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TEXAS Game AND Fish

A MONTHLY MAGAZINE DEVOTED TO THE PROTECTION AND CONSERVATION OF OUR NATIVE GAME AND FISH; AND TO THE IMPROVEMENT OF HUNTING AND FISHING IN TEXAS.



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COVER—By Orville O. Rice

★ In This Issue ★

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CONTENTS

Wildlife Management	4
By IRA N. GABRIELSON	
<i>A rapidly increasing population and an ever growing number of hunters and fishermen complicate restoration of wildlife.</i>	
The Rabbit -- Big Game of The Small Boy	5
<i>More rabbits are killed each year in Texas than all other species of game combined and there is no scarcity of rabbits.</i>	
Aquatic Mysteries	6
By J. G. BURR	
<i>There are many strange things in the processes of aquatic life for which there is no explanation.</i>	
Handling of Minnows	7
By JOHN DOBIE	
<i>Follow these few simple suggestions in seining and transporting your minnows and you will have fewer losses.</i>	
You Can Cant -- But Don't	8
By ADAM WILSON III	
<i>One of the most common faults of rifle and pistol shooters is permitting the gun to turn slightly to one side.</i>	
Civilization in One Easy Lesson	10
By ROBERTS MANN	
<i>Some of the greatest thinking has been done at the butt of a cane pole with a worm or minnow on the other end.</i>	
Catfish Tricks	12
By R. A. "DOC" JENKINS	
<i>A few secrets of the catfish are revealed to those who would like to know more about this favorite food fish.</i>	
Recipes	14
<i>The chefs in the Old French Quarter in New Orleans have several new ways of preparing Mr. Bobwhite for the table.</i>	
Prehistoric Hunters and Fishers of the Texas Coast	16
By T. N. CAMPBELL	
<i>The remains of an early Indian people are found among the shells on the shore of Copano Bay near Rockport.</i>	
Books	18

ROGER M. BUSFIELD
Editor

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Wildlife Management

AN OBSERVER attempting to forecast the future of wildlife management cannot fail to be impressed by two phenomena which directly affect wildlife programs and about which wildlife interests can do little or nothing. One is the constant shrinkage of the total, either actual or potential, habitat capable of producing wildlife. As long as the human population continues to grow, the total wildlife habitat inevitably will shrink. Every new building, home, factory, airfield, business block, highway, and other structures devoted to intensive human use shrinks the actual or potential productive habitat.

It is impossible to visit any city and talk to the older hunters or fishermen without being told that in their youth areas that are now built up solidly to residences or factory districts were fine hunting grounds and produced good hunting close to the much smaller city that existed at that time. The same men can point to former productive fishing waters that are now little better than open sewers. This can be expected to continue as population grows and human needs become more varied and demand more land for purposes other than food production.

The other phenomenon is the steadily and sometimes rapidly growing number of those who desire to get their recreation by hunting and fishing for the nominal license fee collected for that privilege.

These two trends create the great basic problem for wildlife management and that is, stated baldly: how can more game and fish be produced for more and more hunters and fishermen with less and less productive habitat to grow it. There are only two possible answers. Either the American idea of providing hunting and fishing for a nominal fee for all who care to participate will gradually disappear and hunting and fishing will become more and more the privilege of a wealthy group of citizens, or each hunter and fisherman will have to be content with a smaller share of the total available crop. In other words, they will have to be satisfied with less pieces of game and fish per individual when they pursue these limited recreational activities.

Judging by past record, the latter is the more probable answer to the question. Looking back, it is easy to see that the tendency in total legal bags, both per day and per season, has been steadily downward for many years in most areas. It will probably continue in that direction despite occasional opposite trends for short periods of time where big concentrations of game animals, birds or fish are present. In one lifetime, limits on waterfowl have gone from no limits to fifty a day and on down to the present four. Yet, there are more waterfowl hunters than ever and there has been less trouble over the reduc-

tions from 25 down than there was in getting it down to 25 when it became necessary. The story has been the same for other game. With rare exceptions, shorter seasons and lower daily and annual limits have come as the number of those who take wildlife has increased while the total productive area has decreased.

The game manager comes into this because he can contribute definitely to a long-time modification of this trend. Such management actively involves the management both of wildlife and of the humans who take them as well. The game manager's permanent job is to work constantly and intelligently to get the greatest possible annual production out of existing environment and to improve conditions in every possible way.

On analysis it is easy to see that there are at least three phases to this program. First, the protection of existing environment. This involves the purchase of lands for the exclusive use of wildlife and their protection and administration primarily for

By Ira N. Gabrielson

that purpose. The purchase of low cost lands inevitably means that such lands will produce only a minimum of wildlife for many years to come. The saving factor is that by intelligent management it is possible to build up the productivity even of poor land over a period of time. Along with it, some better lands suitably located must be purchased and devoted to wildlife throughout the range of the species which is being developed and protected. These need not necessarily be large areas for all species, but they should be strategically located to maintain reservoirs of breeding stock well scattered over the range of the species or group of species in question. It is fortunate indeed that small upland game in any community will usually respond to such development with some degree of unanimity. For example, by judicious planting and management squirrels, rabbits, and grouse can be cared for and preserved on the same area with little conflict. The same thing is true of various other species of wildlife. Quail, rabbits and squirrels can do well on comparatively small areas with suitable food and cover for each integrated into the development and management program.

The second phase would be in the improvement of existing environment. In agricultural areas this involves developing for the greatest possible wildlife production those lands that for any reason are considered unsuitable for cultivated crops. This can be accomplished in cooperation with landowners, with soil conservation districts or with other agencies that may

be operating in that particular community. These areas will be the poorer, gravelly or sandy spots, the eroded gullies, the hill-sides too steep for permanent cropping, overflow stream banks, and various miscellaneous bits of land which can be developed into suitable wildlife habitat. It also involves the improvement of environment on publicly-owned land administered for purposes other than wildlife production. Wherever food or cover are deficient enough to prevent normal production, artificial planting and management of natural vegetative reproduction can increase the productivity.

The third phase will involve the restoration of environment wherever possible. This still is possible in many sections of the country. For waterfowl, there are drainage districts which were never drained satisfactorily and that can be purchased and restored to marshland for the production of waterfowl and for the production of furbearers. For upland game, there are worn-out farms and eroded lands that can be purchased and over a period of time restored to productive environment. There are many areas which for various reasons are not being used by human population to the extent that they were formerly which can be restored to productivity. Many of the lands needlessly drained for mosquito control can, with better and with more modern methods of handling these pests, be restored to marshlands and still be prevented from contributing materially to the mosquito menace. These activities alone will occupy the time of the conservation forces of the country for many years.

The second point is one that must be approached directly. It is the job of educating people to get more enjoyment out of less game and fish. To put it another way, the job is to get more true sportsmanship into the hunting and fishing addict. There are men, of course, who have the highest standards of sportsmanship. These men limit their take to that which they can use and give every possible break to the game or fish pursued. To assume that this is the attitude of the average hunter is to assume something that is far from the truth. The majority of hunters and fishermen of this country still have much of the "meat-hunter" in their makeup. This educational job is going to be difficult just now with the greatest demand for fish and game yet known and in the face of what obviously is the greatest let-down in standards of sportsmanship and decency of conduct in the field witnessed in many generations.

Widespread reports indicate that there is extensive and conspicuous violation of conservation regulations, particularly on

★ Continued on page 11

The Rabbit

Big Game of the Small Boy

THE cottontail rabbit is not only the big game of the small boy, it is also the leading game animal of this state. The bobwhite quail may attract more attention, and draw a bigger crowd for its December debut, but the cottontail season is much longer, about twice as many cottontails are killed annually, and the cottontail occupies considerably more area in this state. Also, the cottontail is most abundant in areas where the quail is comparatively scarce.

The hares and rabbits form a family, the *Leporidae*, scattered widely over the earth, but being most numerous in northern regions where the animals have always been an important food resource for man and beast. All members of the family are much alike in the long, haunched hind legs, which give great leaping and dodging power; tall erectile ears; divided upper lip; and grizzled brown coat, with variations of white and black.

The term "rabbit" has almost entirely replaced "hare" in America, because the common small hare of the Atlantic coast, one of the animals first seen by the early settlers, looked more like the rabbit they had known in Europe than like their bigger European hares; and they ignored the difference in habits as they did so many other facts in their careless naming of the New World animals after those of Europe. It must be remembered that the Pilgrims, Puritans, and Cavaliers came mostly from cities, and knew little about rural things, to which ignorance they owed many of their hardships and misfortunes in their new home. Hence, the small hare of the eastern and midwestern United States became the "cottontail rabbit," the varying hare of northern regions became the "snowshoe rabbit," and the big-eared hare of the west be-

came the "jack rabbit."

Actually, the true rabbits are colonial dwellers, living in crowded diggings called "warrens," which are labyrinths of connecting burrows. The young are born in these warrens. The hares, to which our American group belongs, do not dwell in warrens, and the young are born in the open in small depressions called "forms." Only in severe winter weather does our cottontail occasionally enter a woodchuck hole for shelter from the storm, or to escape enemies, while the snowshoe hare and western jack rabbit probably never enter burrows.

The gestation period of the cottontail averages 30 days, but the time may vary between 25 and 35 days. The first litter is usually born early in April although young are occasionally found even earlier. Three or four litters per year seem to be common in southern Michigan.

The female, before the young are born, digs a bowl-shaped depression in the ground about four to six inches in depth and four inches in width which she lines with dry grass and then fur from her own body. The young cottontails, which are born blind and helpless, are placed in this nest, where they remain for about two weeks. The average litter is about five, but there is considerable variation. The mother is believed to return from time to time during the night and occasionally during the day to lie over the nest, allowing the young to nurse without leaving their snug haven.

If danger threatens, the mother can dash away, while the nest remains securely hidden. It is difficult to discover a rabbit nest until the young have left it, so well is it concealed. Systematic search often proves fruitless, and nests are usually discovered by chance. The well-concealed

nest protects the young from keen-eyed predators.

