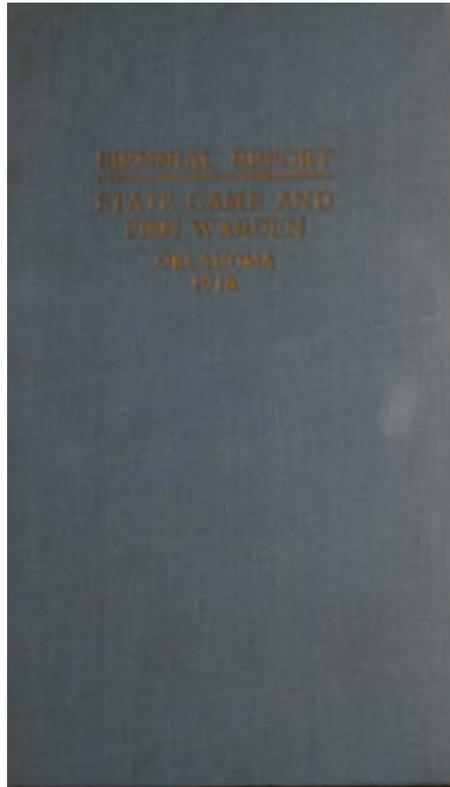


Biennial Report State Game and Fish Warden Oklahoma 1918
(Report of the State Game and Fish Warden, G.A. Smith
to the Governor of the State of Oklahoma, The Honorable R. L. Williams).



Introduction:

By Rich Fuller, Sr. Information & Education Specialist, ODWC

Although there were two very popular Biennial Reports (books) produced in the earliest days of the Oklahoma Game and Fish Department (1912 Field, Forest and Stream in Oklahoma, and the 1914 Outdoor Oklahoma), there was no biennial report made for 1916; and for good reason. The Game and Fish Department disbanded in late 1913 and was closed for the next four years.

After the Department was re-established with the brief term of Warden, John Chenoweth (1917), George A. Smith was appointed by the Governor, R. L. Williams to the State Game Warden post in 1918. In that year, Smith commissioned the 1918 Biennial Report, which takes on a more governmental format and less of a “narrative” tone as its 1912, and 1914 predecessors, but still provides interesting reading.

Within the book there are descriptions of several of Oklahoma’s unique ecosystems, but none as intricately detailed as two new state-owned/managed properties, the fish and game hatcheries at Medicine Park (known today as the James A. Manning State Fish Hatchery), and at Armstrong, OK (known today as the Durant State Fish Hatchery). These facilities no longer produce any game birds or animals, but are still intensively used for the propagation of game fish to stock within state waters. At nearly a century old each of these hatcheries have produced billions of channel catfish, native-strain largemouth bass, Florida-strain largemouth bass, multiple sunfish species and smallmouth bass just to name a few.

The report also describes the newly acquired McCurtain County Game Preserve (now known as the McCurtain County Wilderness Area) with its vast timber and wildlife resources. Another section describes the yet unnamed Lake Overholser dam on the North Canadian River on the west side of Oklahoma City.

BIENNIAL REPORT

**STATE GAME AND
FISH WARDEN**
OKLAHOMA
1918

Biennial Report
of the
State Game and Fish Warden
of the
State of Oklahoma



1918

G. A. SMITH, WARDEN

HARLOW—OKLA. CITY.





R.L. WILLIAMS
GOVERNOR



G.A. SMITH
STATE GAME AND
FISH WARDEN



Letter of Transmittal

Honorable R. L. Williams,
Governor of the State of Oklahoma,
Oklahoma City, Oklahoma.

My Dear Sir:

In transmitting to you the biennial report of the Game and Fish Warden of the State of Oklahoma, I take the opportunity of thanking you for your liberal contribution of time and thought to this department, and to assure you that the same has resulted in placing the department upon a most successful business basis.

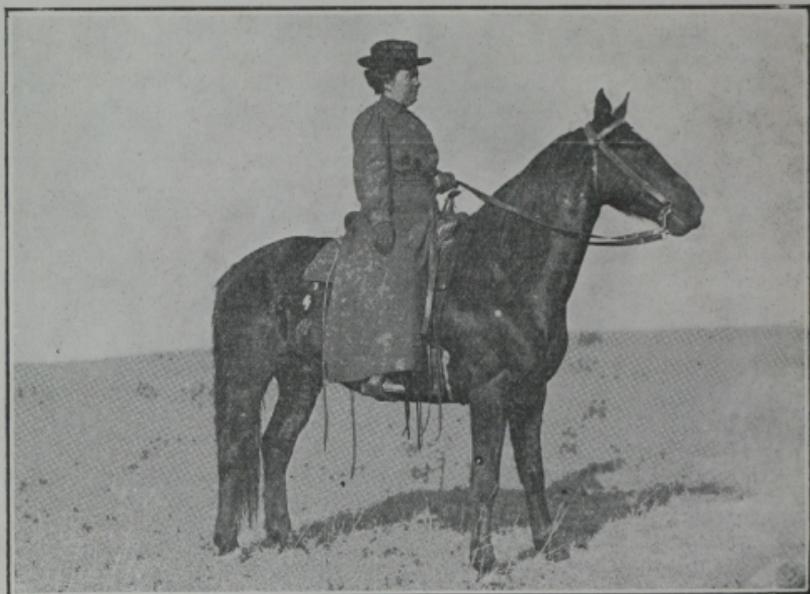
The personal attention you have given to this department is known and appreciated by the American Game Protective and Propagation Association, as revealed by numerous letters on file from the officers of the association.

Hon. Wm. T. Hornaday, director of the Zoological Park of New York, under date of October 29, in expressing his appreciation of the work of this department and in speaking of our assistance in preventing the extermination of the American bison, says: "With the addition you are about to make from the Corbin herd, Oklahoma will have the prize state bison herd—that is, unless some other state gets very busy."

The wise investment of more than \$300,000.00, most of which was accumulated during your administration without the assessment of any taxes, is sure, when known, to be appreciated by the people of Oklahoma.

Sincerely yours,

G. A. SMITH,
State Game and Fish Warden.



MRS. FRANK RUSH ASSISTING IN PRESERVING AND PROPAGATING GAME ON WICHITA NATIONAL GAME PRESERVE.

If you break up a hen's nest or a bird's nest it will result in fewer chickens or birds. If a fish nest be disturbed the result is the same; therefore breeding waters should be disturbed as little as possible by domestic animals, selning, etc., during the spawning season: April, May and June. The destruction of one fish nest means the destruction of several thousand young fish.

The more hunting licenses the department sells the more money is made available for enforcing the law and educating the people. The better the law is enforced and the more the people become educated the better the sale of hunting licenses. Each boosts the other.

When a man buys a hunting license through a desire to uphold the department rather than through fear of prosecution, a great moral victory has been achieved and the conservation of wild life has acquired a true friend.

Rats, snakes, crows, hawks, horned owls, skunks, coons, mink, weasels and other vermin rob the nests of millions of birds, either taking the eggs or killing the young birds, and cats are the worst enemy of all, taking the largest toll. It is open season all the year for predatory animals. Destroy, kill, annihilate them, and song birds, game birds and domestic poultry will increase. Neglect to destroy vermin and failure will attend the poultry business and the propagation of birds, both song and game.

Game Farms and Game Preserves.

The Game and Fish Department of the State of Oklahoma has enjoyed a substantial growth during the past two years, and can now boast of property assets amounting to more than a quarter of a million dollars.

The appropriation of \$94,137.10, by act of the Legislature approved March 3, 1917, for the purpose of acquiring or purchasing land for game preserves in the State of Oklahoma, has acted as a mighty stimulant in arousing the interest of the people in the conservation of wild life and in the development of some of the natural resources of the State of Oklahoma, which hitherto have gone almost unnoticed.

The ideas of game farms and game preserves are not new ones, many of the older states having proved their utility, and the Federal Government having set aside many large and valuable tracts of land for the conservation of timber and wild life. A game farm is usually a small tract of land where game animals and game birds are reared in captivity. A game farm is particularly valuable for the propagation of game birds, such as turkeys, pheasants, quail, ducks and geese, and almost an incredible number of birds are sometimes produced on a farm of one hundred acres of land. Here the work of collecting the eggs, setting them under hens, feeding the young birds and protecting them against predatory animals can be carried on with a minimum of labor. A couple of months ago I visited the game farm of Wallace Evans at St. Charles, Illinois, where more than fourteen thousand (14,000) pheasants and a large number of aquatic birds were produced this year on only a few hundred acres of land. In the propagation of both animals and birds, on a game farm, extraordinary care must be exercised to prevent disease and to give both animals and birds as much natural exercise as is possible in propagation in captivity. Game farms, both public and private, are springing up all over the United States, and afford to hundreds of people an interesting



CHOTEAU SPRINGS

The Water From These Springs Now Runs Across the State Game Farm near Bigheart, Oklahoma



NEAR THE ILLINOIS RIVER IN CHEROKEE COUNTY

and remunerative occupation. The laws of the State of Oklahoma are so drawn as to encourage this industry, and for a license fee of \$2.00 any one may take out a permit for the propagation of game animals, game birds and fish, which entitles them to the proceeds of their labor and gives them immunity from the ordinary game laws of the state, allowing them to sell their productions for food or propagation purposes, subject only to such rules as may be made by the State Game Warden. There is room in Oklahoma 1 hundreds of game farms, and there is a market for the sale of every game animal and game bird which can be produced on these farms. The propagation of quail, pheasants, wild turkeys, aquatic birds, deer, elk and buffalo holds out alluring promises of more than ordinary returns for the labor involved in their production. After the war is over and people feel more free to indulge their tastes and fancies, game raised in captivity will command almost any price as articles of food for banquets and social functions. Hundreds of people will be willing to pay fancy prices for the privilege of eating a piece of venison or a portion of wild bird. Game farming may be carried on with the production of domestic animals and birds. In encouraging the establishment of game farms, the department does not wish it understood that all efforts will be successful. We do not mean to convey the idea that it is as easy to raise pheasants, quail and wild ducks as it is to raise chickens and tame ducks, and many failures have been recorded in the production of common poultry. Therefore it stands to reason that many will fail in the production of game animals and game birds. The careful, persistent, studious and industrious person is the one who will succeed, and many failures will only serve as future guides. The State of Oklahoma, under the provision of the appropriation referred to above, has acquired three tracts of land for the purpose of establishing game farms. One tract of land is in connection with the State Fish Hatchery, at Armstrong, Oklahoma, and contains land the quality of which there is no better in the State of Oklahoma. It would be an ideal farm for almost any purpose, and insures to the State of Oklahoma a game farm equal to any of the older states of the union. Another tract of land of one-quarter section has been purchased adjoining the State Fish

Hatchery at Medicine Park, Oklahoma. This tract contains about one-half valley land and one-half mountain land, and provides an ideal pasture for buffalo and deer, as well as plenty of level land for the propagation of game birds. A third game farm has been purchased in the Osage Nation, adjoining the famous Choteau Springs, the water from which runs in a rivulet across the quarter section of land acquired. This is timbered land, and a splendid house and barn have already been erected upon it, and sufficient material is now on the ground for fencing it with a seven-foot woven wire fence, placed on red cedar posts. The game farm at Medicine Park is also enclosed with a similar fence, and a portion of the game farm at Armstrong has a seven-foot woven wire fence with bois d'arc posts. If sufficient funds are provided by the coming session of the Legislature to maintain these three game farms, the tremendous impetus will no doubt be given game farming in the State of Oklahoma, and game birds will be produced in sufficient quantities to stock the entire state.

A game preserve differs from a game farm in that it is usually a large tract of land, and the game animals and game birds are allowed to propagate

under their natural conditions, and being given them by the destruction of their natural enemies. The birds and animals on preserves are to all intents and purposes wild animals and wild birds. It was the intention of the present administration to purchase two large game preserves, one in the northeastern part of the state and one in the southeastern part. Honorable Charles D. Carter, M. C., offered a bill in Congress, which was made a part of the Indian Appropriation Bill, which authorized the Secretary of the Interior to sell to the State of Oklahoma twenty sections of Indian land located in McCurtain County near Mountain Fork river. No opposition developed to this bill and negotiations are almost completed for the acquiring of this splendid tract of land at an average of \$6.13 per acre, which makes the purchase price \$71,718.05. This depletes the fund to the extent that the present administration feels it will be impossible to purchase a tract in the northeast-

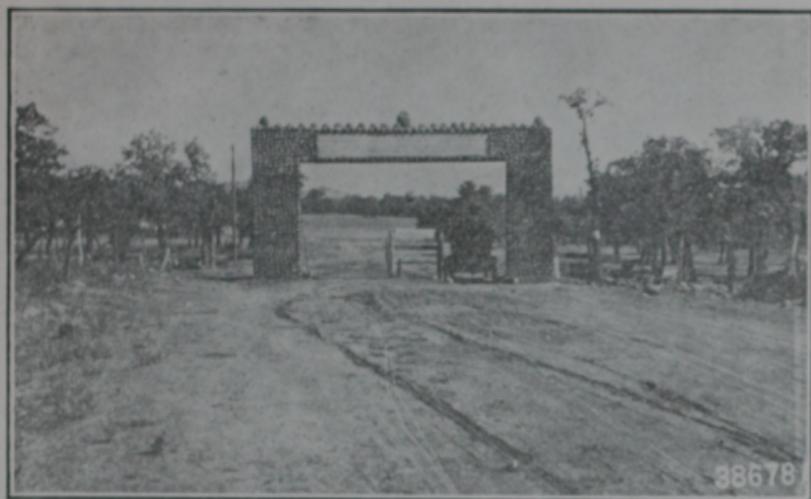


SCENE ON THE McCURTAIN COUNTY GAME PRESERVE

ern part of the state as contemplated, but it is to be hoped that the Legislature will make provisions for the purchase of a tract of land of sufficient dimensions for a good game preserve, acquiring a well watered, well wooded tract, especially adapted to the production of deer and turkey. With one large tract located in the southern part of our eastern mountain range and another in the northern part, provisions can be made which will insure deer and turkey hunting for all time to come. These tracts should first be stocked to their capacity with deer, turkey, elk, pheasants and quail. The birds will naturally go out from these preserves in all directions, and the excess of wild animals could be liberated each year. Most of the states are passing what is known as "a one buck law," which allows a man to kill but one buck and no doe during any one season. From these preserves hundreds of bucks could be liberated every year, and the animals allowed to run out over the surrounding mountains, offering to the hunters not only an opportunity, but a reward for their skill. This tract of land can also be made to produce a large amount of timber. By reasonable conservation, millions of young cedars, pines and hardwood trees can be planted upon these large tracts and the old timber, as it becomes available for lumber, can be utilized, the young and growing timber not being subject to waste at any time. The present Game Warden believes that it is possible that the revenue derived from this source can be made to support these tracts of land. The tract in McCurtain County contains many millions of feet of valuable pine, cedar and hardwood timber.

