CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

CONTENTS.

A BRIEF HISTORY OF THE NON-SALE OF GAME IN CALIFORNIA.

By Harold C. Bryant.

The non-sale of game was first brought prominently before the people of California in 1893, in which year the sale of deer was prohibited. The slaughter of quail by market hunters led to the taking of this species from the market in 1901. A few years later the non-sale of ducks and other water fowl began to be advocated by those conversant with game conditions. A crisis was reached when, in 1913, along with many other bills relating to fish and game, there was introduced into the legislature what has since been known as the "Flint-Cary Bill," prohibiting the sale of wild ducks and wild pigeons, in addition to the wild game the sale of which had been previously forbidden.

After a hot campaign and much active work on the part of conservationists the bill was passed by both houses and in due time was signed by the governor. The victory was largely due to the active work of the State Fish and Game Commission, and the California Associated Societies for the Conservation of Wild Life, the latter organization consisting of a number of prominent scientific societies of the state having been organized to further this needed conservation measure.

At the time this bill was before the legislature there was great opposition from certain special interests directly connected with the sale of game. The Northern California Hotel Men's Association lobbied con-

finally, and market hunters and game dealers helped with campaign expenses. Failing to prevent the passage of the bill, these same interests got up a referendum petition, circulated it almost entirely in San Francisco and Oakland, and filed it with the requisite number of signatures. Consequently the non-sale of game bill was set aside and will appear on the ballot at the general election, November 3, 1914, as proposition No. 18. Soon after the filing of this referendum petition it developed that gross frauds had been committed in the securing of signatures. Mr. Theodore Kytka, the famous handwriting expert of San Francisco, examined the petition at the direction of the San Francisco grand jury and obtained evidence of thousands of forgeries. As this article goes to print the attorney general of the state, at the direction of the governor, is investigating the alleged frauds committed in connection with the circulation of the petition.

The circulation of an initiative petition by the "People's Fish and Game Protective Association," an organization made up almost entirely of market hunters, game dealers, and persons connected with the Northern California Hotel Men's Association, having for its purpose the amending of practically all of the present game laws and the placing on sale of all game, greatly endangered the cause of conservation and complicated the problem before the public. Fortunately, the backers of the initiative petition succeeded in obtaining much less than the 32,000 signatures required by law, even after a most strenuous statewide campaign. Consequently this troublesome proposition will not appear on the ballot.

Conservationists throughout the state were not daunted by these attacks on necessary and just laws, and united in a campaign to have the legislature and the governor sustained through the approval of the non-sale bill at the November election. A work of publicity and education has been and is being conducted in every part of the state, and it is hoped that the public will have by election time a correct idea as to the causes that menace the game supply.

In order to sustain the legislature and the governor and to secure the measure most needed for the conservation of the state's wild life, vote YES on proposition No. 18. A vote of YES will also be a rebuke to the interests and the fraudulent methods responsible for setting aside a wise law and causing the people of the state the expense and trouble of a referendum vote.

SOME NOTES ON THE NON-SALE OF GAME.

By Ernest Schaefele, Executive Secretary, Fish and Game Commission.

The wild game belongs to the people in their sovereign capacity and as such should be enjoyed by the people and cared for and preserved for their benefit. It must not be considered as the property of a class and no class should be permitted to monopolize it.

It is generally agreed that wild game is attractive to a great many persons and that it has such value that the state should care for it wisely, as the state cares for land, water, forests, and other assets of a public nature.

Said Theodore Roosevelt, "It is not merely folly, it is wickedness, to permit a small number of our people, perhaps two or three per cent, to destroy the animals and birds in which the other ninety-seven per cent have an equal ownership, and in which posterity of all should have an equal ownership."

Obviously, game should be preserved in order that the people may enjoy and use it. This brings us to the matter of best and most profitable use—so far as all the people are concerned.

Dr. T. S. Palmer of the U. S. Biological Survey, one of the foremost game authorities in the world, states: "I am satisfied that the time has come when the market should be closed to the trade in game if the state is to conserve its present supply."

The state ornithologist of Massachusetts declares the prohibition of sale to be a very effective means of checking the slaughter of game.

