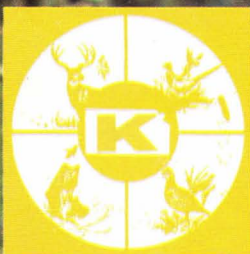


# KANSAS

## FISH & GAME



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JULY—AUGUST 1972



# KANSAS FISH & GAME



July-August, 1972

Vol. 29, No. 4

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Front cover—Deadly cottonmouth water moccasin. Ektachrome transparency by Vic McLeran.

Back cover—Delicious morel mushrooms. Kodachrome transparency by Vic McLeran.

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## Alice in Disneyland

"Alice in Disneyland," a feature article by Margaret Nichols in the May issue of *Field & Stream*, provides a total exposé of Alice Herrington's Friends of Animals group and the similar anti-hunting group known as Funds for Animals, headed by Cleveland Amory, TV critic.

These anti-hunting outfits, which have succeeded in making noises out of all proportion to their size and who are listened to in Washington circles with a credibility unjustified by their biological backgrounds—which according to the article are nil—Miss Nichols lays bare financially.

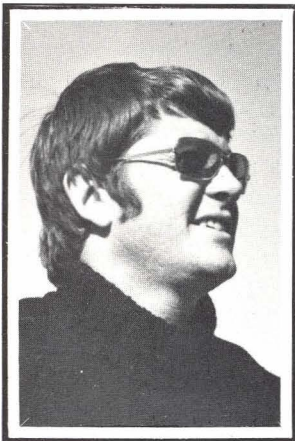
Miss Herrington's Friends of Animals, for example, collected \$468,166.00 in 1971 from contributions and other income, of which \$333,604.00 went for "charitable purposes"; \$97,315.00, for public information; and \$101,002.00, for administrative costs, including Miss Herrington's \$19,267.00 salary. *No contributions, it seems, went for conservation or wildlife management.* In fact, their \$330,000.00 allotment for "charitable purposes" is less than 1 per cent of what hunters make available for conservation each year through their license fees and taxes on their sporting equipment.

While the hunter-contributed funds go promptly to the states for conservation, the Herrington outlay, on the other hand, went to veterinarians to redeem spaying certificates. The prime purpose of Friends of Animals, it seems, is spaying cats.

Despite its remoteness to practical conservation, the Friends of Animals outfit somewhere finds the authority to label the National Wildlife Federation, the largest non-governmental conservation association in the world, a group of "Assassins." In fact, they also categorized in their "Assassins Unlimited" group the equally prestigious Wildlife Society, World Wildlife Fund, International Association of Game, Fish and Conservation Commissioners and others. So absurd is this accusation that professional conservationists, when confronted with it, don't know whether to laugh or cry. The threat is deadly serious, though some feel the most effective way to lessen the menace of the Herrington and Amory groups is via the laughter route.

BOB DELFAY,  
National Shooting Sports Foundation





"It makes a good story—this 'cottonmouth' thing—especially over a few beers! But in reality, most of our Kansas 'moccasins' are non-venomous water snakes."

Vic McLeran  
Editor

# The Moccasin Myth

Story and Photos  
by Vic McLeran

**I**T WAS AN OLD, ramshackle filling station-beer joint which had probably done a pretty good business before the Interstate was built. Now, in its cross-roads location on the old highway, it was dying. I'd stopped for gas and a little something wet to cut the August road dust when I overheard several old-timers talking about snakes in their area.

The speaker, a grizzled veteran in his seventies, was garbed in overalls, denim shirt and a slouch hat. His chair was propped against the building's outer wall and the lump in his lower cheek suggested a quid of Red Man.

"Yeah, I remember the day pore li'l Jimmy jumped in the swimmin' hole down there on Mud Crick," he said, in that authoritative, all-knowing tone a lot of old-timers use. "He come up outta' that water with snakes all over 'im. Dead 'fore he reached the bank. Had a hunnert an' seventy-three bites on 'im!" the old man exclaimed. "Boys from the County dynamited that hole

later and killed about a thousand snakes. Cottonmouth water moccasins—ever one of 'em!" he concluded.

I've heard that tale or one similar; in countless towns and villages across the country—even in areas where cottonmouth moccasins never existed in a natural state. It makes a good story but the fact remains, only one cottonmouth moccasin has been recorded in Kansas. That specimen was taken in 1937 by the late Dr. Henry Hall, former biology professor at Kansas State College of Pittsburg. Dr. Hall lifted the dripping reptile from one of the murky, back-water sloughs along the Neosho River in western Cherokee County.

The snake responsible for this little tale and many others like it was probably one of the natrix water snakes. It's not surprising really, since there is a great deal of confusion between this species and the cottonmouth moccasin. Ray Burkett, former KU graduate student who wrote his master's thesis on the natural history of the cottonmouth moccasin, noted,



For years, non-venomous natrix water snakes, like the one pictured here, have been mistakenly called "cottonmouths."





The true cottonmouth moccasin (above) is stubbier in appearance than the natrix (right). Also, markings on the natrix are more visible than those of the moccasin.



"Because of the general public's fear of snakes and their (the public's) reluctance to learn to discriminate between the poisonous and harmless species, numerous kinds of snakes seen in or near water have been called moccasins. The general appearance, pugnacious behavior, and whitish mouth of watersnakes (Natrix) have earned them a bad reputation. In fact, a great majority of the 'cottonmouths' reported in many areas are found to be water snakes."

Carl Kauffield, nationally-known herpetologist and author of several books on snakes, concurs saying, "The confusion of the various water snakes with the poisonous cottonmouth is almost universal . . . even where the cottonmouth is not found."

**Distributed statewide** with the exception of two or three counties in the southwestern corner of the state, the natrix, in one subspecies or another, is the snake you're most likely to encounter around water. Swampy or marshy areas, creek and riverbottoms, sloughs and weedy areas near lakes and ponds—all are favorite haunts of the natrix.

Hobart M. Smith, in his "Handbook

of Amphibians and Reptiles in Kansas," lists four species of water snake found in the state; the diamond-backed, yellow-bellied, Graham's and the common water snake. Of these, the common water snake is the most widely distributed in Kansas.

**Water snakes** are characterized by a gray, olive or brownish ground color patterned with irregular, dark cross-bands or blotches which vary with individual subspecies. The Graham's, however, has a yellow stripe down each side. The underside of a natrix will vary from pale white to light yellow. Adult natrix water snakes range in size from 18 to 48 inches with a record of 63 inches for the diamond-backed variety.

**The cottonmouth's coloration** is also olive or brownish above and pale beneath. Bands too, are occasionally visible. While the two species' coloration is often similar, the cottonmouth's shape is usually stouter. Due to variable coloration and markings, some

water snakes resemble the cottonmouth closely enough to be mistaken for the poisonous species. In the heavy foliage of a marsh, it often takes an expert to tell the two apart. And it's not inconceivable that an occasional cottonmouth could wander across the Oklahoma or Missouri line into extreme southeastern Kansas.

Writing of the lone cottonmouth found in Cherokee County, plus another specimen taken from the Spring River three-quarters of a mile across the Missouri line, Burkett notes, "Both of these specimens were taken after a flood, and no additional specimens have been taken in this area. However, sufficient habitat is probably available along the Neosho and Verdigris Rivers in the southeastern part of Kansas."

**Ray Ashton**, herpetologist and Director of Public Education for the Museum of Natural History at Lawrence, and Joseph T. Collins, the Museum's herpetologist and vertebrate



preparator, agree with this "available habitat" theory, saying, "The backwater sloughs along the Neosho River near Chetopa constitute as fine a cottonmouth habitat as we've ever seen." Both men are veteran snake hunters, having collected cottonmouths in Louisiana, Arkansas, Tennessee, Kentucky and Georgia.

**Burkett's earlier mention** of floodwaters is significant since the Spring River flows from Missouri through southeastern Kansas into Oklahoma. It would be possible for a cottonmouth riding driftwood in floodwaters to travel quite a distance from its original habitat.

Writing in Transactions of the Kansas Academy of Science, Dr. Hall, who found the only cottonmouth recorded in this state, penned the following observation regarding floodwaters and the possible existence of cottonmouths in Kansas: "These reports from localities near Kansas lead us to believe that more than one (cottonmouth) snake has probably been carried into the state by backwater, and that the species has become established within the boundaries of Kansas."

**In addition** to the specimen located just across the Missouri line, cottonmouths have been located to the south of us in Oklahoma. Burkett, in his research, found the northernmost record of a cottonmouth in Oklahoma was near Vinita—approximately 30 miles south of the Kansas line.

Due to the possible existence of an occasional transient cottonmouth in southeastern Kansas, reptile authorities caution outdoorsmen about handling snakes found near water in that part of the state.

**Although basically nocturnal**, water snakes have a habit of basking in the sun for short periods each day. They can be seen sunning on logs and rocks near or actually in the water. When disturbed, they usually drop off the log into the water and swim away. However, they have a nasty disposition and if cornered or handled, they'll bite viciously. Although non-venomous, natrix can hardly be classified as harmless since their strong jaws and needle-sharp teeth can inflict a nasty wound.

**Several years ago** I was bass fishing a small pond in north Mississippi when I spotted a large natrix swimming across a shallow neck of water. It was late afternoon and I was top-water fishing with a Heddon chugger. Casting the plug several inches beyond the swimming reptile, I gave a sharp yank and snagged the snake. As I retrieved line, the natrix went wild, thrashing about and striking the plug viciously. Once I had the snake at the water's edge, I eased line pressure and he swam away. Although made of hard plastic, the plug still bears marks from the reptile's teeth.