It is to be hoped that the State of Oklahoma, by acquiring this land and demonstrating the practicability of game preserves, will encourage the establishment of similar private and company enterprises. There are millions of acres of land scattered throughout these mountains that are of absolutely no value from an agricultural standpoint, but which are capable of producing a large amount of lumber, a few domestic animals and a large number of wild animals and wild birds. These tracts of land are most of them well watered, and when provided with a woven wire fence of sufficient strength to prevent the escape of both wild and domestic animals, can be made more than self-supporting. Deer and elk do not subsist upon the same kind of feed as domestic animals. They are browsing animals and feed upon the bushes, berries, leaves and weeds of the mountains, leaving most of the grass for domestic animals, and it is therefore practical to have domestic animals and wild animals in the same enclosure. One of the main duties of the owner of a game preserve, as well as a game farm, will be an eternal warfare upon predatory animals and birds. Wolves, foxes, mink, coon, cats, hawks, owls, crows and many other natural enemies of game animals and game birds, should be hunted, and the law has provided a perpetual open season against this class of animals. Boys should be encouraged to kill these animals and birds at all times. It offers an avenue for their sportsmanship instinct and the opportunity of doing great good in encouraging the production of game animals and game birds.

Oklahoma has many men of wealth, who spend thousands of dollars going to some places in Canada for a few days' sport. Why not acquire a piece of land in the mountains of Oklahoma, build a woven wire fence around it, stock it with deer and elk and have a game preserve here in Oklahoma where animals can be killed at pleasure at any time of the year, subject only to reasonable rules and regulations governing their sale and shipment? These ideas are worthy of the consideration of the sportsmen of our state. These mountains afford an opportunity for the gratification of every instinct of sport and for the production of millions of pounds of wild game food.



MAIN ENTRANCE WICHITA NATIONAL GAME PRESERVE

The Wichita Forest Preserve.

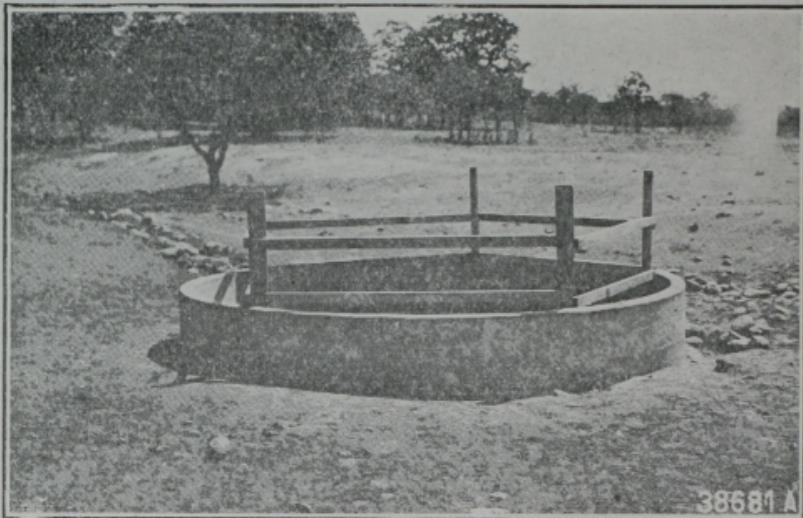
The way to the establishment of game preserves in Oklahoma was blazed by the Federal Government. The Wichita National Forest Preserve, in Comanche County, embraces 62,000 acres of land, which was set aside by Congress at the time the Kiowa and Comanche countries were opened to settlement. Hon. Frank Rush was selected as supervisor of this preserve, and for fourteen years he has labored with the most marked success in the production and conservation of wild life.

By Act of Congress, a buffalo range of 9,760 acres was established and surrounded by a seven-foot woven wire fence. In 1908, through the assistance of Hon. Wm. T. Hornaday of the New York Zoological Society, fifteen buffalo, nine females and six males, were shipped from New York to Oklahoma, the shipment being accompanied by Frank Rush. This was the nucleus of the splendid herd which has since developed under the supervision of Mr. Rush.

White-tailed deer are inhabitants of both the inside and the outside of the buffalo pasture, and are multiplying by hundreds.

Elk have been introduced from the Rocky Mountains, and like the buffalo and deer, have proven entirely satisfactory. Within this splendid pasture, they are as wild as elk ever get to be, and it is with extreme difficulty that they can be approached even within a sportsman's range.

Mr. Rush has also succeeded in propagating a fine flock of wild turkey. In fact, the experience of Mr. Rush on this splendid game preserve is a lamp to the Game and Fish Department of the State. Mr. Rush is justly proud of his success, and with the most hospitable and affable manner welcomes all visitors and explains to them the national theory of conservation of wild life.



CONCRETE WATERING TANK OF WICHITA NATIONAL GAME PRESERVE

Financial.

Thousands of the best farmers of the State of Oklahoma are those who came to the country with their effects loaded in a covered wagon driven by a team of mules or ponies. They began business in a small way, first breaking out a few acres and raising a crop, and using the proceeds of that crop to break out more land and to purchase more stock. Success along this line led to the acquisition of more land and more stock until the farmer finally became "comfortable," "well fixed," or "wealthy." Had the farmer neglected to use his revenue toward the expansion of his business these results should never have been obtained.

What is true of the farmer is true of the business man. Year after year the merchant uses his profits in the expansion of his business, and this results in creating great stores from small stores. The Game and Fish Department is no exception to natural business laws. It is a business institution subject to growth and development, or to stagnation and decay. At the present time the State Game and Fish Department possesses assets amounting to more than a quarter of a million dollars, not one penny of which has been acquired through taxation. This department now has two well equipped State Fish Hatcheries, with ponds, piping buildings and land well worth \$75,000.00; three game farms each of 160 acres or more. It has completed arrangements for the purchase of a game preserve of twenty sections in McCurtain County, for which more than \$72,000.00 is being paid, and the money is available and appropriated for that purpose. Besides appropriation for the purpose of the game preserves, we have on hand money appropriated for expenses of the department, for rewards and for improvements on game preserves and game farms, \$38,682.04. We have standing to the credit of the Game Protective Fund in the State Depository on November 1,

\$83,882.55, and we have unappropriated in the State Treasury to the credit of the Game Protective Fund \$6,863.47. During the months of November and December, based on last year's collections, we should collect the sum of \$25,601.11. These assets amount to \$307,039.17, but they are not all of the assets of the department because we have belonging to the department at the fish hatcheries and game preserves several horses, the best herd of buffalo of any state in the union, a great many deer and birds of various kinds, the value of which would be several thousand dollars.

This department has grown to this proportion largely during the present administration, because the best business methods have been used and because like other successful enterprises, the profits of each year have been used to expand the business. I desire to impress upon the Legislature the necessity of continuing this practice, and I think that it is more than possible that the assets of this department can be increased to a million dollars within the next four years. As shown above, there will be unappropriated cash in the Treasury on January 1 amounting to about \$116,000.00. Revenues derived from the sale of hunting licenses, from fines and from interest during the coming two years can conservatively be estimated at \$150,000.00. This will give to the department a working capital of \$266,000.00. I recommend that the whole amount be appropriated by the Legislature for the benefit of this department firmly believing that every dollar appropriated will bring back increased revenues and increased benefits to the agricultural interests of the state in part, and to the whole state in general. At least \$10,000.00 more should be appropriated to assist in the propagation of game animals, game birds and game fish, available to June 30, 1919, or an additional appropriation to what has already been made. I think this is necessary from the fact that game farms have been established and should be utilized. More animals are needed in the way of horses and other stock, as well as wild animals and birds. This will leave \$256,000.00, of which \$150,000.00 should be appropriated for the expenses of the department during the ensuing two years, or \$75,000.00 each year. This will still leave \$106,000.00 which should be appropriated to the improvements of the game farms and game preserves already purchased and to the purchase of additional land for game preserves, of which a large one should be purchased in the mountains in the northeastern part of the state.

If this liberal action be taken by the Legislature there is no doubt in my mind of the rapid growth of this department. It is merely the application of business principles to a business enterprise. It is the expansion of the business of this department by placing back the profits of each year, and it is not costing the taxpayers of the state a single penny, every dollar of it will come through the activities of this department.

Game Wardens and Law Enforcement.

Every state in the union has tried to solve the problem of the enforcement of the game law, and various and numerous methods have been tried, many of them proving absolute failures. Every observer will admit that there is a better enforcement of law now than formerly, and that the sentiment in favor of game and fish laws and their enforcement is steadily growing. This is not only true of Oklahoma, but is true of every state in the union.

The better any law is enforced the better it is respected by the people, and the non-enforcement of law, even though it be a good law, breeds contempt for that law. Where the prohibitory law is rigidly enforced it is

always respected. Where it is not enforced it is held in contempt, and this is largely true of game and fish laws and other conservation laws. The growth of sentiment in favor of the enforcement of law makes its enforcement much easier, and the enforcement of law always creates sentiment in its favor. This accounts for the growth of sentiment in Oklahoma, and also accounts for the fact that during the past four years the sale of hunting licenses has steadily increased. During the season 1915-16 the number of resident hunting licenses sold was 34,800. During the season of 1916-17 the number sold was 44,575. During the season 1917-18 the number sold was 56,725. During the season 1918-19 up to November 1 the number sold was 39,075 as against 35,375 on the same date a year ago. This would indicate that the sale of licenses for this year would be greater than last year in spite of the fact that 80,000 of our best men are no win the army, a large number of which would purchase hunting licenses if they were in private life.

These figures show a steady and rapid growth of the sale of hunting licenses and indicate an equal growth of sentiment in favor of law enforcement. There are two reasons why men buy hunting licenses. The first is because a large number of them realize the importance of upholding the department and protecting the game fish and birds, and that in doing so their extermination will be prevented and a supply insured to future generations. This class of men realize that it requires money for this purpose, and they willingly and cheerfully pay for a hunting license and would do so even if the price of the same was raised several times the amount now asked. There is another class of men that buy hunting licenses to prevent prosecution. They realize that while it might be possible for them to go out and hunt without a license, they are taking a great risk in doing so and consider it a good business proposition to insure themselves against prosecution. Many of these men first buy licenses from the second motive and then become interested to the extent that they buy them from the first motive. Therefore, **education is the most potent factor in the upbuilding of the Game and Fish Department.** The better the people are educated the more revenue the department will have for the propagation and conservation of game and fish. The less money required to be spent on law enforcement the more money will be available for propagation. At the present time the better the law is enforced the more hunting licenses will be sold. If the enforcement be made more vigorous during the coming administration, the sale of licenses can be doubled to what it is now and it will only require a fraction of the revenue derived from the sale of these licenses to affect this enforcement. Only a fraction of the revenues of this department should be spent for enforcement. The largest part of it should go for propagation and conservation, and a portion of it should be appropriated for education. As mentioned above, when a man buys a hunting license through a desire to uphold the department rather than through fear of prosecution a great moral victory has been achieved and the conservation of wild life has acquired a true friend.

The schools, the pulpit, Boy Scout organizations, newspapers and every other educational avenue should be utilized and special efforts should be made to impress the boys with the necessity of protecting the song birds and conserving game birds, animals and fish, and of destroying the vermin which preys particularly upon our birds. If the boys of the State of Oklahoma could be induced to continually destroy millions of crows and tramp cats as well as hawks, skunks, weasels and all of the vermin that prey upon the song birds, game birds and poultry; if they could be taught that it is open season the year round for predatory animals and that in destroying them they are performing an important public function in which the people of the state

will notice an increase in the number of song birds and a decrease in the insect life, and a corresponding increase in the crops of the state.

As mentioned above, all of the states have tried various plans for many years, seeking the best methods of enforcement and education, and the Federal Government has also experimented along the same line. Without exception biologists and conservationists, men who have spent their lives in the production and conservation of wild life, have come to believe that the warden system is the best system of enforcement and education, and that the salaried wardens get much better results than wardens who are on a fee basis. It has been found by experience that the local game warden is too often influenced by his likes and dislikes, that he allows many law violators to pass unprosecuted because the violator is a personal friend of his, and many instances have been found where men have been harassed when they had not violated any law because they were enemies of the local warden who used his office to vent his spite.

I am not speaking particularly of the State of Oklahoma. This complaint is nation wide, and it also serves to show the weakness of any system in which local county officers or township officers are used in the enforcement of conservation laws. The best enforcement officer is one who is unacquainted with the people in the district in which he is operating, where he has no friends to reward or enemies to punish, and where he has no interest other than performing the duties of an officer. Where a fee or a fine is the reward for enforcement rather than a salary it tends to induce the enforcement officer to pick out the easiest cases and to prosecute the man the least able to defend himself and oftentimes it leads to persecution rather than prosecution. It leads to the assessment of fines against the ignorant, while the shrewd law violator escapes. The law of the State of Oklahoma recognizes the necessity, however, of employing salaried assistants, and also of appointing a large number of assistant wardens. If every warden in the state could be on a salary the condition would be ideal, but it is impossible to produce revenue enough to place a sufficient number of paid assistants on the pay roll to enforce the law, therefore a large number of assistants are appointed, who, under the law, get one-half of the fines and the same fees for making arrests and serving papers as do sheriffs. In my estimation this system should be continued and salaried men added to the list as rapidly as revenues will permit.

As mentioned above, the enforcement of the law is only a part of the duty of the warden and his assistants, and I have endeavored to impress my assistants with the necessity of doing everything possible in the way of educating the people and in explaining the necessity of conservation laws. Every assistant game warden should continually talk to his people of the value of game laws from the standpoint that they make more game; from the standpoint that they protect the song birds and decrease insect life and to impress upon the farmers the idea that the activities of this department means millions of dollars annually to the farmers of the State of Oklahoma. Every game and fish warden should spend his time in making friends for the department, and to do this it is only necessary to make the people understand the objects and work of the department. In this connection I desire to state that the present system of appointing a new game warden under each succeeding political administration is a bad one, and I regret my inability to suggest a remedy. Any man who acts as game warden for four years, who is industrious and makes the best of his opportunities, who studies hard and who reads the best books and communicates with the best men, both state and national, has fitted himself to begin a career of usefulness in this office. He has had an experience, which, if his other qualifications permit, would

make him of great value to the State of Oklahoma. Therefore, if the next administration can, in some manner, make the State Game Department an office regulated by civil service rather than by politics, it will be doing much for conservation. The best results can never be achieved so long as the head of this department is changed for political reasons at just about the period when he acquires sufficient knowledge to be of real benefit to the state.

Recommendations.

The Legislature of the State of Oklahoma is to be congratulated on having constructed one of the best game and fish statutes of any state of the entire union. The motive actuating the Legislature has apparently been: first, the absolute protection of song and game birds; second, the conservation of game animals, game birds and game fish; third, the rights of the farmer whose crops are benefited by the protection of birds, but who, on the other hand, feeds not only the non-game birds but the game birds and game animals.

I particularly commend that section of our law which makes out of every land owner or occupant a game warden with power to close the season permanently on such land as he controls. Of course, he is controlled by the closed season imposed by the Legislature, but in addition to that he has absolute control in open season and can exclude all hunters and fishermen or can admit such as he desires. He can protect any kind of animals or birds that he desires to have propagated on the land and can give permission to hunt those he does not care to protect in open season, and he can also hunt upon his own land during open season without a license. Of course, he cannot delegate this right to others, as that would entirely destroy the State Game Department. No law more liberal to farmers or to occupants of land has ever been drawn than that possessed by the State of Oklahoma. Every farmer in favor of the perpetuation of game and in favor of maintaining his own rights should be a strong supporter of this department.