From 50 to 95 per cent of the state's game has been killed off within one generation. Unless killing is restrained, all desirable varieties will be practically extinct within twenty-five years. It is a fixed principle that every wild species of mammal, bird or reptile that is pursued for money making purposes eventually is wiped out of existence. Even the whales of the sea are no exception. The value of game as food is now infinitesimal, compared with its value in stimulating outdoor life. A round $15,000,000.00 is spent in California each year on hunting and fishing, which expenditure depends entirely on the presence of something to hunt and fish.

So long as the sale of game is permitted, lawbreaking will be common; the price is a bounty, encouraging the killing of more than the limit and even the killing during closed season, when illicit profits are greatest.

The right of any generation to careless indifference or wanton destruction can not be admitted. Each generation is the guardian of the existing resources of the world; it comes into a great inheritance, but only as a trustee; and there is no recovery or resurrection of an extinct species.

EFFORTS TO CONSERVE THE GAME AND CONTROL THE VIOLATOR.

By Frank M. Newbert, President State Fish and Game Commission.

The total fund collected and disbursed by the State Fish and Game Commission is obtained by the sale of hunting and fishing licenses and through fines collected for violations of the fish and game laws. The state has not, since 1909, appropriated one cent from the general fund for use in fish and game matters.

Since those who hunt and fish contribute the whole of the funds at the command of the Fish and Game Commission, it is but just and natural that the efforts of this Commission should be directed toward conserving, for the benefit of the people, the grand heritage of wild life that has come to us from our forefathers. To that end we have endeavored to perfect our patrol system until now we have as efficient a force of field deputies as may be found in any state in the union. We have utilized to the fullest extent the capacities of our fish hatch-

eries, and plant in our streams more trout fry than any other state in the union. We have taken the lead in protective measures, such as screens and fishways, until to-day California leads the world in such devices.

A high standard of specialized knowledge is essential to the proper management and discharge of the manifold duties reposing in this Commission. To that end only the very best of men have been employed in the work. Deputies must maintain a high percentage in the excellence of their work, fish culturists are the best in the world, and all other employees must hold the same high standard of efficiency.

With such an efficient force at command we are enabled, to a degree, to carry out the ironclad rule of this Commission, and that is to accomplish the greatest good for the greatest number. To conserve the fish and game, to increase the supply, to prohibit wanton destruction, and to restrict fishing and hunting to the taking of what is necessary to the individual, is the aim of this Commission.

OUR RESPONSIBILITY FOR THE PRESERVATION OF THE GAME AND FISH.

By Hon. Frank M. Rutherford.

Early settlers in California found antelope abundant in the Sacramento Valley. It was only necessary in those days, in order to "bag" an antelope, for the pioneer to go out on the plain where some of them were in sight, lie down on his back in the tall grass and kick his feet in the air, when the foolishly inquisitive creatures, attracted by the unusual sight, would begin bounding around in a circle about the strangely animated object and, as their curiosity increased, keep getting closer and closer, until coming within range, a shot from the long squirrel rifle would bring one to the ground. It was not many years until the antelope of the Sacramento Valley had entirely disappeared. Yet to-day how we would be delighted if we could just now and then catch a glimpse of one of those beautiful animals bounding over the plain.

Every other game bird and animal of our state, sooner or later, was doomed to the same inexorable fate as the antelope had they been left unprotected. While most birds and animals are not such easy prey to the hunter as the antelope, the increased demand for game, with the better facilities for taking it with improved firearms, trained dogs, and various devices, has so overcome the protecting instincts of the animals and birds that they must have inevitably been destroyed without protection.

So often we lock the door after the horse is stolen. Let it not be so with the game birds and wild creatures of California. Though some are already things of the past, yet the supply and variety of most of them are sufficient, with proper protection, to restore their former numbers and perhaps increase the quantity in many instances. The Fish and Game Commission has worked earnestly and faithfully and has accomplished much in this respect. Through its vigilance deer

have been increasing rapidly in parts of the state, grouse have been saved from extermination and mountain quail are holding their own.

Every citizen and resident of the state should take an interest in the protection and preservation of the game birds and animals. They are the property of all the people, and the state is endeavoring by legislative enactments to give all an equal show in pursuing and taking game, under such restrictions only as are proper for the preservation of the game. The efforts of the state and the efforts of the Commission are ineffectual without the co-operation of the people.