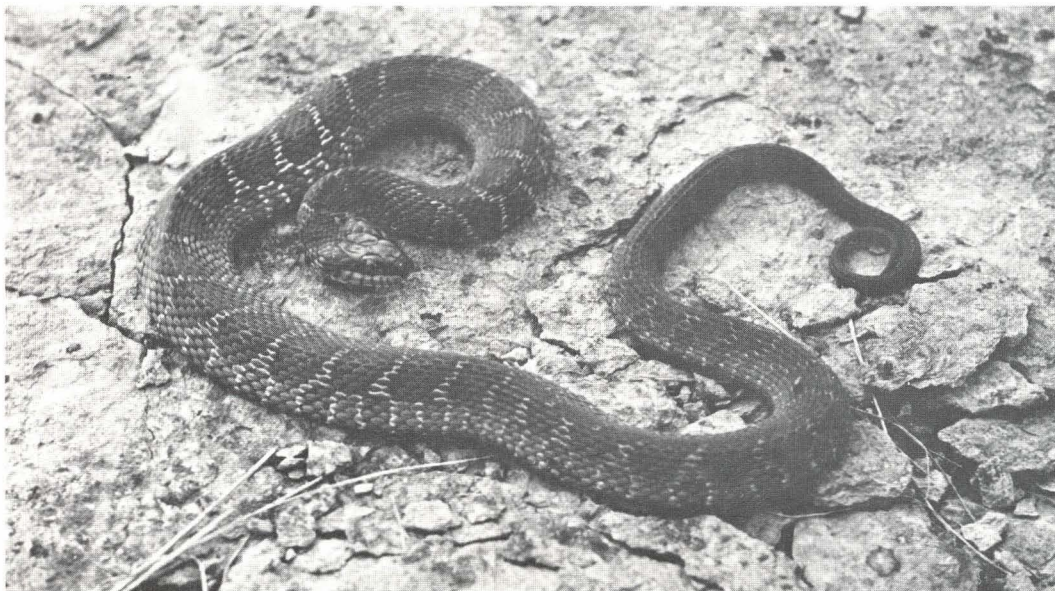
In addition to striking repeatedly when captured, natrix have the un-

pleasant habit of spraying their captors with a foul-smelling fluid which is exuded from the base of the tail.

**Water snakes mate** during April or May in Kansas. One spring while searching beneath rotten logs for salamanders to use as bass bait, I uncovered a pair of copulating natrix. Their bodies were entwined in perfect symmetry. Early in September the female gives birth to an average of 25 or 30 young natrix, although a brood of 99 is on record.

The young natrix, averaging seven or eight inches in length at birth, serve as food for a host of natural enemies. Large bullfrogs, king snakes, herons, owls, cranes, hawks, largemouth bass, snapping turtles and raccoons are common natural predators on the natrix.

**I once had** the opportunity of observing this predation by raccoons in a semi-natural state. Years ago, as a kid growing up in Coffeyville, I had a pet 'coon which would accompany me on fishing trips. Our destination was generally Sycamore Creek, a lazy little stream which meandered along the west edge of town. During drought years, especially in the summer, the stream usually contained only a few small, intermittent pockets of water. These small pools held a great many leopard frogs, turtles and small fish. As such, they were good places for a kid to pick up some bait. However, the 'coon and I weren't the only visitors. Invariably each pool held a natrix or



Natrix water snakes have a nasty disposition and if cornered or handled, will strike savagely.



two, evidently there to feed on the trapped fish. The little 'coon would wade into the shallow water, moving her dextrous forepaws this way and that, examining anything she could catch. As soon as she grabbed a natrix, the fight was on! Growling and squalling as she was bitten, the little 'coon would drag the reptile out of the water on to the bank where she would finish it off with her sharp teeth.

Carl Kauffield found that both cottonmouths and natrix haunted drought-shrunken water holes in the South. After the reptiles ate all the trapped fish life, the cottonmouths often dined on the water snakes!

**Upon reaching maturity,** water snakes themselves become effective hunters, preying on a multitude of small, streamside critters, including small fish, crawfish, young turtles, aquatic insects, small snakes, salamanders, tadpoles and frogs. Frogs especially, are favorite food items and on several occasions, I've observed water

snakes catching or swallowing the little amphibians. Invariably the frogs were squealing a distress cry similar to that of a rabbit in trouble, although lower-pitched.

**The water snake's** nocturnal habits plus its taste for frogs make it imperative that frog hunters look carefully before grabbing a "shined" frog. A nearby natrix might have its eye on the same frog. Then too, there's some indication that natrix are drawn to the lights since snake hunters in the South use lights to attract and capture these reptiles.

Authorities say water snakes can and often do, capture and swallow their prey underwater. There is no truth to the old tale about snakes being unable to bite underwater.


**Even though water snakes** catch a few fish, they certainly can't be regarded as serious fish predators. In fact, research has shown they actually improve fishing by culling sick and

weakened fish as well as rough fish. The value of natrix water snakes to anglers was revealed recently when a Michigan study showed that water snakes fed largely on miller's thumbs—small freshwater sculpins which eat trout eggs. In some cases, however, the water snake's fondness for fish has been its downfall. Natrix have been found dead as the result of being impaled on the sharp spines of catfish they have swallowed. Most studies point to carp, small suckers and shad as the fish most often taken by water snakes.

**A couple of southern fellows** I know like to tell about the water snake's fondness for shad and white lightnin' whisky. These two southern gentlemen, Waldo and Ival, were catfishin' one evening when they noticed a large natrix water snake on the bank. The snake had captured a fair-sized shad and was trying to swallow the fish.

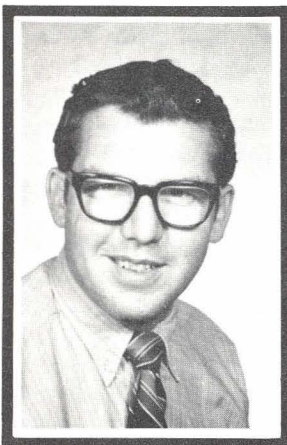
"Some cut shad-sides might get these catfish to biting," drawled Ival. Tying the boat to some brush on the bank, the pair cut a forked stick, pinned the reptile's head and relieved it of the shad. Since it was rather cool that evening, Ival allowed as how the snake might like a little drink to ward off the chill. While Waldo held the snake's head down, Ival uncorked a bottle of pure Tennessee corn and poured a couple good slugs down the reptile's throat. Waldo then flipped the snake back into the river. Baiting up with fresh shad sides the pair resumed fishing from the bank. As Waldo tells it: "We'd been fishin' for about ten minutes when Ival felt somethin' nudge him on the ankle. Lookin' down, he saw that big old snake—back again with another shad!"

**I can't vouch** for the truth of that little tale but it's probably just another myth regarding the natrix. Because of all the fear and misunderstanding which surrounds reptiles, it's no wonder the myths often become mixed up with the truth. Keep this in mind the next time you hear about someone killing a "cottonmouth" down at the local fishin' hole. Chances are, the reptile in question is that old perpetrator of the moccasin myth—a natrix water snake.



Contrary to common opinion, snakes can and do bite effectively under water. Cottonmouth venom is much more powerful than the copperhead's—more nearly comparable to that of the rattlesnake.





"As commercial production of channel catfish continues to grow, the species could become an important asset to the Kansas economy."

Farrell Brewer  
Staff Writer

# Catfish Experiments in Kansas

Story and Photos by Farrell Brewer

**F**OOD PRODUCTION technology may reach a new horizon if experimental projects using warm water discharges from power plants to raise catfish are successful.

In Kansas, a state noted for vast fields of wheat and production of beef, catfish could become the catalyst which will join food production technology into a mutually beneficial relationship with electrical power production.

Two experimental operations are under way in Kansas. One at the Kansas Power and Light plant near Hutchinson operated by Kansas State University and another at the Kansas Gas and Electric, Gordon Evans plant near Colwich.

**Russell Gross** operates the warm water fish farm at Kansas Gas and Electric's 540,000 kilowatt generating station. The facility has been in operation since June, 1971. Fish farming is not new to Gross as he has been connected with it for 14 years in southeastern Arkansas.

Gross said "I worked in the fish farming business many years using conventional methods. Some years when I fished my ponds out I found a

whole year's work was in vain, as the yield of fish wouldn't even meet the payroll. It was during these years I decided there must be a better and more profitable method to raise fish."

After years of experimenting in ways to mechanize fish farming operations Gross installed what he calls "the ultimate" fish farm near Colwich. "It is the only fish farm I know of that

With the aid of warm water and high protein food, fingerling catfish are raised to a weight of about one and one-half pounds in eight months at Grosstrol.





doesn't have nets and an abundance of manpower," Gross said.

**"Keeping the overhead down** is a must in fish farming," Gross said. "I have one full time employee and one on a part time basis."

From a first glance the farm appears to be a very simple operation. A closer examination reveals a highly sophisticated installation with motors, gears, wheels and push buttons.

The facility consists of a large pond which contains 5¼ million gallons of water and ranges in depth from 11 feet at the deepest part to five and one-half feet in the raceway. The pond is open, while most of the raceway is housed in a metal building.

Also housed in the building is the secret of the operation, starting with a water conditioning wheel and on down the raceway to the harvesting equipment and feeding tanks.

**KG&E is participating** in the project with the owners of Grosstrol because of its interest in finding a use for warm water discharged from electric generating plants. In some parts of the nation, warm water discharges have been called "thermal pollution," but on KG&E's system, cooling towers keep the heat out of public rivers, lakes and streams. It is water from these towers, discharged at temperatures ranging from 70 to 120 degrees depending on the season, that fill the fish facility operated by Gross.

The water is taken into the raceway ahead of a water conditioning wheel, that resembles a wheel of a stern-powered boat. This 10 foot high by five foot wide wheel helps to control the water temperature and circulates one million gallons of water per hour through the entire complex. There are a series of tanks located in the wheel which trap 15 cubic feet of air each and immerse the air in the water to obtain the needed oxygen saturation. The wheel forms a waterfall which drops the water from five to seven feet allowing for evaporation and cooling of the water.

**This water conditioning wheel,** Gross said, "allows us to accomplish what many biologists would call, 'over stock' the water. We have approximately one and one-half to two million fish in this pool." Gross stated that in

normal fish farm operations a pond such as the one used at the Colwich facility would only accommodate two thousand fish.

Fingerling catfish from four to six inches long are obtained from southeastern Arkansas and placed in the facility. Gross said he has been able to produce channel catfish that weigh from a pound and a quarter to a pound and one-half on the average in a period of eight months.

A specially developed high protein feed is utilized at the facility. It is intended to help the catfish convert their food into meat more quickly than they would in a natural food environment. At Grosstrol facilities the catfish will convert two pounds of feed into one pound of edible catfish meat. In comparison beef cattle require eight to ten pounds of feed to produce one pound of meat.