While contending that we have the best law of any state in the union, we admit that it is capable of improvement, and I desire to submit the following recommendations, which, in my estimation, will add to the effectiveness of our statute:

Section 3305 limits the traveling expenses of the State Game Warden to \$800.00 per year. This law was passed at a time when demand for traveling on the part of the State Game Warden was very little and during the time when the purchasing power of a dollar was almost twice what it is at the present time. The increased rates on railroads, at hotels, in fact almost every item of traveling expenses has so diminished the traveling possibility of \$800.00 that not more than half of the territory can be covered now as could be when the law was passed. The establishment of state game preserves and of the state fish hatcheries has more than doubled the necessity for traveling and inspection on the part of the State Game Warden. I therefore, recommend that this section be amended to read actual and necessary traveling expenses.

The same section fixed the salary of the State Game Warden at \$1,800.00 per year. The purchasing power of this \$1,800.00 is now but little more than one-half what it was when the salary was fixed and in the interest of reasonable compensation and the hopes that it will secure a high-class man for this position, I recommend that the salary of the State Game Warden be made \$2,500.00 per year.

Section 1 of chapter 15 of the Session Laws of 1909 establishes the position of License Clerk at a salary of \$1,200.00; Stenographer, \$900.00, and Bookkeeper at a salary of \$1,000.00. I recommend that the salary of License Clerk be made \$1,500.00 and that the salary of the stenographer and the salary of the bookkeeper be made \$1,200.00 each.

Streams Should Be Seined for Coarse Fish.

Early settlers in Oklahoma recall the time when the streams were filled with bass and crappie as well as with the coarser fish. The game fish are the ones that are more often caught on hook and line because the coarser fish feeding on the bottom do not bite as well as the game fish. Under these conditions game fish are becoming scarcer and scarcer, while the coarser fish are becoming more plentiful. Since that time German carp have been introduced into these streams, and they, with the buffalo, are fast becoming almost the entire fish supply and seldom bite a hook.

It seems, therefore, that it would be a part of wisdom to enact a law permitting the seining of all streams with a sein containing a mesh as large as 2½ or 3 inches, with the present provision it be unlawful to catch bass in a sein in any stream in the state. A license fee of at least \$25.00 should be charged for the ownership of a sein, the license to be revokable at any time the owner is convicted of violating the law.

I feel that a law of this character would protect most of the game fish because a sein with mesh of this size would only catch the larger fish and it would be unlawful to catch bass of any size. Sunfish and almost all of the catfish would slide through the mesh, and the larger carp and buffalo would be taken from the streams. This would give the game fish a better chance to propagate and would furnish to the people an avenue of food supply of coarser fish that would be acceptable and economical. There are certain seasons of the year when buffalo and carp would make a fine addition to the family table, and during these seasons it is impossible to catch them with hook and line. They are best when the water is cold.

Of course, the use of a sein of any character should be prohibited during April, May and June, the spawning season of Oklahoma fish. No stream or pond should be disturbed more than is absolutely necessary during the season when most of the fish are spawning because it destroys the nests of the fish. The dragging of a sein down a stream or through a pond might destroy millions and millions of hatching fish eggs in an hour's time, and the penalty for seining during April, May and June should be made drastic.

The present law permits the spearing and giging of game fish. This law will come nearer exterminating the game fish than if they were allowed to be caught in a sein, and in my estimation it would be wise to repeal this law.

I particularly commend the ideas as crystalized into law by Senate Bill 333, Session Laws of 1915, encouraging the production of fur-bearing animals, game and fish. Section 10 of this law provides that a person owning a natural pond of not more than twenty acres, or an artificial pond upon his premises, stocked at his own expense with fish artificially hatched or reared, may take fish from such natural or artificial pond any time for the purpose of propagation or consumption as food, provided the sources of the water supply of such natural or artificial pond are entirely upon his premises, and the fish do not have access to such pond from water not under said owner's control.

or from waters stocked at the state's expense; provided that it shall be unlawful to take, catch, possess or fish for any black bass, small mouth bass, large mouth bass, strawberry or calico bass, rock bass (otherwise known as goggle-eyed), crappie, white perch, yellow perch, brook trout or speckled trout, from January 31 to May 1; provided further, that no bass under eight inches in length shall be taken, nor shall more than ten bass be taken in any one day, and provided, further, that it shall be unlawful to use in any manner whatsoever the young of any bass or game fish for bait.

I recommend that this section be amended so that the restriction of the twenty-acre pond be removed. The state should encourage the building and stocking of large lakes, the larger the better, and the owners of these artificial lakes or ponds should have full and complete control, using the production for food or propagation purposes at his own discretion. In fact, he should exercise as complete control over fish raised in these ponds as he exercises over his domestic animals or poultry. Pond culture should result in the production of millions of pounds of fish every year in Oklahoma. It should open up an avenue of important food production and the means of remuneration.

I also recommend that the prohibition against legitimate fishing for game fish during February, March and April be removed. I can see no reason why fishermen should not catch bass, crappie and other game fish during these three months, as it comes before the spawning season and not during the spawning season, and it comes at a time of year when the farmers in particular can afford to spend some time in fishing without interfering with their farm work, and I do not believe that legitimate fishing during these three months would seriously affect the stock in Oklahoma. I approve the length limit and the number limit on the crappie and bass.

The Attorney-General, under request of this department, investigated the law as amended by the last Legislature and decided that under the law no protection was offered to doves. The Federal Department, since that time, has closed the season on doves for the entire year except from September 1 to December 15. I therefore recommend that the law of Oklahoma be made to conform to the Federal regulation, and that a closed season on doves be made by statute from December 16 to August 31, inclusive.

Under the law of Oklahoma the squirrel is not a game animal. Section 3260, Revised Laws of 1910, contains this provision: "The term 'game animal' shall include all animals protected by this act (chapter) and any part of such animal."

No act protects the squirrel in any way, therefore he is not a game animal and is subject to destruction at all times of the year. In some places, the squirrels are so plentiful that they become a menace to the farmers, but they are in reality valuable little game animals, and in my estimation, should be protected during the breeding season. I, therefore, recommend that a closed season on squirrels be made during the months of February, March and April.

The Pollution of Streams.

The Indian inhabitants, and the few white settlers of Indian Territory prior to 1889, had not marred the primeval beauty of what afterwards became Oklahoma. When Congress and the President listened to the importunities of the early boomers, under Captain Payne and other leaders, and opened for settlement six counties in the center of what was then Indian Territory, the day of opening being April 22, 1889, thousands of homeseekers, repre-

senting almost every state in the Union, traveled toward the "new mecca" from all directions, the main conveyance being the covered wagon or prairie schooner. The breath of spring enveloped the whole country and filled the hearts of the homeseekers with joy and hope. They considered themselves real pioneers in a virgin country, and they hoped for an opportunity to establish a home on a piece of rich agricultural land in a country blessed with fruitful soil and mild climate. Their hope was not lessened by the primeval beauty of the country, and while they could not express their thoughts and emotions as did Washington Irving when he crossed this country in 1836, they were the direct recipients of the same inspirations. Washington Irving immortalized the beauty of the country as only a literary genius could do. These people utilized the natural resources of the country as only pioneers have done.

As slowly, day by day, the covered wagons wended their way over many different rails leading to the heart of Indian Territory, they were greeted by the sight of thousands of herds of deer and thousands of flocks of wild turkeys. Deer and turkey were as common in Oklahoma at that time as beef and chicken in Illinois. Thousands of homeseekers up to that time had never seen a wild deer or a wild turkey, and to suddenly have a large flock of turkeys rise with a whirring noise almost at their feet and sail majestically off to some cover, was certainly an exciting experience, and the sudden appearance of a herd of twenty or more deer and their almost miraculous disappearance over a nearby hill, followed by the wild shot of an untrained sportsman, was an incident of almost daily occurrence.

These homeseekers were delighted with the appearance of the streams of Oklahoma. The waters were as clear as crystal. They flowed over beautiful rocks and shells, and most of the banks were lined with fringes of budding trees and opening flowers, and the green grass extended to the very edge of the water. Millions upon millions of bass, crappie, sunfish and catfish swam in the limpid waters and feasted upon the natural food with which they abounded and furnished to the homeseekers an abundance of fresh food



SEQUOYAH CLUB HOUSE



MOUNTAIN FORK, ABOVE "THE NARROWS," McCURTAIN COUNTY, OKLAHOMA

as well as sport and recreation. It was not an unusual thing for the camper to rise from his bed, go down to the stream and catch a good mess of fish for breakfast. A meal without fish or game of some kind was the exception and not the rule. Game and fish were not confined to a small portion of the territory, but were general and in abundance everywhere. In 1891, the Sac and Fox and Iowa country were opened to settlement and another "run" was made on September the twenty-second. The Cherokee strip, the Kiowa and Comanche and other large reservations were opened to settlement and soon the western part, then known as Oklahoma, became so thickly populated that but few quarter sections of agricultural land remained without a family. The eastern part, still known as Indian Territory, was also settled very rapidly, the land being leased from the Indians. In 1907, Indian Territory and Oklahoma were joined in statehood and Indian Territory became only a matter of history, and Oklahoma living, throbbing, energetic commonwealth.

As was to be expected, the large game in the agricultural regions became almost extinct. Within a few years the sight of a deer or a turkey was rare. Their haunts became corn fields and cotton fields and indeed it could not be expected that mischievous creatures like deer would be allowed to survive in an agricultural country.

It was not expected, however, that the fish would be exterminated like the large game. There is no economic reason why the streams should not produce the same amount of fish now that they did in 1889, and all will admit that the state needs every pound of fish that can be produced. The slaughter of the American buffalo stands as a National shame. The extermination of the deer was an economic necessity, but the poisoning of the beautiful streams of Oklahoma and the annihilation of the fish is a senseless, inexcusable and wicked waste.

No sooner had the homeseekers taken possession of the beautiful prairies and the virgin timber and begun the erection of cities and rural homes than they also began to pollute the streams of the state. Every city and town dumped its untreated sewerage into some stream. Dynamite and poison were used by the commercial fishermen, who perpetrated upon the state the

worst crime against the production of its food supply for which punishment is provided by our statutes. Any man who would dynamite or poison a stream possesses that quality of mind which would induce him to chop down his neighbor's apple tree to get the apples. Manufacturers of various kinds were established and the poisonous chemicals were turned into the nearest stream, but by far the most destructive pollution has been caused by the development of our oil fields. Here, in their mad race for millions, men have forgotten everything except the best methods of producing the most oil and the speediest way of turning it into the greatest number of dollars. From thousands upon thousands of oil wells, oftentimes producing large quantities of oil, worth but a few cents per barrel, the wasting by loose fitting and improperly set pumps was considered of small moment in comparison with the production of thousands of barrels, run into pipe lines, but every barrel of oil wasted from every well tended to pollute some nearby stream. Thousands upon thousands of miles of small and large pipe lines, conveying the oil from the well to the refinery, were of times carelessly laid and loosely fitted, and millions of barrels of oil have been wasted in imperfect pipe lines. Every barrel of this wastage finally found its way into some of the streams of the state. From the collection tanks where the oil is allowed to settle before being run into the pipe line, a thick black matter technically known as B. S. (below standard) accumulates. It is highly combustible, but the careless producer, instead of destroying the B. S. when run from the tank, usually dumps it into some draw or stream, and millions of barrels have been wasted into the streams, every barrel of which was a barrel of pollution. After the oil wells, came the refineries, and from these refineries millions of barrels of the most poisonous acids have been dumped into the streams of the state, and these acids also pollute the streams. Not only is every vestige of animal life destroyed, but vegetation along the streams is also annihilated. For miles and miles down the streams where refineries dump their refuse, domestic stock has been killed when forced to drink the water. It therefore stands to reason that the people who are interested in agriculture are also interested in stopping the pollution of our streams. Millions of dollars of hogs and



BLUE HOLE, ILLINOIS RIVER, LOOKING EAST HOME OF LARGE GAME FISH

cattle have been poisoned by using the polluted waters of streams, which should be as clear now as they were when the inhabitants took possession of this country for the purpose of founding homes. To say that the streams of Oklahoma, particularly of the oil producing part, are polluted is putting it mildly. They are worse than polluted. They are absolutely poison. The clear waters that greeted the sight of Washington Irving, and of our pioneer settlers, are now coated with a black, oily substance and saturated with poison acids. The green grass which fringed the streams to the water's edge has now receded many rods, and the fringing trees are dying from the effect of the pollution and poison, and instead of being beautiful streams, they are now merely open, unsightly, disgusting sewers. Fish life has been absolutely annihilated in many of these streams. Thousands of acres of land is polluted to the extent that when the water collects in little ponds it is covered with a scum of oil and saturated with salt water. Domestic animals are dying by drinking the water, and it is reasonable to believe that even the birds, both the song and game varieties, will follow the fish to extinction. Should this happen, an agricultural tragedy would be almost sure to ensue. The birds are the most powerful friend of the farmer. They hold in check the insect life which otherwise would destroy every acre of grain planted by him. If this part of the country becomes poisoned to the extent that the birds become exterminated, it is reasonable to believe that insect life will become unchecked and will devastate the crops of the farmer. This is not a mere idle brain storm of a theorist. It is a punishment decreed by Old Mother Nature, the result of one of her immutable laws.

The Legislature of the State of Oklahoma has not been recreant of its trust. It has given consideration to this subject and has enacted two wise provisions, which are as follows:

Section 4324.—DISPOSITION OF WASTE FROM WELLS:

"No inflammable product from any oil or gas well shall be permitted to run into any tank, pool or stream used for watering stock; and all waste of oil and refuse from tanks or wells shall be drained into proper receptacles at a safe distance from the tanks, wells or buildings, and be immediately burned or transported from the premises, and in no case shall it be permitted to flow over the land. Salt water shall not be allowed to flow over the surface of the land.

"PENALTY: Fine \$25.00 to \$500.00, or jail 30 to 90 days."

Section 3301. Amd. 1915, p. 378.—CONTAMINATING WATERS.

"No person shall deposit, place, throw, or permit to be deposited placed or thrown, any lime, dynamite, poison, drug, sawdust, crude oil or other deleterious substance, in any of the streams, lakes or ponds of this state, and any person violating the provisions of this section shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars, or by imprisonment in the county jail not exceeding one year."