There is no other subject, perhaps, upon which legislation has been so prolific of dissatisfaction as upon regulating the taking of fish and game, no other subject upon which prejudices apparently arise so easily and about which is made so much adverse criticism—not only criticism, but base insinuations and false accusations. Yet there has not been a law passed in this state, for the last fifteen years at least, regarding fish and game, that has not been passed honestly and conscientiously with the single object in view of doing that which was the best for the fish and game of the state. There has never been a law passed during that time that was intentionally designed to favor any citizens, or class of citizens, of this state. Mistakes may have been made, but they have been mistakes of the head and not of the heart. Such adverse criticisms and accusations are most always the outcroppings of ignorance, prejudice, and distemper. Well-meaning persons have made mistakes perhaps, but, if they will honestly investigate, they will not be long in discovering their errors.

Everyone should cooperate with the wardens in their work of protecting and preserving the fish and game of our state. California, with her highly diversified and wonderfully attractive physical features, her varied and alluring climatic conditions, her flowers, her fruit and vast resources, to which generous nature has added fish, bird, and animal life so varied, so distinctive and so plentiful, that it would not only mar the symmetry of nature's gracious endowment, but brand our people as indifferent, careless, and unprogressive, to neglect that attractive feature of our state.

Thoughtful, intelligent, and progressive residents of the state are coming to view the matter of the preservation of fish and game with more consideration each year and to enter into the spirit of it more zealously. It is gratifying to observe this welcome change in public sentiment, and it is sincerely to be hoped that it will not be long until the sentiment of every community of the state is in full accord with the laws for the protection and preservation of the fish and game. No laws can be upheld without public sentiment behind them, particularly when no moral turpitude is involved. Laws for the protection of fish and game must be supported by public sentiment, and wherever the sentiment for the enforcement of laws is strong there will be few violators of the law. It will not be long until that sentiment prevails throughout the state.

FISH AND GAME CONSERVATION DEPENDENT ON CONSERVATION OF OTHER NATURAL RESOURCES.

By Ex-Governor Geo. C. Pardee.

Everybody who has given the subject much thought admits that fish and game ought to be conserved, not preserved, for the public benefit. Practically every state in the union has some sort of fish and game laws, some sort of a fish and game commission.

We commonly speak of such laws and such commissions as "fish and game preservation" laws and commissions. That, however, is a misnomer. For of what good to the public would preserved fish and game be?

Like all other natural resources, our fish and game should be conserved, that is, used, at such times and in such quantities and under such conditions as the public needs require, but without unnecessary waste or destruction.

Preserved game and fish, like preserved forests or preserved waterpowers, are of no practical public good. Preserved fish and game die; so do preserved trees; preserved water-powers run to waste. Conserved—that is, used and protected—fish and game, forests, waterpowers and all other natural resources are, of course, of practical benefit to the public. And, therefore, fish and game conservation—not preservation—commissions are of practical benefit to the public.

We do not permit anybody to destroy the publicly-owned forests. There is an unenforceable California law against the "cold-storaging" of water-powers. It is the duty of the Fish and Game Commission to see to it that our animated natural resources are not destroyed or wasted.

Our game, however, can not be conserved, or even preserved, if the cover in which and the food on which it lives be not conserved. Our fish can not be conserved, or even preserved, if the waters in which they live be not kept at least free from pollution. If our wild places be permitted to be fire ravaged and destroyed, if our streams and bays be made the dumping grounds for noxious materials, then there will be no use for game and fish conserving laws, no need for a fish and game conservation commission—there will be no fish and game to be conserved.

Everybody, therefore, who believes—as almost everybody does—in the conservation of fish and game, must, if he takes a second thought, believe just as thoroughly in the conservation—that is, the use without unnecessary waste or destruction or impairment of the necessary use of—our forests and our waters. The fish and game conservationist, therefore, must be a forest and water and waste places conservationist, whether they be publicly or privately owned. For it is just as much an injury to the public, including the hunter and fisherman, amateur or professional, if our forests are destroyed, no matter whether they be publicly or privately owned. For upon the continued existence of our forests, whether publicly or privately owned, depends very largely the full running of our streams, without which our fish and game can not be fully conserved. And as forests may be forever used without being destroyed, it follows, of course, that the fish and game conservationists must deprecate the destruction of privately-owned forests and must oppose the further giving away of our publicly-owned forests into private ownership, which has always ended in their destruction.