**The feeding takes place** in a series of three bays along the raceway which keeps large and small fish separated while eating. This is the only food available to the fish, therefore they must enter the raceway to eat.

Gross attributes the rapid growth of the fish to the warm water. He stated that warm water enhances the growth capabilities of fish. At a 60 degree water temperature fish will consume two percent of their body weight in food a day. For every five degree increase in temperature they will eat another one percent of their total body weight, according to Gross. This means when the temperature of the water is from 74 to 80 degrees fish will consume five percent of their weight which explains their rapid growth rate.

What does Gross plan to do with the fish when they reach a marketable size? He explained, "market them, naturally" but one of the planned marketing facilities will be unique.

**Gross is converting** a former grain storage facility into an indoor fishing arena. Fish raised at the Colwich farm will be transferred for processing or stocked in a "custom fish out" operation in southwest Wichita. The indoor lake measures 720 feet long and 150 feet wide and should be open for public fishing early in June. From fishing decks constructed above the two

and one-half acre indoor lake anglers will be able to ply their skills for fresh catches of catfish. Gross stated he is planning to have a minimum fee with a guaranteed catch of three pounds. "If they can't catch fish we will turn on our harvester and give them three pounds of fish."

The fish harvester is another outstanding piece of equipment developed by Gross. "It sure takes the work out of catching fish for market," Gross said. The harvester located in the raceway rotates a full 360 degrees and has sizing screens which allow fish too small for market to return to the water unharmed.

**The fish will be transported** from the Colwich farm to the public fishing area in another one of Gross's inventions. It resembles a small pond on wheels and incorporates a small water conditioning wheel to supply oxygen for the fish during transportation. This unit will also be used for bringing fingerlings from Arkansas.

The indoor lake will be patterned after the Grosstrol operation at Colwich. It will also utilize warm water for operation which will be obtained from another power generating station operated by KG&E.

Piping water from the power plant to the indoor lake was not an easy problem to solve, according to Gross. The water lines had to be placed under railroad tracks, a road and routed through a maze of industrial sites to reach the desired destination, he said.

**The six million gallon indoor lake** will also serve as a reservoir for the fire department in the Garvey Park area, Gross said.

When setting up his warm water catfish farm Gross also entered an experimental operation by placing bass, carp, bullhead, goldfish and shiner minnows in with the channel catfish. He said they seem to be very compatible and thinks the reason they do not become cannibalistic or prey on each other is because there is an adequate food supply available.

Gross stated that there is a definite need for fish in the United States as there are approximately 2¼ billion pounds of fish imported annually. He also stated that catfish are always in



demand because of their excellent food qualities.

**He feels that fish** raised in a controlled situation are better to eat because they have a controlled diet. He said fish in streams and lakes have to eat what is available.

The other warm water catfish experiment utilizes warm water discharged from the Kansas Power and Light Company's generating plant near Hutchinson.

This study is being conducted by J. F. Murphy, Assistant Professor, Department of Extension Agricultural Engineering and R. I. Lipper, Associate Professor, Department of Agricultural Engineering, Kansas State University.

Their research has found the channel catfish to be a warm water species. The catfish requires a temperature of at least 65 degrees for vigorous feeding. They state the optimum temperature is approximately 80 degrees. A growing season of 210 days with water temperature above 60 degrees is widely regarded as a requirement for profit-

able production. Kansas is on the northern edge of the commercial catfish production region. Extension of the growing season through environmental modification could make catfish production more attractive in Kansas and other parts of the Midwest.

**Lipper and Murphy** feel warm effluents from electric power generation are an obvious and attractive source of energy for environmental modification. They believe that fish will be grown on a commercial scale to market size in thermal waters from power production in the near future.

The study, in its third year, is taking place in a 40 by 60 foot pond lined with plastic and has an average depth of five feet. Four attempts have been made in three years to induce early spawning of channel catfish. Test results indicate it is technically feasible to spawn the fish at least two or three months in advance of normal spawning dates and thus get additional growth on the fish. Fry hatched from the early spawn can be grown in tanks with complete environment control

until they reach market size or until outdoor ponds are warm enough for stocking.

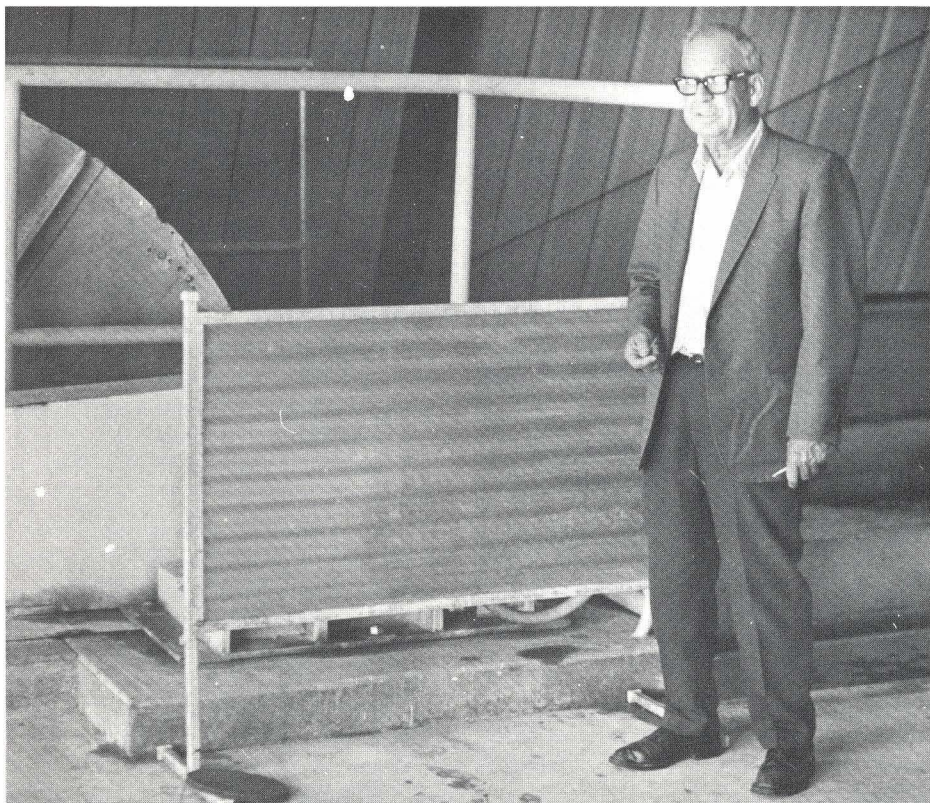
**In one of the early** attempts to induce early spawning, small and poorly developed egg masses were retrieved and hatched. They felt the disappointing results were attributable to malnutrition of the brood stock. Plans were initiated for future trials to hold water temperatures in the 70 to 75 degree range for three to four weeks of feeding before raising the temperature to 80 degrees to induce spawning.

**This was accomplished** in the 1971 attempt. The pond temperature was raised to 80 degrees at the rate of two degrees per day. Four pound brood stock consisting of 20 females and 10 males were placed in the pond and fed prior to raising the temperature. Spawning commenced nine days after the temperature reached 80 degrees. Eggs collected from the spawns were of average size and had good color. The eggs were hatched and an estimated 40,000 fry were returned to co-operating fish farmers, Bus Hartley and Vernon Krehbiel. Another 5,000 fry were given to Dr. Otto Tiemier of the Kansas State University Division of biology for experimental purposes. Approximately 3,000 were retained by the project leaders to conduct feeding tests and filtering systems to be used in commercial catfish operations.

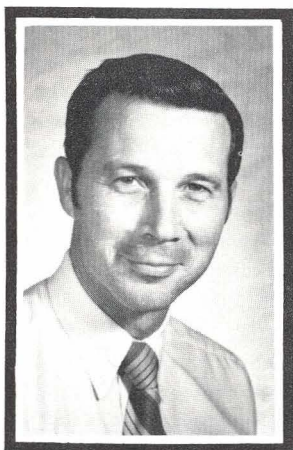
**The coordinators** of the project feel that although they have failed in their attempts to date to spawn fish as early as the first of March, that it is technically feasible. They have demonstrated that early hatched fish can be started in controlled environments on commercial feed with facilities that are relatively simple. They admit that no doubt many refinements can be made but believe that commercial producers could adopt their systems now on a pilot scale to gain experience in designing systems to meet particular needs.

As commercial production of channel catfish for marketing in food stores and for sport fishing continues to grow and with the efforts of Russell Gross's operation and the experiments of this group, catfish could become an important asset to the Kansas economy.

Russell Gross operates the warm water fish farm at Kansas Gas and Electric's generating station near Colwich.







"A channelized stream is an insult to nature. For conservationists, there is absolutely nothing commendable about channelization."

Ross Manes  
Staff Writer

## *The Straight and Narrow*

By Ross Manes

Photos by KEN STIEBEN

**A**SK A hundred outdoorsmen from across the country to describe their favorite river or creek and you'll get almost that many answers, but each stream will share some common elements. Each will have a tree-shaded pool, or an undercut bank where the current carries the bait in a certain way, and perhaps a fallen log or concealing rock where there always seems to be a big'un. Not a person will describe a watercourse with high, barren, steeply sloped banks, a smoothly rounded mud or sand bottom, and a trickle of water that moves at an even speed and even depth as far as the eye can see.

In the past, when a man was said to walk the "straight and narrow," it implied certain commendable characteristics. Today, however, when a man travels the straight and narrow it may once have been a tiny trout stream in Tennessee, or a meandering, snag-studded catfish creek that has been straightened and narrowed by channelization. For conservationists, there is absolutely nothing commendable about it.

A channelized stream is an insult to nature. It's like a site that has been prepared for construction. Scraped bare, gouged and crushed, waiting

nudely embarrassed for creativity that never comes. Instead of stately cottonwoods, elms, black walnuts, and hackberry, only smoldering piles of ashes remain. Instead of buckbrush, ragweed and native grasses, only the crumbling soil, beginning the steady erosion that typifies new channelization.

