is translucent and blends beautifully with the sand over which it is found. There is a series of 14 or 15 small squarish blue blotches along the back and sides. It lives almost entirely over sand bars in the larger streams in Iowa and is capable of burrowing into the sand with remarkable speed. Frequently they can be found thus hidden with



Newly hatched walleye pike are smaller than mosquito larvae, the familiar wigglers of the rain barrel. This small vial contains several hundred day-old walleyes.

only their eyes visible to the observer. Its food consists principally of small insect larvae.



Sand Darter

The log perch is the largest of the Iowa darters, frequently attaining a length of six inches or more. The color is olive green above and silvery below, and the sides are crossed with a number of darker green bars. It is sometimes locally called the zebra fish. In Iowa it is usually found in lakes and large rivers. It is less frequently found in small streams. Like the western Johnny and blackside darters, it is less specialized in its preference of environment. Spawning occurs in April or early May, but little is known of its breeding habits in this state. The food of the log perch consists principally of crustaceans, small worms, insects, and insect larvae.



Log Perch



Blackside Darter

As a group the darters are often referred to as the hummingbirds of the fish family. Most of them are small in size and equipped with broad fins, pointed heads, and other physiological characteristics which enable them to maintain themselves in the swift, shallow water they usually inhabit. Some of the riffle and sand bar species are inconspicuously colored, blending with their surroundings, while others are brilliantly colored.

Their small size and maneuverability enables them to hide under rocks and in crevices, thus avoiding the larger fishes of prey. Peculiarly enough, some of the smaller darters inhabit large, deep bodies of water and some of the larger ones are taken from tiny brooks. Apparently they afford a small percentage of the food of our larger fishes.

"Enclosed you will find \$1.00 for which please send me your book titled 'Waterfowl in Iowa'. Do you have anything along this line on fish?"—Algona, Iowa.

Indian No Waste-- White Man Heap Crazy

The Oklahoma Farmer-Stockman recently published two pictures, one of a washed-away field. The magazine offered a prize for the best essay on the two pictures. The first prize was won by a Cherokee Indian who wrote this:

"Both pictures show the white man crazy. Make big tepee. Plow hill. Water wash. Wind blow soil; grass all gone. Squaw gone, papoose too. No chuck-away. No pig, no corn, no hay, no cow, no pony. Indian no plow land. Keep grass. Buffalo eat. Indian eat buffalo. Hide make tepee, moccasins too. Indian no make terrace. No build dam. No give a dam. All time eat. No hunt job. No hitch-hike. No ask relief. No shoot pig. Great Spirit make grass. Indian no waste anything. Indian no work. White man heap crazy."—Lake Park News.

A Laugh On the Game Warden

According to George Bates, of Boston, Mass., a game warden, during the hunting season in Maine, flagged a car that had two deer strapped to the running board. A man and a woman got out and the warden asked the usual questions. Then he noticed both animals had been shot right between the eyes. Suspecting that the deer had been "jacked", or hunted at night with lights, which is illegal, the warden asked the woman at what distance the deer were shot. She replied, "About 75 yards."

The warden said, "Okay, if you're that good a shot, you should be able to hit my watch at 75 yards." He paced off the distance and hung his watch on a tree. The woman objected to shooting, but the warden overruled her. Taking quick aim, she shot and blasted the watch to smithereens.

Then the male passenger of the car spoke for the first time and said, "Perhaps we should have told you. We're demonstrators for a firearms manufacturer, and on vacation."—From the National Wildlife Federation.

"I am sure that the book 'Waterfowl in Iowa' will be a welcome addition to the library of all Iowa sportsmen. Your 'Iowa Conservationist' is a very interesting periodical and each issue is received with pleasure."—Manly, Iowa.

"Am enclosing check of \$1.40 for which please send me a copy of your 'Waterfowl in Iowa' and the 'Iowa Conservationist' for one year."—Waterloo, Iowa.