Water is a natural resource, the most necessary of them all, which belongs to the people and can not be alienated from them. It is only the right to use water that can become private property. Upon the proper employment of this right to use, when it becomes private property, depends not only the fisherman's and hunter's vocation and sport, but also the prosperity and comfort, even the necessities, of all the people. The general public, therefore, as well as the fishermen and hunters, is interested in seeing to it that our water resources are conserved, that is, used, at such times, in such quantities, under such conditions as the public necessities require, without any unnecessary waste, without monopolies that will interfere with the public good.

How shall the public see to it that its water resources are conserved? Shall this important function be given over to the Fish and Game Commission, which is a commission with a highly specialized function, viz., that of conserving fish and game? Shall it be made the duty of the already over-burdened Railroad Commission to see to it that the right to use our waters is not improperly or wastefully acquired or exercised? Somebody, representing the public, must do it. To whom better than to a water commission, making a specialty of this highly important and very special matter, can the conservation of our waters be intrusted? In other words, the work of the Fish and Game Commission ought to be aided and supplemented by a water conservation commission, in addition to the already existing forestry conservation commission.

The work of a water commission is as highly specialized as is that of a fish and game commission, or a forest conservation commission, or a railroad commission. Recognizing that it is impracticable, if not impossible, to create one commission with special knowledge in all these diverse and very important matters, other states have created, as California has, a separate commission for each of them.

At the last session of our legislature, an act was passed creating a water commission, with power to see to it that the water resources of the state shall be conserved, that is, used at such times and in such quantities and under such conditions as the public necessities for power, irrigation, domestic purposes, etc., may require, but without unnecessary waste, and without monopoly detrimental to the public.

The passage of this law through the legislature was vigorously fought by an organized and expensive lobby, which was financed by an association of power and water companies. And no sooner was this water commission law passed by the legislature and signed by the governor than the same interests that opposed its passage organized and financed an expensive referendum campaign against it. For getting signatures to the referendum petition, which was circulated, among other places, in the redlight districts of San Francisco, Oakland and other cities, the hired petition circulators were paid 5 and 10 cents for each of the twenty-odd thousand signatures, forged and unforged, to the referendum petition.

As conservationists of the fish and game natural resources of this state, every fisherman and hunter, amateur and professional, is interested in the ratification by the people, at the November election, of this referendum water commission law. For every citizen who is interested in the conservation of our fish and game is, of course, interested equally in the conservation of our waters, on the saving of which the conservation of our fish and game largely depends.

Further than that, every fisherman and hunter, amateur and professional, is interested, along with all other law abiding citizens, in the honest carrying out of our laws. One of these laws, which it has become quite fashionable to violate, because it appears to be entirely safe to do so, is the referendum. For it is claimed that wholesale forgeries and perjuries were committed in the matter of the petitions by which the redlight abatement, the blue sky, the non-sale of game, and the water commission laws were suspended on referendum. In fact, regarding the first of these referendumed laws, the district attorney of San Francisco has been quoted in the daily press as asserting that not only were many, many forged names attached to the petition by which it was suspended by referendum, and that many perjuries were committed in the verification of those signatures, but also that there was in his possession sufficient evidence of these crimes against the people to send the forgers and perjurers to the penitentiary. But, up to date, so far as appears to be publicly known, but one of these law breakers has ever been indicted, and the penitentiary seems to have no terrors to his fellow conspirators against the people.

Every honest California hunter, every honest California fisherman, and every other honest Californian interested in the conservation of our animated natural resources is, of course, interested in seeing crime suppressed and criminals punished. As it appears to be impracticable, if not impossible, to get sent to the penitentiary either those who forge signatures to referendum petitions or those who instigate and pay for those forgeries and perjuries, there appears to be but one other way in which honest men and women can rebuke such crimes. And that is by voting to ratify laws the referendumming of which is tainted with crime. In this way only, it appears, can honest people do their part toward rendering such crimes against the public and themselves useless and unremunerative and, therefore, unfashionable.