When accomplished without restraint and consideration for the wildlife resource, channelization amounts to total disaster for the aquatic life of a stream. During periods of heavy run-off the man-made channel carries away water so quickly and efficiently that the current scours and smooths the already ruined bottom, eliminating the last vestiges of spawning habitat for larger fishes. In dry weather, when runoff becomes nonexistent, the stream flow may be so low that water temperatures exceed tolerance levels for most game fish, and no deep pools remain to protect them. Mud from eroding banks clogs the stream, severely limiting populations of small aquatic organisms, destroying the delicate food chains required to maintain a fishery.

In Mississippi, a stream that contained five bass of about two pounds each prior to channelization was found to have only four bass with a total combined weight of less than one-quarter pound after treatment. A study conducted by the North Carolina Wildlife Resources Commission involving 23 channelized streams showed that 90 percent (by weight or numbers) of the game fish were lost. Even after 40 years no appreciable improvement has occurred. Similar studies in another state have indicated no more than a ten percent recovery 75 years after channelization. Only continuous, severe pollution over a long period of time can produce comparably detrimental effects on game fish populations.

Fish and fishermen aren't the only ones to suffer from channelization. Hunters, naturalists, photographers, game animals, and non-game animals are equally serious losers in the war on waterways.

In large areas of central and western Kansas, streamside vegetation provides the only suitable nesting sites for squirrels, hawks, owls and many songbirds. The success of attempts to establish the Rio Grande turkey in arid southwestern Kansas depends largely on streamside habitat. In areas where the land is intensively farmed, and that includes most of the state, Bob-



white quail, pheasant, and cottontail rabbits find some of the best nesting and escape cover along undisturbed creeks.

While it is true that channelization and the removal of trees and brush are followed by seeding the area, replacement species of vegetation are usually poorly suited for wildlife habitat. In fact, because the new grasses are selected more for their compatibility with rapid water transport, the area frequently has only slightly more appeal for wildlife than a paved parking lot.

Many of the channelization projects being implemented in states other than Kansas are under the authority of the U. S. Bureau of Reclamation. Numerous large areas of prime wildlife habitat have been, and will be destroyed for the expressed purpose of conserving or improving water, or to increase the amount of tillable farmland by draining wetlands. Both purposes appear to be worthwhile goals until you consider that while destroying fish and wildlife habitat, at the taxpayer's expense, the projects are designed to increase farmable land to grow crops that are already considered to be in surplus.

Kansas has not escaped the blight of channelization. The U. S. Army Corps of Engineers, with congressional authorization, has taken dead aim at Big Creek, Wet Walnut Creek and Gypsum Creek. Corps flood control projects have already left their indelible mark on some Kansas streams, such as Mud Creek. The small, northeastern Kansas stream has been partially channelized, and additional work has been delayed only because of a last ditch stand by conservationists. In the same part of the state, Stranger Creek was stripped bare of cover for 50 feet on both sides of a 50 mile stretch. The Kansas Forestry, Fish and Game Commission strongly objected to the Stranger Creek project to no avail. Instead, the Corps suggested mitigation.

**Boiled down**, mitigation means to lessen the severity of a project, usually by reducing the amount of habitat destruction originally planned. Wildlife conservationists have found it dif-

ficult to understand how mitigation of this type helps wildlife in the remaining affected area.

The Soil Conservation Service, under the U. S. Department of Agriculture, also initiates channelization projects. While Corps of Engineers projects are intended to protect life and property, S. C. S. projects are designed primarily to protect the soil.

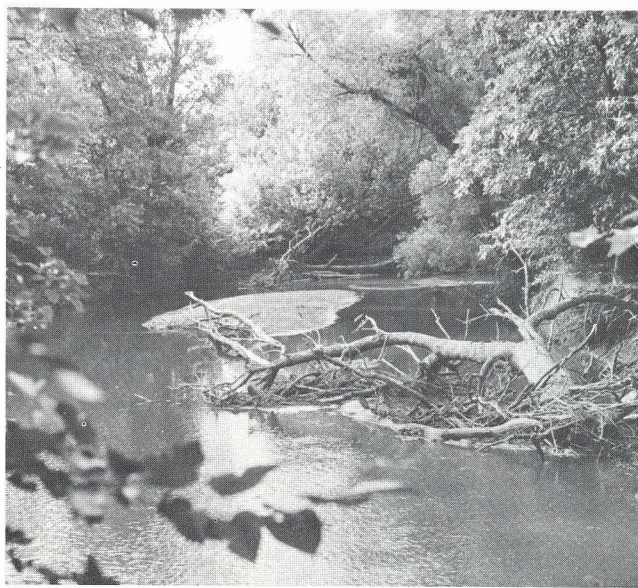
Most channelization work conducted by the Soil Conservation Service is made up of relatively small projects, compared to those of the other two federal agencies. This does not necessarily mean that the projects have any less impact on wildlife since they frequently involve many small drainages totalling an enormous amount of habitat when combined. Currently in Kansas projects are planned, underway, or completed on several small watersheds including Bee Creek, Twin Caney, Walnut Creek, Big Sugar Creek and the Vermillion River.

The S. C. S. following newly established federal guidelines and regulations, has begun to show an encouraging inclination to consider the wildlife resource on projects being undertaken in Kansas. Mitigation has taken on a new, if somewhat limited meaning. Hopefully, other agencies will follow

suit, and eventually all will recognize that other methods and new priorities must be found which will permit man to live in harmony with his wild environment.

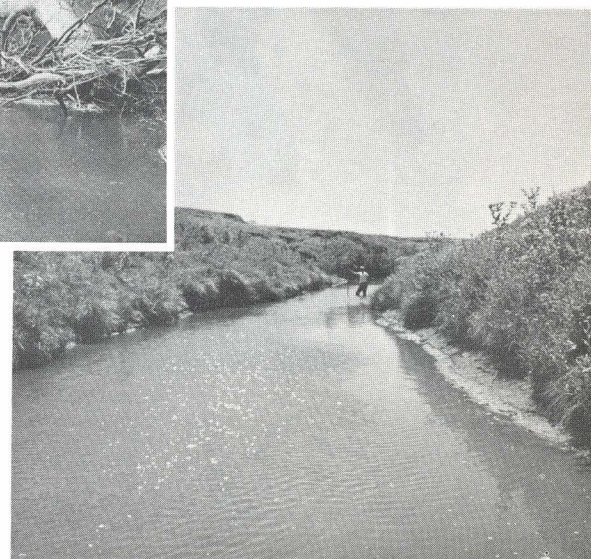
**Federal agencies** are not alone in their involvement with channelization. State highway departments frequently play a major role in reducing wildlife habitat. In Kansas the Highway Department is one of the larger contributors to habitat loss. Each time a road or highway crosses a stream, a bridge must be constructed; and each time a bridge is constructed, a small portion of the stream is channelized to protect the structure. When a highway parallels a stream, close to the bank, channelization is often used to protect the roadway from being undercut. When considered alone, each of these projects is insignificant, but the cumulative effect is devastating.

**There are bright spots** in the channelization picture. Each day brings an increasing public awareness of the environment, forcing more responsiveness from the government agencies. But the war of the waterways is far from won. Conservationists must remain constantly alert to the threat of channelization, or one day find themselves up the straight and narrow creek without a paddle.



Tree-shaded pools, an undercut bank, a fallen log—all are typical of the free, unchannelized stream.

Scraped bare of brush, channelized streams leave little in the way of fish and wildlife habitat.



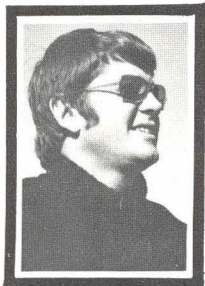


The Plastic Worm—Today's Super Lure—is One of the Hottest Bass Baits Around. Here Are a Few Items Which Can Make it Even More Effective!

# WORMS 'N' THINGS

Story and Photos by Vic McLeran

**R**EMEMBER the first few plastic worms that hit the market? They were marketed in only four or five colors, and came equipped with two or three pre-rigged hooks, a couple of red beads and a propellor-type spinner on the front. And most of 'em left quite a bit to be desired in terms of flexibility!



McLeran

When fishing one of these rigs you'd cast out, let the worm sink and start your retrieve. More often than not, your net result was moss, a gob of aquatic weeds or an irretrievable snag where the lure was lost for good.

Flitail, Mann's Yum-Yum, Lindy's, Creme or Burke—regardless of your preference, the plastic worm is a fantastic bass bait.

Well, today's plastic worms are quite an improvement over their predecessors. The present-day wigglers come in more than 40 different colors, many with special fish attracting flavors and they're extremely flexible.

In addition to all these improvements, modern bass anglers have come up with a number of "things" which they feel make the plastic worm even more productive in filling a stringer with bass.

Let's take a look at some of these "accessories" which can enhance the phony worms' appeal and effectiveness.