Cottontail Studies Project No. 568

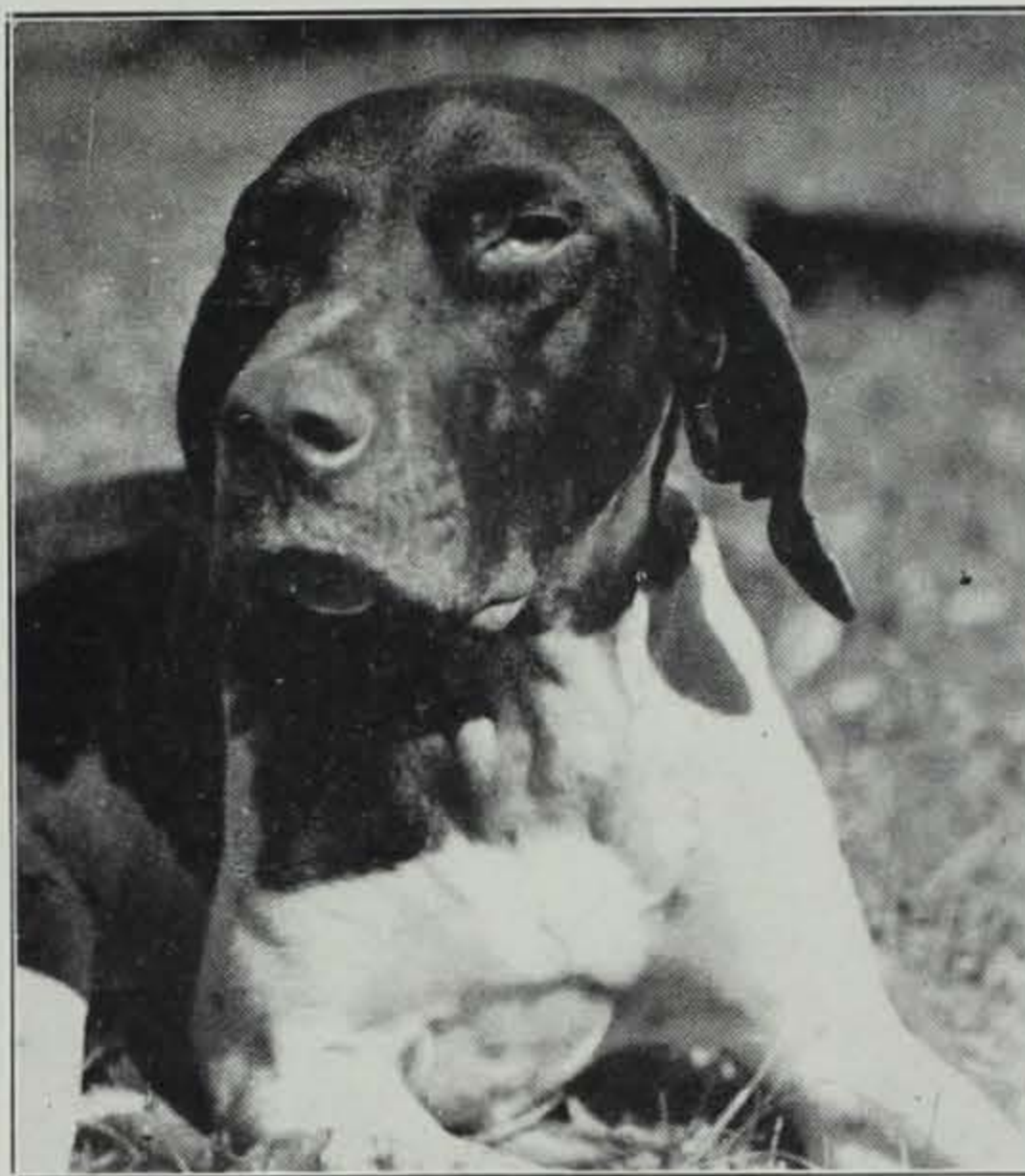
Leader, GEORGE O. HENDRICKSON
Badger Food Habits

Edwin Snead determined the kinds and quantities of food taken by the badger in Iowa by the frequency of occurrence percentages of food remains in 51 scats for the summer period, 1939, in northwestern Iowa and in 188 scats for the period from March 15 to December 15, 1940, in central Iowa. Ground squirrels (67.67 per cent), mice (45.55 per cent), cotton tail (25.49 per cent), and insects (27.10 per cent) were major food items in central Iowa. Of less importance were birds, pocket gophers, and snakes. Traces of plant material were found in the scats. The most frequent prey, the striped ground squirrel, was taken in greatest numbers in summer when the least number of mice were consumed. Insects, especially various ages of bumblebees, May beetles, and larger ground beetles were eaten in greatly increased proportions during the summer months. Data for northwestern Iowa were much like those for summer in central Iowa. Badger food caches were observed to a limited extent particularly in the spring. Besides acquiring food on the ground surface and digging prey from burrows, the badger consumed many striped ground squirrels and cottontails made more readily available by intermittent co-use of the various types of previously formed badger excavations by both predator and prey.

Although the badgers ate many cottontails, the badger in reality aids the cottontail by providing shelter cover. In a 38-acre hilly bluegrass pasture, for instance, several cottontails were repeatedly seen to use as sites of forms the old, shallow badger excavations and hollows of caved-in badger burrows. The forms were well toward the middle of the pasture, which was sheared almost entirely of surface vegetation tall enough to offer concealment for a cottontail. Immediately around the utilized cavities the grass was taller than elsewhere, apparently a result of such areas being avoided by livestock. The more recent burrows, perhaps of the previous year or two, were surrounded by old stems of lesser ragweed and other annual weeds that sprang up following disturbance of the sod and remained through the winter. In other places, cottontails were flushed from forms in

What's a Dog's Life, Anyway?

"I wonder who originated the silly expression 'leading a dog's life.' Look at the lazy mutt there. All he has to do is eat, sleep, and play."



"I wonder who originated the silly expression 'leading a dog's life,'" I remarked to the boss-at-home the other night. "Look at the lazy mutt there. All he has to do is eat, sleep, and play."

About that time the pup opened one eye and growled, "I know I ain't supposed to talk, but I can't keep quiet any longer. You've made that crack about leading an easy life once too often."

"Do you think it's any fun making an unholy show of myself to keep myself in your good graces?"

"Do you think it's any pleasure to jump up and wag my back almost half off every time you step in the house?"