With these laws upon our statutes and with the Game and Fish Department charged with their enforcement, it would seem as if it were an easy matter to clean up the state, but two years' experience as Game Warden leads me to know that it is not an easy matter. In the first place, a great deal of damage was done ten years or more, and at the present time we find that most of the oil producers and refiners are attempting to clean up. Under these conditions, it would be worse than useless to prosecute. Some of the companies are spending a large amount of money, and one refining company, located at Tulsa, is credited with an expenditure of a million dol-

lars in its attempt to, not only prevent future pollution, but to take much of the oil which is being wasted by flowing down the rivers. The Mid-Continent Oil and Gas association recently issued to its membership of more than a thousand producers and refiners a bulletin prepared by this Department presenting about the same facts as are now being presented by this report. Assistant Game Wardens are visiting the various oil wells and suggesting ways and means of preventing further pollution, and in most instances find the oil producer anxious to co-operate. Many suits have been instituted against producers and refiners who showed no disposition to co-operate, and several convictions have been secured, but as a general thing it is a difficult matter to bring these cases to trial, and courts are oftentimes loathe to assess a penalty because of a showing made by those polluting the streams that the pollution was almost a necessity and that to immediately stop pollution would mean the stoppage of production or refining. The enforcement of law depends largely upon the education and willingness of the people. For many years the pollution of streams went forward almost with no protest, because everybody was anxious to have the oil produced and refined, and the dreadful outcome of pollution was not made apparent. With the awakening of the public conscience and with the knowledge of the terrible effect that has followed and will follow the pollution of these streams, and with the increased price of oil and its products, it is reasonable to believe that the law will be much easier to enforce in the future than it has been in the past. The Game and Fish Department of the State of Oklahoma has for a part of its work the restoration of the natural beauty of the state and the restocking of our streams with fish after pollution has been discontinued. There is now sufficient pollution in the soil of Oklahoma to affect the streams for several years if not another barrel of oil or acid be thrown, untreated, into the streams. It will take time and work to bring Oklahoma back to its original purity, but it is certainly worth the effort, and should be demanded by every patriotic citizen. The oil producer and refiner who does not thoroughly clean up his premises and discontinue pollution must be made to do so by the courts of the state. This cannot be effected without expense. The production and refining of oil is a lucrative business. It has made more millionaires in the State of Oklahoma than all other lines of business combined. I don't know of anything the Legislature could do to improve our law. As compared with the law of other states, it seems to be the best yet devised. The Game and Fish department, however, must receive the moral support of the people in the enforcement of law. It has taken more than twenty years to poison the streams of the state, and it stands to reason that it will require a few years to bring them back to comparatively pure conditions.

In the meantime the State of Oklahoma is preparing to not only restock the streams where fish have been annihilated, but is assisting the farmers in stocking private ponds. The state has established two fish hatcheries, one of which is located at Armstrong, Oklahoma, and the other at Medicine Park, Oklahoma. The productions of these fish hatcheries are being used, first, for the stocking of ponds and lakes, and the fish that are left from each year's hatch are then put into the streams of the state. The propagation of fish offers to the farmers of the state a source of food supply of great importance. There are in the State of Oklahoma, according to the Department of Agriculture, 194,784 farms. If it were possible that these farms would average one acre of water properly stocked with fish, the yield in food supply would be one of the most important of the farmer. An average of 500 pounds of fish per acre per annum is not impossible when properly stocked with not only fish but aquatic plants. This would make the annual

production of fish in Oklahoma from ponds 97,392,000 pounds, which at twenty cents per pound would be worth \$19,478,400. Surely the possibility of producing this amount of good food should call forth our best efforts. Fresh fish directly from these ponds would not be like the fish purchased from the market that had been packed in ice and subjected to cold storage for days and perhaps weeks and months. They would be good, fresh, wholesome and palatable and would make a fine addition to the family supply of food. Of course, an acre of water on each farm is an ideal which could not possibly be realized, but an average of one acre is not only possible but feasible, and many farmers will not be satisfied with merely one acre.

The Department desires to impress this fact upon the reader. It requires no more skill or knowledge to propagate fish than it does to propagate poultry. It is not everybody that makes a success of the propagation of poultry, and therefore it is not expected that every one who tries will become successful fish culturist. Some farmers' wives with a dozen old hens will raise many times the number of young chickens that other farmers' wives will raise with no better opportunity, and some farmers with an acre pond will raise many times the fish that will be raised by other farmers with conditions just as good. In order to obtain the best results in raising poultry it is necessary to feed and care for the poultry. In spite of this fact many farmers produce a great many chickens by merely letting them run at large, combatting their natural enemies and rustling their own feed, and many men will be indifferently successful in the production of fish by merely turning young fish loose in the ponds, allowing them to shift for themselves, fight their enemies and rustle for their food, but many other farmers will be more successful by stocking their ponds with food plants, by fighting the enemies of the fish, by seeing that they are not disturbed, and are provided with the necessary amount of water. Care and attention will pay big dividends in the production of fish as it does in the production of poultry and livestock.

Natural Ponds.

Oklahoma is one of the states having the fewest number of natural ponds and lakes, and most of the so-called natural ponds are merely bayous caused by the rivers changing their courses and leaving a lake or pond where the rivers formerly flowed. Most of these ponds are splendid fish ponds, with the exception that they are subject to overflow from the river adjoining during the high water. Some of them overflow almost at every rise of the river, while others overflow only in extreme cases of high water. Very little can be done toward bettering the conditions of these so-called natural ponds. The enforcement of the law preventing the dynamiting and seining will conserve to their owners a fine lot of fish each year. Most of them are stocked with bass, crappie, catfish and with the coarser fish such as carp, buffalo and shad. Most of these ponds become overstocked with the coarser varieties of fish, and under the direction of an assistant game warden, they should be seined occasionally and the coarser fish removed along with the natural enemies of fish, to-wit: snakes, turtles and garfish.

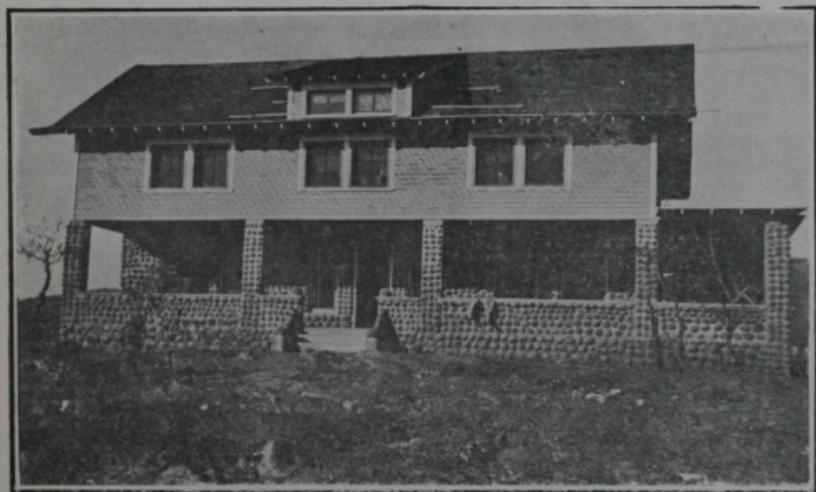
An Ideal Pond.

An ideal fish pond would be one of two acres or more; and the more the better, fed by springs of sufficient capacity to maintain a level or to keep the water at a uniform height. The amount of water necessary per acre to maintain a pond and to provide against evaporation and seepage is very hard

to estimate. The National Bureau of Fisheries in its splendid bulletin entitled, "Fish Ponds on Farms," estimates the amount of water necessary to overcome seepage and evaporation of an ordinary pond at 50 gallons per acre per minute. It can be readily seen that some ponds will require many times as much water as other ponds. If the ponds are constructed in loose, gravelly ground the seepage will be great, while on the other hand, if they are constructed in tight land with clay bottoms the seepage will be but very little. The evaporation during hot months of summer is many times that of the cooler months, and in dry weather is many times more than during rainy seasons. Therefore it is almost impossible to estimate the amount necessary to overcome seepage and evaporation and can only be determined by a trial. At the state fish hatchery located at Armstrong, Oklahoma, ten ponds cover about four acres of land. This hatchery is supplied with water pumped from the Blue river under a contract with the cities of Durant and Caddo. Up to the present time Caddo has done all of the pumping and the exact amount of water for any month is accurately known. During the months of June, July and August, 1917, the months of greatest evaporation, the amount of water pumped into the hatchery was 1,932,000 gallons. The number of minutes in these months was 131,480. The number of gallons divided by the number of minutes is just a little less than 15. Therefore 15 gallons per minute served four acres during these months, which, per acre, would be a little less than four gallons per minute. While the hatchery did not receive as much water as was desired, sufficient water was pumped into the ponds to keep the fish in good condition, and the spawning season of the most of the fish was over at this time.

The ponds at Armstrong are constructed in reasonably tight loam and the seepage is very small. This serves to show that a very small amount of water under certain conditions insures a good, healthy condition of the pond.

An ideal pond should be deep in the center and shallow at the edges. The deepest place should be next to the dam where a four or six-inch pipe should drain all the water underneath the dam and where the drainage would



SUPERINTENDENT'S HOUSE, STATE FISH HATCHERY, MEDICINE PARK, OKLAHOMA

be thoroughly controlled by a valve in the pipe. Of course, the deeper the water the better, but it should be at least ten or twelve feet deep in the center. Deep water remains cool and keeps the large fish in good condition, and shallow water is absolutely necessary for most species of fish during their spawning seasons and for the protection of the small fish against the larger fish after they are hatched.

The ideal pond should have a cement dam, although there are many ponds and lakes in splendid condition with a dam entirely constructed of earth. In case the dam is made of cement it should extend well below the surface in the bottom of the depression and well into the sides of the banks of either side, and in case the spillway is constructed in the dam a cement basin should be built at the bottom of the dam, on the outside, for the water to pour upon so that it would not wash a deep hole, which would ultimately undermine the dam. The ideal spillway is not built in the dam, however, but is built in the solid earth around the dam, and the farther around and the longer the spillway, the less danger there will be of washing it to a depth that will be detrimental to the pond. If the spillway be cemented or rip-rapped the danger of erosion will be lessened. This is an important matter and will well repay the expense necessary. The spillway of a pond, whether it be built in the dam or around the dam, should be well provided with a woven wire screen to protect against the loss of fish in going out with overflow waters. The screen should be placed at the entrance of the spillway. Many people have become disgusted with pond construction because they have dammed up some low place in which the pond received water from a large area, and during the time of rainfall the ponds would become flooded, would soon rush over the dam, and if not washing it entirely away, would tear out great gaps and entirely empty the pond of water, and if the same contained fish the entire crop would be lost. If the dams be constructed of earth adequate spillways must be provided and the spillway must be gauged according to the largest amount of water necessary to be taken care of during the times of greatest rainfall.

The ideal pond should have all of its banks well sodded with Bermuda grass. Oklahoma is fortunate in this respect. Bermuda is the best grass known for sodding purposes and is natural to this state. Many of the states north, including Kansas, have made failures along this line because the Bermuda grass north of Oklahoma winter-kills, but in Oklahoma every farmer can have his pond banks well sodded and well protected with Bermuda.

The ideal pond should be well shaded with trees, and where nature has not provided them it is the duty of the farmer to plant upon the banks of his pond, willow, cotton woods or other trees of rapid growth for the purpose of providing shade for the fish and for the protection of the banks against washing.

As stated above, the ideal pond is one that is watered by springs, but there are few ideal ponds in Oklahoma, and the farmer should not be discouraged because he has no ideal location. His family can be well supplied with fish from a pond far below the grade of "ideal." I have observed in the western portion of our state ponds constructed on high, level prairies by throwing up embankments on all sides, the earth being furnished by scraping out the bottom of the pond. As a general thing, this soil is of a tight nature and "holds water like a jug." The water is furnished by wind pumps and usually the wells are deep. The idea of these ponds is usually stock water, but every one of them would furnish an excellent home for fish. Most of them are little more than one-fourth of an acre in extent and one good well appears to keep them well supplied with water. This would indicate that

three or four wells would supply an acre, and these ponds have the advantage of being absolutely free from any overflow, and where the banks are well built and well sodded no difficulty would be encountered in maintaining them. This seems to furnish the possibility of a fish pond miles away from any stream or spring, and the farmer possessing the ponds has a splendid watering place for his stock, and under some circumstances might have water enough for irrigation purposes for a small plot of ground.

By far the greater number of ponds in Oklahoma already constructed are made by damming up low places, and most of them are watered only by surface water. This is not an ideal pond, but there will be more fish raised in this kind of pond in Oklahoma than in ideal ponds, and this form of pond need not necessarily be a small pond.

Northeast lake, located near Oklahoma City, is not fed by springs or by water of any kind except surface water, and yet it is a splendid fish pond. At low seasons of the year it contains a hundred and sixty acres and during rainy seasons much more. It is true that its depth varies at different seasons of the year, but it is deep enough that it never goes dry and contains sufficient volume of water to keep cool during the hottest summer days.

Another notable example of this form of lake is the city waterworks of Ardmore. A large lake has been constructed, a large acreage has been leased and kept in grass land. The water from the land flows into the lake and the watershed is large enough and the lake is deep enough that Ardmore is furnished with good, clear, cold water the year around, not a gallon of which comes from springs.

Some of the larger ponds and lakes of the state are made by damming up small streams. The most notable example of this character is Lake Lawtonka, at Medicine Park, which supplies the city of Lawton with water and which at the present time supplies the great reservation at Fort Sill and the fish hatchery also located at Medicine Park. A great strong dam has been built across Medicine creek. It is built of granite rock and cement and an immense lake of water has been formed. It is proposed to build the dam still higher and make the lake still larger, in which case it will not only conserve enough water to supply a city or several cities, but will furnish an adequate amount of water to irrigate several thousand acres of land.

In building fish ponds the farmer is confronted by the same problems on a smaller scale that confronted the cities above mentioned. They can dam up small streams, and where this is done a cement dam is absolutely necessary, or they can dam up low places with either an earthen or cement dam and protect the dam, especially if earth, by an adequate spillway. In building dams it should be remembered that there is little danger of making them too strong or too good, and in building spillways it should be remembered that there is little danger of building them too large. If the farmer expects to raise bass the pond should contain at least two acres and be twelve feet deep in the center, but satisfactory fish culture can be obtained from ponds all the way from one-fourth acre to two acres for the propagation of crappie, sunfish, perch and bullhead catfish.

Where possible the grounds should be surrounded by grass as the tendency to fill up with silt is much less, but even this is not always possible. Mention was made above that an ideal pond is one in which the water could be drained out through a pipe controlled by a valve. This enables the farmer, in case the pond becomes overstocked with aquatic plants, to drain the pond and rid it of the useless growth of plant. It also enables him to sort his fish.

and to take out any undesirable fish, but if the farmer has but one pond this would be unnecessary as he would have no place to put the fish while he was draining the pond. Therefore the draining is unnecessary where but one pond is provided. The more cultivated the ground and the looser the ground surrounding the pond the quicker it will fill. Therefore care should be taken to protect the pond with as much grass land, Bermuda preferred, as possible.

The builder of ponds will often times find it necessary to construct them in soil in which the seepage is very great. He is warned that disappointment may result the first time the ponds are filled with water and that within a few days they may become dry on account of seepage. Discouragement should not result because many ponds have been builded in just such places and much can be done to improve them. The tramping of stock and the harrowing of the sides and bottoms by allowing a harrow to be dragged around after horses, many, many times, and the growth of aquatic plants all tends to tighten the land and to stop seepage. Where possible, if a coat of clay be put in the bottom of the ponds and on the sides it will often times entirely stop the seepage and the constant filling and refilling of the pond will in time make them almost tight. In some places it may require a year's work or more to make the ponds water tight, but it will be worth the effort.

Aquatic Plants.