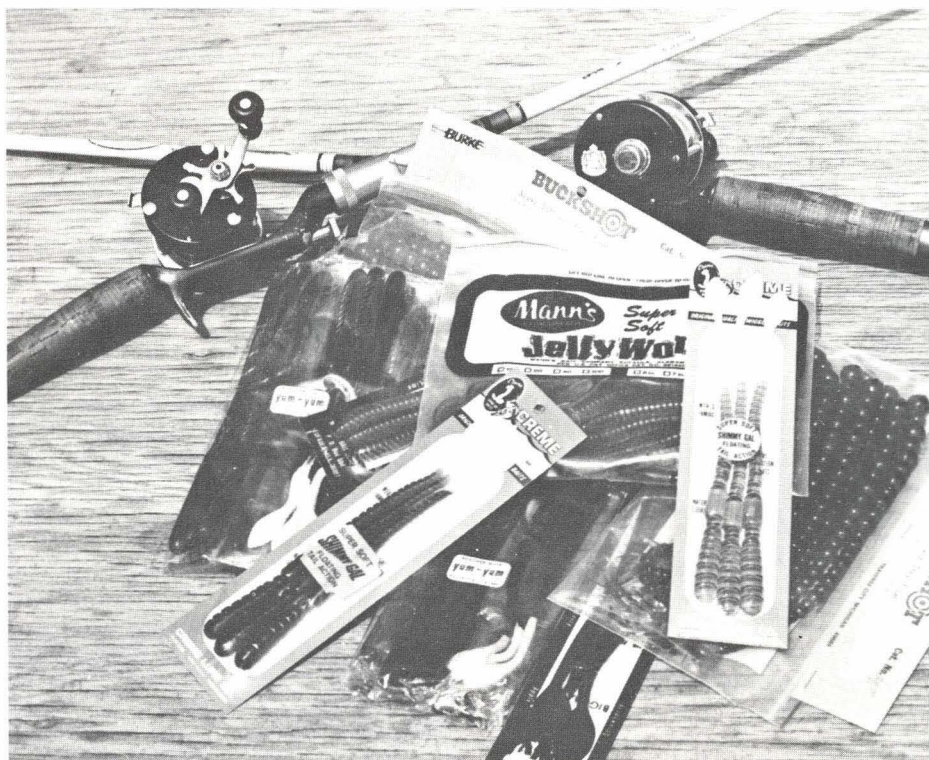
## HOOKS

During the plastic worm's early history, the lure came equipped with

several exposed hooks. Later, worm manufacturers began attaching weedless hooks in an attempt to reduce the lure's constantly hanging up on underwater debris. As time went on, manufacturers began marketing worms without hooks. This allowed the angler to rig his own lure. At first, many fishermen were using the weedless hooks. Later, however, bass men in the South started inserting plain hooks in the worm's body making the rig weedless. This was a forerunner of the so-called "Texas" rig which is probably the most popular method of rigging the plastic worm today. The "Texas" rig employs a slip-sinker in the  $\frac{1}{4}$  to  $\frac{1}{2}$  ounce class, a 4/0 or 5/0 single hook and a plastic worm.

After the line is set up on the rod, it is threaded through the small end of a cone-shaped slip sinker and tied to the eye of a worm hook with an improved clinch knot. The point of the hook is then run straight down through the head of the worm about one-half inch and back out the side. The worm is then shoved up the shank of the hook until the hook's eye is embedded in the center of the worm's head about one-half inch from the front end. The point of the hook is then embedded in the worm to make the rig weedless. A toothpick is shoved through the worm and the eye of the hook. It's shoved hard enough to wedge it in the eye of the hook. This helps hold the worm in place on the hook. The protruding ends of the toothpick are clipped off with nail clippers.

When anglers rigged their worms in this manner with conventional hooks, there was always a slight but unnatural bend in the worm's body. This caused the lure to revolve when retrieved and as a result, line twist was common. Hook manufacturers







Spinners, spoons and jigs are traditional baits which work well when paired with plastic worms.

soon took the cue and began producing offset-shank hooks. When the phony wigglers are rigged with a hook of this type, the point is in direct line of pull with the line and the worm will retrieve straight without causing line twist.

### SINKERS

When the first plastic worms hit the market, they were usually fished without weight of any sort. Later, bass men started clamping split shot a few inches ahead of the worm. Even today, some bass fishermen use a couple split shot ahead of the lure when fishing with light line and open-faced spinning reels. They claim this ultra-light rig is advantageous when fishing gin-clear water where bass are spooked by heavier lines and larger lures.

For the most part, slip-sinkers are the favorite form of lead used with the plastic work today. Ranging in size from  $\frac{1}{8}$  to  $\frac{1}{2}$  ounces, these sinkers serve several purposes. First, they get the worm down to the bottom where bass are often located. Secondly, since the monofilament is free to run through

Here are a few of the "things" which can make the plastic worm even more effective.



the slip-sinker, the bass can take the worm in its mouth without the added weight of the lead.

Then too, after a bass is hooked and the fight is on, the slip-sinker often slides up the line a foot or so. This means the fish can't use the weight of the lead to help throw the hook.

### SLIP SPOON

A variation of this sliding sinker theory was introduced recently in *Field & Stream* magazine. Using a slip-spoon in place of a sinker, the angler is able to combine the flashy appeal of a spoon with the fish-catching ability of the plastic worm. At

the same time, he retains the characteristics of the sliding sinker. This lure consists of a plastic worm rigged weedless with a bass hook and a spoon bent in a shallow U-shape. The spoon, a shoe-horn variety with a small hole drilled in each end, is threaded slip-sinker fashion onto the line directly in front of the worm. In this manner, the spoon is free to flutter and flash as the worm is worked along the bottom.

### TOOTHPICKS

How many times have you had a plastic worm ripped and twisted down around the bend of your hook after a



tussle with a bass? It's happened to most of us who fish the worms. One of the little round toothpicks can take care of this problem. Earlier, when describing the method of rigging a worm "Texas" style, we mentioned the use of a toothpick shoved through the worm and into the eye of the hook. Fashioned in this manner, the worm is "locked" to the hook and generally takes a great deal of punishment before pulling free. Some anglers use a thin piece of wire to achieve the same effect.

The humble toothpick has another use. Some fishermen prefer to slide the sinker a foot or so up the line and let the worm trail behind. They keep the sinker in one place on the line by shoving one of the 'picks into the hole on the front end of the sinker. This wedges the sinker against the line and holds the lead securely in place.

#### ANISE OIL

Recent fisheries research seems to indicate human scent alarms bass, especially when it's on lures. Since wearing rubber gloves while fishing is kind of a hassle, thinking bass anglers decided to disguise the human odor by soaking their plastic worms in anise oil. They claim the anise (licorice) odor not only hides traces of human perspiration, insect repellant and gasoline but that it's actually appealing to largemouth bass. Some bass men prefer to soak toothpicks, rather than worms, in the substance. They say the 'picks absorb enough anise to disguise human odor when they are used later in the worm rig.

**The plastic worm did it again! Author (right) admires a four-pound largemouth which fell to a jig 'n' worm combination.**

#### SPINNERS

Some fishermen use a No. 2 or No. 4 spinner in front of a seven-inch plastic worm and a 3/0 or 4/0 single hook with the snap-type weed guard. No lead is added when fishing shallow water since the added weight causes the rig to snag and hang up. Anglers using this rig claim it's ideal for cast-

ing with light lines and an open-faced spinning reel. A variation is the addition of a plastic worm to a skirted, spinnerbait. The attention-getting qualities of the spinnerbait coupled with the soft appeal of the plastic worm make this combination deadly at times.

Dennis Pope, Haysville attorney and one of the state's finest bass fishermen, is a firm believer in the effectiveness of the spinnerbait-plastic worm duo. "I've reached a point where I use plastic worms on my spinner baits more than I use pork," he said.

#### JIGS AND SPOONS

The jig and eel has become a "must have" item in the tackle boxes of serious bass fishermen. But even though bass anglers have traditionally paired pork rind with jigs, the extremely flexible nature of today's plastic worms makes them work about as well as pork. This is especially true during the summer months when water temperatures are warm.

The spoon is another lure which has normally been used in conjunction with pork rind. But today's phony wigglers work as well on a spoon as they do on a jig. Dennis Pope, who

knows that one secret to catching lunker bass is getting the lure down in good bass cover, claims a Johnson spoon-pork rind combo is great for fishing moss and heavy weed beds.

Joel Packard, Mulvane, another excellent Kansas bass man, often uses a sort of "simulated" jig when fishing the plastic worm. Unlike some anglers, Packard uses a weedless hook when fishing the worm slip-sinker fashion. "When fishing the slip-sinker rig, I take a Hawaiian Wiggler skirt and slip it over the exposed eye of the weedless hook in a reversed manner," he said. "With the skirt reversed, the strands start forward and then flow back along the worm in a tantalizing manner. It's been real effective for me around here, especially during mid-summer."

Looking back at the plastic worms of the late '50's and early '60's we can see quite an improvement in today's product. Improvement not only in the worms' construction but in the method of fishing them. And some of the "things" we've covered here are partly responsible for the lure's improved effectiveness. Keep 'em in mind when you rig up for that next worm fishin' trip!





# HISTORY OF FIREARMS

By Jim Keefe

Reprinted from the Missouri Conservationist



**I**N HIS mind-stretching book *African Genesis* author Robert Ardrey proposed that the designation "man the tool-maker" more properly should be "man the weapons-maker." For, while tools distinguish man from the lower animals, weapons also are a unique human attribute. Along with the earliest tools made of flaked rock, archeologists have found obvious weapons in the form of clubs.

Thus, through the ages, man's weaponry has developed right along with his other implements and the history of firearms is as fascinating a story as the development of the tools of agriculture.

As in the case with most inventions, origins are usually obscure. Quite often an idea is conceived long before it comes into practical use. For example, breechloading cannons were known as early as 1400 A.D., though the first really practical breech-loading system did not occur until about 1776 and was not in widespread use until much later.

Following is a chronology of events leading up to modern firearms. There were numerous side excursions and overlapping, and only rarely does the real inventor get the credit that is due him.

1250 ca. Roger Bacon wrote of gun powder he had made. Although the Chinese are usually credited with the invention of gun powder and Marco Polo with its introduction into Europe, Polo was born about the time Bacon was noting his experiments with the stuff. Possibly Bacon got his ideas from old manuscripts of the Arabs. It will probably never be known with certainty who invented gun powder but Bacon is our first written clue.

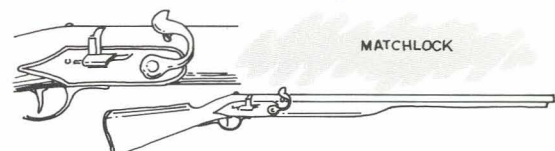
1300 + "Guns" already in use. One legend attributed their first use to hurl a projectile to one Black Berthold about the year 1355.

1326 A manuscript of an order for cannon at Florence, Italy. They apparently looked like vases or bottles and were fired through a touch hole with a hot wire. Projectile was of iron and arrow-like in appearance. Balls of stone were soon known, though.

Aug. 26, 1346 Battle of Crecy in which cannons were used. Probably first documented use in warfare.

1350 ca. Hand guns in use. Simple iron or brass tubes fired by hot wires through a touch hole.

1374 ca. Wooden poles added because heating of the tubes made handling uncomfortable.





1400 *ca.* Invention of the "match" followed by the "serpentine" which held the punk or match.