"But I thought you liked me," I protested.

"Sure, you're a nice guy, but I get tired of telling you about it all the time. But if I didn't you'd say I was an ungrateful wretch and didn't know which side of my bone had meat on it."

the entrances of newly dug badger burrows. The cottontails by sitting erect in the various forms were able to see above the ground level.

In these examples two considerations seem evident. One is that the habitability for cottontails of overgrazed, badger-inhabited fields was increased markedly through the provision of cover in the form of badger holes and depressions, and indirectly by the relatively taller vegetation following the disturbance of the plant succession. The other consideration is that rabbits making use of such cover would be more vulnerable to attacks by badgers occupying the range or returning to it. The increased vulnerability would result from the predator's habit of revisiting former excavations and from the loca-

"And the fuss you make over a little spot on the rug! When a fella's gotta go, he's gotta go."

"And the kids around here! Now kids are a great institution and I like 'em. And I like to play. But there's a time and place for everything, and when I'm trying to take a nap ain't no time for a kid to be playful."

"And talk about eating! Listen, brother, any resemblance between food and that stuff you put in my pan is purely coincidental."

"Furthermore, I wish you'd start keeping a fire overnight. It gets darned chilly around here at three and four o'clock in the morning."

"Any time you're ready to change places, brother, just let me know. I'm ready when you are."

All of which goes to show that dogs are just as dumb as humans. They don't know when they are well off either.—Author unknown.

tions of the forms exposing the cottontails, cornered or chased down the holes proper, to more dangers from attacks by badgers. Nevertheless, a closely grazed pasture with badger holes had more cottontails than a similar pasture without the shelter cover provided by badger dens.

"I have long awaited such a book as is described in the Trigger and Reel column of the Sunday Register on the description and identification of ducks. Am enclosing my check for one dollar and hope to receive the book in the near future."—Kelley, Iowa.

"I would like to have two more copies of 'Waterfowl in Iowa' and am enclosing my check for same."—Spencer, Iowa.

Market Hunting

(Continued from Page One)

The peace was shattered by the loud explosion of the gun, followed by the roar of wings and cries of alarm as countless hundreds of birds took wing in unison. On the water remained the quiet bodies of the fallen waterfowl, disturbed only by the erratic rushes of those hit but not killed, seeking the protecting reeds or diving beneath the surface of the water. But most of the wheeling flock was unwilling to leave the resting grounds and in the quiet darkness settled at another spot, only to have the stillness broken again by the mighty blast of the swivel gun.

Such were the practices of the market hunters of waterfowl many years ago when the only thought was to obtain as many birds as possible. No laws governed the shooting, and punt and swivel gunning, a carry-over from the European way of hunting, were the easy methods by which large numbers of birds could be obtained. Fortunately these methods had not many followers, but those who used them killed countless thousands of ducks, geese, and swans.

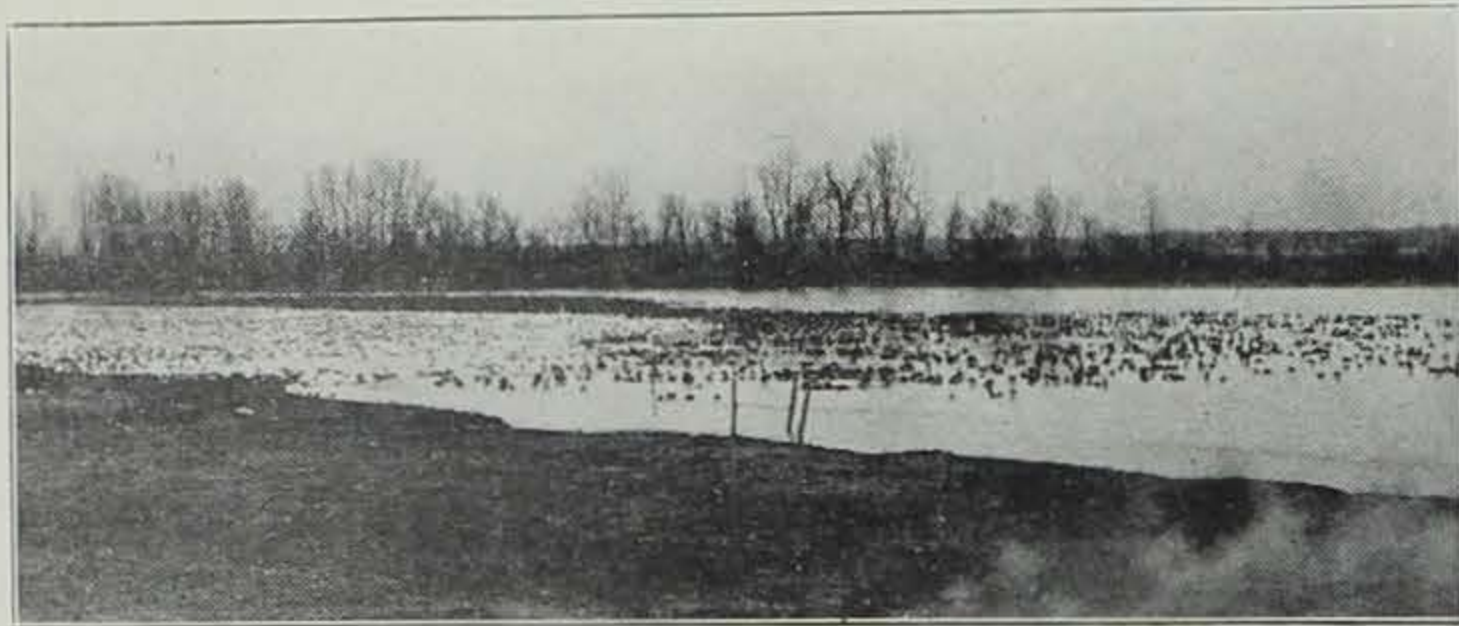
In some communities the guns (Can we call them guns? In reality they were cannons.) supplied plantation owners with meat to feed their colored slaves. Records tell of cases in which slaves were fed canvasback till the very sight of the birds was distasteful to them and other types of food had to be found.