Cottontails are not as defenseless as is generally believed, and have been observed to defend themselves from cats by leaping over the cat's back, upsetting the cat with blows from the hind legs en route. The big Belgian hares so common in captivity are reported to defend themselves successfully from dogs in the same way. Of course, the principal defense of the rabbits and hares is their speed and ability to dodge. They have astonishing skill in halting, doubling, and changing their course, by which means they get a fresh start before their clumsier pursuers can see what has happened and change their own course to correspond. Along with this extreme timidity and watchfulness, in which the big ears serve a most useful purpose, rising at the slightest sound, but dropping out of the

Continued on page 15



Aquatic Mysteries

By J. G. Burr

THESE are strange things in the processes of aquatic life for which we have no explanation. We do not know why the salmon and certain species of herring and shad leave the ocean and ascend rivers to spawn; or why the eel travels from rivers to the ocean to bring forth its young. Those are fixed habits; but still other forms of apparently fixed habits stray from their accustomed habitat and take up their abode in an alien environment. Mulletts, for example, quitting the bays where they school by the thousands, find their way in small numbers into the fresh water of rivers. To what distance and in what streams this occurs our information is limited, but they ascend the Colorado River as far as Austin, and are plentiful in Eagle Lake which is filled by pumps from that river. They ascend the Brazos and the San Jacinto; in the latter, as far as the town of Humble, and perhaps further. Unlike other river migrants they do not ascend the rivers for the specific purpose of spawning, though they become landlocked and there they are said to spawn.

Contrariwise, the gars, at home in fresh water, descend into the bays and are even caught in the Gulf of Mexico. The writer saw at least one of the long-snouted variety about four feet long lying on the beach of Galveston Island, presumably dragged out by seiners. Also a large one was active in Offats Bayou until picked up by resentful fishermen. It is hardly possible that they ever spawn in salt water. Their custom in rivers is to swim upstream to spawn, especially when rises occur and the salt content of the water is at a minimum.

In the tide water of rivers, fresh water fishes enter brackish areas gradually but retreat to fresher water when the salt becomes excessive. High tides sometimes salt the Neches River for sixty miles upstream, killing fresh water fishes which are hemmed in and unable to pass the dam at Evadale which impounds the water supply for Beaumont.

Low stages of rivers and limited coastal drainage cause all bays to become very salty, some of them as salty as the Gulf. At such times the salt water moves inland inviting salt water species to ascend the streams. Sharks are known to ascend the Colorado River to the town of Matagorda which is now several miles from the extended delta.

Fish can not tolerate a sudden change of salinity from one kind of water to another. Where the extremes meet, the osmotic pressure is fatal, even though the fish may survive the initial shock of the sudden change. At tide water where rivers enter, there is a gradual blending of the

fresh and salt water which enables the fish to adapt itself to the modified salinity, but the general rule is that both salt water and fresh water fishes remain loyal to their native waters, and do not stray far into strange environment. They have a sense of discrimination and the power to choose and they do choose.

But such is not the case with the oyster, the clam and the conch. The conch may drift with favoring tides, and the clam has a foot which enables it to shift its position, but the oyster is fixed on the bottom of the bay. These forms must tolerate a wide range of salinity. When the bays become fresh by swollen streams, cutting the salinity down to about ten parts per mille, for a period of time, the conchs die. The type most abundant in Texas bays is the conch or drill *Purpura haemastoma*, but it prefers the higher salinity.

Several kinds of mussels and clams show varying degrees of salt toleration. *Mytilus hamatus*, a mussel that is abundant in Copano Bay, is partial to low salinity, the limits not defined, and it may be added, is without edible value. On the other hand, some edible clams have been taken from Aransas Bay which is frequently as salty as the Gulf. Likewise, edible clams occur in Galveston Bay but are little used. It is claimed that the Galveston species is the same as those that are imported from the Atlantic coast. The subject deserves further study. Scallops are found scatteringly along the Texas coast, and dealers in shell fish are anxious to learn of the economic possibilities. Their proper home is sea water. Bay Scallops, *Pecten irradians*, according to Gutsell (1931) Bureau of Fisheries, are in danger when the salinity is below 20 parts per mille.

But the oyster, *Ostrea virginica*, commands our highest respect for its power of adaptation. You will find them in the mud with bills barely projecting above the mud, or on hard shell bottoms; they are found in salinities that fluctuate from fresh to sea water; but there is a limit to the duration of extreme tolerations. In Matagorda Bay oysters were observed to live at least six weeks in water that was fresh enough to drink. After two months of the fresh water there was a high mortality noted, but just the exact date of the dead line was not ascertained. However, not all in the stricken area were killed, the survivors being the younger oysters. This phenomenal adaptation was made possible by the very slow change from salt to fresh water over a period of weeks. In other bays not so buffered by a wide expanse of salt water, where an abrupt change occurred in two or three days, the oysters were killed outright.

When rivers are low and there is little surface drainage, the bays gradually take on the salinity of the sea, sometimes above 33 parts per mille, yet the oyster still is in good condition, though quite briny to the taste. Much of the oyster production in Louisiana is from water with a salinity ranging from 28 to 30. In such salinities oysters sometimes die and the oyster men attribute this to "bad water." High salinity in English waters, 32 to 34, is regarded as an ideal condition, but the European oyster, *Ostrea edulis*, has greater salt tolerance than the American oyster.

High salinity in Texas bays has been the rule in many summers. What the maximum toleration is has not been proved. High salinity and remoteness from the nutrition of shore drainage are perhaps

★ Continued on page 13

Treat the Farmer Fair

"Here are a few simple rules which may be counted upon to get results:

"Always ask permission to hunt. This is nothing more than common courtesy. You wouldn't want a stranger spreading a picnic table in your own front yard, without as much as a 'by your leave,' would you?"

"Assure the farmer you will close his gates, be careful of his fences and refrain from shooting around his livestock.

"Show a sincere interest in his family, his children, his crops and his livestock.

"Whether you have good luck or not always drop by and thank him on

your way out. And if you do have good luck divide your game with him. After all, he either owns the land or has charge of it, and your equity in it is nil.

"Share your hard-to-get shotgun shells with him, and replace his old worn-out pocket knife with a new four-bladed stock knife.

"Don't make yourself at home too quickly. Be friendly but don't push yourself.

"Remember that you are the farmer's guest, accorded the freedom of his fields and woodlands only through his hospitable generosity.

★ Continued on page 18

Handling of Minnows

By John Dobie

BAIT dealers are often troubled with a heavy loss of minnows in holding tanks. Studies by the Fisheries Research Unit of the Minnesota Division of Game and Fish show that most losses result from injury to fish during seining, shock caused by improper tempering, suffocation from inadequate aeration or temperature control in holding and transporting tanks, and the disease that abounds in unclean tanks overcrowded with minnows. The warm water in lakes and the injury from wave action produce a high loss of minnows in live boxes. Some dealers have noticed a heavy mortality when stream minnows have been held in ponds not suited to their needs. For minnows held in small tanks, prevention of injury and disease infection are the only practical methods of reducing loss. There is no magic formula.

Prevention of injury must start at the time of seining. The net should be landed along a solid bottom whenever possible in order to avoid the roily water that is so injurious to fish. A seine full of fish should never be pulled up on shore but should be bagged loosely and floated to deeper water for sorting into floating live boxes. When the fish are being transferred to the truck tank, neither the dip nets nor the carrying containers should be overloaded.

"Soft" minnows, like the golden shiner, should never be seined during hot weather because the mortality is too high. They can be harvested by means of a baited drop net hung with cheese cloth to minimize the injury. Dip nets used to transfer fish should also be covered with a soft material.

Slow tempering is the most important method of preventing loss of minnows. Fish have no means of adapting themselves to rapid changes of temperature. A sudden change of more than ten degrees F. will give the fish a fatal shock, though death may not occur for several hours or even until the next day. As fish can be hauled better in cold water than in warm, it is often necessary to transfer the minnows from the warm lake or stream to the cold water of the truck without injuring the fish. Safe tempering requires at least 20 minutes for each ten degree change in temperature. A small diameter syphon hose will mix these waters at a gradual rate, but a thermometer should be used to determine the differences of temperature.

Minnows will stand the strain of transportation best when the hauling equipment is carefully designed. The tank should be of sufficient size to handle the number of minnows to be carried, and the inside should be smooth enough so that the fish will not suffer injury. The aeration system, whether oxygen or sprayed water, must supply a minimum of three parts of dissolved oxygen per million parts of water when the tank is fully loaded with fish,

but a concentration of five or six parts is preferable. The fish are more hardy at low water temperatures so the water in the tank should be maintained at 65° F. or lower, especially when the fish are hauled long distances. Missouri minnow dealers often haul fish 1,000 miles in truck tanks insulated with four inches of cork, which are iced when necessary along the route. Minnows that have been "hardened" for 24 hours in cold water will stand long hauls much better than fish taken directly from warm water.

The greatest loss of minnows will be noticed in the holding tank, but most of it is due to an accumulation of seining and handling injuries. The ill effects of rapid tempering will become apparent by the time the fish are transferred to the holding tanks. Since the minnows will remain in the holding tanks for a number of days, the tanks should be operated so as to minimize injury and disease infestations.

The holding tanks should be smooth on the inside so the fish will not lose scales when rubbing against the sides and to facilitate cleaning and sterilization operations. The aeration system must maintain at least three parts of dissolved oxygen per million parts of water when the tank is full of fish, and the tank should be deep enough so that the fish are not injured by the stream of water from the jets.

The water for tanks should be filtered (spring water is filtered by nature). A number of small tanks are more desirable than one large one. Diseases can be controlled better because fewer fish are held in one place and the turnover is more rapid. The tank should be small enough so that the entire contents can be sold in four to six days. No additional fish should be added until the original lot has been disposed of, otherwise, some minnows may remain in the tank for several weeks. The

longer that fish are held in unnatural conditions, the more susceptible they are to fungus disease. When one batch of minnows has been sold, the tank should be drained, cleaned and thoroughly sterilized in sodium hypochlorite. The sides and bottom of the tank should be scrubbed with a solution of one-half pint of bleach (Hilex or Chlorax) in 15 gallons of water. The tank must be rinsed until all traces of the bleach are gone before it can be refilled for a new batch of fish. All tools and dippers should be soaked in the hypochlorite solution for several hours.