1475 *ca.* Matchlock invented. Now had lock, stock and barrel and readily recognizable as a gun. The matchlock consisted of an arm (also called "serpentine") which held a glowing "match." When depressed by a trigger mechanism, it touched the hole at the breech, igniting the powder. The matchlock was the first firearm brought to the New World. This was the arm that confounded the Indians in the early encounters between explorers and aborigines.

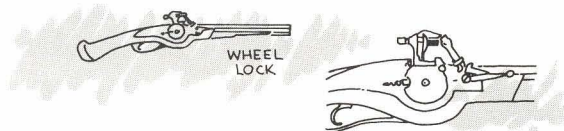


1500 *ca.* Rifling of barrels in some use.

1550 "Cornd" powder discovered. This was the first major improvement in gun powders making for more consistent operation. Previously powder was merely mixed dry—saltpeter, charcoal and sulphur—which was dangerous to handle, often not homogenous, and absorbed moisture and formed lumps, some of which did not explode. "Corning" or granulation of powder was done by wetting the mixture and forcing it through screens to produce hard little grains which burned quickly and cleanly. This was black powder's fullest development, essentially the same process used today.

1600 *ca.* Lead ball in almost universal use.

1508 *ca.* Wheel locks invented (and were in use until at least 1829!). This freed one hand, making it possible to aim a weapon more precisely and made invention of pistols or hand guns possible. Also made



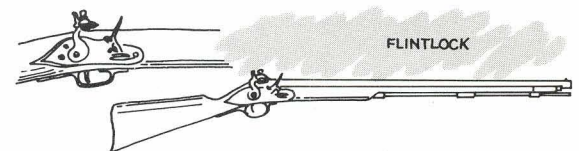
invention of booby traps possible. The match lock was the first type of firearms used in America, but the wheel lock soon supplanted it. The wheel lock worked on the same principle as our cigaret lighters—a serrated wheel spinning against an iron pyrite "flint" throwing a shower of sparks. These were di-

rected into a pan of powder, which in turn ignited the powder in the barrel. It required a key or spinner to wind the spring which turned the wheel and was an unusually sophisticated mechanism for the time.

1510 *ca.* Cartridges of a type were in use, instead of loading with loose components. The wheel locks were losing favor because they were expensive to make, temperamental in operation and subject to malfunction. A lost key or spanner was a real tragedy.

pre-1550 Snaphaunce lock invented (and was in some use until about 1885!). "schnapphahn" = "pecking rooster." The snaphaunce was a primitive flintlock with a fixed steel that was struck by the cock, which held the flint. It had a separate cover for the pan which held the ignition or priming powder. The pan cover had to be manually pushed back or actuated by a push rod before the gun could be fired.

pre-1550 Miquelet lock invented. Steel and pan cover the same. The mainspring was outside the lock and held and released the cock. Uniting the striking steel and pan cover enabled the flint to rock back the steel-pan cover exposing the powder in the pan.



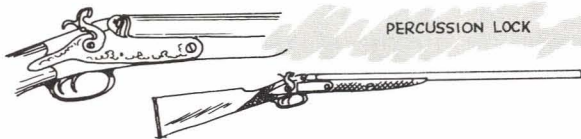
1600 *ca.* The patched ball was known. The significance of the patched ball is that it permitted use of rifling without deforming the ball while driving it down the barrel. Previously, bullets were driven down the barrel and deformed to fit them into the rifling. Now the patch gripped the rifling, imparting the stabilizing spin to the ball.

1610 *ca.* The flintlock invented, probably by Marin le Bourgeois of Lixieux, Normandy, France. The flintlock enjoyed a longer use than any other type of ignition, some 200 years. The true flintlock differed from the snaphaunce by having a pan cover and striking steel in one piece that rocked back on being struck by the cock, similar to the miquelet lock. It differed from the miquelet in having a tumbler and main spring inside, which actuated the cock.

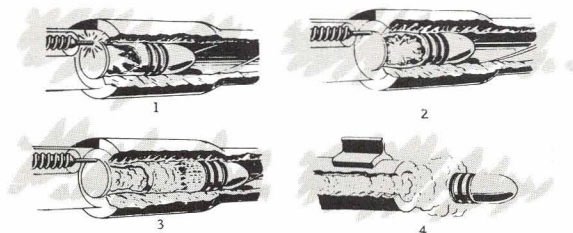


From this period until shortly after our Revolutionary War, only minor improvements on existing firearms were made. About 1750 the Pennsylvania-Kentucky rifle came into being.

- 1807 Alexander Forsyth invents fulminate priming.
- 1818 *ca.* Prelat patented a percussion cap of copper. Others had experimented with various types of caps previously.
- 1825 Derringer switches from flintlocks to percussion system.
- 1836 *ca.* Cylindrical-conical bullet with a hollow base devised by Captain Delvigne, improved by C. E. Minie and J. H. Burton. This permitted faster loading of muzzle loading guns, since the hollow base expanded on firing to grip the rifling, doing away with necessity for patching the bullet.
- 1803 U. S. Army adopted the rifled musket.
- 1841 U. S. Army adopted the percussion cap, although sportsmen had been using them for nearly 20 years.
- 1862 Telescopic sights in use.

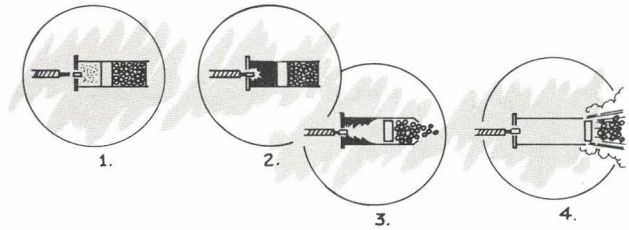


- 1776 British Army officer James Ferguson invented a practical breech-loading flint-lock rifle, but not until
- 1819 was John Hall's breech-loading rifle adopted by the U. S. Army, though he patented his rifle in 1811!
- 1812 J. S. Pauley invented a breech-loading arm using metallic cartridges. Note this is before the invention of the percussion cap, but attracted little attention.
- 1837 *ca.* Johann N. von Dreyse invents the "needle" gun, a breech-loading cartridge weapon fired by a firing pin.
- 1848 Sharps patented a cartridge for breech loaders. About the same time LeFaucheux invented the pinfire cartridge, which is basically the modern firing system.
- 1858 Rimfire cartridges were brought out by Horace Smith and Dan B. Wesson.



- 1852 *ca.* Center-fire cartridges known, and were perfected in
- 1886 by Berdan. There have been only slight changes in cartridges since.

Note that all these improvements are prior to our Civil War (1861-65), although that war was fought almost entirely with muzzle-loading weapons.



- by 1870 Breech-loading systems were in widespread use and muzzle-loading systems were obsolete. By or close to 1870 all our present systems of operation were known—bolt action, trap door, rolling block, drop block and tip-down.

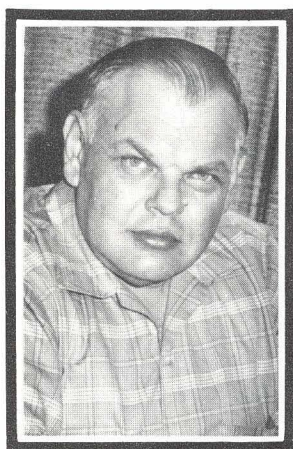
While attempts to devise repeaters had been known since the earliest times, development of the metallic cartridge made possible practical repeating arms.

- 1830-35 Sam Colt perfects the first practical revolver, patented 1835-36.
- 1857 Smith and Wesson adapted the revolver to metallic cartridges.
- 1858 *ca.* B. J. Henry perfects the repeating rifle which was first marketed in 1866.



Despite all the advertising ballyhoo, no basic changes have been made in firearms since about 1870, only improvements and refinements.





"The use of computers in assembling waterfowl information should accelerate the process of setting basic duck season lengths and limits."

George Valyer  
Staff Writer

# Computerized Ducks

By George Valyer

**I**F YOU ARE an average hunter, at one time or another you have probably concentrated some of your efforts on waterfowl. If you are a confirmed duck or goose hunter, you probably hunt waterfowl year after year regardless of their relative scarcity or abundance.

Regardless of whether you hunt occasionally or regularly, you probably haven't heard about the latest system for determining the total waterfowl populations and thus establishing the basic seasons. The reason you haven't heard about it is that it's brand new this year.

For the first time in the history of waterfowl management, computers will be used extensively by technicians in checking populations of ducks and applying this information to the setting of the basic season length and limits. This may not be so innovative as it sounds but it will speed up the process of gathering and interpreting the vast amount of information it takes to adequately understand the population trends of ducks. And, after all, it is the annual surplus that determines how many of the continent's waterfowl that may be safely harvested in the regular season.

Actually, the computer won't result in any simplified manner of determining how many mallards are nesting in Manitoba or the brood size of pintails

in Saskatchewan. It still takes manpower to fly airplanes, count ducks and census water areas. But the computer will hasten the vast assimilation of all available information into a framework which will allow the maximum harvest by the hunter while still protecting the breeding stock.

Let's take a chronological trip and travel to the various meetings and activities concerning the setting of a duck season.

Planning for each year's waterfowl seasons begins early in the year, in fact as soon as the preceding year's seasons have ended. In January, the first of many surveys begins with the annual winter population survey of ducks on the wintering grounds.

Aerial flights are made over the major water areas containing wintering ducks and observers estimate the numbers seen from the planes. It is remarkable how close these trained observers can come in counting actual numbers of ducks during these flights. Ground checks and the examination of aerial photos reveal that persons experienced in counting waterfowl by this method are able to determine duck numbers with only a small margin of error.

Independent ground counts are also made on many large bodies of water and the totals from this method are

added to the aerial surveys. Many ducks are missed in this count since only the major water areas are censused and dispersal into the smaller bodies of water is common in the southern coastal areas and rice fields of Arkansas, Texas and Louisiana at that time of year.

With the advent of spring migration, ducks begin the trek northward to the nesting areas of Canada and northern United States and it is in these areas that the major censusing activity is conducted. By the time May arrives, most of the continent's waterfowl are gathered on the lake and pothole regions of Alberta, Saskatchewan, Manitoba and the other provinces of the "land of the maple leaf." By far the majority of the North American ducks and geese have their beginning in Canada. Only a small percentage are hatched as far south as the prairie areas of the Dakotas, Minnesota and Montana. Since waterfowl recognize no geographical borders, it can easily be understood why cooperation between the Canadian Wildlife Service and the U. S. Bureau of Sport Fisheries and Wildlife is so important.