As the country became more settled there was a great demand for waterfowl on the city markets. Many men followed hunting as a profession, obtaining waterfowl for the markets in town, where they were exposed for sale at small cost in great bunches. Often large shipments to distant cities spoiled before reaching the market and were lost.

With so many market hunters in the field punt guns and swivel guns became unpopular, not because of the destruction they meted out, but because little opportunity for their use existed because of competition. The use of four-, six-, and eight-gauge guns became popular in waterfowl hunting, and the trend toward smaller gauges continued to increase as it became necessary to shoot individual birds on the wing. Large gauges were useful only on groups on the water; their excessive recoil and the expense of loading them did not justify their use on flying birds.

Constant advances were made in the arms of the market hunter. Muzzle-loaders were replaced by breech-loaders. The choke bore was introduced, closely followed by the development of repeating

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The tendency of wild ducks and geese to congregate in large masses or rafts made swivel and punt guns extremely deadly in the early days of market hunting.

Market Hunting

(Continued from Page Five)

arms, all increasing the likelihood that the market hunter could secure large bags of birds. But this began to have a telling effect on the waterfowl population. As their numbers declined, prices on the market were increased and the hunters redoubled their efforts.

The prices for canvasback, for instance, increased from 25 cents to \$1.00 a bird, but in spite of this rise the hunters could no longer supply the demand. Redheads were substituted; the ruddy duck, formerly scorned by hunters, became known as the dollar duck. Since the flavor of these birds approached that of the lordly canvasback, they were supplied to the restaurants and hotels of the cities.

The large six- and eight-gauge guns became increasingly less popular; rather the hunters depended more and more on the smallest gun then in use, the ten-gauge. Already the use of decoys was popular, and many stools of them numbered into the hundreds. Spring was the favorite season, as the birds were easier to get and their bodies were in prime condition, but regardless of season, if enough birds could be secured, the market hunter was at work. Only those whose skill in hunting made it a paying proposition persisted in market gunning, but still enormous numbers of birds were killed.

Secrecy was the rule among the hunters; they left no records. Only in late years, therefore, has enough fragmentary evidence been gathered to piece together the story of the market gunner. From the few old-time market shooters left today, we get tales such as bags of 450 ducks in one day, mostly canvasbacks and redheads, or 150 canvasbacks in a single day's shoot. One man killed 369 ducks in one day, another 430. The greatest destruction of geese recorded is 218 in one hour's shooting, when the hunter ran out of ammunition; he returned to finish the day with 450 birds.

Fortunately market shooting endured only a short time after

the advent of repeating arms, which multiplied the hunter's chances. The effectiveness of these new guns cannot be doubted. Factory ammunition replaced hand loads; six shots replaced two. Some hunters, not satisfied with six, had extended magazines of nine shots. The birds had little show. Public sentiment became aroused, and the year 1918 saw the end of market hunting.

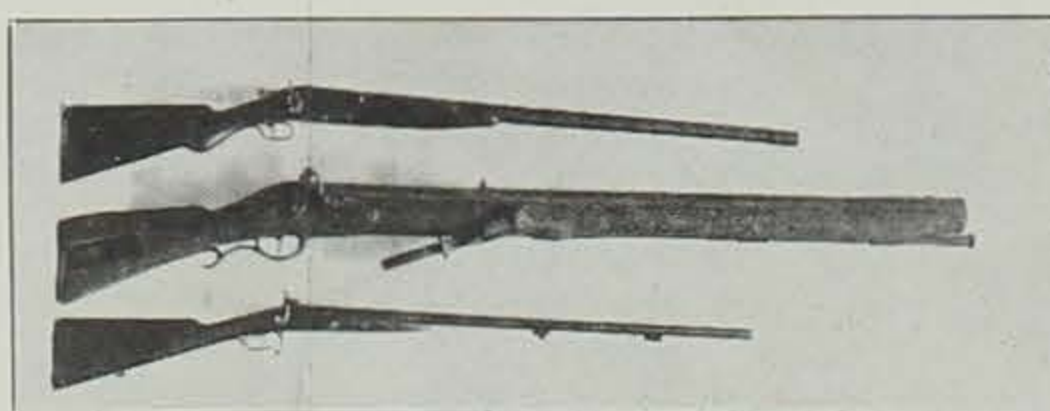
Market gunning almost caused the extinction of the finest species of waterfowl, the canvasback. So highly were they prized by epicures that only canvasback appeared on the menus of the more famous hotels and restaurants. Redheads and ruddies, the best substitute, were also reduced to a pitiful remnant.