For if neither the actual lawbreakers shall be punished nor the instigators and financiers of the crimes shall be rebuked, then, of course, the referendumming of laws by criminal means will become a fixed, organized, remunerative, and recognized vocation. And instead of California being a government of the people, by the people, for the people, it will become a government of the people by perjury and forgery for those who are willing to employ organized bureaus of forgers and perjurers.

It is not so much a question as to whether the honest citizen agrees with the policy of the referendumed redlight abatement, blue sky, non-sale of game, or water commission laws, as it is a question of whether the honest men and women of California are willing to be governed by forgery and perjury.

Everybody, therefore, who votes against a law that has been referendumed by forgery and perjury, votes to make remunerative and, therefore, fashionable organized bureaus for the government of California by forgery and perjury. And everybody who votes against a law referendumed by a crime-tainted petition, simply because he disagrees with the policy of that law, is debarred from making any objection or outcry if and when a law, with the policy of which he agrees, is referendumed by forgery and perjury.

ATTEMPTS TO PROTECT THE SEA FISHERIES OF SOUTHERN CALIFORNIA.

By Charles Frederick Holder, Throop College of Technology, and President of the Wild Life Protective League of America.

The writer has been observing the fisheries of southern California for nearly thirty years. In that time the supply has dropped off to a menacing extent, due to lack of laws, lack of protection, and over-fishing where fishes should be protected.

In 1886 the waters of southern California presented an amazing spectacle in the abundance of fishes, shellfish and crustaceans. One of the common fishes was the tuna, which has practically been driven away. The principal sea game and market fishes are:

White sea bass—*Cynoscion nobilis.*
Black sea bass—*Stereolepis gigas.*
Yellow fin tuna—*Germo macnlata.*
Leaping tuna—*Thunnus thynnus.*
Albacore, called long-finned tuna—*Germo alalunga.*
Oceanic bonito—*Gymnosarda pelamis.*
California bonito or skipjack—*Sarda chilensis.*
California barracuda—*Sphyraena argentea.*
White fish—*Caulolatilus* sp.
Sheepshead.
Swordfish—*Xiphias gladius.*
Swordfish—*Tetrapturus mitsukurii.*
Various rock bass—*Paralabrax* sp.
Halibut—*Hippoglossus hippoglossus.*
California yellowtail—*Seriola dorsalis.*
California whiting or surf-fish—*Menticirrhus undulatus.*
White croaker—*Seriphus politus.*
Spotfin croaker—*Roncador stearnsi.*
Little roncador—*Genyonemis lineatus.*

The mainland shores of southern California are bordered with open beaches, and few of the large fishes approach them except at Redondo and other places where deep water approaches the shore. In the surf, the surf fish is taken, but to secure most of the others, the angler must go out into the Santa Catalina Channel or the Santa Barbara Channel and troll. All the large fishes are found in greatest numbers about two groups of islands: (1) the Santa Barbara Islands in the channel of that name—Santa Cruz, San Miguel, Santa Rosa, and Anacapa; and (2) a group of islands in what the charts call the Santa Catalina Channel, about one hundred and thirty miles off Los Angeles County—Santa Catalina, San Clemente, Santa Barbara Rock, and San Nicholas. These islands lie so that each has a pronounced lee, particularly Santa Catalina, where, from seal rocks to the Isthmus, fourteen or so miles, the water is often like a lake, even though the island is thirty miles at sea. San Clemente Island, though forty miles off Orange County, also has a lee, but less than that of Santa Catalina.

All the large fishes described above were found in vast numbers by the writer at Santa Catalina Island in 1886, when there was but one boatman at that place, "Mexican Joe" (Jose Felice Presiado). As years went on it was evident that inroads were being made upon the fisheries. Boats went out with six or eight hand lines, and tons of fish were brought in and towed out to sea and fed to the sharks. To stop this the writer in 1898 organized the Tuna Club. The public supposed

it was a fishing or angling club to catch tunas, but the original institution, which I drafted with Mr. W. H. Landers, read:

The Tuna Club of Santa Catalina Island, California, is hereby formed and composed of gentlemen and ladies who have by their skill and perseverance succeeded in taking with rod and reel in the waters of this state, and with a line not larger than a 24-thread, one leaping tuna of not less than 100 pounds weight. The object of this club is the protection of the game fishes of the State of California and to encourage and foster the catching of all fishes, and especially tuna, yellowtail, sea bass, black sea bass, etc., with the lightest rod and reel tackle, and to discourage handline fishing, as being unsportsmanlike and against the public interest.