The next step in fish culture after the construction of the ponds is the stocking of them with aquatic plants. I mentioned above that these plants will serve to prevent the seepage of water, but of course, before this result can be accomplished it will be necessary to have the entire bottom of the pond covered with these plants. These plants are oftentimes called "mosses," and are found in most of the streams and cold water ponds of the state. They consist of such plants as cattail, water lilies and the mosses above mentioned. Of the so-called mosses the most important are Chara Fragillis, commonly known as Chara Fanwort (Cahmbe, Caroliniana), Spiked Water Millfoil (*Myriophyllum Spicatum*), Hornwort (*Ceratophyllum Demersum*), and many other kinds of moss and grass common to the waters of this state. In fact, almost any kind of aquatic vegetation that grows in the pond will be found of great advantage. In some localities one variety will grow better than others, and the best plan is to plant several different varieties in the pond and the one best adapted will finally crowd out all the balance. This exemplifies the law of "survival of the fittest." Chara Fragillis and potatoeeton have proved to be the most prolific at the state hatchery. Most of these plants grow readily by merely taking some of the plant and tramping it into the bottom of the pond. Care should be taken in transplanting the plants to keep them in water all the time so that the exposure to the air will not render them unfit for transplanting. Most of the so-called mosses can be attached to a mudball and tramped into the bottom of the pond or where the water is very shallow can be inserted in the mud in the bottom of the pond with the hands. Cattails and other plants can be dug up and propagated from the roots.

These plants play a very important part in the propagation of fish by their constant purification of the waters. They take up the carbonic acid gas caused by the decomposition of animal and vegetable matter and they give off oxygen which is absolutely necessary in fish life. No doubt the reader

has often noticed that a pond stocked with aquatic plants contains clear water and the same pond, if not stocked, would be muddy.

These plants furnish a constant supply of food for the fish. They become completely covered with minute forms of animal life, Crustacea, mollusks and minute insects, which furnish the principal food for both the young and old fish. Where ponds are well stocked with aquatic plants no other foods will be needed until the pond becomes overstocked with fish.

If possible the pond should be stocked partly with mosses and such plants as water lilies and with cattails and other tall grass around the edge.

It oftentimes happens that old ponds become overstocked with plants and it becomes necessary to reduce them. They become so luxuriant as to almost crowd out everything else and it becomes a problem to abate this nuisance. It can generally be controlled by paddling over the pond in a flat bottomed boat and gathering the mosses with a heavy pitchfork. Where the bottom of the pond is smooth a barb wire is sometimes fastened to a strong support, a horse hitched to the other end and dragged around the pond. In this way a great quantity of moss can be dragged out very easily, but if the bottom of the pond contains rocks or stumps this method cannot be pursued. Sometimes the water lilies become so luxuriant as to leave little ground for fishing. This can generally be controlled by cutting the water lilies off beneath the water several times in succession and in doing this they will gradually die down for the want of air. Grasses like cattails will grow only in shallow water, hence they hardly ever become sufficiently thick to interfere with the fish. We want to say, however, that as a general thing ponds are understocked instead of overstocked with aquatic plants. It is the intention of the state, as soon as possible, to furnish aquatic plants at the same time fish are furnished, and this can possibly be done in 1918, but at this time a sufficient supply has not been grown at the hatcheries to enable the state to furnish free plants. As a rule, however, a visit to adjacent streams or ponds will result in the accumulation of a sufficient number of plants to begin their cultivation.

The fish now being produced at both Medicine Park and Armstrong are the fish found inhabiting our ponds and streams by the early settlers of the state, to-wit: bass, crappie, sunfish and catfish. It is also believed that the yellow perch will prove a good pond fish, and from the Federal hatchery at Neosho, Missouri, a small quantity has been secured and is being propagated. All of the fish mentioned above are so well known that they need but little said in their behalf to the people of Oklahoma. However, as a general proposition, it has been found by the experience of not only the various states, but by the Federal government, that bass are adapted to ponds of more than two acres in extent, and that when ponds are less than that amount they do not thrive on account of their cannibalistic habits. They not only devour every other fish in small ponds, but devour their own young, and therefore the ponds of small capacity, if stocked with bass, will soon have no fish at all. In the opinion of the Department, the crappie is the best pond fish for ponds of all sizes in the State of Oklahoma, and their introduction with bass in large ponds is strongly recommended. In fact, when a pond contains more than two acres, bass, crappie, sunfish and catfish can all be introduced. In ponds of less than two acres, crappie, sunfish and catfish can inhabit the same pond.

The application for fish to the Department is made on a form of which the following is a copy.

"FISH AND GAME DEPARTMENT"

Application for Fish.

Date of application _____
 Name of applicant _____
 Postoffice address _____
 County of _____ State of _____
 Fish to be delivered to _____
 Whose postoffice address is _____
 Whose telegraph address is _____
 Whose telephone connection is _____
 Whose nearest express office is _____
 Railroad station where fish are to be delivered _____
 Name of railroad _____
 How long does it take to drive from the railroad station to the water to be stocked _____

Disposition.

Endorsement.

Mess _____
 No. _____

Description of Waters to Be Stocked.

Describe only one lake, pond or stream on this blank.

1. Name of water _____
(It is desired that a name be given all water.)
2. Is it a pond, lake or stream? _____
3. In what county? _____ 3a. State _____
4. How long is it? _____ 4a. How wide _____
 4b. How deep? _____
5. What are its sources of supply—spring, swamp or surface water? _____
6. Where does it empty? _____
7. Highest summer water temperature? _____
 7a. Does it ever go dry? _____
8. Is the bottom mud, sand or gravel? _____
9. What vegetable life does it contain? _____
10. Is the current rapid or slow? _____
11. Is it in wild or cultivated lands? _____
12. Is any sawdust or other substance deleterious to fish emptied into it or its tributaries? _____
13. Are any irrigation ditches supplied with water from it, and if so, are they properly screened to prevent the entrance of fish? _____
14. What is the sentiment of the locality in regard to the laws for fish protection? _____
15. Are the laws well enforced? _____
16. What kind of fish does the water now contain? _____
17. What kind of fish do you wish to introduce? _____
18. Have fish ever been planted in it? _____ 18a. When _____
19. What kind? _____ 19a. With what success _____

20. What constitutes principally the local food of the fish?-----

21. Will you meet the fish at the depot and place them in the waters above described, and will you report the results of the plant you propose to make on the third year after receiving the fish?-----

After the application has been made and forwarded to the Department, it is then sent to one of the fish hatcheries from which it is most convenient to supply. When a sufficient number of applications have been collected from any particular part of the state to justify a shipment the applicant is notified of the shipment of fish by a card of which the following is a copy:

STATE FISH HATCHERY.

The party addressed on this card, an applicant for fish from the state fish hatchery, is sent this advance notice that it is expected that delivery of fish will be made within the next 20 days. Telegram notifying you of the train to meet will be sent when the fish leave the hatchery. Please meet the train prepared to carry a 10-gallon can of fish from the baggage car to the pond and promptly return the can to the station.

Supt. State Fish Hatchery.

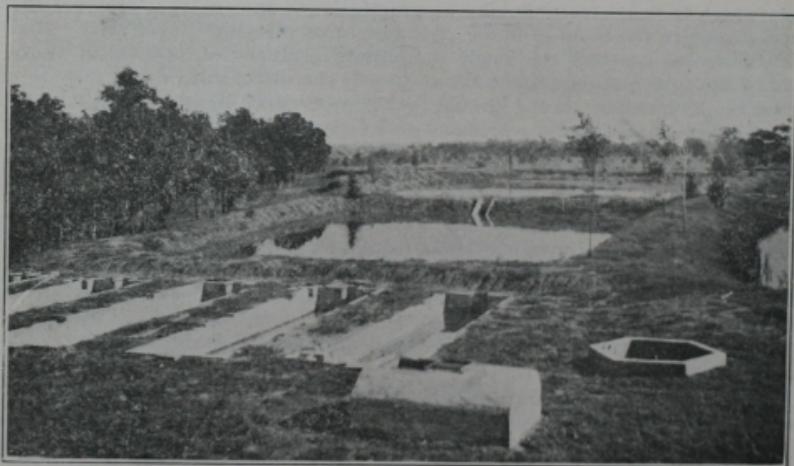
REMARKS.

A few days after receiving the card, he will then receive a telegram from the Superintendent of the fish hatchery notifying him of the exact train to meet, and the fish will be shipped in the baggage car in milk cans. It is the duty of the applicant to meet the train, to convey the fish immediately to the pond and plant the same, returning the empty cans as dead-head baggage back to the fish hatchery. The prompt co-operation of the applicant in returning cans will greatly aid the Department as the cans must be used over and over. The operations of our fish hatchery at Medicine Park were not nearly so successful in 1918 as they were in 1917. The State of Oklahoma has a contract with the city of Lawton to furnish water for the fish hatchery at the nominal sum of \$1.00 per year, the city permitting the hatchery to take water from its main so long as practical, but the contract provides that it may require the state to build an independent pipe line to the dam. However, since the contract was made the military authorities have taken possession of the lake and dam and have requested the discontinuance of the use of water by the hatchery on the ground that it was needed by the soldiers at Fort Sill. As soon as the request was made an attempt was made by the Department to install a pumping plant that the water might be pumped from Medicine creek. It was found to be impossible to purchase a new engine and a second-hand engine was bought from the International Harvester company, which proved to be inadequate. Therefore the water in the ponds at Medicine Park could not be kept at a proper level and many of the ponds had to be abandoned. The hatchery has therefore done very little during the present year and conditions are altogether unsatisfactory. If they cannot be made better during the coming year no attempt should be made, in my opinion, to hatch fish. In fact, no attempt should be made until an adequate water supply is absolutely insured.

The streams in the mountainous part of the state rival in beauty and scenery and purity of water the streams of Colorado. Of course, it is not so cold, but it is the result of springs which are affected very little by dry or wet weather. These streams were originally stocked with bass and other native species of fish, and it was believed for many years impractical to stock them

with trout. However, the Federal government, a few years ago, placed rainbow trout in a few of the streams, and they appear to be outstripping the native fish in growth and numbers. In Spavinaw creek, one of the most beautiful streams of the state trout now predominate, and as the waters of the Spavinaw are very much the same as are the waters of Wauhillau, the upper course of the Illinois, the Kiamichi and its tributaries, Mountain Fork, Glover, Little river and many other smaller streams in the eastern mountains, I am firmly convinced that this part of the state is adapted to the propagation of rainbow, steelhead and brown trout. The waters are not cold enough for the production of brook trout, but the three varieties mentioned will all of them thrive in these waters, and in my estimation an attempt should be made to stock these streams with trout. For this purpose the Game and Fish Department should either make arrangements for an annual supply from some state or the Federal government, or should establish a trout hatchery somewhere within this territory. The propagation of trout and the hatching of trout are much cheaper than the production of pond fish. I do not advocate the placing of trout in any of the streams outside of those flowing from the eastern mountains, but there is sufficient water in these mountains to absorb the production of one trout hatchery.

With the establishment of thousands of private ponds in the state, with the restocking of the polluted streams after they have been brought to a state of comparative purity, with the stocking of the mountain streams with trout, the production of fish in Oklahoma can be augmented many millions of pounds annually. Oklahoma will never be fit for the commercial production of fish, but it can be made a great state for the production of fish for family use. The small ponds and small streams can be made to supply every family in their vicinity. An opportunity is offered to the inhabitants living upon the high prairies of western Oklahoma to develop this industry. There the water supply comes from deep wells with a wind pump, and the danger of the banks of the ponds washing away is entirely obviated. Each small pond can be made to produce enough fish for one family without interfering in the least with the use of water for stock or irrigation purposes.



FISH PONDS AND GATHERING TANKS, STATE FISH HATCHERY, ARMSTRONG, OKLA.

Pond Fish—Crappie.

The Department unhesitatingly recommends the crappie as the best pond fish for the State of Oklahoma. The crappie, as all other fish described in this report, are indigenous to our waters and are found in almost all of the lakes and streams of the state. They inhabit the waters of nearly all of the states from the Great Lakes to the Gulf in the Mississippi Valley and all of its tributaries. It is a most excellent pan fish of extremely delicate flavor. Many people consider his meat superior to that of the bass. The habits of the crappie make it very suitable for pond culture and it does best in water slightly turbid, and has no objection at all if the water is absolutely roily.

The crappie is a very delicate fish and should be handled with the greatest care, and where fish are being removed for propagation purposes they should not, if possible, be handled at all with the hands, and when taken from the pond or net should be handled with a vessel so that the water can be dipped up with the fish. Extreme care should be taken with the fish that no scales be scraped from the fish, because where this is done a fungus growth is likely to result in the death of the fish. The Department desires to caution the amateur culturist against leaving fish out of the water. It is true that they may remain out several minutes and when put into the water may swim off and have all the appearance of perfect health. It is also true that during the moments they remain out of the water they may have contracted what in a human would be lung fever, which may result in their death a few days later. A fish out of water is subject to the same inconvenience as a human being submerged in the water. Fresh air rushing into the lungs of a fish has very much the same effect as a large amount of water rushing into the lungs of a human being. Human beings need water, but they need it in moderation. Fish need air, but they get a sufficient supply in good, pure water. The crappie is a very prolific fish and at the ponds in the state fish hatchery shows a larger increase than any other fish. While not strictly speaking a game fish,



COUNTRY CLUB BOAT HOUSE, NEWKIRK, OKLAHOMA



SUPERINTENDANT'S HOUSE, STATE FISH HATCHERY, ARMSTRONG, OKLAHOMA.

the crappie bites readily at a hook baited with a worm, insect or meat of any kind, and is sufficiently game to make his fishing extremely interesting, and is easy enough caught to not discourage the women and children. A pond of crappie will make any farmer a pleasant hour of recreation as often as he desires and a pleasant half hour of splendid eating after each hour of recreation.

Black Bass.

Here is the sportsman's favorite and probably, also, indirectly, the cause of more large fish stories than any other fish inhabiting Oklahoma waters. They grow large in Oklahoma—two and one-half or three pounds being ordinary, and five or six pounds no exception, while, of course, the ones that get away were much larger. He is the game fish. He is a mighty good fish to eat, and if it was not for his extremely bad habits no one would need to look further for a fish to cultivate in the ponds, but, unfortunately, he is sociably inclined and has such a ravenous appetite that he is ambitious to eat up every other fish in the pond, including his own children. Black bass should never be introduced in a pond of less than two acres, and the larger the pond the greater the chance for success in raising black bass. He lives almost entirely upon live food and during a period of one year will eat many times his own weight in other fish. In fact, he will sometimes accomplish this feat in a week's time; thus it will be seen how rapidly he will devour the other fish of the pond and how much live food is necessary to his growth. In the larger ponds this is not only possible but feasible, because fish propagate with great rapidity. A German carp will lay from one to three and one-half million eggs at a time, and if a small percentage of these reach maturity a pond will soon become well stocked. Mr. Bass is very fond of carp, and while most people object to putting carp in ponds, there are a large number of eminent fish culturists who advise that this be done if for no other purpose than the furnishing of food for game fish. I have noticed, in seining the lakes and streams of Oklahoma, that wherever a large number of bass and crappie are

found, carp is also found in abundance. In ponds where bass are to be propagated, plenty of aquatic plants should be furnished and plenty of shallow water provided that the smaller fish may have an opportunity to escape his ravenous onslaughts.

Sunfish.