Though the methods outlined here will keep fungus disease at a minimum, there are times when the fish will become infected in spite of good care. Minnows that are infected or have been exposed to fungus disease can be dipped in a solution of one-eighth ounce of malachite green in 15 gallons of water for ten seconds. This treatment is effective as a preventive or as a cure. The solution loses its strength in 24 hours and should not be saved. All dead and dying fish should be disposed of as soon as they are noticed. Dead fish floating in the tank are a breeding grounds for the fungus and, consequently, aid in its spread.

Fish that are held for long periods of time should be fed daily. Soybean meal, finely ground oatmeal, or similar foods can be used. The fish should be fed only the food they will clean up in 15 minutes. An excess will only pollute the tank and increase the danger of fish loss.

Minnows in holding and transporting tanks are living under very adverse conditions. They have been handled roughly, they have been crowded, and now they are living without food in water that is entirely lacking in natural disease preventives, so even under the best of conditions they will have a hard time keeping alive. The bait dealer can keep the loss at a minimum by making the conditions as favorable as possible. There is no magic formula that can be used at this time.

There may be considerable loss from the common practice of selling minnows wholesale by the gallon. This procedure necessitates the measuring of minnows in a nearly dry state. It is impossible to imagine that such measuring can be done without injury to the fish. Minnesota hatchery men weigh fish by first filling a metal basket half full of water, weighing the basket and water, and then adding the fish and reweighing. The difference in weight is the weight of the fish. By counting the number of fish in a pound, it is possible to determine the number of fish sold. By this method it is possible to wholesale fish by numbers, pounds, or by gallons, allowing eight pounds to the gallon. There is very little injury to the fish during weighing.—Minnesota Conservation Volunteer.

Odds and Ends

The Atlantic swallow heads the list of fish remarkable for their eating. It has such an expansive stomach compared with its size, that it can swallow fish larger than itself. The stomach stretches until it is so thin it becomes transparent.

The albatross has the longest wingspread of all birds, often 14 feet from tip to tip.

The "call" of the tree toad is generally considered as a prophecy of rain. Some truth in this, but not the whole truth. Warm, moist air, which usually precedes rain, releases the male toad's mating urge, so he "sings."



ARMS AND AMMUNITION

By Adam Wilson III
Gun Editor

You Can Cant — But Don't!

ONE of the common faults among rifle and pistol shooters, particularly among those in the beginner's class, according to Henry P. Davis, Remington Arms Company, is "canting."

"Canting" is the slanting or turning of the gun slightly to one side. Most rifle shooters are familiar with the term and its meaning, but the "whys" of the effect have long been a mystery to many.

Dr. C. S. Cummings, supervisor of ballistics standardization at Remington Arms Company, explains the effect of this fault as follows:

"The effect of 'canting' on the point of impact of a bullet is fairly simple to deduce, but does not seem to have been given very much prominence in gun literature. Qualitatively, the rule is simply this:

"Canting to the right will cause the bullet to move to the right and slightly down on the target.

"Canting to the left will cause the bullet to move to the left and slightly down on the target.

"In other words, the effect of canting the rifle is to move the point of impact horizontally in the direction of the cant and at the same time drop it below the point of aim.

"This rule is not obvious, but a simple experiment may make it easier to visualize.

"Bend a four or five inch piece of wire to form a sharp 'V' (a hairpin will do). Then, with the thumb and forefinger, hold the V by the end of one leg so that the leg is horizontal, the V being held in such a way that the other leg is directly below the one being held. The upper leg represents the scope (line of sight).

"To simplify things further, let us assume that the line of sight very nearly intersects the muzzle of the gun. The point of the V then represents the intersection of the line of sight with the muzzle, and the lower leg represents the bore of the gun.

"We now have a situation in which the line of sight and the bore of the gun lie in a vertical plane. Neglecting drift and jump, this plane will contain the trajectory of the bullet.

"Point the V at an imaginary target. Then slowly rotate it between your fingers,



"Canting" of a rifle only slightly can result in a clean miss on small game, or a predator such as the sly blue-darter hawk shown above, even though the arm may be sighted in perfectly.

holding the direction of the upper leg as nearly steady as you can. The position assumed by the lower or free leg will then represent the bore of the gun for various amounts of cant. When the V

is horizontal, i.e. when it has been rotated 90°, you will immediately see that the bore is pointed far to the side of your imaginary target and makes an angle with the line of sight equal to the original angle of elevation of the rifle.

"The trajectory of the bullet will now lie in a vertical plane containing the line of the bore and intersecting the plane of the target at a distance to the side of the point of aim given approximately by the expression:

$$(\text{Displacement in inches}) = (\text{angle of sight setting in minutes}) \times (\text{range in units of 100 yards})$$

$$(\text{The exact expression is } D = R \tan A, \text{ where } D = \text{displacement, } R = \text{range, and } A = \text{angle of sight setting})$$

"Since the bore is now parallel to the ground, the bullet will have an effective angle of departure of zero and will drop far below the level of the point of aim.

"The above situation of a 90° cant is, of course, absurd, but does show that the rule is correct insofar as the direction of the displacements due to canting is concerned.

"The next question to be answered is: 'What are the practical effects of cant?'

"As stated above, the effect of cant is made up of two parts. One is the introduction of an 'angle of horizontal deflection.' The other is a reduction in the 'true angle of departure' of the bullet.

"Limiting ourselves to a maximum angle of cant of 10° (probably 5° is more nearly a practical maximum) and a maximum angle of sight setting of 30 minutes, the following table can be constructed.

Table of Angles of Horizontal Deflection in Minutes

Angle of Cant	Angle of Sight Setting in Minutes				
	5	10	15	20	30
1°	0.1	0.2	0.3	0.3	0.5
2°	0.2	0.3	0.5	0.7	1.0
3°	0.3	0.5	0.8	1.0	1.5
4°	0.3	0.7	1.0	1.4	2.1
5°	0.4	0.9	1.3	1.7	2.6
10°	0.9	1.7	2.6	3.5	5.2

"For example, for an angle of cant of 2° and an angle of sight setting of 15 minutes, the angle of horizontal deflection is 0.5 minutes.

"This table has been computed to the nearest 0.1 minute, which accounts for the apparent irregularity in some places.

"Remembering that one minute of angle is approximately equal to one-half inch at



J. P. Kirk, employe at the Hearne postoffice, and his 25-point trophy, which he bagged in Llano county on November 20. The buck weighed 117 pounds.

fifty yards, one inch at one hundred yards and two inches at two hundred yards, the effect at various ranges can be computed providing you know the correct angle of elevation for that range.

"The following table of angles of elevation for 22 long rifle cartridges will be useful in connection with the deflection table:

Range in Yards	Angle of Elevation in Minutes for 22 L.R. Standard Vel.	22 L.R. High Vel.
50	6.8	5.2
100	14.4	11.4
150	22.6	18.4
200	31.7	26.0

"For example, the angle of elevation for the 22 long rifle match cartridge for 100 yards is 14.4 minutes. For a 5° cant, this gives us 1.3 minutes to the nearest 0.1 minute, as the angle of horizontal deflection. Using our relationship that one minute equals one inch at 100 yards, we see that we have moved our center of impact horizontally by approximately 1.3 inches, a very serious error.

"The effect on the angle of departure, and hence on the vertical displacement of

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the shot is considerably less, amounting to only 0.1 minute for 5° cant and 30 minute angle of elevation.

"Both effects are, of course, more serious for longer ranges. However, the above discussion should convince the shooter that, first of all, the effect of cant is in the direction of cant and, secondly, the effect is by no means negligible, even for small degree of cant and short range shooting."

More sporting firearms were produced in the last twelve months than in any time in the 81-year history of the Winchester Repeating Arms Company division of Olin Industries, Inc.

This is revealed by W. S. Allen, Winchester sales manager. "In spite of our tremendous production, thousands, and perhaps hundreds of thousands, of persons still cannot purchase Winchesters," Allen said.

"We have made only a dent in satisfying the demand which was built up for sporting arms during the five-year period when the plant was devoted to the production of military arms. To this backlog we have the additional demand created by ex-G. I.'s. Millions of American troops became acquainted with the Company's products by using Winchester-produced Garands and carbines and seeing billions of rounds of military ammunition stamped with the initials 'WRA.'

"By maintaining the Company's traditional quality production, we can still stamp the 'WP' (Winchester Proofmark) on all sporting arms rather than sacrifice quality for even larger production of lower quality rifles and shotguns," Allen said.

The plant's entire production is still being distributed to jobbers and through jobbers to dealers on allocation basis, Allen added, and will probably continue so

★ Continued on page 15



The Sportsman whose judgment is as good as his aim has his trophies mounted at Nowotnys.



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Civilization In

One Easy Lesson

By Roberts Mann

Superintendent of Conservation
Forest Preserve District of
Cook County, Illinois

BEHOLD the vacationist, poor guy, headed for the hinterland — he hopes. He's going to rough it. Yeah. He'll rough it with guides, a lodge, fireplaces and wassail. He'll hurry there and hurry back. Why? I don't know. He has some vague idea of recapturing the simple delights of the old swimming hole where the catfish used to bite. Plus a trophy.

Why all the gadgets? Why this ponderous preparation? Will he hear, amidst the calculated casting of his fly-rod, the whispering of the wind? Will he sense the strength and dignity of the trees? Will he see the carpet beneath them? Will he find peace and comfort in the rain? Will he bless the sun? I doubt it.