In a word, the movement was the first attempt to conserve the sea game fishes of southern California. I secured the co-operation or moral support of Gov. Roosevelt of New York, Gifford Pinchot, Chas. Hallock of New York, Dr. Henry Van Dyke, Senator George F. Edmunds, Henry E. Huntington, Admiral Peary, General John W. Foster, Stewart Edward White, Dr. David Starr Jordan, Lord Westborough, and others, who agreed with me as to the necessity of reform. Despite various tribulations, the Tuna Club enlarged its scope, eminent men became honorary members on my suggestion, and the organization became an influence for reform. The Tuna Club accomplished its object—protecting the fishes, by stopping the overcatch—and this was done by offering prizes to anglers for taking the *largest* fishes with the *lightest* tackle. An extensive and elaborate propaganda was worked out, which to-day finds expression in 6-ounce, 9-ounce, and 16-ounce rods, and 6, 9, 21 and 24-thread lines with which all the great game fishes of the region are taken.

The following are some of the particulars of the plan, interesting as showing how a great reform was accomplished:

TACKLE SPECIFICATIONS

TUNA CLASS.

Blue Button—Awarded to angler taking a tuna of 100 pounds or over, under club rules and tackle specifications of Blue Button class; and who is regularly elected.

Red Button—Awarded to angler taking a tuna of 50 pounds or over, under club rules and light tackle specifications; and who is regularly elected.

Swordfish, Gold Button—Awarded to angler taking a swordfish of 200 pounds or over under club rules and who is regularly elected.

NOTE.—Button open to light tackle competition.

TACKLE.

Tuna and Swordfish Class—Rod to be of wood, consisting of a butt and tip, and to be not shorter than 6 feet 9 inches over all. Tip not less than 5 feet in length, and to weigh not more than 16 ounces. Line not to exceed standard 24-thread.

LIGHT TACKLE CLASS.

	Buttons.		
	Bronze	Silver	Gold
Yellowtail	20-lb.	30-lb.	40-lb.
Albacore	20-lb.	35-lb.	50-lb.
White sea bass	20-lb.	35-lb.	50-lb.
Tuna	20-lb.	35-lb.	50-lb.

TACKLE.

Light Tackle Class—Rod to be of wood, consisting of a butt and tip, and to be not shorter than 6 feet over all. Butt to be not over 14 inches in length. Tip not less than 5 feet in length, and to weigh not more than 6 ounces. Line not to exceed standard 9-thread.

THREE-SIX CLASS.

*An angler using three-six tackle is given a handicap of 25 per cent in his favor as against light tackle. Thus, a yellowtail of 16 pounds caught on three-six tackle earns a bronze button; one of 24 pounds a silver button; one of 32 pounds a gold button. The complete table follows:

	Buttons.		
	Bronze	Silver	Gold
Yellowtail	16-lb.	24-lb.	32-lb.
Albacore	16-lb.	28-lb.	40-lb.
White sea bass	16-lb.	28-lb.	40-lb.
Tuna	16-lb.	28-lb.	40-lb.

TACKLE.

Three-Six Class—Rod to be of wood, consisting of a butt and tip, and to be not shorter than 6 feet over all. Weight of entire rod not to exceed 6 ounces. Butt not to be over 12 inches in length. Line not to exceed standard 6-thread.

BUTTONS—RULES.

BUTTONS.

A *bronze, silver* or *gold button* will be awarded to angler taking a fish of the weight specified above, under club rules and tackle specifications of light tackle or three-six classes, and upon payment of $2.50 entrance fee. This fee entitles holders of bronze buttons to exchange them for silver or gold buttons, when earned, without additional payment.

Swordfish Silver Button—Awarded to angler taking a swordfish under club rules and upon payment of $2.50.

NOTE.—Anglers qualifying for the above buttons do not thereby become members of the Tuna Club.

RULES.