Wood ducks, the most beautiful birds in North America, were sought not only for their plump bodies, but for their plumage, so highly prized by fly fishermen both here and abroad. Wood duck skins in prime condition once brought \$3.00 each from manufacturers of fine English trout flies. Many early duck hunters speak of shooting wood ducks on the evening flight till the gun barrels had to be submerged in the water for cooling and the juice of wild grapes, running from the throats of the beautiful birds, made purple pools in the bottom of the boat.

The days of market shooting are gone forever, and the day that saw its close came none too soon. Had it persisted, our modern day guns and high-powered ammunition, coupled with the drainage and plowing of nesting grounds and feeding areas, would have left few of our wildfowl.

Many hunters unthinkingly demand more privileges in duck hunting—larger bags, live decoys,

These game guns of the past are, from top to bottom: eight-gauge breech loader, weight 12 pounds; flintlock swivel gun weight 86 pounds, bore diameter $2\frac{3}{8}$ inches; 14-gauge muzzle-loader, a very popular gun among early day market hunters.



OAK WILT

By WILBUR A. RUSH

Assistant Chief, Division of Lands and Waters

The State Conservation Commission and the Iowa Agricultural Experiment Station have set up a cooperative research program for the purpose of investigating the cause, nature and control of the oak wilt disease which has been seriously infecting the oak trees in the state.

For many years the loss of oak trees has been viewed with much concern by those connected with the preservation of our woodland and park trees. Aside from the loss suffered from an esthetic viewpoint, there has also been a great commercial loss because the oak trees are one of our most valuable timber trees. In recent years the spread of oak wilt has become comparable to the spread of the much dreaded Dutch elm disease in the eastern states.

It is not known yet at just what time of year infection takes place, but generally to the casual observer the first evidence of infection is noted during July and August. A slight wilting will be noticed at first on the very top branches or possibly the extremities of one or two branches on the side of the tree. This is at first just a drooping and crinkling condition of the green leaves. Gradually the leaves turn yellow

baiting. Were they to think of the years of effort required to reestablish our waterfowl and bring them to their present day status, were they to think how few seasons these birds would last under the old practices, they would cease their clamor. Today, with our restrictions, you and I can go to marsh and stream and enjoy duck shooting, but not as the man who killed for a livelihood, exploiting selfishly for himself what really belonged to all. We may enjoy our hunting as sportsmen should and in return must lend a helping hand in the restoration and conservation of our waterfowl, so that our sons and grandsons may also know the thrill of hunting wild ducks.

and brown, and within a few days the entire tree begins to wilt. As the leaves wilt the color change progresses, giving the tree the appearance of attaining its fall color prematurely. As the wilting and browning progresses, the leaves begin to fall, and within a few weeks the tree is almost completely defoliated. Growing leaves will appear along the trunk and main branches, but they die very soon afterwards. The disease is almost 100 per cent fatal to trees in the black and red oak group. White oak is somewhat more tolerant, and in some cases white oak trees have survived the infection.

Under the terms of the agreement reached by the two cooperating agencies, the Conservation Commission has agreed to set aside \$7,000 toward financing the program. This money will be used to employ trained personnel, to defray travel expenses, to buy special equipment, and to employ hourly labor. Such equipment as the Conservation Commission now has in the way of tree sprayers, ladders, tools, etc., will also be made available for this program, the first phase of which will continue until June, 1945.

The Experiment Station, through its staff in the botany and plant pathology section, will select, direct, and supervise the personnel employed to investigate the wilt disease. Laboratory facilities, greenhouse space, and office space will also be furnished by the Station, which will also publish the results of research through its regular channels of publication.

For the past several years the State of Wisconsin has been carrying on a similar program of research, and it is hoped that through correlation of findings in both states a practical control program can be worked out.

Observations of this disease have been made in Iowa for the past 12 years by Dr. I. E. Melhus, Head of the Botany Department of Iowa State College, as well as by the writer. Dr. Melhus has made some preliminary studies of the disease in the vicinity of McGregor, Iowa.

The Conservation Commission has attempted in the past to carry on tree sanitation control methods in an effort to curb the spread of the disease but has met with only partial success in some cases and complete failure in others.

The writer has found the disease prevalent in all parts of the state in which black or red oaks occur. Infected oak trees have been observed in 29 state park areas ranging from Waubensie State Park in Fremont County in the southwest to the McGregor Areas in Clayton County in the northeast, and Farmington State Park in Van Buren County in the southeast to A. A. Call State

(Continued to Page 7, Column 2)

When Others Desert, He Remains



The one absolutely unselfish friend a man can have in this selfish world, the one that never deserts him, the one that never proves ungrateful or treacherous, is his dog.