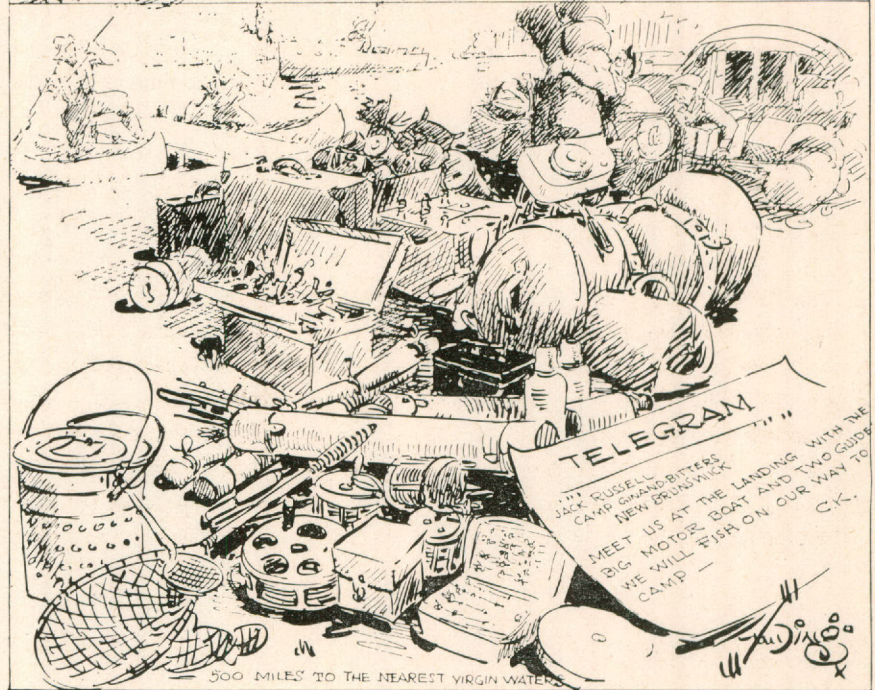
He's a creature of what we call civilization — lopsided mentally and physically. His daily life is saturated with speed, noise and deadly routine. Herded into jostling crowds, he shuns solitude as he would a plague. The apparent futility of material and moral husbandry has him licked. He's a lonely frightened soul. His makeshift god is Success, measured by his income tax and what the Joneses do. But he can't bait his own hook.

Some of the great thinking in this country has been done on the banks of what we call a "crick" in my country, at the butt of a cane pole with a worm or minnow on the other end. Some has been done behind the plow. Some at the handle of an axe. Since then we've gained in conveniences and luxury but we've lost in conviction of what really counts.

I'm minded of the dudes whipping the mountain streams of Wyoming while the



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OF YOUR OWN BACK DOOR"



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No Wonder It Costs Us More To Live These Days

bull cook and a wrangler, poking poles with worm-baited hooks out between the alders farther upstream, caught the trout for supper. I'm minded of the nights we caught frogs and fished in the backwaters of the Illinois River and then ate 'em by

a campfire — listening to the far-off music of hounds running a coon.

I'm minded of the psalmist who said: "HE maketh me to lie down in green pastures. HE leadeth me beside the still waters. HE restoreth my soul."

"Dead" Buck Takes Off

EVERY deer season brings many a tale of "the big 'un that got away," but Monroe Knudson's tale of woe is worth re-telling.

Knudson, a Houston taxpayer, knocked off an 8-point buck one Sunday afternoon in a pasture near Weimar. Laying down his rifle, he went over to the still form of the deer, looked it over admiringly and counted the points. Then he reached for his hunting knife and started slitting the deer's throat in the approved manner. The "dead" buck leaped to his feet and took off in the proverbial cloud of dust and hasn't been seen since.

But the experience of Francis Boettcher in the same area shows a much more cooperative attitude on the part of an 8-point buck. It seems Francis had strolled a short distance from camp, on his way to his "stand" and had paused a moment to cast a casual glance at the woods. Out stepped Mr. Buck, and Francis popped him with the fatal pellet. The buck didn't fall immediately, as few of them do, but began to run toward Boettcher's car. When the deer fell dead, it was right beside the front car fender. Commented Francis:

"Just couldn't make that rascal crawl upon that fender before he died."

Tois Jordan of Odessa realized the hunter's dream when he killed two legal deer with one shot. This feat of marksmanship took place on a ranch near Mason. Jordan was hunting alone when he saw

two bucks in perfect broadside alignment. The charge struck the foremost back in the spine and the second in the heart.

A softball bat is an effective deer hunting weapon, according to Blondy Cross, sports editor of the San Angelo Standard-Times, who relates that he and Bruce Bomar of Mineola, tiring of the chase, were demonstrating their diamond prowess at their car when Bodie Hunter, Marfa football coach, on horseback, scared a deer down a deep, narrow ravine. Cross swung with the bat, felling the buck, and Hunter, dismounting, slit the animal's throat. It was a 7-pointer.

Ponder the plight of W. W. Cox, who went deer hunting on a lease near San Antonio. Cox figured he wouldn't need but one of two boxes of 30-30's he had stored away so about 2 a. m., one day, he

FULVOUS TREE DUCK

On the water or in flight the male and female look alike and are easily recognized by their long legs and tawny-brown color. When on land their long legs give them an odd appearance. They crowd together, crane their necks and look extremely tall for ducks. In the air they trail their feet past the tail unlike any other duck. Their flight is strong and goose-like. The Fulvous Tree Duck is of a shy, retiring disposition and feeds mostly at night. Incidentally, the term tree duck, as applied to this species, is a misnomer, as this duck doesn't perch in trees nor does it nest in trees. It is easily approached but not easy to find, as it prefers the dense tules and marshy ponds.

BLACK-BELLIED TREE DUCK

This duck is abundant in Mexico and frequently visits Texas. It is also known as the "cornfield duck" because when corn is available it feeds on nothing else. This duck perches in trees, and in the cornfields will perch on cornstalks while reaching the grain. It is easily domesticated and is an excellent table bird. Their long legs give them an odd look as they wander on land or wade in the shallow waters. When surprised they raise their long necks after the manner of geese. They fly low and in a line. Their large wings with white bands present a striking aspect and give the impression that they are much larger than they really are.

FLORIDA DUCK

This duck is seldom found in Texas, although it is closely related to the mottled duck which ranges through Louisiana and Texas. It closely resembles the black duck in appearance and habits. It is less shy than the black duck because it is less hunted. It nests on the ground, usually near water. It is heavily hunted in Florida.

Fulvous Tree Duck

Sexes Same

Black-Bellied Tree Duck

Sexes Same

Florida Duck

Male

Florida Duck

Female



reached into the storage space, picked up the flat box and gaily went his way. When he got out of the car, bright and early on the opening day of the season, Cox carried his hunting coat, with the box of ammunition. On the stand, Cox started to load his rifle. He reached in his pocket and pulled out the box of ammunition. But it wasn't ammunition. It was a box of sardines.

B. B. Chandler of 2100 Fort Avenue of Waco, went on a deer hunt in Llano County with a rifle and six shells his grandfather picked up on a Civil War battlefield in Georgia.

And every time Chandler takes a shot with the rifle, it costs him a dollar.

The six shells are all the ammunition Chandler has for the old rifle, and he can't get any more. So he's been sending the empty brass hulls back to Stonington, Conn., to have them re-loaded, and that costs him a dollar per shell.

The old Civil War rifle is a well-preserved model of the B. F. Joslyn patents of 1861 and 1862, and marked the transition in firearms from the old cap-and-ball to cartridge models. (Baylor has one in its museum.)

The rifle has a bore big as an elephant gun and packs a hefty wallop.

Chandler's grandfather picked it up on a Southern battlefield beside a Northern soldier. He also found the six shells, a powder horn, cap-and-ball pistol and a sword. The rifle was handed down in the Chandler family.

Eight years ago Chandler cleaned the gun and got out the six shells, then 75 years old. He decided a rifle with that big a bore might cause quite a commotion, if the shells fired, so he took it out in the country and aimed at a cedar post.

"The shot scattered cedar kindling all over the place," Chandler said. "Since then, I've shot all six shells and had them re-loaded."

The rifle shoots a rim fire cartridge considerably bigger than a .45 pistol bullet. A .45 in the barrel rattles like a marble in a pop bottle.

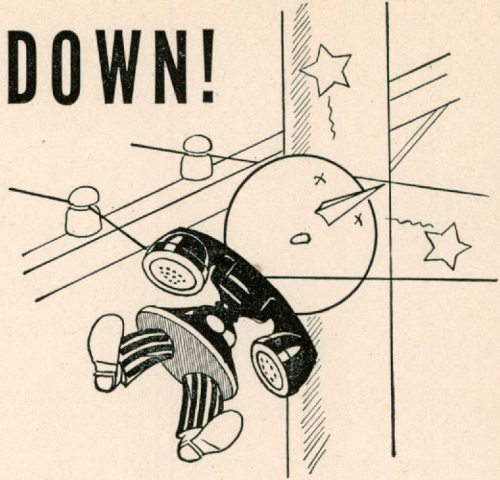
Wildlife Management

★ *Continued from page 4*

the part of professional men who should know better. I have heard it said recently that doctors, lawyers, dentists, ministers, and others from comparable professions are the worst violators. There is no way of checking the validity of this statement, but any experienced law enforcement officer knows that some of the worst offenders do come from these groups. To the extent that this is so, it indicates a failure of efforts to raise standards of sportsmanship since these groups should be the most easily reached of any part of the public.

Management measures can take two forms. The first and probably most permanently useful would be intensive educational activities to acquaint those who hunt and fish with the fact that there are definite limits on the total production; that the total production is apt to go up or down from year to year as seasons are favorable or unfavorable for the particular species. It should attempt to inform and

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make a part of the basic thinking of this group the fact that we cannot take more than the annual crop produced under any circumstances unless we want to reduce the breeding population, and that wise management should be based on a harvest somewhat less than the annual crop in order to provide insurance against the unforeseeable contingencies of nature. Self-restraint and law observance are necessary contributions to such a program by all who really love to hunt and fish.

The other phase is, of course, to step up the law enforcement program. Law enforcement is an essential of wildlife management. It always will be since there is no possibility that every man who hunts or fishes can be educated to exercise self-restraint and to cooperate in maintaining good breeding stocks of the various wildlife forms. Law enforcement officers in the majority of states can be better trained and better equipped than they are at present, and there should be many more of them. Some states have gone to considerable lengths to select competent men and give them adequate training, but this is far from the general practice.

As the human population increases, a greater number of law enforcement officers and even better-trained officers will be needed. These officers should be not only law enforcement men but should be trained to carry a part in the educational load of informing the public of basic facts and conclusions.

Many workers in the wildlife field feel that some of the basic things have been said so often that they are stale. They seem to forget that repetition is the only way in which any idea can be made a part of public thinking. They also fail to realize that each year there is a new crop of people to educate. While the repetition may become stale and tiresome to them, it is an absolute essential in maintaining an educated and intelligent attitude on the part of even a minority of the public directly involved. Basic facts cannot be repeated too often and the major effort should be to make the presentation as interesting and varied as possible without in any way obscuring the basic principles to be illustrated.