At both of the fish hatcheries in Oklahoma a number of ponds are being stocked with sunfish and a large number of fingerlings will be shipped to those desiring fish for propagation. The sunfish is a splendid pond fish and a splendid pan fish, comparing favorably with crappie and not possessing the bad habit of the black bass. In a pond of two acres or less the sunfish, crappie and catfish, and if the owner desires, such coarse fish as buffalo and carp can be raised in perfect harmony, as none of these fish are cannibalistic, although all of them except the buffalo and carp eat the fish of other kind, but are not so ravenous as the bass. Some of them feed largely upon vegetable matter, and all of them are very well satisfied with crustacea, mollusks and larvae that gather upon the aquatic plants in the pond and insects that fall into the ponds.

The suggestion of sunfish or perch takes us back to our early childhood days, when, with a cotton thread, a crooked willow pole and a pin hook, we took those interesting little fellows from the old swimming hole.

Because sunfish can be caught with this sort of tackle, it does not follow that he is not a game little fellow. He is game, and while he must necessarily fight in the feather weight class, he invariably puts up a good fight. We all know how the little "pumpkin seed" two inches long can easily submerge the largest cork ever attached to a fish line. The larger varieties, such as the bluegill and the green sunfish, grow to a size that makes them satisfactory for every purpose. The bluegill average from eight to twenty-four ounces. The sunfish are very friendly little fish, coming close to the edge of the pond to feed, where they may be seen and admired, and are easily taught to eat all sorts of artificial food.



BIRDSYE VIEW FISH PONDS AT STATE FISH HATCHERY, MEDICINE PARK, OKLAHOMA

Catfish.

It can easily be proven by any boy that the catfish is the most dependable fish in our streams and ponds. Whenever we fail on everything else, we can at least be consoled by catching a few bullhead. The stock in no pond in Oklahoma would be complete without a few catfish. They interfere mighty little with other fish, they feed largely upon the bottom of the pond, they propagate very rapidly, and after all, they are mighty good fish to eat. They have few bones and when taken from reasonably pure water and are reasonably well cleaned and well cooked, they furnish a most palatable meal. In speaking of the catfish above we refer to the bullhead catfish, which is the only catfish for pond propagation in Oklahoma. The channel catfish is a splendid fish found in the rivers of the state, but after twenty-five years of incessant trial the Federal government has given up his propagation in ponds, because we find he will not spawn in captivity. Frequent calls are made on the state fish hatcheries for channel cat, but they cannot be furnished for pond propagation.

Carp.

The German carp was introduced into this country about twenty-five years ago, and so far as I know we have always had the buffalo. Neither of the fish are propagated at the state hatcheries. It is not necessary—they propagate themselves everywhere else. All the rivers and most of the lakes of the state are full of them.

It is true that the flesh of these fish is not so good as that of the bass, crappie or catfish, but when they are taken from reasonably good water, killed and bled and immediately well cleaned, taking all of the outer skin, on which the scales are located, from the fish, and all of the black tissue from the inside cavities, and then are well baked, they make a fairly palatable meal, and we believe the more study given to the preparation and cooking of these fish the more they will be appreciated by the people of Oklahoma, and we know they can be raised by the millions and millions of pounds. I also know that they furnish excellent food for bass, crappie and other fish, and while some culturists claim that they rob the nests of game fish of spawn, other culturists deny this, and as mentioned above, in seining the lakes and streams of Oklahoma they are always found where bass and crappie abound.

If any citizens of the state desire carp for propagation purposes, the same can be furnished by the Game Warden from some nearby stream or lake. The owners of ponds, however, are warned that the prolific tendencies of the carp are such that if not restrained may cause them to become the sole inhabitants of the pond, and as they do not respond readily to hook and line fishing, it becomes necessary to seim them out occasionally, and this can be done, under our present law, under the direction and permission of the Game Warden or any of his assistants.

There are many kinds of good pond fish not described in this report, but if those fish described herein are propagated no mistake will be made. These are the fish that were in Oklahoma before the eighty-niners came and they will be the favorites of the great-great grandchildren of our pioneers.

The Spawning Habits.

Every owner of a fish pond is interested in the spawning habits of the fish introduced into his pond. He is interested to the same extent that he is

interested in the eggs laid by his poultry, and every farmer's wife necessarily studies the habits of the hens—where they are most likely to build their nests, when they lay their eggs, how many they lay, what pests destroy the eggs, how long it takes to hatch the eggs, and what per cent of the eggs can be reasonably expected to hatch under favorable circumstances and what constitutes favorable circumstances.

So it is with the owner of a fish pond. First, he will be delighted to know that each female fish lays from 2,000 to 1,000,000 eggs each season, and that the spawning begins in the spring about the time the water in the pond or lake reaches a temperature of 60 degrees Fahrenheit or higher. Most of the spawning in Oklahoma by pond fish occurs in the months of April, May and June, although some spawn earlier and some spawn later. Fish seem to have a better idea of the division of labor than most of the lower order of animals. The female fish, it is true, lays the eggs, but it is the male fish that selects the nest, fertilizes the eggs after they are laid, and then carefully and patiently hovers over the nest until the little fish are hatched and then extends his parental care over the school of fish until they arrive at an age, which in his discretion, he believes they are able to shift for themselves. In fact, the fish seem to have adopted the Sunday paper idea of "letting George do the work."

During the spawning season of all fish as much care should be taken as possible to keep the waters in the ponds at a uniform height and to see that the waters in the pond are disturbed as little as possible. Many of the ponds will be used for watering stock as well as raising fish, and I suggest that where this is desirable that a small portion of the pond be fenced so that stock can drink only from that portion and tramp over that portion of water without disturbing the rest of the water. One of the duties of papa fish in his care over the nest is to keep the eggs fanned, by means of his fins, absolutely free from sediment. While he is laboring to hatch his young, should an old cow come along and put her big foot upon the nest, a million fish would be destroyed at one time. Stock of all kinds, geese, ducks, in fact everything that disturbs the waters are particularly detrimental to the fish during this time of spawning and nesting. It can also be seen that when the fish select the spawning place and make their nests, that if the water be allowed to be drained below the nests or to such depth that the right temperature could not be maintained, all the eggs would be killed before they were hatched, or if the water be allowed to rise to such height that the water became colder than was natural for their hatching, the eggs would become chilled and would not hatch. This is the reason why fish culturists insist upon maintaining a proper level, as nearly as possible, during this season of the year.

Feeding the Fish.

In several places in this report I have mentioned the necessity of stocking the pond with aquatic plants. Bullhead catfish eat a great quantity of vegetable matter. Carp, buffalo and suckers live almost exclusively upon vegetable matter, but most fish are by nature flesh eaters. Sunfish, however, consume a small portion of vegetable matter. The purpose of these plants, however, is not to supply vegetable matter for the fish. They grow beneath the water and soon become covered with crustacea, mollusks and insects, and these are the principal food of all pond fish, and where the pond is not overstocked furnish sufficient nutriment for their growth and development. The better the pond is stocked with aquatic plants, the more fish can be produced

in a given area of water. As stated elsewhere, when the baby fry is first hatched he remains attached to the egg, which nourishes him for two or three days. He then begins to eat the minute particles of animal matter found on and around the aquatic plants. There is no use to try to feed fish when very small because they will only consume their natural food. Numbers of fish culturists claim to have had indifferent success in the feeding of crappie, but as crappie eat all sorts of insects and will bite at a hook when it is baited with a worm or meat is suggestive to an intelligent mind that even crappie can be fed provided the feed be of an animal nature.

Bass are great feeders and when fed at some certain hour each day will congregate in the spot where they are usually fed and will even follow their feeder from point to point awaiting their food. They feed almost exclusively on meat products and little animals of almost any kind can be ground up in a sausage mill and utilized.

Sunfish are like the bass and can be taught to expect and to congregate for their feed. Like the bass, they prefer animal food. Almost any cheap meat, including liver, can be ground up and fed to them.

The catfish are the greatest feeders of all pond fish, and while they prefer animal feed, can be taught to eat almost any kind of vegetable food. Even corn when thrown into the water and allowed to become water-soaked makes them an acceptable meal, while cooked cereal of all kinds will induce rapid growth and are always acceptable to the catfish. They will also eat cabbage, potatoes, carrots, in fact almost any kind of garden vegetable.

The great proposition in the culture of fish is to raise them on their natural food and until the pond is overstocked with fish or understocked with aquatic plants it will not be necessary to introduce artificial food. When either of the above mentioned conditions arrive artificial food can be used, and of course must be regulated by its cost. Where the coarse varieties of fish abound they are often ground into fine meat and fed to the more gamey fish. This makes the carp and buffalo valuable as they use but very little of the same kind of feed used by the game fish and furnish either alive or in the form of ground meat, food for bass, sunfish and catfish.



OKLAHOMA IS ASSISTING IN SAVING HIM FROM EXTINCTION



PART OF HERD ON WICHITA NATIONAL GAME PRESERVE

Buffalo.

The wonderful food and clothing supply once furnished to the aboriginal inhabitants of Oklahoma by the buffalo, or correctly speaking, "the bison," is a familiar matter of history. His tragic extinction as a wild animal is one of the darkest pages in the history of sportsmanship and food economy, and stands as a perpetual indictment against the white hunters of all nations, reflecting the most wanton and wicked waste of a natural food supply ever recorded in the entire world's history.

These hardy animals, able to withstand the most severe blizzards of winter, flourishing alike in the verdant valleys, the wooded districts, the parched plains, and even the sandy deserts, once covered almost the entire continent of North America. Steadily they were driven westward, but it was not until about the year 1865, when transcontinental railways were constructed, that the awful wanton slaughter began.

Oklahoma, in common with other western states, was stocked with innumerable thousands and even millions of these animals. Indeed, it is believed that billions were slaughtered between the years 1865 and 1883, but a very small per cent of them were utilized for either their food or their splendid robes. Millions upon millions were slaughtered merely to gratify a desire on the part of the hunters by killing the largest number of buffalo in the smallest space of time, and nothing but the tongue or a portion of the hump was rarely used as food. Hunters came from every part of the civilized world eager to make a record of killing buffalo, and within a few years countless herds, sometimes reaching as far as the eye could see, were reduced to a mere straggling remnant, most of them confined in amusement parks and zoos throughout North America and Europe.

About the year 1889, Dr. W. T. Hornaday published a book in which he plainly showed that the extermination of the American bison was almost at hand. He gave the total number of bison then in existence as 1,091. A



COMMANCHE INDIANS FEASTING ON BUFFALO MEAT ON
WICHITA NATIONAL GAME PRESERVE

This Buffalo Was Killed by Other Buffaloes in Battle.

second census was taken in 1903, according to the American Bison Society, in which the total number was placed at 1,753. The American Bison Society was then formed and a census was taken in 1908, 1910, 1911, 1912, 1913, 1914 and 1916, and were published in annual reports. In the census of 1918, which at this writing, has not yet been published, I am indebted to Martin S. Garfison, secretary, for advanced issues which show that a summary of January 1, 1918, gives a total of pure blood bisons in North America at 6,466 and shows that in 1917 more than 900 calves were born. Of the total number of buffalo, 70 are wild in the United States and 500 in the Dominion of Canada. The rest of them are all held in enclosures or on preserves belonging to the Federal Government, various State Governments, game preserves, zoos and parks. Of the total number held in the United States, to-wit: 2,843, 758 belong to the United States Government. Only 57 bison are held outside of North America, and these are in zoos and parks.

Governor Williams has greatly encouraged the Game and Fish Department of the State of Oklahoma to assist in the conservation of these distinctively North American animals. Last spring the department became the possessor of ten head of buffalo, one of which was a yearling calf purchased from Col. G. W. Lillie (Pawnee Bill), directly from his ranch at Pawnee, Oklahoma. Eight heifers and one bull, all coming three years old, were purchased from Ray Spurrier of Bigheart, Oklahoma. One of the young cows was loaned to Oklahoma City for the purpose of exhibition and was placed in a pen with a splendid five-year-old bull at Wheeler Park, and under con-

tract with Oklahoma City any increase from these buffalo will belong to the State of Oklahoma. Four of the buffalo, three cows and one bull, are still in the pasture near Bigheart, and will be moved to the state game preserve at Choteau Springs probably before this book is published. Two of the young cows were taken to the state game preserve at Medicine Park and were placed in the pasture with a splendid three-year-old bull borrowed from the Federal herd on the Wichita preserve. I regret to announce that the buffalo calf and two of the three-year-old heifers were sent to Armstrong, Oklahoma, and were placed upon the state game preserve, where they shortly died, whether from the effects of disease acquired there or from poison the department has not been able to decide.

At the present time the department is negotiating with the Newport, New Hampshire, Blue Mountain preserve for the purchase of ten mature buffalo, and hopes to add this number to our herd by December 1. We have already made arrangements to acquire, by loan, another bull from the Wichita herd. This will give a total to the State of Oklahoma of nineteen head of buffalo, all mature enough to reproduce. Thus it will be seen that the State of Oklahoma is doing its full part toward the conservation of these animals, which only a few years ago came so near the edge of utter extinction.

The bison, like all other wild animals, thrive better in large pastures, but even in small quarters maintain good health, and is a splendid zoo animal.

Besides the interest being taken by the State of Oklahoma, we have some public spirited men who have taken a leading part in preventing the extinction of these animals. The Miller Brothers at Bliss, Oklahoma, and "Pawnee Bill" of Pawnee, Oklahoma, maintained herds and propagated buffalo during the darkest days, when it looked as if their extermination was only a matter of a few years. There is now within the State of Oklahoma buffalo as follows:

Choteau Springs Game Farm.....	4
Medicine Park Game Farm.....	3
Oklahoma City (Wheeler Park).....	2
Pawnee, Oklahoma (Col. G. W. Lillie).....	70
Sand Springs (Tulsa Amusement Park).....	3
Jack Howensteine, Lawton.....	1
Miller Brothers 101 Ranch, Bliss.....	25
Wichita National Game Preserve, Cache.....	100
Total in Oklahoma	208

The finest herd now in the State of Oklahoma is the one on the Wichita preserve, where they have about 8,000 acres inclosed in one pasture. This pasture is capable of producing food for more than one thousand buffalo, and under the wise supervision of Frank Rush, it will no doubt soon be stocked to that extent.

With the encouragement given the propagation of buffalo by both the State and National Government, it now appears certain that future generations of Oklahoma will not only have the privilege of viewing buffalo, but of eating them from time to time.

Deer.

The Virginia or white-tailed deer is the most prolific member of the deer family, and is common to the entire United States from the Atlantic Ocean to the Rocky Mountains, and from the reindeer region of the north to the Gulf



MASTER EDWIN FRANKLIN RUSH AND HIS PET DEER.

of Mexico, and Oklahoma appears to have been the most favored grounds of all. As mentioned elsewhere in this report, the time is within the memory of even some of our young people when deer were very plentiful in Oklahoma.

From a report gathered from my assistant game wardens in the spring of 1917, I became convinced that there were not more than five hundred wild deer in the State of Oklahoma. A vigorous enforcement of the game laws, in the southeastern part of the state, where most of the deer were then congregated, has resulted in a great increase in their number. The propagation from these deer and the immigration from the hunted districts of Arkansas into the protected districts of Oklahoma has, in my estimation, considerably more than doubled the number of wild deer, and I am confident that there are now more than a thousand, perhaps twice that number.