Biologists from each of these agencies are joined by similar technicians from the various states and, together, they form teams to check on the number of nesting ducks. Once again the



airplane is pressed into service as the pilot and a trained observer make slow flights over the pothole marsh areas of the Prairie Provinces to determine the numbers of breeding pairs. The routes of flight and the areas of enumeration are carefully planned in advance since a ground team follows the flight transect to provide an additional check on the aerial counts.

The next censusing effort is one to determine the extent and condition of the water areas suitable for duck habitat. This is also done from the air following a pre-arranged route so that a comparison may be made from one year to the next.

**These water areas** or potholes are an essential part of the duck's habitat. If they are non-existent at the beginning of the nesting season, then nesting efforts will not be forthcoming on the part of the ducks. The majority of the waterfowl will concentrate on larger water areas where nesting habitat is less desirable and competition for the available nest sites is quite keen.

Snow melt is the major source of pothole water but, when snowfall is below normal, potholes may not fill in the spring or they may dry up before young ducks get their flight feathers and be able to leave. When such conditions occur, there probably will be fewer ducks winding their way south in the fall migration.

**Goose populations** seem to suffer less because their nesting areas are usually farther north where water fluctuations seem to be less pronounced. Duck areas seem to be more often affected by reduced water availabilities.

Meanwhile, back at the computer, vast amounts of information collected by the field men conducting these waterfowl studies are assembled, transformed into tape and stored in the memory banks for immediate retrieval. Each little bit of information has its relative value in the overall waterfowl picture and each bit of knowledge about the duck habitat, breeding population and regulations is being evaluated by the computer so that immediate information can be obtained for distribution to interested agencies and organizations.

**What are these agencies and organizations?** Well, basically, they are organizations from each of the four waterfowl flyways of the United States. These groups, called Flyway Councils, are composed of the directors of the wildlife departments of each of the states of the individual flyways. As an example, the director of the Kansas Forestry, Fish and Game Commission is a member of the Central Flyway Council while the Director of the Missouri Conservation Commission is a member of the Mississippi Flyway Council. The various Flyway Councils select members of their groups to compose the National Waterfowl Council which makes recommendations to the Bureau of Sport Fisheries and Wildlife regarding the overall management of the waterfowl resources.

Each Flyway Council also has a technical committee composed of the waterfowl project leaders of the flyway states. These biologists act in an advisory capacity to the Flyway Council in matters concerning local state programs and how they affect the overall flyway management programs.

**Although the major** responsibility for management of migratory game in the United States rests with the Bureau of Sport Fisheries and Wildlife, cooperation of the wildlife agencies of the states is vitally important in the total management program. In order to effectively contribute to the program, it is essential that up-to-date information be available and this is where the computer system will be of assistance. The more information available quickly to the technicians in the various states, the better prepared they are to make a worthwhile contribution to the overall management program. The same goes for the Flyway Councils.

Because of space limitations, it is not possible to enumerate every step which transpires between the first survey in January and the last in mid-summer. However, the climax of the activities occurs in August with the meeting of the Waterfowl Advisory Committee in Washington, D. C. This committee has been fully appraised of

all reports and suggestions from the field staff and the Flyway Councils and then it must make a decision on the basic waterfowl seasons for the four flyways.

**The framework** of allowable dates is established, the length of the season and its alternative bag limits is prescribed and this information is passed along to each state wildlife department for their own selection of that state's waterfowl season.

It may seem a complicated and drawn out process to the hunter who is interested only in when he can hunt ducks and how many he can take but, fortunately, the dedicated waterfowl hunter is concerned enough about the future of waterfowl hunting to support an extensive management program of this nature. Just knowing that there will be another season when he can crouch in a blind and listen to the whistling wings of a flight of ducks as they wheel across his decoys seems to most hunters adequate reason for all the activities leading up to it.

The business of managing the waterfowl resources of a continent is a big job involving hundreds of people and thousands of hours of work—some of it the bone-tiring labor that comes from wading all day in a swamp. It's a job that entails long hours of statistical work and the skill of a good pilot. It's the broad back of a biologist or a game protector who can shoulder the heavy nets of a trap used for catching waterfowl for banding purposes. It's the trained eye of a technician who can scan a body of water and tell you how many ducks are there.

**If dry weather** should plague the Kansas countryside this fall and ducks seem scarce when they should be plentiful, just remember when the Kansas ponds and potholes were full of water and ducks, even though the total flyway populations were down. Rest content in the fact that dedicated men are constantly keeping check on those wonderful birds that have brought so many hours of enjoyment to so many people. With that electronic marvel, the computer, now on the job, maybe the work will be a little lighter for those who are responsible for waterfowl conservation.



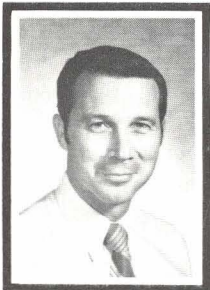
Commercial shooting areas have a lot to offer today's harried businessman.

# Hunting in a Hurry

By Ross Manes

Photos by KEN STIEBBEN

**A**HEN PHEASANT exploded from the thick grass, caught the gusting wind and levelled off toward a distant plum thicket at terrific speed. The pop of a little 20 gauge shotgun was almost swept away by the near gale, but the bird tumbled and was quickly retrieved by a hustling orange and white Brittany spaniel.



Manes

There may have been a faint trace of guilt in the hunter's eyes as he



Stiebben

accepted the bird from his dog and smoothed the uniformly buff-colored feathers. Shooting hens, even legally, doesn't come naturally to most dyed-in-the-wool Kansas pheasant hunters. For that matter, neither does hunting pheasant in mid-March.

On that same March afternoon the hunter could legally have taken as many as five different species of game birds. Provided, of course, that he continued to hunt on one of Kansas' many licensed controlled shooting areas.

There were 27 such areas open for business during the 1970-71 season, which by law extended from September through March 31. Actually, 18 of the 27 licensed areas are private and not available to the public. Hunting is limited to members and guests, and membership is determined by the wishes of the particular group.

There are nine commercial shooting areas open to the public in Kansas. They operate on more than 8,000 acres. An annual membership is required at four of these areas, but acceptance is limited primarily by the prospective hunter's willingness to pay. The other five areas accept hunters on a day-to-day basis, but reservations are often necessary to insure an opening.

Commercial shooting areas range in size from a modest 320 acres to the legal maximum of 1,280 acres. They release a variety of game birds which in addition to pheasant, quail and ducks includes chukar partridge and turkey that would not otherwise be available to Kansas gunners. The more active areas release up to 12,000

Author (left) and Topekan Jon Flint prepare to swing on exploding hen pheasant as staunch Brittany looks on. Hunters on controlled shooting areas are expected to take hens as well as cock pheasants.



or 13,000 total birds during the season, while the smallest figure reported last year was only 217. The average number was approximately 3,500.

In spite of often heard comments to the contrary, there are many excellent reasons for the popularity of controlled shooting areas. Although Kansas has reasonably good populations of pheasant, quail and ducks in most years, many people find it difficult to take advantage of the natural hunting.





All the early training, cussing and anxiety blossoms into pride when a dog delivers the goods like this one.

Some of our wonderful old-timers, for instance, can still enjoy the thrill of a dog on point and the feel of a shotgun without walking the countless miles that wild pheasant hunting requires.

People in many professions have a problem scheduling hunting trips into a busy work routine. For them, the controlled shooting area offers a convenience that permits squeezing a hunting trip in with business appointments, or between a morning's work and an evening social engagement. There are shooting preserves open to the public within a 20 or 30 minute drive of most of the larger urban areas in the state. Almost any of them can provide a varied and successful hunt in the course of a short afternoon. The average time required, including travel, is probably less than five hours. For the resident of eastern Kansas who wants good pheasant hunting, this represents a tremendous savings in time.

Conserving time is not the only convenience offered by commercial shooting areas. The long season allows the hunter to schedule trips at his convenience, and the last week of the season is just as good as the first. Many of the people who utilize these

Flint and Mr. Johnson, owner and operator of J&F Shooting Preserve, north of Bushong, admire a mixed bag of pheasant and chukar.





facilities realize that because of the limited number of trips they make each year keeping a bird dog is not feasible. In addition to the poor economy of feeding a dog year around, constant kenneling doesn't make a dog happy or improve his hunting ability. Most of the commercial areas keep a good supply of proven bird finders, and some prefer that hunters use the provided dogs. Others permit and even encourage the use of personal dogs.

**To top everything**, for a nominal fee the paying shooter can have his game cleaned by his host and go home with table-ready fare. This is of particular importance to travelling businessmen that make up a significant portion of the traffic at some areas.

One of the more popular misconceptions surrounding this type of hunting is that it offers no sport. It is true that occasionally an operator will pay insufficient attention to the breeding and care of his stock, and release birds that lack vigor or are too heavy to fly well. It is also true that if a client wants a "skeet range" shoot the operator can probably arrange it. Normally, however, the shooter is provided an area with plenty of hard-flying birds to satisfy him. Putting them in the bag is still his problem, and it can be a real problem.

**At one shooting preserve** a usually competent gunner was asked to down a mallard or two for the camera. In spite of the fact that ducks flew over, in front of, and behind the gentleman, in good range, and in spite of the expenditure of large quantities of powder and shot, nary a feather fell. You can allow the gunner some excuse for pressure caused by the camera, but give the ducks their due. A similarly embarrassing event involving chukar and yours truly took place in another area west of Emporia. The flying qualities of the birds will vary from species to species and place to place, but all shooting preserve operators are aware that their continued success depends on providing challenging targets.