One of the noblest tributes to the dog is part of an address to a jury made by Senator George Graham Vest during the trial of a man who had shot a fine dog belonging to a neighbor. The eulogy is so remarkable for its simplicity and dignity that we quote it in full:

"Gentlemen of the jury: The best friend a man has in this world may turn against him and become his enemy. His son or his daughter, that he has reared with loving care, may prove ungrateful. Those who are nearest and dearest to us, those whom we trust with our happiness and our good name, may become traitors to their faith. The money that a man has he may lose. It flies away from him, perhaps when he needs it most. A man's reputation may be sacrificed in a moment of ill-considered action. The people who are prone to fall on their knees to do us honor when success is with us may be the first to throw stones of malice when failure settles its cloud upon our heads. The one absolutely unselfish friend that man can have in this selfish world, the one that never deserts him, the one that never proves ungrateful or treacherous, is his dog. Gentlemen of the jury, a man's dog stands by him in prosperity and in poverty, in health and in sickness. He will sleep on the cold ground, where the wintry winds blow and the snow drives fiercely, if only he may be near his master's side. He will kiss the hand that has no food to offer; he will lick the wounds and sores that come in encounter with the roughness of the world. He guards the sleep of his pauper master as if he were a prince. When all other friends

desert, he remains. When riches take wings and reputation falls to pieces, he is as constant in his love as the sun in its journey through the heavens. If fortune drives the master forth an outcast in the world, friendless and homeless, the faithful dog asks no higher privilege than that of accompanying him to guard against danger, to fight against his enemies. And when the last scene of all comes, and death takes the master in its embrace, and his body is laid out away in the cold ground, no matter if all other friends pursue their way, there by his graveside will the noble dog be found, his head between his paws, his eyes sad but open in alert watchfulness, faithful and true even to death."

"Every duck hunter in Iowa should have one of these books."—Emmetsburg, Iowa.

"I see by the Wheatland, Iowa, Gazette that you have issued a book entitled 'Waterfowl in Iowa'."—Roundup, Montana.

"Send a copy of 'Waterfowl in Iowa,' as soon as possible, please, as I want it for a birthday gift."—Charles City, Iowa.

Forestry Chips

(Continued from Page Six)

Park in Kossuth County in the northwest. The disease, however, appears to be more prevalent in the eastern and especially northeastern part of the state. Reports from other states indicate that the disease is prevalent in all of the upper Mississippi Valley region.

Rabbit Has Graced the Table Of Prince and Pauper Alike

By ANNA MARGRETHE OLSEN

Iowa has a large potential crop of cottontails if the following story, "Rabbits Is Rabbits", from the Iowa Conservation Commission's bulletin quoting the Oelwein Register reflects conditions throughout the state:

"A victory gardener saw a rabbit in his garden and wrote the O.P.M. asking how he could get rid of it legally. By the time a reply arrived, advising securing a permit from his State Game Commission, the rabbit had become six. He wrote the Commission and was sent an application to fill out. By this time there were 38 bunnies. When the permit was finally received, the rabbit problem was 165 strong. He is now said to be trying to get a priority on a machine gun."

These same cottontails can pay for their feed by supplying non-rationed meats to the gardeners and farmers they worried and robbed last summer, as well as contribute materially toward relieving the scarcity of meats. In 1942 some 1,216,000 rabbits netting 2,140,500 pounds of food were taken in Iowa by hunters.

Wild Rabbit Meat Can Be Eaten Safely

Tularemia, an acute infectious disease caused by bacterium tularensis, occurs under normal conditions in over 20 kinds of wildlife, especially rabbits and hares. Cold weather greatly reduces the danger of tularemia. However, tularemia is here to stay according to specialists on the subject, and since man may become infected through cuts or bruises when handling infected rabbits, or by bites of infected blood-sucking ticks and flies, it is highly important to exercise care at all times in handling and eating rabbits. Dr. G. O. Hendrickson, Project Leader, Wildlife Research for Iowa, discusses in the November 15, 1942, issue of the Iowa Conservationist the danger of tularemia from rabbits in Iowa and summarizes briefly how to use wild rabbit meat safely under the following simple rules:

1. Hunt cottontails only during cold weather, in late fall and in winter.

2. Take only fast-moving cottontails, which probably are healthy.

3. If you handle and dress rabbits with bare hands, afterwards wash the hands thoroughly. Use plenty of soap, and additional disinfectant is advised. We advise your wearing gloves in handling, and rubber gloves in dressing rabbits.

4. When you see small white

spots on the liver or spleen, burn the carcass at once and wash the hands, knife and utensils more thoroughly than ever.

5. Cook the meat all the way through.

6. Don't shoot cottontails for the sport of shooting only; plan to use the meat or leave them for someone who does.

Rabbit Cookery

The cooking and serving of rabbit meat with other game animals no doubt dates back to antiquity. Rabbit dishes graced the tables of the loftiest as well as the lowliest. The earliest cook books consulted are English and contain recipes for cooking rabbits and hares. The earliest book dates back to 1659, and is the "Twelveth Edition". The book is very small in size, 2 inches by 4 1/4 inches, with 140 pages. It is divided into two parts, "I. A Choice Manuall, or Rare and Select Secrets in Physick and Chyrurgery, and II. A True Gentlewoman's Delight Wherein is contained all manner of cookery: Together with Preserving, Conserving, Drying and Candyng, very necessary for all Ladies and Gentlewomen". The following recipe is one of the four found in the book and might well be a present day modification of stewed rabbit:

"A Stewed Rabbet—Cut your Rabbet in pieces and season it with Pepper, and Salt, Thyme, Parsley, Winter Savoury, and sweet Marjoram, three Apples, and three Onions minded altogether, stew it till it be tender with Vinegar and water, put a piece of butter in, stir it together in your dish, put sippets in the bottom, then serve it up with the head in the middle of the dish with sippets in the mouth."