The closing of the season on deer hunting was not for the purpose of abridging the personal rights of the people who inhabit the mountainous part of our state, because they, more than any one, are interested in preventing the extermination of these valuable wild animals. They possess the only opportunity for the propagation of deer in any quantity. Wild deer in an agricultural country are an impossibility. Each deer, if they were protected, would each year destroy grain beyond the value of the deer. Hence their propagation, except in fenced enclosures, is an utter impossibility in an agricultural country, but in the mountains of the eastern part of the state their propagation in wild state is not only a possibility, but is feasible, and will bring to that part of the state an immense revenue and an opportunity of sport for the people. If the state game preserves first be stocked, and a law providing only for the killing of bucks, be enforced, there is a possibility of even greater deer hunting than has ever existed in the State of Oklahoma. This possibility is worth the best efforts of the Legislature and the moral support of the people of the entire state, and especially of that part of the state which is to be benefitted.

Antelope.

At one time Oklahoma was covered with countless herds of these valuable little game animals. Today they are represented by two small herds in Cimarron County. If the state does not intervene, they will soon become extinct so far as Oklahoma is concerned. Efforts to breed these animals in captivity have brought forth very little results. We now have under consideration the purchase of a quarter section of land over which they are now partly using and the capture of the entire herd, putting them upon this land surrounded by a fence of sufficient height to restrain them. I feel that this is purely an experiment, one which has not been tried by any state in the union, one which may succeed and may fail, but is well worth a trial. Should we succeed in propagating antelope even with fair success on their native grounds, we will have accomplished something that no other state or game farmer has accomplished, and may possibly demonstrate a method of saving these little animals from utter extermination.



ONE OF THE LARGE ELK ON WICHITA NATIONAL GAME PRESERVE

Beaver.

A few days after my introduction into the duties of this office I was informed that there were still beaver in the State of Oklahoma. Immediate investigation proved this report to be true, and I spent several days on the headwaters of the North Canadian River, on Beaver Creek and Wolf Creek in Woodward, Harper and Ellis Counties, and visited live colonies of beaver, and saw the remains of a great many abandoned beaver homes. I have reports from various sources proving to my satisfaction that beaver exist in several other places in the State of Oklahoma. In fact, four were killed on the Washita River last winter, and several colonies remain. The Legislature has closed the season on these animals, and I find a sentiment for their protection in most neighborhoods where they exist. Governor Williams was very anxious to find some location where they now exist where there is

plenty of water and soft wood trees to insure their remaining, and if such place could be found, the department would purchase the land for the purpose of protecting the beavers and to the best of our ability propagate them. The trouble now seems to be that the currents of the rivers along which they now live change so often that the beavers are compelled to move their abodes to suit the changes of the rivers. I also know that they often change locations because they exhaust their food supply, which is in that part of the country principally cottonwood and willow trees. The problem confronting

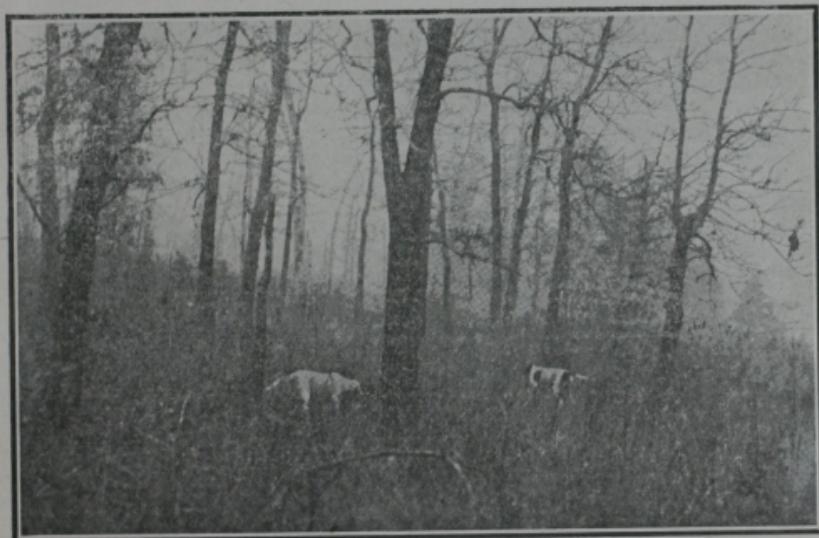


A BEAVER IN ACTION



WORK OF BEAVER NEAR FORT SUPPLY

us is to find enough water and enough wood so that the beavers will be satisfied to remain on the preserve which we would purchase for them. However, I do not feel that with even reasonable enforcement of law they will be exterminated. In fact, I believe that the number can be very greatly increased. I think I am safe in saying that there are probably one hundred colonies of from one to one-half dozen families now in the State of Oklahoma. There is no reason why this number should not in the next few years be increased tenfold.



STEADY AND TRUE

Quail.

By far the most valuable game bird in the State of Oklahoma is the bob white quail, and his propagation and conservation calls for the wisest action on the part of the Legislature, this department and the people. This beautiful, valuable and toothsome bird is common to every county in the state. He is the one game bird that so far has successfully withstood the onslaught of both animal and human enemies, and has increased in number since the settlement of the country. From early in the spring until late in the fall he works unceasingly in behalf of the crop producer, destroying millions of pounds of harmful insects. His worth to the farmer can only be roughly estimated in seven-figure numbers, and then for a few days during the open season he furnishes to the legitimate sportsman the finest opportunity for the gratification of his sporting instinct and to the tables of thousands of Oklahoma homes a dinner that would do honor to the crowned heads of all ages. He also furnishes to the game hogs, law violators, pot hunters, and to the unthinking younger generation, a temptation to which is so frequently yielded that more cases are furnished for the courts and more grief heaped upon this department than all other violations of the game law.

The climate of the State of Oklahoma is unsurpassed for the production of this great game bird. While the bob whites of the northern states are

hovering under snow drifts, creeping in places beneath hedge fences and starving in small iced enclosures, those of Oklahoma are basking in winter sunshine and feeding from grain and weed seeds secure in the amount of food necessary to their propagation, secure against the ravages of cold and snow, harassed only by the innumerable live enemies and the unlawful hunter. In Oklahoma it is not a problem of hunting up a few bunches of quail and feeding them during the winter time in order to carry them over until spring for propagation purposes.

There is food enough wasted every year, or worse than wasted—weed seed, which might well be consumed by quail, which later germinate much to the detriment of the farmers—to not only support the quail in Oklahoma with food, but many, many millions of others. The cold and the snow in Oklahoma never last long enough to seriously interfere with the foraging of Mr. and Mrs. Bob White. It is never necessary to carry their dinners to them. In Oklahoma they are self-supporting.

The value of the quail as an insect destroyer and his world-wide fame as a game bird is the cause of two schools of thought in this state. There are those who advocate the feasibility of placing the bob white on the song bird list and declaring a perpetual closed season against hunting him. These people point out the value the closed season would be to the farmer and the millions of bushels of increased grain production that would be caused by his insect destroying ability if hunting were absolutely prohibited.

There is another class of people who desire to gratify their appetites and insist that we open the season for hunting quail, except perhaps during the nesting and rearing time, and as a result would probably, within a short time, make quail as scarce in Oklahoma as they now are in the northern states.

Neither of these schools of thought are correct. The quail is not now, nor never has been, a song bird. From the time he was given to the children of Israel, along with manna, as a gift from heaven to sustain their famishing appetites until the present good moment, the quail has been decreed by nature a game bird, and no edict of the Legislature or any body of men can change God's plan or nature's law. The quail is no more a song bird than is the Plymouth Rock in the barnyard. The quail should be considered a valuable asset of our economic system. Chickens are also insect destroyers, but their use as food is not prohibited on this account. Poultry is made valuable from the fact that it is protected not only by statutory law, but by economical family enforced rules and regulations. Rats, hawks, snakes, cats, skunks and all other foes and vermin are combated in the interest of little chickens, and their growth and development is eagerly watched by every member of the family. Whenever the quail receives this same careful attention from every member of the family, whenever their nests are jealously guarded by the boys, whenever their enemies are ruthlessly destroyed, quail will become so plentiful in Oklahoma that not only will their insect destroying ability in the summer time be augmented, but they will furnish millions of pounds of the finest food that can be placed upon the tables of our people and the finest sport furnished to our hunters. I think it would be as serious a mistake to permanently close the season against the hunting of quail as it would be to declare that no farmer could kill and eat his own poultry, and if the Legislature feels that further action is required on its part, I advise that it be exercised in the extermination of all vermin which feed upon quail as well as all song and game birds.

During the past year, fifteen dozen Gambel's quail were introduced in the state from Arizona, a trade being made with the State Game Warden of Arizona in which Gambel's quail were received in exchange for bob whites.

The arrangement will probably be continued this fall. These beautiful birds propagate with such rapidity and in such numbers in Arizona that they appear to be worthy of introduction into Oklahoma, and will make a fine addition to our bob white stock if the introduction is successful. A number of Gambel's quail were hatched out at the Medicine Park game farm, but unfortunately all of them were drowned by the carelessness of one of the keepers, who watered them from a deep instead of a shallow vessel. The introduction of these quail is purely experimental, and the department does not hazard a guess as to whether or not it will be successful.

I take this opportunity of calling attention to what in my estimation is the greatest enemy of all birds, both song and game, and that is the tramp or marauding cat. It is not my intention to place myself in the position of advocating the extermination of the cat. I do not desire to disturb the balance of nature and I believe that the cat has an important part to play in the balance of nature. It would be as serious to allow the grain to be destroyed by rats and mice as to allow it to be destroyed by bugs and insects, and all fair-minded people will admit that pussy plays an important part in destroying rodent enemies, but pussy must be regulated. The pussy that sits around the hearth fire, that plays with the children, that hunts mice and rats around the house and barn is not the pussy that does the great injury to the game and song birds. This pussy may occasionally destroy the quail's nest, but she has so much food so near her habitation that she seldom goes out foraging at any great distance, but this pussy is liable to produce a family, all members of which do not share in her domestic habits. In many places cats become so numerous that they are not desired by the household and sometimes they are sacked up and carried for miles in order to be rid of their presence. Sometimes they voluntarily leave when food becomes scarce, and the result is that they become marauding cats, the property of no household, who must eak out an existence. They roam the woods, the fields, the prairies and the city streets in quest of food, and it is these cats that destroy the quails and the nests of other ground birds, that climb the tallest trees and rob the cardinal, the wren and the mocking bird. It is these cats that unbalance nature and that destroy our feathered friends by the millions. Many predatory animals are protected by nature. Some of them are protected by their colors, some by swiftness of foot, some by claws and some by quills. The tramp cat is protected by the most protective armor ever thrown about an animal—that of superstition. Thousands of people are afraid to molest the tramp cat for fear of a visitation of "bad luck," while others even fear to make a journey or transact business because a cat whose coat happened to be black ran across their path. If the members of the State Legislature can find any way to destroy this superstition, they will be performing a service to the State of Oklahoma. If they can do anything to encourage the killing of millions of marauding cats they will help agriculture, they will help game protection and they will assist in the propagation of millions of song birds and game birds and their praises will be sung by millions upon millions of appreciative little feathered throats.

The same pests that prey upon poultry also maim the lives of birds. The great horned owl, the sharp-shinned hawk, the goss hawk and the crow are the principal feathered destroyers of game and song birds and should be killed on sight. Rats and other members of the rodent family continually prey upon birds, especially those that build their nests upon the ground. Skunks, snakes and weasels are unrelenting enemies and live largely off of our feathered friends. I want to remind our Boy Scouts and boys who are not scouts that it is open season on these pests the year round. Their capture calls for the highest degree of ability in sportsmanship, and I would like

to see a spirit of emulation among the boys as to who can capture the greatest number of these enemies of birds and I want to see the tramp cat enumerated as one of these enemies. I am willing to assume all of the "bad luck" which comes from the killing of any tramp cat. The boys of Oklahoma should be its most enthusiastic game wardens. Whenever they kill any enemy of game they are saving the life of game, whenever they kill an enemy of the song bird they are saving the life of a song bird, and they can gratify their sporting instincts more by this means rather than by the killing of birds and useful small animals.

The newspapers, public school teachers, ministers of the gospel, lodges, clubs and everyone interested in the educational development of the state should persistently inculcate in the minds of our young people the complete destruction of superstition. Instead of teaching the young people that it is "bad luck" to kill a cat, they should teach to the boys that it is good luck to kill every tramp cat, but to discriminate between the tramp cat and the house pet.

I am firmly convinced after a nation-wide investigation in which all of the authorities have been liberally consulted that in order to get hardy and numerous birds, flocks must be broken up and new blood introduced as often as possible. Every state, so far as I have been able to ascertain, that has had a permanently closed season for more than one year has retarded rather than helped the propagation of quail. The law of "survival of the fittest" has been irrevocable for a million years, and it is just as potent today as it was when the caveman had dominion over the world. Those birds that by their dexterity are able to escape the onslaught of the natural enemies and the "hogghishness" of the pot hunter, make the best parents for the coming season's hatch, but if allowed to go undisturbed soon accumulate enough weak birds to retard the development of the flock, and to cause utter extermination by disease and weakness. If the farmer does not care to give hunters the privilege of shooting on his premises, he should in the very interest of propagation, shoulder his shotgun and kill some of the birds and scatter the flocks himself. It is true that these birds are a great economic assistance, but the farmer should be interested enough in another year's crop to help him exterminate next year's vugs, and in the interest of this should cooperate with Old Mother Nature in protecting the birds against their natural enemies so that he himself can conserve a goodly portion of each flock for food, allowing the most active and hardy birds to escape for the purpose of propagation.

Wild Turkey.

The turkey is the largest bird of the pheasant family in existence, and the wild turkey is the largest game bird of Oklahoma. The early settlers can recall the time when they were almost as plentiful as quail now are. They are so near the point of extinction that the Legislature has closed the season indefinitely, and it is now a violation of law to hunt or kill wild turkey at any time in Oklahoma.

There are still a few flocks left in the mountains in the eastern part of the state. From these birds it is hoped that the state will be able to stock some of the game farms and from the game farms propagate enough birds to restock the larger preserves. On the tract which the state is acquiring from the Indians in McCurtain County are several flocks of wild turkeys, and these flocks have been protected by the game wardens during the past two years, and they report a considerable increase. On the Wichita National Forest preserve near Cache, Oklahoma, is a fine flock of wild turkeys which is



WILD TURKEYS ON WICHITA GAME PRESERVE, CACHE, OKLAHOMA
—Photograph by G. A. Smith, State Game Warden

rapidly increasing. The experience of Mr. Rush, supervisor of the preserve, in propagating these birds will be a great benefit to the state game farm keepers, and it is believed that within a few years wild turkeys will be propagated in such abundance that an open season can again be fixed by the Legislature.