With present knowledge, these are the two possible immediate approaches to the main problem. They will not and cannot solve the problems caused by an increasing density of human population. They can only make the best of that situation and to the extent possible alleviate its immediate and long-time effects. Perhaps in some future time someone will find a better way to do it. At present it does not seem feasible to look forward to anything except an overall decrease in the productive habitat for all species of game and fish. There will be local exceptions to this caused more by shifts in the centers of production and human population than by wildlife management efforts. However unpleasant it

★ *Continued on page 18*



Catfish Tricks

By R. A. "Doc" Jenkins

CATFISH usually feed on one particular food at a time. Try several kinds of bait until you find out what they are taking.

When catfish are not biting well open the stomach of the first one you catch and examine the contents . . . then use what you find in it for bait.

While catfish seem to feed on only one natural bait at a time they will take prepared baits at anytime if these baits contain the right ingredients combined with attractive lures. The lure and bait ingredients are the secret of making catfish baits.

When lure ingredients are used in combination with baits it is well to remember that no single lure will work all the time. Use instead a combination of several different lure ingredients blended together.

A favorite feeding place for all kinds of catfish is where small tributaries empty into the larger stream. Fish in deep, shady pools and along overhanging banks with washed out caves beneath them. Use a scent lure with a good bait to bring out the cats.

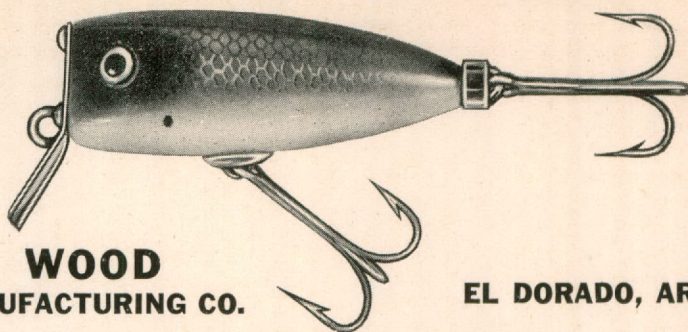
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DO YOU HAVE A DIPSY DOODLE?



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Morris J. Felty of San Antonio, and his father-in-law, Mr. Peterson, caught this 40-pound blue cat on the Hudspeth Ranch in the Devils River above Del Rio on the first of October and during "moonlite," too.

Big catfish got that way because they were suspicious and refused ordinary baits. Use snelled hooks and long leaders. Cover the whole hook with bait.

When stream fishing don't do any unnecessary walking along the bank. Catfish can "pick up" the vibration much in the same way a radio signal comes in on the dial of your radio and as cats scare easily they will hide and refuse to bite.

If you should be fishing from a boat avoid making a noise with the oars, scraping your tackle box or scuffling your feet on the bottom of the boat. Sound travels

These fish, known locally as "hurales" were caught by Sr. Pedro Brito, Morris S. Felty of San Antonio, and Pedro Brito, Jr., where the Rio Papaloapan enters the Gulf of Mexico at Puerto de Alvarado, south of Vera Cruz, Mexico. The fish averaged about 25 pounds and were caught on a large spoon. Fourteen were caught in one school in less than 30 minutes.

and the vibrations will put the catfish on their guard.

Don't fish a "fishy looking" pool so your shadow falls across it. While catfish have poor eyesight they can easily see a moving shadow on the bank because it is magnified down in the water.

During high water in the spring and early summer large cats may be found in the smaller tributary streams.

Channel cats feed more during stream rises and during and after a thunder storm or a hard rain.

Catfish hunt their food more by taste or "smell" than by sight. The barbels, or "whiskers" have taste buds at the ends and with these the catfish locates its food. That is why the right bait is important.

Dry matches. Dip heads of paper or stick matches in finger nail polish.

Catfish go on the prowl after food from dusk until dark. At dusk fish the channels



and in the deeper water. As the darkness increases the cats move in toward the shore into shallow water.

You can keep bait minnows limber and lifelike a week in strong vinegar.

Keep bait shrimp in a box of damp (not wet) sawdust.

Your cabin, tackle box or boat padlock can be sealed against rain, snow, ice and dirt by slipping a rubber finger stall over it.

Triple the life of rubber baits or bait-skirts by keeping them in a can of tire talcum.

Oars can be kept from slipping from their sockets by a 2-inch wide elastic band cut from an old inner-tube.

To separate rod joints, tie a piece of wet string or fish line to the top of the male ferrule. Tie ends of string to a tree branch or oar-lock. Don't twist but pull gently and steadily.

Aquatic Mysteries

★ Continued from page 6

equal factors in retarding the progress of oyster growth. But in Matagorda Bay two or three months of the high mark of 33 parts per mille resulted in no appreciable harm, and setting of the larvae was still in progress.

D. M. Williams of Matagorda brought in a sample of Gulf water which was taken at a point 18 miles out which measured 37.1 parts per mille. A comprehensive survey of the salinities of the Gulf revealed that 36 parts was about an average salinity. My test was made with an accredited hydrometer, and also by chemical calculation based on the chlorides.

The Texas oyster is, politically, a middle of the roader, about half way between the extremes of fresh and salt water, or 15 to 18 parts per mille. The greater the variety of environment to which an organism can adapt itself, the more tenacious of life it becomes. The big factor,

therefore, in the life of an oyster is fluctuation of the salinity in which it lives. The introduction of fresh water produces variety in the kinds of organisms on which the oysters feed. To a lesser degree this is true when tides bring in the sea water.

Why does the oyster select this middle ground for a habitat? A microscopic examination of the water gives us at least part of the answer. In the sea there is not the density of marine algae that we find in the bays, and on which the oyster feeds. This bay food is more richly produced because minerals and salts essential to plant growth are brought down the rivers, such as organic nitrogen, phosphates, silica and carbonates.

The diatom *Coscinodiscus* dominates the plankton of the bays as an oyster food. Because of its circular shape it might be called the oyster biscuit. It and related species may be found in the widest range of salinity. Not so plentiful in the Gulf, it has nevertheless been found in Laguna Madre where the salinity was 59 parts per mille. In that salinity at Carolina Beach *Coscinodiscus* and copepods were found, but no protozoans or other algae. That is not to say they did not exist, for many of the forms are seasonal and may come and go.

The flowering of plankton in the bays is somewhat erratic. In the summer, diatoms are sometimes exceedingly scarce or entirely absent; other years they are abundant throughout the summer, but with a usual let-down in the month of August. With the arrival of cooler weather the flowering resumes and oysters begin to fatten. The water temperature in late summer is around 30 degrees centigrade in Texas bays. With a drop of several degrees, oyster may be expected to start fattening, if food conditions are favorable.

Old oyster growers tell us that an unusual rise of the tide causes oysters to lose their fatness for the time being, for which there seems to be some reason. The oyster is an adept in self-adaptation and is critical of anything that threatens change. The usual tide brings only a slight increase of salinity from the Gulf. As this happens daily it does not disturb the routine of feeding, but let a high tide crowd itself in and push back the bay water, and the food on which the oyster has been feeding,

Things You May Not Know

What is said to be the largest duck to be taken in Minnesota in 25 years recently fell to the gun of Kenneth Peterson of Minneapolis. It was a Mallard Drake weighing over six lbs.

The heart of an insect is a slender tube suspended along the midline of the back, close to the dorsal wall of the body.

More than 300,000,000 pounds of fish and shellfish are landed annually at East Coast ports from Rhode Island to Virginia.

Polar bears are such good swimmers that they have been seen over 200 miles from land in the open ocean.

The noise made by the ostrich is a roar, and at a distance it cannot be distinguished from that of a lion.

The average bee is compelled to travel approximately 550 miles to make a teaspoonful of honey.

An elephant's trunk contains 40,000 muscles.

The ancestors of our present-day goldfish were originally green in color.

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substituting for it a higher salinity and perhaps a slightly different bill of fare, jerking as it were the menu card right out of the oyster's grip, and he says: "Huh! I don't have to stand for that," and shuts his lips up tight.

An oyster can close and stop feeding for days without consuming any oxygen. Not that it goes on a sit-down strike or fast, but naturally it must feel its way cautiously until it becomes adapted to a changed environment. A new adjustment is necessary and during that period the oyster may lose some weight.

A continued low tide may sometimes leave an oyster reef projected above water. At such times the oyster remains closed until the return of the tide. Though the oyster has no brain it is too smart to open its valves and lose its vital juices. These organisms fight the battle of life by self-adjustment to conditions of vast range. We can all learn a lesson from the lowly oyster and fit ourselves into our own environments and do it gracefully, if we will.

The tide of my thought is now running low and perhaps I had better close up until another tide comes along.

RECIPES

DECEMBER saw more quail hunters in the field than ever before in Texas. And it is a sure bet that until January 16 every person with a desire for quail hunting and a taste for a quail dinner will be making the most of the remaining days of the open season. The bobwhite quail is one game bird beloved and respected by all who go afield. Sometimes known as "the partridge" in the southern states, this explosive little game bird proves a worthy adversary for the combined skills of man and dog; and sportsmen everywhere labor to outwit the wary quail. But the crowning point of the hunt comes when the prize is brought to the table. And as the sportsmen are spurred on in the field so in the kitchen are the ladies inspired to new heights in culinary art when the bobwhite becomes the central ingredient.

With the Christmas holidays not long past, it is difficult to tempt the palates of the family even with choice foods. However, the quail offers a bright solution to this problem and will bring the cook back into the limelight with enthusiastic praises from everyone.

Here we have set down a few choice recipes to help the ladies do justice to the bobwhite quail and to their personal pride in cooking accomplishment. Whether the dinner planned be simple or elaborate, graced by this most delicious of game birds, it will be a pronounced success! First, let us look into a simple recipe for quail that is preferred by many.

BROILED QUAIL

Split birds down the back and rub thoroughly with salt. Grease the bottom of a hot pan with butter, place the quail split side down and cover tightly. Steam 3 minutes, turn quail and place a teaspoonful of butter on each bird. Continue turning until birds are brown and tender. 20 minutes is sufficient for young birds. For older ones more time is required. When done add ½ cup of hot water to the drippings and pour over the birds. Serve on buttered toast. Garnish with parsley and sliced lemon.

Perhaps in Texas more than any other state we are proud of barbecue dishes. Quail properly barbecued can shame any other gamebird. If you haven't a favorite recipe of your own, we guarantee this one will please!