The two next oldest books date back to 1726 and '27. They are more like our books of today in size. "The Royal Cookery or the Compleat Court Cook by Patrick Lamb, Esq., near fifty years Master-Cook to their late Majesties, King Charles II, King James II, King William and Queen Mary, and Queen Anne" appeared in its third edition in 1726. The following recipe no doubt refers to the musky or game flavor of the hare.

"To Make Civet of a Hare—Cut off the Legs and Wings whole; and cut the rest in pieces: Lard them with Bacon, and toss them up with melted Bacon; then stew them in strong Broth and White Wine, a Bunch of Herbs, Salt, Pepper, Nutmeg, Bay-Leaf and sliced Lemon. Fricassy the Liver, pound it in a mortar and strain it through a sieve with a Culis,

(Continued to Page 8, Column 1)

Because of their abundance, cottontail rabbits are one of the most important game resources in Iowa. Rabbit populations fluctuate greatly. When calamity overtakes them in an area, in a few seasons they are abundant again. These two cottontails, photographed on a floating log during last spring's Missouri River flood, will form



part of the nucleus for the future rabbit populations in this area.

Rabbit

(Continued from Page Seven)

and a little of the same Broth; pour this on your Hare when you have dish'd it, and serve it warm."

"The Compleat Housewife or Accomplished Gentlewoman's Companion; a collection of upwards of Five Hundred of the most approved receipts with Bill of Fare for every month in the year" was published in 1727. It has a long fascinating preface which traces the development of cookery with specific references to the Old Testament. For 2,000 years man lived on vegetable foods. When man began to feed on flesh, fowls and fish, then seasonings grew necessary to render food more palatable and savory, and for preservation. Boiling and stewing were the principal methods of cookery, followed by broiling and roasting. These methods were used for 2,000 years. "When luxury entered the world, cooking was no longer simple but grew to an art, nay a trade." The following recipe has remained popular through the ages.

"To Jug a Hare"—Cut a Hare in pieces, but do not wash it; season it with half an onion shred very fine, a sprig of Thyme, and a little Parsley all shred, and beaten Pepper and Salt, as much as will lie on a shilling, half a Nutmeg, and a little Lemon-peel; strew all of these over your Hare and slice half a pound of fat Bacon into thin slices; then put your Hare into a Jug, a Layer of Hare, and the slices of Bacon on it: So do till all is in the jug; stop the Jug close that not any steam can go out; then put it in a pot of cold water; lay a tile on the top, and let it boil three hours; take the Jug out of the Kettle, and put half a pound of Butter in it, and shake it together till the Butter is melted; then pour it in your Dish. Garnish with Lemon."

"Mrs. Beeton's Every-Day Cookery" (no publishing date given) brings English cookery down to more recent years. "For half a century she was the guide, philosopher, and friend of countless happy homes." Her recipes have been imitated and adapted "but

her work stands today, as of old, without a rival". The following recipe is one of 27 on hare and rabbits.

"Hare, Croquettes of—Ingredients"—6 tablespoonfuls of finely-chopped cooked hare, 2 yolks of eggs, ½ pint of brown sauce, a pinch of powdered cloves, salt and pepper, egg and breadcrumbs, frying-fat, parsley.

"Method"—Make the sauce as directed, add the yolks of eggs, and stir over the fire until it thickens. Put in the hare, add the cloves and salt and pepper to taste, mix well, and turn onto a plate. When cool, form into cork-shaped pieces, coat with egg and breadcrumbs, and fry in hot fat until nicely browned. Drain well, and serve garnished with crisply-fried parsley.

"Time"—To fry, from 4 to 5 minutes. Average cost, 1s. 9 d. to 2s. 3d. **Sufficient** for 4 persons."

In this country game has been prized as a food from the presidents of the United States and their wives down to the ordinary folk. "The White House Cook Book, A Comprehensive Encyclopedia of Information for the Home Containing Cooking, Toilet and Household Recipes, Menus, Dinner-Giving, Table Etiquette, Care of the Sick, Health Suggestions, Facts Worth Knowing, Etc." by Hugo Ziemann, Steward of the White House and Mrs. F. L. Gillette (Copyrighted in 1887) has 24 recipes on game cookery including birds and mammals. The following recipe is one of six on the preparation of rabbits or hares. Try it.