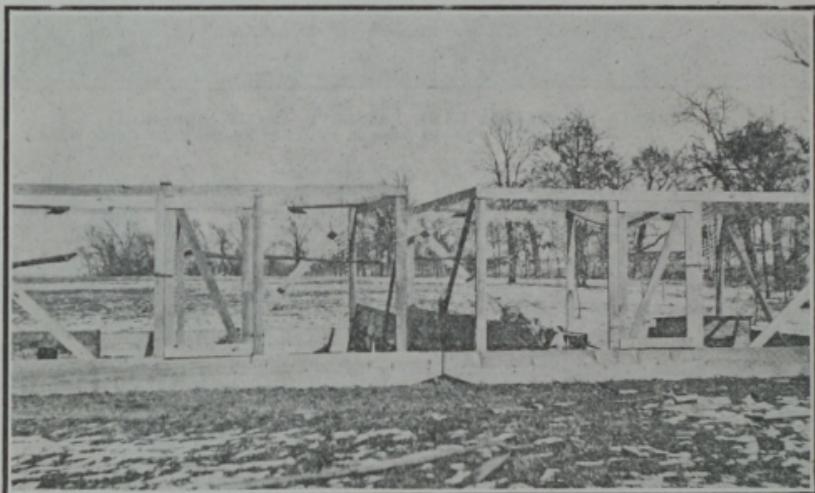
On the game farm it will be a question of rearing them in captivity, and on game preserves a problem of rearing them in their wild state, seeking



THESE TURKEYS WERE TRAVELING FROM THEIR ROOSTING PLACE TO FEEDING
GROUNDS ON THE WICHITA NATIONAL GAME PRESERVE NEAR CACHE
—Photograph by G. A. Smith, State Game Warden

only to protect them against their enemies, hawks, coyotes, mink, coon and other vermin. During the past year the game wardens have killed many of the predatory animal on the tract on which it is proposed to establish a game preserve in McCurtain County. When title is acquired to this land and permanent residence is established there, one of the duties of the keepers will be to trap and hunt for these predatory animals. This will give the wild turkeys a chance to reproduce, and it is the opinion of Mr. Rush, and also myself, that under these conditions our preserve will become well stocked.

Of course, from such a place the wild turkeys will be continually escaping and it is hoped that in doing so they will establish other flocks in all directions from the preserve. The propagation of wild turkeys furnished to the game farms an opportunity for a most profitable enterprise. The breeders of tame turkeys are continually seeking wild birds for the purpose of infusing new blood in their flocks, and pure bred wild turkeys at all times command a very high price.



PHEASANT PENS AT STATE GAME FARM, ARMSTRONG, OKLAHOMA

Pheasants.

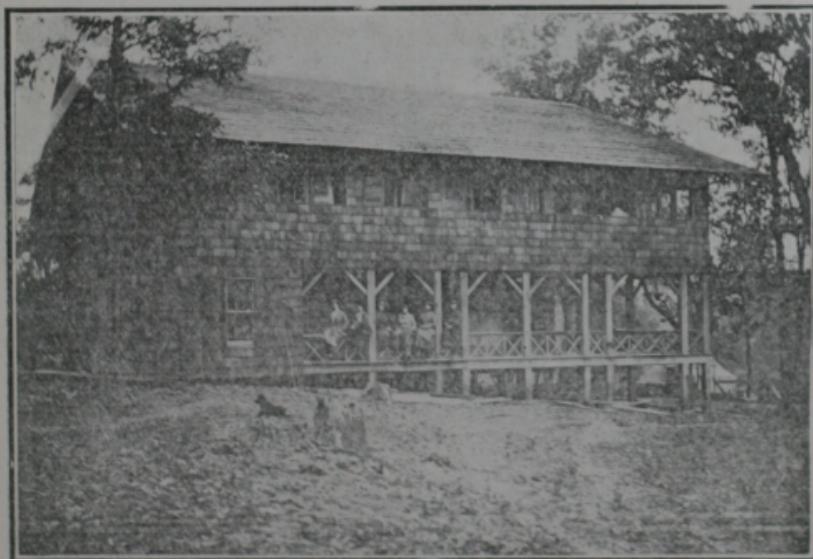
During his incumbency in the office of State Game Warden, Hon. John B. Doolin, under the Cruce administration, made an earnest, honest effort to stock the State of Oklahoma with ringneck pheasants. Hundreds of mature birds and thousands of eggs for hatching were issued to different farmers and sportsmen of the state. These efforts were continued by Mr. Chenoweth, and several dozen birds were liberated by him in different portions of the state.

After a careful investigation of the result of these efforts, I regret to state that there are not as many birds in the State of Oklahoma now as have been liberated at different times, and that the efforts to stock the state so far can only be classed as failures.

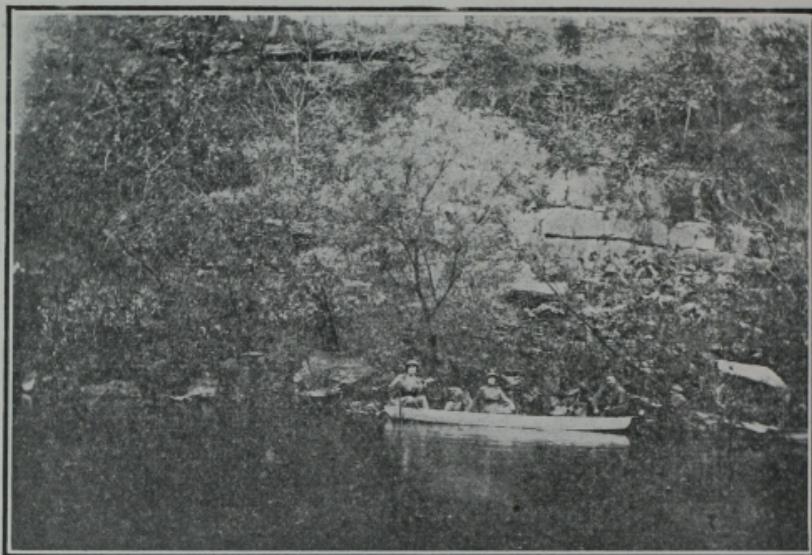
At the state game farm at Armstrong, several birds were confined in the kind of pens recommended by the American Game Protective and Propagation Association of New York City, and an attempt was made to, on a small

scale, propagate them in confinement this year. I regret to announce that this effort was also a failure, but I am inclined to think that it was more on account of the inexperience of the keepers and the carelessness of his help than to climatic conditions. The keeper at the game farm at Armstrong is an experienced fish man and has achieved considerable success in the propagation of fish, but he has made no claim to being a gamekeeper.

In the State of Oregon are millions of ringneck pheasants. They are the result of just one effort on the part of Judge Denny, and it has required but very little scientific effort to establish these birds in that state. Oklahoma has made many times the effort as did the State of Oregon to stock the state, and I am therefore compelled to believe that climatic conditions of Oklahoma are not the most conducive to the development of the ringneck pheasant, but before giving the matter up I feel that one more effort should be made. It is useless to apportion these birds in pairs, trios or even a dozen. They should be propagated on one of our state game farms in large numbers and then transported to other game farms and liberated in considerable numbers. I am not at all sure that this will succeed, but I feel that it is the last chance and that Oklahoma is entitled to this chance before abandoning the propagation of these valuable and interesting birds. Should the succeeding administration take this view of the matter I recommend that a game keeper of experience in the propagation of birds be secured and stationed at Armstrong, and that he be given supervision over the game farm there. I would not advise the propagation of pheasants on any other game farm, as it is, in my estimation, the one best adapted to this purpose. If success attends the efforts of the game keeper there, the mature birds should then be transported to Medicine Park, Choteau, and to McCurtain County and liberated in large numbers. From these centers the surrounding country could be stocked, providing the climate and other conditions will permit.



TULSA-OZARK CLUB HOUSE ON THE SPAVINAW
(Before Completion)



A SCENE ON SPAVINAW CREEK

The Tulsa-Ozark Club.

By W. A. DOWNING, Secretary.

The beautiful hill country in northeastern Oklahoma, with its clear running streams abounding with game fish and its mountains affording a home for wild animal life, has been the scene of much activity during the year 1918.

The Tulsa-Ozark Club, with its office in Tulsa, Oklahoma, has acquired more than ten miles of continuous fishing waters on Spavinaw Creek, and which is the cream of fishing grounds in the state. The club house is situated about five miles up the Creek from the town of Spavinaw, and consists of a large living room, dining room, kitchen and spacious fireplaces on the ground floor, a large lounging room each for ladies and gentlemen, and seventeen (17) sleeping rooms with both plunge and shower baths in connection on the second floor. There is a large porch surrounding the entire building and an up-to-date electric light plant and fire fighting apparatus has been installed. Every facility has been provided to make of it an admirable rendezvous for the club members where they may enjoy splendid hunting and fishing in season, and at the same time enjoy all of the comforts of a modern city home in what is probably the most sparsely populated part of the state.

A caretaker will be in charge of the club property whose duty will be to anticipate the wants of the members in the matter of fishing, hunting, recreation and sport.

The club is working hand in hand with the state authorities with a view to acquiring a large tract of land in the vicinity of the club grounds for a state game preserve to be stocked with buffalo, deer, elk and wild turkey. The land is of little value other than for this purpose, and will be acquired at a reasonable figure.

The officers of the Tulsa-Ozark Club are:

President, Frank S. Gray.

Vice-President, Mark E. Carr.

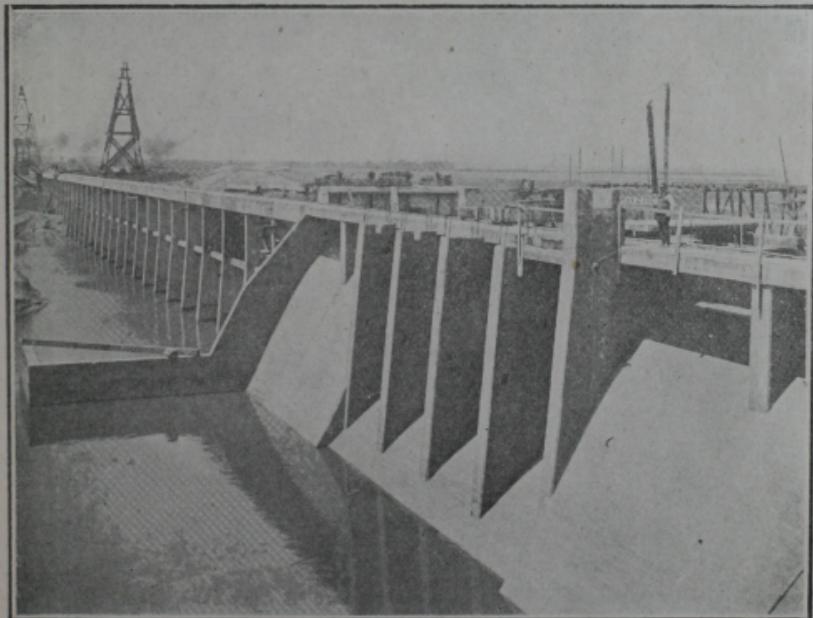
Treasurer, M. C. Hale.

Secretary, Walter A. Downing.

Oklahoma City's Water Reservoir.

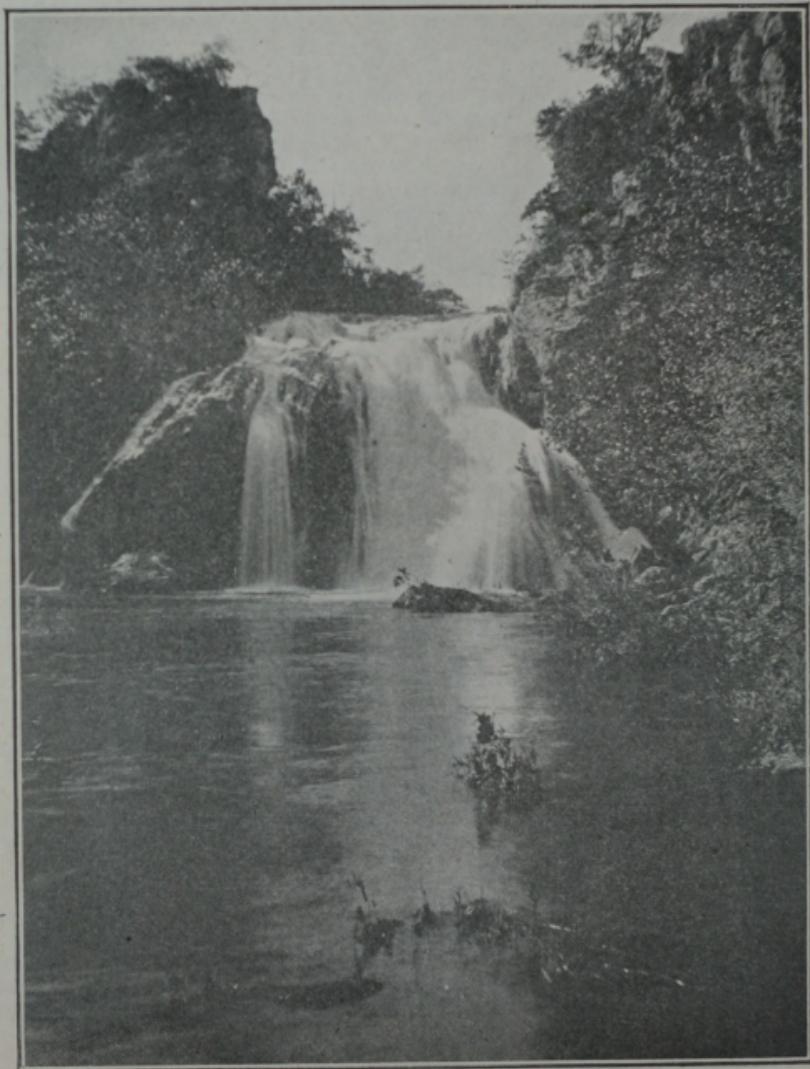
Oklahoma City will soon be the possessor of the largest natural fish hatchery of the State of Oklahoma. At a cost of about one-half million dollars, an immense dam has been thrown across the North Canadian River. It is 1,600 feet in length and 54 feet high, and will cause an artificial lake of 1,700 acres to be formed. The main reservoir of the lake, it is said, will hold 7,000,000,000 gallons, and the sedimentation basin will hold another 3,500,000,000 gallons.

An adequate fishway has been provided in the construction of this dam, which will permit the fish to go from or to the lake at their will. This great body of water will soon become a natural fish hatchery, which will supply the North Canadian River with fish for many miles both up and down the stream. Bass, crappie, sunfish, and coarser fish, like buffalo, carp and catfish, will soon increase by untold millions in this lake, and contribute a continual supply to the river. If Oklahoma City will co-operate with the state and stop all pollution of the stream, this part of the Canadian River is destined to become the greatest fishing ground in the State of Oklahoma. A little care on the part of the city officials in stocking the lake with aquatic plants and a free use of coarse seines in preventing buffalo and carp from becoming too numerous will insure a plentiful supply of game fish.



GEAT DAM AT OKLAHOMA CITY RESERVOIR

I have no doubt that a good revenue can be derived by the city in seining and selling the coarse fish from the lake. It would be impossible to prevent the propagation of buffalo and carp in the lake, even if it was desired, but I do not think it would be wise to prevent it, even if possible. The game fish will feed upon the small fish of the coarser varieties, and if care is used to reduce the stock of large fish by the use of seines, a great many millions of pounds of good food can be gleaned from the lake, and millions of young fish furnished for the consumption of game fish. I want to emphasize this fact, however, that unless pollution of the North Canadian River be stopped the great benefit to be derived from this lake will be naturalized.



TURNER FALLS