BARBECUED QUAIL

Prepare quail as for broiling. Birds may be split or left whole. And now for the sauce:

- 1 cup tomato catsup or chili sauce
- 1 cup vinegar
- juice from 4 lemons
- 4 teaspoons Worcestershire sauce
- 1 teaspoon meat extract
- 1 pound butter
- red pepper and salt to taste

Prepare sauce in large pan by first melting the butter then adding all other in-

gredients. Simmer a few minutes over slow fire and it's ready for duty.

Use a pit if possible, though an oven can be used, and make your fire of oak, hickory, or charcoal. When only red coals are left, lay birds on wire rack placed over pit and turn constantly until slightly browned. Now dip each bird in the sauce, return to fire. Continue this process until birds are done, dipping them frequently in the sauce. Place birds in steamer, pour remainder of sauce over them. Steam until ready to serve, turning birds occasionally in the sauce.

For those of you who grow nostalgic when Louisiana cooking is mentioned, the following recipe is recommended. It has all the distinctive flavor you dream of and will bring forth blissful sighs of satisfaction.

LOUISIANA QUAIL

- Clove of garlic ½ teaspoon pepper
- 2 cups olive oil ½ teaspoon paprika
- 2/3 cup lemon juice quail
- 1 teaspoon salt buttered toast

Rub deep bowl with cut end of garlic clove. Add oil, lemon, and seasonings and mix well. Clean quail and submerge in dressing. Let stand 24 hours. Broil quail quickly, basting at least 6 times with the dressing. Do not overcook. Place each bird on a slice of buttered toast and serve at once.

Now for a quail dinner fit for kings — we offer this recipe for a quail dish that defies Webster's superlatives. It isn't suitable for an impromptu soiree. This must be planned! Your patience may be sorely tried but the rewards are celestial to the palate and beneficent to the soul. Your husband's boss not only will be impressed, he will become your slave and don't say we didn't warn you! Here it is:

(Part I)

CAILLES AUX LAITUES

(Quail With Lettuce)

Clean 6 plump quail and place in the cavities their livers mashed with equal

parts of butter. Truss. Set aflame with good gin and after the flame dies out, rub with mixed salt, pepper and nutmeg to taste. Line a casserole, large enough to hold the 6 birds easily, with 6 thin sheets fat larding pork, each sheet topped with a thin slice of raw, lean ham the same size as the fat pork sheets. Arrange each quail in the center of a sheet. Fill the empty spaces with 1 scant cup lean veal cut into small cubes and mixed with ¼ cup chopped onion, 1 clove garlic chopped, and 1 teaspoon each of shallot, parsley and chervil. Then add 1 large bay leaf, 2 whole cloves with heads removed, a pinch of thyme leaves to taste, a small bouquet garni made with 8 sprigs fresh parsley and 12 blades chives, tied together with kitchen thread, 8 whole peppercorns crushed, and a pinch of powdered marjoram. Pour over all 1 cup white wine mixed with 1 cup rich chicken broth. Cover the casserole with a round, buttered white paper, and gently push into a moderate oven, (350°). Allow to cook for about 35 to 40 minutes, basting occasionally with the liquid. When done, place each bird with its sheets of pork and ham, on a piece of fresh toast on a large, hot service platter. Between the quail put 6 lettuce rolls prepared as follows:

(Part II)

LAITUES FARCIES GASTRONOME

(Stuffed Lettuce Gastronome)

Soak 3 or 4 good heads of lettuce in salted water for at least 1 hour to free them from grit and foreign matter. (A little tip on coring lettuce preparatory to using whole leaves — grasp the head of lettuce firmly the core on the downside. Hit the core sharply and solidly against the surface of your kitchen table or drain. Lift out the core.) Drain and remove 18 large and perfect leaves. Place the leaves in a shallow pan and scald for 5 minutes with boiling chicken stock; drain thoroughly and cool. Place lettuce leaves in groups of 3 atop one another, trim them

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- **VITALITY BODY BUILDER DOG FOOD—** for building solid bone tissue, improving muscular tone, and extra stamina in the field.
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 - **VITALITY WHOLE AND KIBBLED BISCUITS—** for an eager appetite and real taste appeal.
- Ask your dealer or write for details of the Vitality Feeding Program.

VITALITY MILLS, INC.
BOARD OF TRADE, CHICAGO 4, ILLINOIS

neatly to the same size. Place in the center of each tier of 3 leaves the following stuffing:

In a mixing bowl place 6 tablespoons each of fresh mushrooms, peeled and ground, using caps and stems; ground lean raw ham; meat sausage; and chicken liver previously parboiled; 1 tablespoon chopped shallot and a clove of garlic crushed. Season to taste with salt, pepper, nutmeg, and thyme. Blend to a smooth paste adding enough thin cream to make a fine smooth mixture. Cook this in 2 tablespoons butter for about 5 minutes over a gentle flame, stirring constantly. Remove from fire, and stir in 2 fresh egg yolks.

Place equal parts of stuffing over each tier of lettuce leaves. Roll the leaves up not too tight, secure with thread at both ends and in the middle. Place the rolls in a buttered shallow saucepan and pour over them the liquid (strained free from fat) in which the quail were originally cooked. Cover pan with a buttered paper and cook in a moderate oven (350°-375°) for about 35 minutes, basting occasionally.

Serve a side dish of bread sauce and another of currant, grape, quince, or peach jelly.—T.S.

The Rabbit

★ *Continued from page 5*

way as the animal makes off in a series of bounds; and hares can go faster uphill than down, owing to the greater length of their hind legs — a decided advantage.

Knowing these tricks, most predators resort to counterstrategy, a stealthy approach and quick rush; although a few, like the dog and weasel, may follow the track with stubborn persistence, hoping to overtake and corner their prey eventually.—G. W. Brandt, Michigan Game Division.

You Can Cant - But Don't

★ *Continued from page 9*

until the pipeline from the factory to the consumer has been filled. How long this process will take cannot be predicted. The Company is making the wide range of styles and types of sporting arms which were popular before the war, and the current, unprecedented demand seems to indicate that the line continues to be well balanced.

I know a few gunners who will be glad to know that they will again be able to obtain ammunition for their slug-throwing .405 and .401 caliber rifles.

The old .405 cartridge with its 300-grain bullet at 2220 f.p.s. muzzle velocity is an excellent medium-range load for all American big game, as well as being adequate for taking the big thin-skinned African animals.

I have never had any use for the .401 caliber. It looks good on the ballistic tables, but accuracy is poor and the range must be short.

What Texas Editors Say

The failure of the Texas legislature to enact the universal fishing license law desired by many Texas fishermen is due to a state of mind which manifests itself in many other matters. Too many legislators seem to be allergic to modern ideas. It took a decade of agitation to bring about passage of a drivers' license law in this state. Texas lags behind most other states with respect to judicial procedure, county government and its state administrative set-up.

The trouble in connection with hunting and fishing licenses, as pointed out by Al Parker in his article in *The Times* last Sunday, is that there are too many legislators who are unable to divest themselves of the ideas of the horse-and-buggy era. Time was when the hunter and the fishermen hunted and fished where they pleased, when they pleased, with little thought of conservation or the rights of land-owners. Within the memory of some men, game and fish were abundant enough to make restrictions seem unnecessary.

Much has happened to Texas streams and Texas hunting grounds since those lush days. Today there is no fishing and no hunting except where measures have been taken to propagate and conserve. Such measures cost money. And it is only by the judicious expenditure of money that Texas can continue to have facilities for hunters and fishermen. There still are too many of the latter who are out-of-date in their thinking, as the legislators are. Not uncommon is the individual who cheerfully spends several hundred dollars for the fancy equipment his recreational activities demand, but who grumbles and balks when asked to pay the very modest license fee without which his equipment would be useless to him.

The sooner it is realized, by out-of-doors men, by legislators and by the public, that there will be no satisfactory hunting or fishing places except by spending money to create and maintain them, the more prompt and more happy the solution will be. There are states with far fewer natural advantages, as to wild life and fishing, than Texas has, which offer hunters and fishermen much more sport. They have followed policies of propagation and conservation that paid off. They have taken into account the unpleasant fact that streams which once teemed with fish have been polluted, that the automobile has brought the city dweller much closer to the out-of-doors, in point of time, than he formerly was and that changed conditions have wrought disastrously upon the supply of game. They have faced the changes and successfully combated them.

Texas must become 20th century in its thinking about such matters.—Wichita Falls Daily Times.

At its last meeting the Brazos County Game Protective Association looked over results of a long range deer conservation program which has repopulated hunting

lands in Grimes and Brazos County along the Navasota River area. The work was good, reflecting goals which can be accomplished through organized game protective associations.

The idea for the move was fostered by Sam Cavitt, who was, at the time, State Game Warden for this area. He eyed lands along the banks of the Navasota River in Brazos and Grimes Counties, deploring the fact that deer had been exterminated through wasteful hunting practices. The logical move which suggested itself to Cavitt was planting of new deer in the area, allowing them to repopulate the empty hunting grounds.

Cavitt and J. P. Yeager approached the State Game department, requesting that deer be imported into the Navasota area, then protected with a closed season until they had an opportunity to multiply sufficiently to make shooting feasible.

The game department turned thumbs down on the proposal, claiming that local residents would hunt the planted deer with dogs and shoot them out of season, exterminating the new animals also.

Cavitt and Yeager were persistent in their demands and finally drew an agreement from the department to plant deer if landowners in the area would sign an agreement to protect the animals. The two men immediately signed up the Navasota area of the two counties 100 percent.

In the beginning of the repopulation process, captured fawns which had been hand-raised were imported. Time revealed that these creatures were too tame to survive. Next, the department trapped grown deer and brought them into the section. These animals took care of themselves and readily became adapted to their surroundings. Two closed seasons of five years each gave the new residents time to multiply.

In all, 137 deer were brought into the Navasota area originally. Today sportsmen of this vicinity have good hunting in the repopulated lands with deer rapidly spreading out to new territory.

Skeptical landowners who, at first, feared the damage deer would do to crops, now realize that deer are worth more than their cost. State Game Warden William Kincannon estimates the cost of importing the deer at approximately \$3,000. Today landowners are reaping nearly \$5,000 annually from the sale of hunting rights. No restocking is required and, according to the game warden, benefits are likely to increase rapidly in the next few years.