Fricassee Rabbit — Clean two young rabbits, cut into joints, and soak in salt and water half an hour. Put into a saucepan with a pint of cold water, a bunch of sweet herbs, an onion finely minced, a pinch of mace, half a nutmeg, a pinch of pepper and half a pound of salt pork cut in small thin slices. Cover and stew until tender. Take out the rabbits and set in a dish where they will keep warm. Add to the gravy a cup of cream (or milk), two well-beaten eggs, stirred in a little at a time, a tablespoon of butter, and a thickening made of a tablespoon of flour and a little

milk. Boil up once; remove the saucepan from the fire, squeeze in the juice of a lemon, stirring all the while, and pour over the rabbits. Do not cook the head or neck."

Iowans will be interested to know that Mrs. Mary B. Welch, first instructor of domestic economy at Iowa State College, Ames, Iowa, 1884, did not include special recipes on rabbit or hare in the chapter on soups, meats, poultry and game in her cook book, published in 1884. Other books, however, dating back to that time devoted considerable space to rabbit cookery.

Today practically all cookbooks contain a multitude of recipes for cooking rabbits and hares. For specific recipes for cooking domestic rabbit meat, see Wildlife Leaflet 240, Fish and Wildlife Service, U. S. Department of the Interior, Chicago, Illinois (July, 1943), which contains a collection of 42 recipes gathered from many sources and suggests canning rabbit meat by the pressure cooker method.

In general, rabbit meat, both wild and domestic, can be cooked according to favorite recipes for cooking chicken or poultry. Young rabbits are tender and juicy and can be fried, broiled or roasted. Older rabbits, however, require long, slow and moist cooking, and are better if braised, stewed, fricasseed, or cooked in casserole dishes.

Wild rabbits should be ripe but not gamy. They should not be hung for more than two or three days unless held frozen or in cold storage. The age of the rabbit can be determined by testing the paw. If there is a little nut in the paw and the paw can be broken easily, the rabbit is young.

According to various authorities on wild rabbit or game cookery, the flavor or odor can be reduced or removed in several ways, i. e., by removing the thin, muscular membrane that extends from the flank over the intestines; by soaking in a weak salt solution or in water for several hours or overnight; by wiping inside with equal parts of vinegar and water; by parboiling for five minutes before cooking. The gall bladder must be removed from the liver with extreme care. The healthy liver and heart are usually saved and some use the kidneys as well.

The following recipes have been taken from various sources, as indicated, and show trends in game cookery:

JUGGED HARE or VENISON

- 1 hare or 2½ lbs. venison
- 1-2 bay leaves
- 2 sprigs thyme
- 2 sprigs parsley
- 2 onions
- 6 whole allspice
- 2 tablespoons flour
- ½ teaspoon black pepper
- 1½ teaspoons salt

- Peel of ¼ lemon
 - 2 tablespoons mushroom or other ketchup
 - ½ pt. or less Port or other dark wine
 - 4 tablespoons butter
 - 1. Draw and hang hare 2-3 days.
 - 2. Skin it.
 - 3. Wipe thoroughly with damp cloth.
 - 4. Cut into conveniently sized pieces.
 - 5. Brown in 2 tablespoons butter.
 - 6. Place meat, herbs, spices, lemon peel and onion stuck with whole cloves in a casserole or roasting pot.
 - 7. Cover with water, cover.
 - 8. Cook slowly about 3 hours in oven if casserole is used, or on top if pot is used.
 - 9. Ten minutes before serving mix 2 tablespoons butter and flour together and stir into stew.
 - 10. Cook 10 minutes longer; then add wine.
- (E. M. Ferguson—the preparation and cooking of game. Farming in South Africa, Sept. 1933.)

RABBIT DELIGHT

- 1 young rabbit
- 1 cup broth
- 1 tablespoon fat
- ¼ cup lemon juice
- ¾ cup orange juice
- 2 green peppers, chopped
- ½ cup mushrooms chopped
- 1 tablespoon parsley chopped
- Pinch of ginger

Joint the rabbit, brown pieces in fat, then add broth and other ingredients. Cover and cook slowly until tender.

(Tempting Recipes by the Camp Cook. Wisconsin Conservation Bulletin, Nov. 1942.)

BRAISED RABBIT

1. Always soak wild rabbit overnight in salt water, changing water several times during evening. Domestic rabbits need not be soaked.
 2. Cut up and brown in bacon fat. Dredge with flour, add 3 sliced onions, 1 bay leaf, some dry celery leaves, 1 tablespoon strong cider vinegar and boiling water to cover.
 3. Cook covered until tender—domestic rabbits take 2½ hours.
- (Harry Botsford, Huntsman and gourmet. Don't be afraid of wild game. Woman's Home Companion, Oct. 1943.)

Things You May Not Know

At least eight states have nicknames which have been given them from species of wildlife. These are not "official" nicknames, but designations commonly used. Alabama is sometimes called the "Lizard" state. Arkansas has the nickname of "Bear State". Others are: Louisiana, "Pelican"; Michigan, "Wolverine"; Minnesota, "Gopher"; Mississippi, "Eagle" (the most popular nickname for this state is "Magnolia"); Nebraska, "Antelope"; Oregon, "Beaver"; South Dakota, "Coyote"; Wisconsin "Badger".—Remington News.

"Not knowing the cost of 'Waterfowl in Iowa' I cannot send you a check with this order; but if the cost does not exceed \$10, kindly ship me a copy at once."
—Mansfield, Ohio.