**Much of the resistance** to controlled area hunting is based on expense, and at first glance the per-bird rate does

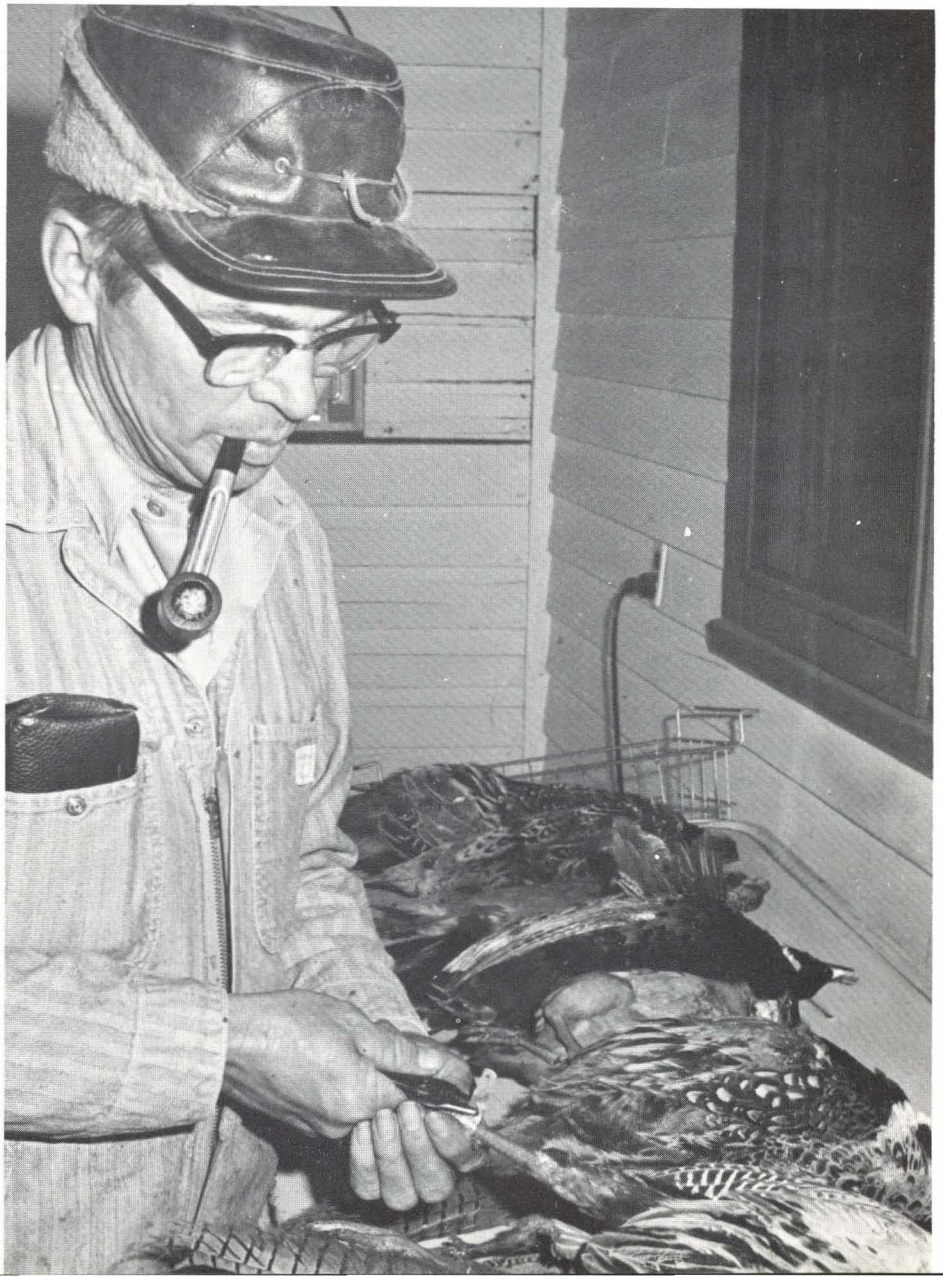
seem exorbitant. The facts indicate, however, that in many cases birds purchased from fee hunting areas actually cost less than wild birds. For example, a Kansas City resident could shoot five commercially reared pheasant for as little as \$20.00, plus the expense of a short trip. If the same man travelled to good pheasant country in northwestern Kansas five pheasant could easily cost him \$30.00, and probably much more. The cost savings of a Kansas resident hunting chukar where they exist naturally, as opposed to hunting them on a nearby preserve, is phenomenal.

The rates charged by controlled shooting areas may vary widely from

one to the next. The hunter may pay \$4.00 for each pheasant released, or \$6.00 for the pheasant he actually takes. These are only examples, and the prospective hunter should inquire about rates and services before agreeing on a shoot.

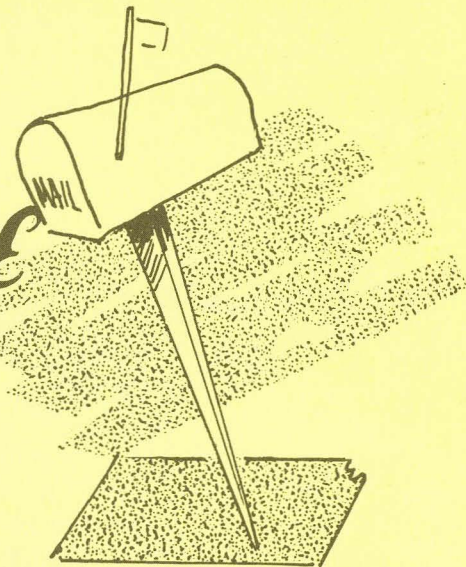
**Shooting preserve hunting** is naturally not for everyone. Many hunters will feel that the excitement of taking a wild reared bird can't be equalled. Others limit their hunting to certain costs, and can't justify the expense of commercial shooting. But for those who have already walked too many miles, or those who want to guarantee meat in the pot it's a good bet. And it's just the ticket to hunting for the man in a hurry.

**Birds taken at controlled shooting areas must be tagged as required by law.** For a nominal fee, the shooter can have his game cleaned and return home with table-ready fare.





# Readers' Response



**More on Cats**—I'm writing in reply to the letter of James W. Wiggs, M. D., which appeared in the March-April issue of KANSAS FISH & GAME. I think Dr. Wiggs has focused his attention on a very small aspect of a much larger problem. He accuses domestic cats of being dangerous to game and says 'A hunter at least eats what he kills.' I agree wholeheartedly with this quote provided Dr. Wiggs inserts the word 'good' before 'hunter.' There are many hunters who don't eat what they kill but are out only for trophies. Their kill either rots in the field or is eaten by wild animals. There are other hunters and fishermen who exceed the bag limit. Still others fish and hunt out of season or by illegal means. I feel these types of hunter are a much greater threat to game populations than the house cat. In addition, a cat which kills a quail isn't cognizant of the fact that it is depriving some hunter of game. However, the 'sportsman' who shoots more quail than his limit is aware of the fact. I must say that I'm bound to focus my anger on the bad hunters rather than on the cats.—Robert E. Dressler, Ph. D., Kansas State University.

**Copperheads and Mushrooms**—"Please enter my subscription to KANSAS FISH & GAME. I especially enjoyed the March-April issue with Vic McLeran's story and photos on copperheads and morel mushrooms. I've read quite a few articles on both subjects which did not approach his thoroughness."—Warren T. Liston, Kansas City.

**We Did**—"Sweet, lovable, benevolent ole Charley,—smack dab in the middle, twixt the snake and the spider. You didn't?"—Paul B. Seiwald, Prairie Village.

**From California**—"My family and I just moved to California and in the short time we've been here, we have been surprised at the opinions expressed by some of the locals as to our home state of Kansas. The words, 'dust bowl, flat, dry' pop up with great frequency. I have the last few copies of KANSAS FISH & GAME which I've put to

use many times here in an attempt to change some attitudes. It works every time. The articles and photos put together by your staff are great publicity for Kansas. Keep up the good work."—Ron McChristy, Sovereign Life Insurance Company, Santa Barbara, California.

**B. C. D. Club**—"My name is Jeff Wiltfang. I am eight years old. I live in Topeka. I have a friend named Danny. He and I have a B. C. D. club. B. C. D. stands for bird, cat and dog. Danny has a bird, I have a dog and a cat. We work to save all kinds of animals. We made first-aid kits. We like your fish and game magazine. My birthday is February 9th. I got some birthday money and I keep asking my Mom and Dad if I can get a bird. Danny is going to start asking my Mom and Dad if I can. I hope I can."—Danny and Jeff.

**Helped Identify Mushrooms**—"My husband and I recently picked a half bushel of what we thought were morel mushrooms. We needed confirmation to make sure our mushrooms were edible. Someone handed us a copy of your March-April issue which contained the interesting and informative article on mushrooms. It enabled us to positively identify our mushrooms as morels."—Mrs. Floyd Deines, Haddam.

**One of the Most Enjoyable**—"Your KANSAS FISH & GAME publication is one of the most enjoyable magazines we have ever read. We especially enjoyed the last two which contained articles on snakes. The story

**KANSAS FISH & GAME invites all readers to submit their comments, suggestions, likes and dislikes to Readers' Response. In each issue the magazine will feature as many letters as space permits. We reserve the right to edit and condense letters.**

—Editor.

on mushrooms was helpful to us since we were unable to identify edible mushrooms until reading this article."—Mr. & Mrs. Alvin Hailey, Elmdale.

**Hasn't Outgrown His Interests**—"Just wanted you to know I'm not like the guy from Dodge City who cancelled his subscription because it had 'outgrown both his interests and sense of economy.' I enjoy your magazine and don't believe I've ever received an issue that didn't contain at least one article that was worth the whole year's cost per issue. In the March-April issue for instance, the cover picture and article on copperheads was worth a lot to me since I visit Toronto Reservoir and have always been warned about copperheads there."—Floyd H. Smith, Wichita.

**Nets a Sturgeon**—"Enclosed is a color slide of a sturgeon which we took from a seven acre spring-fed pond on the main post here at Fort Riley. It was caught in one of the gill nets we use for sampling ponds. I'm the Conservation Officer at Fort Riley and receive your fine magazine through my office. I think it's the most professional and best written fish and game magazine I've seen. I keep all back issues in my reference library."—Philip R. Dolberg, Conservation Officer, Fort Riley.

**Just Discovered It**—"After living in Kansas 25 years, we just discovered the KANSAS FISH & GAME magazine. Someone left it behind on a TWA plane. Please add us to your subscription list."—Ken Lisher, Kansas City.