Careful management and repopulation of areas in which game has become extinct represent conservation programs which will furnish sport for all hunters and preservation of game at the same time. The success of the Navasota Area Project is living proof of that.

Hunting can be big business for an area with all persons profiting. \$157,000,000 is spent each year on hunting and fishing in Texas. The conservation work of the Brazos County Protective Association can readily result in attracting a generous slice of that \$157-million to Brazos and surrounding counties.

Through conservation everyone profits—hunter, game and landowner.—Bryan News.

Prehistoric Hunters and Fishers of the Texas Coast

By T. N. Campbell

JUST before the war, archaeologists from the University of Texas excavated a shell heap on the shore of Copano Bay near the town of Rockport. Here, in a region which is famous among modern salt-water fishermen, they found the remains of an early Indian people who made their living by hunting and fishing. The site excavated is known as the Johnson site, and the archaeologists have given the name Aransas to the culture of its people. These Aransas people lived on the Texas coast about a thousand years ago.

The shell heap—archaeologists call it a shell midden—represents the spot where the Aransas people camped. Excavation showed that it contained great quantities of shells from the shellfish which they collected, and it also contained numerous bones of fish, birds, and mammals which they took for food. Mixed with the shells and bones were tools and implements of shell, bone, and chipped stone. There were also a few burials showing how they disposed of their dead.

Actually this shell heap was their garbage dump. It was made up of all the imperishable objects which they threw away or lost around the camp. To call it a garbage dump implies that they gathered up their refuse and threw it in a special place. They do not seem to have been that tidy, for it is believed that this refuse was simply thrown on the ground in camp and allowed to lie there. In time enough refuse collected to form a low knoll about five feet high and one hundred feet across. A strong smell of fish and decay must have hung over this camp, especially on warm days.

Although there is little evidence to show just what methods were used to get their game and fish, archaeologists know the kinds that were taken. The bones and shells from the site have been identified by expert biologists.

The biggest game hunted by the Aransas people consisted of bison and deer. These they killed with the dart or spear, for there is no evidence to show that they had the bow and arrow. The bow was brought to the Texas coast in later times. They also took several small animals, probably by stalking, trapping, and drives. These included peccary, raccoon, rabbit, and coyote.

They were great duck hunters too. Bones of four kinds of duck were found in their camp refuse—mallard, pintail, wid-geon, and shoveler. They also hunted the loon. Just how they hunted these birds is not known, but it is possible that they either trapped them or slipped up and hurled spears into large groups while they

were feeding. They may also have used some form of blind.

The bulk of their diet was taken from the shallow waters of Copano Bay. Various forms of turtle were captured and eaten, and a few bones of the porpoise show that this sea mammal was also eaten. They must have caught all the common forms of salt-water fish, but fish bones are small and fragile and do not last very long in the soil. Only one common form has been identified—the triggerfish. No fishing tackle of any sort was found by the archaeologists. The Aransas people probably had nets and traps and caught some of their fish by these methods. Historic Indians on the Texas coast speared fish, and the Aransas people may have done the same.

There is no question about the Aransas people being fond of shellfish. Twenty-one different species of shellfish were represented at the Johnson site. The common oyster was eaten in great quantities, but the conch and various kinds of clams were also favorites. It is these shells which make up the greater part of the shell heap or midden. Thousands and thousands of them are piled up in the heap, the spaces between being filled with dark soil.

Since the flat coastal plain of Texas yields little stone, most of the tools and implements of the Aransas people were made of shell and bone. The big conch shell was used for several different kinds of tools. For a hammer they simply held a large conch shell by the small end and banged away. Parts of the conch shell were made into cutting, scraping, and piercing tools, such as axes, gouges, scrapers, and awls. Heavy oyster shells with large holes knocked out of the center were probably hafted to sticks and used for digging purposes. Perhaps this was what they

used to dig clams and loosen oysters from their beds.

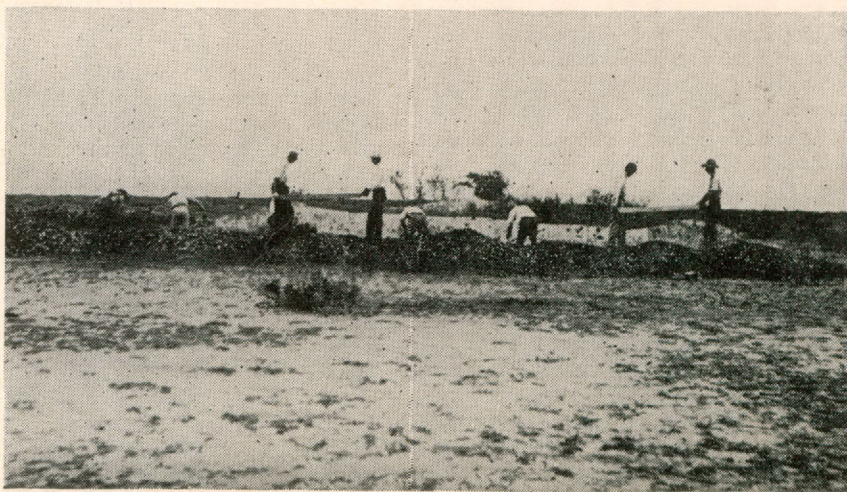
Deer bones and antlers furnished material for such things as awls and flint-chipping tools. The small, light wing and leg bones of aquatic birds were cut in sections and strung as beads.

Not many stone tools were found. Most common are chipped flint knives and points for their darts and spears. Archaeologists believe that Aransas people got their flint from trade with peoples who lived farther inland, where flint occurs naturally. There were a few hammerstones, milling stones, and abrading stones. The milling stones were probably used for grinding wild seeds collected by the women. There is no indication that milling stones were used for grinding corn, for these Indians do not seem to have been an agricultural people. The abrading stones are small sandstone slabs that were used for shaping and sharpening their shell and bone tools. One interesting find was a large, tubular stone pipe with a bone mouthpiece set in one end. This was made of sandstone and weighed several pounds. What they smoked in this pipe is not known, but it was probably not tobacco, unless they got it by trade from other Indians. Archaeologists believe that the pipe was smoked only in ceremonies, not for pleasure.

By a lucky break, the archaeologists discovered that the Aransas people made baskets. No baskets would survive in the open in the damp coastal climate, but these Indians had the practice of smearing asphalt on the inside of baskets to make them waterproof. Fragments of this asphalt have survived, showing impressions which tell how the baskets were woven. Baskets seem to have been the principal containers used by the Aransas people. They did not make pottery.

No definite traces of houses were found, but it is supposed that they had some form of temporary shelter, probably a light framework of wood covered with skins or brush. They buried their dead right in camp. The skeletons were found either flexed (arms and legs folded) or flat on the back as we bury our dead today. They did not place any objects with the dead

Archaeologists excavating a shell heap on Copano Bay. Men standing erect are sifting earth through a wire screen in order to recover very small objects.



at the time of burial as did so many other Indians.

From the evidence at the Johnson site it is possible to picture the Aransas people as consisting of small bands of simple hunters and fishers who wandered from place to place along the Texas coast. If hunting and fishing was good at a certain place, they stayed there a while. If not, they moved on. They probably learned from experience that certain spots were good for hunting and fishing at certain times of the year, and they would return to such places. It is not known if they had boats, but their adzes and gouges are good wood-working tools. It is quite likely that these tools were used for making dugout boats.

The University of Texas archaeologists have not yet determined the exact age of the Aransas culture. It is fairly certain, however, that they lived around Aransas Bay well before 1500 A. D. It is believed that they flourished between 500 A. D. and 1500 A. D. Thus they were hunting and fishing on the Gulf coast as early as 1,000 years ago.

Duck Merchants Seek Damages

Waterfowl merchants, who own or operate farms near Horseshoe Lake State Game Preserve north of Cairo, Illinois, are seeking \$15,000 damages from the Federal Government. The complainants allege that Canada geese attracted to the state refuge have damaged crops on their farms. Parties to the suit filed in the United States District Court in East St. Louis under the Federal Tort Claims Act are not strangers to waterfowl enforcement officers, the Institute learned. The suit was filed by Kenneth L. Martin of Miller City, Gallie E. Martin of Olive Branch, Charles Sickman of Miller City, a tenant farmer, and the three owners of the farm on which he lives, David V., John A., and Roebert L. Lansden, some of whom commercialized the gunning to such an extent that they forced the closing of the area to hunting.

It now is alleged that, under the Migratory Bird Act, they are prohibited from shooting or using other means to get the geese off their lands. As a result, it is contended "a substantial amount of soy beans, corn and other crops have been consumed and destroyed by these geese" since last October.

Are these damages to cover the crop loss or the disappearance of hunting revenue?—many people are asking. After all, one of the purposes of the Migratory Bird Treaty is "to prevent the ruthless slaughter of migratory birds."

In England the harnessing of dogs to vehicles is forbidden but in Belgium it is common practice to harness one or more to small milk carts.

The young of the Surinam water toad are hatched from eggs embedded in the softened skin of the female's back in such a manner that each egg become a separate cell.

Outboard Storage

PREPARING an outboard motor for winter storage is a simple procedure, but the few necessary steps are important in that they insure the engine being in top operating condition for the first spring fishing trip.

A thorough cleaning is the first step. It simplifies the succeeding operating operations, and will reveal any possible defects. A damp cloth will usually suffice, but in the case of stubborn deposits use of a little motor fuel on a cloth will almost always loosen them.

If the motor is to remain for the winter in an unheated area where there is danger of freezing it is most important that the water jacket be completely drained before freezing weather occurs. Many motors have a drain plug on the lower unit. This should be removed as well as the vent and grease plugs. If the flywheel is rocked back and forth a few times and the motor turned from side to side, all water will be dispelled. Any water which has worked into the gear case also will usually drain. Water left in a motor can cause as much damage as can water freezing in the cooling system of a car.

Fresh grease in the gear case will insure all working parts in the lower unit being protected from corrosion. The new grease will also expel the last of any water which has collected there. Use the grade of grease recommended by the motor manufacturer.

A careful inspection of the clean motor will determine if any repairs are necessary. If such is the case it is important that it be taken to the motor service station now and not permitted to remain unrepaired during the winter. Dealers now have the time to make an estimate of what is required and then do the work in an unhurried manner.

If the motor does not require either overhaul or repair, the interior of the power head should be given a coat of oil to prevent corrosion. The fuel tank should be drained to eliminate the possibility of any gummy deposits forming in the fuel lines or carburetor. Use a little fresh fuel to rinse out the tank. If there is a fuel strainer at that point clean it.

Fuel lines can be disconnected and blown out to free them of any sediment. The carburetor bowl likewise will require draining and the fuel screen cleaned with air. Replace all parts, and use only a wrench on fuel line fittings. Pliers will badly mar the soft metal of the fuel system.

To protect the interior of the motor remove the spark plugs. Place about two tablespoons of good oil in each cylinder. Then ground the sparkplug wires on any part of the motor and turn the flywheel slowly several times. This will coat the piston and cylinder walls with the oil. Unless the sparkplugs are very new, it is a

waste of time to clean them. It will be much better to replace them in the spring. But put them back in the motor now to keep dampness out of the cylinders.

The final step is to wipe the entire motor with an oily cloth. Store it in an upright position and keep it from contact with a damp wall. Basement or garage are likely storage places.

New Shooting Pamphlet Out

Do you have a weak spot in your wing-shooting picture? Does a fast rising, left-quartering target give you exceptional difficulty, or is it that swift, low-right-angle flyer that gets away most often?

"It's dollars to doughnuts that, regardless of how well you ordinarily shoot, there is one or more particular shots which present an irksome problem at least periodically if not all the time," according to Henry P. Davis, Remington Arms Company.

"For a long time my jinx shot was a fast-climbing, right-quartering bird, and whether it had feathers on it or was a Blue Rock target I'd almost invariably shoot over and behind it," says Davis. "This particular target got to be a mental hazard and whenever it bobbed up I was licked before I got my gun up.

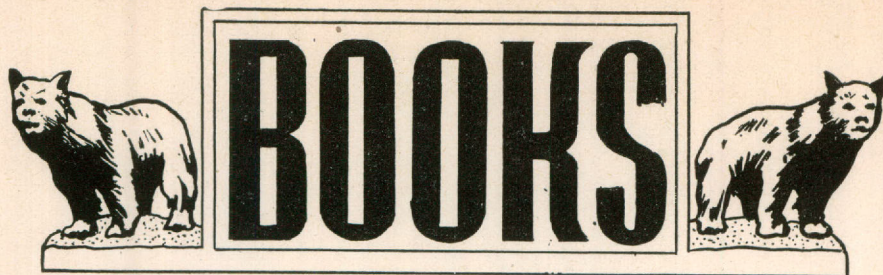
"One day I had eight splendid opportunities on ruffed grouse. As luck would have it, every bird took a twisting zoom to my right . . . and I never touched a feather all day! Two days later I had a friend throw me similar shots in the cover from a handtrap. They were not all exactly the same, but all were rising right-hand quarters. It took four boxes of shells before I licked that hoodoo but now I wouldn't mind if all my wing shots were that kind."

An illustrated pamphlet titled **HOW TO HAVE FUN WITH A REMINGTON HANDTRAP** has just been made available for free distribution by the Remington Arms Company, Bridgeport, Conn. Every type of game shot, from a bobbing rabbit to a high flying duck, can be simulated with the handtrap, and shooters can quickly get their "eyes in" by a bit of practice with "clay" targets under circumstances closely approximating natural conditions.

The pamphlet contains illustrated instructions on throwing various types of angle shots so that the gunner may get a preview of the varied chances he may encounter in a day's hunt.

The new handtrap shooting game, Scoot, is presented in detail. This new informal form of practice shooting may be played by two or more, shooting as teams of two or as individuals. It is not only fascinating fun but exceedingly valuable in correcting shooting errors and determining proper leads.

The pamphlet may be had free, by writing Henry P. Davis, Remington Arms Company, Bridgeport, Conn.



BOOKS

RUFFED GROUSE—by John Alden Knight. 271 xvi pages. Illustrated with 5 full-color reproductions of exquisite paintings by Dr. Edgar Burke, and 17 half-tones of superb photographs. Published by Alfred A. Knopf, 501 Madison Avenue, New York 22, New York. Price \$4.50.

Here is a practical, useful, and replete guide—the painstaking product of a veteran grouse hunter and student of nature. It contains a good mixture of personal experience and scientific material that has been nicely organized and written in a popular style. Mr. Knight, creator of the Solunar Tables, is a renowned outdoor writer and this is one of his better works. The text includes detailed information on the habits and characteristics of the bird and reveals that there really is no hidden secret to being a successful grouse hunter but that there are many lessons that should be learned.

The author has covered the entire field. His theories and opinions on things as diverse as grouse cycles, hunting equipment, hunting dogs, guns, and loads, will be challenged by many. Nevertheless, the book is refreshing and entertaining while being, at the same time, very sound and wholesome in its presentation of the management problems resulting from human invasion of grouse country as well as from the activities of poachers and game hogs. This is one of the celebrated Borzoi Books for sportsmen.

CONSERVATION IN ACTION—Illustrated with half-tones of photographs, maps, charts, and graphs, depicting pertinent parts of the text. Published at periodic intervals by the Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D.C. Single copies may be obtained from the Service, and the booklets are for sale by the Superintendent of Documents, Washington, D.C., at 15c per copy.

Only three editions of this new series have been issued to date: No. 1, "Chincoteague, A National Wildlife Refuge"; No. 2, "Parker River, A National Wildlife Refuge"; No. 3, "Federal Duck Stamps and Their Place in Waterfowl Conservation."

These attractive booklets tell the story of wildlife restoration and management in the United States today. Each issue deals with a particular project for safeguarding and increasing American wildlife. The conservation problem is defined and you learn what is being done to solve it.

The CONSERVATION IN ACTION booklets are intended for hunters and fishermen, nature study clubs, hikers and camera fans, boy and girl scouts, teachers

and students of conservation, workers in conservation projects. For those who have never had an opportunity to enjoy the living resources of our country, these booklets open the door to new experiences and are of special interest to wildfowlers. Every philatelist will want Number 3.

CROW SHOOTING—by Bert Popowski. 216 xi pages. Illustrated with half-tones of photographs and numerous "crowatures" by Gordon Elliott. Published by A. S. Barnes and Company, 67 West 44th Street, New York 18, New York. Price \$2.50.

Many sportsmen, particularly those who are not content to confine their shooting and days afield to the comparatively short open hunting seasons, already have found that the crow is a wise protagonist—an elusive quarry and a difficult target. As the human population and hunting pressure increases and as game stocks decline, especially in years of poor wildlife reproduction, more hunters will seek other prey, and here is detailed instruction on the art of crow shooting. This book was written by a prominent sports writer and is based on 25-years' association with the black birds.

No true sportsman would want to exterminate crows but there is a widespread desire that their numbers be lowered. If sportsmen would take to crow shooting on a larger scale they would have not only year round sport, but would lessen the pressure on more desirable species of game, and would reduce local demands for crow control. This guide actually betrays the crow. There are a dozen chapters on such subjects as crow habits, roosts, blinds, decoys, hunting with shotgun and rifle, and eight crow calls are set to music. Yes, one section tells how to organize a gun club project second to none.

FEDERAL AID IN WILDLIFE RESTORATION (Annual Report of the Pittman-Robertson Program for fiscal year ending June 30, 1947). 32 pages. Illustrated with half tones; 7 tables. Cover drawing by the internationally famous wildlife artist, Walter A. Weber. Published by the Wildlife Management Institute, 822 Investment Building, Washington 5, D. C., 1947. Paper cover. Single copies available free upon individual request.

This is the second annual report on the Federal Aid in Wildlife Restoration (Pittman-Robertson) work to be published. The first report made available by the Institute, covered financial operations, types of work performed, and a tabulation of the projects approved during the year ending June 30, 1946. This current recapitulation and

summarization extends through the fiscal year ending June 30, 1947.

The information, facts and figures contained in this report were furnished by the Federal Aid Division of the U. S. Fish and Wildlife Service. It is a concise report giving nothing more than the highlights of the Federal Aid program. The detail of accomplishments of interest to project workers, administrators, and others, as furnished by program participants in required reports, is abstracted and included in another publication entitled the PITTMAN-ROBERTSON QUARTERLY.

BASS BUG FISHING—by Joe Brooks. 69 x pages. Illustrated by the famous wildlife artist Walter A. Weber. Excellent "know-how" line diagrams. Published by the A. S. Barnes and Company, 67 West 44th Street, New York 18, New York, 1947. Price \$1.50.

Here is a concise, practical guide on the complete technique of fishing with bass bugs, and the methods of making them. This book was written between fishing trips by a well-known outdoor writer, Joe Brooks, who has a comparatively new art to explain and he does it in a few words. There are no false casts in the clear, simple descriptions of an artistry, which, as he says, "anyone can master."

The black bass undoubtedly is the most sought after fresh-water game fish in North America. Its habitat extends the length and breadth of the United States and into Canada and Mexico. It is pursued with all kinds of gear but the fly rod probably is the sportiest. "Bugging" is only a few decades old, and this volume furnishes detailed information and instructions on proper equipment, leaders, varieties and types of special bugs, and on skillful ways of presenting them to the fish in a "popping and teasing" fashion.

Wildlife Management

★ *Continued from page 11*
 may be, there is no escaping the fact that we must, as far as we can, produce more game and more fish in less suitable habitat and divide the take into smaller units to meet the constantly growing demand. If human populations cease to grow and hunting and fishing interests begin to decline, some of the troubles arising from these causes can be eased. Until that time the wildlife management program, even if it should double the total game and fish production of any given area, can provide only a modest average annual bag for those who like those forms of recreation.

Treat the Farmer Fair

★ *Continued from page 6*
 "Be a gentleman as well as a sportsman at all times.

"Practice these few suggestions and you won't have much trouble finding a good place to hunt next year. But remember that one single act of carelessness may close that territory to you, and others not so careless, too, for all time. As a group the farmer is our most generous citizen, but he can stand just so much abuse and no more. It is the duty of every sportsman to see that his hospitality is properly appreciated."

*Somebody is going to
sell a "helluva" lot of*

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