First—Anglers must bring fish to gaff unaided. The fish must be reeled in. A broken rod, either before or after gaffing, disqualifies the angler.

Second—An angler must fish with but one rod at a time.

Third—All catches must be officially weighed and recorded. The weights officially recorded are final unless protest in writing is made before the fish weighed is removed from the wharf.

Fourth—Tackle must be exhibited with the fish at time of weighing.

Fifth—Tournament is open to amateurs only.

Sixth—Membership in the club is limited to men.

NOTES.

a. By tip is meant that portion of rod from outer end of rod to point where same is assembled at butt, with tip fully seated.

b. An angler is not debarred from the use of lighter tackle than that specified under each class, if tackle conforms to club specifications.

c. Catches made on the standard 3-4-5 tackle are given the same recognition as to competition as catches made on three-six tackle.

Line—The standard set by this club for the line to be used under its rules, is as follows: The line to be a standard linen line, manufactured solely from the grade of linen yarn known in the trade as "No. 50."

*Applies to competition for buttons only.

Conditions Governing Award of Club Prizes. First—One prize only will be awarded to an angler. *Second*—If an angler should qualify in two or more species of fish, he may take his choice of prizes in those classes. *Third*—If no fish of gold button, blue button or red button size is taken, a silver prize will be awarded for the largest, and a bronze prize for the second largest fish taken.

The result of all this was to materially reduce the catch.

In 1886 men landed a tuna with a handline in five minutes. In 1898 I took a tuna of 183 pounds with a 16-ounce rod, 21-line, but it took me four hours. From twenty minutes to half an hour is now expended in landing big game fishes with "light tackle," hence a revolution has taken place. The catch has been reduced, no more fish are wasted, and at Santa Catalina we find a standard of sport that has gone around the world.

The angling here in 1886 to 1900 was the most remarkable in the world, and I say this advisedly; but with the coming of power boats the seines, trawls and other nets, the fisheries began to decrease until it was evident that something must be done. The most menacing danger was the alien who attached a gill net to the kelp and ran it out into the sea. Fifty such nets have been counted in a mile and a half, and from Seal Rocks to the Isthmus, Santa Catalina Island, practically twenty miles, scores of nets were placed every night for years, while vast purse nets took ten and twenty tons of sardines in the bays at the same time; thus an army of aliens were not only over-netting the great game and market fishes, but were taking the food of the fishes (sardines) in vast numbers. In the meantime from fifty to one hundred angling boatmen established themselves at Avalon, representing with various industries, dependent upon angling, an investment of three quarters of a million dollars.

The fine angling attracted people from all over the world, and that these boatmen had specific rights is shown by the following letter from the United States Fish Commission:

DEPARTMENT OF COMMERCE AND LABOR, BUREAU OF FISHERIES,
December 26, 1912.

PROFESSOR CHAS. F. HOLDER,
Pasadena, Cal.

SIR: In reply to your letter of December 11th, you are informed that in the opinion of the bureau it is a proper policy to preserve for angling any waters in which fishing for sport greatly predominates over the commercial fisheries, as the prosperity of the adjacent communities is more affected by the expenditures of sportsmen than by the revenue derived from the capture of a comparatively small quantity of fishes for food purposes only. *It is also highly important to both the angling and commercial fishery interest that the fishes should not be disturbed on their spawning grounds.*

Although the bureau has no recent knowledge of the conditions obtaining on Santa Catalina and San Clemente islands, it appears from the statements of Dr. Jordan that these two considerations would be subserved by the proposed measure to establish a fish refuge within territorial waters adjacent to the two islands, and with that understanding the bureau gives the proposition its endorsement.

Respectfully,

H. M. SMITH, Acting Commissioner.

But the rights of the taxpayers were disregarded. The bay of Avalon and spawning grounds of the sardines was looted day and night in season and out, and the supply decreased to almost nothing. The looting continued until 1913. Several attempts had been made in previous years to obtain protection from the state.

In 1913 I was asked to make a report on the island fisheries. This was made the basis of a bill and in that year Mr. E. W. Hedderly, the editor of "Western Field," and Mr. R. D. Duke, of the California Fish and Game Commission, framed a law making Santa Catalina a fish reserve.

Years previous to this I had taken various experts over the ground—Dr. Van Dyke, Gifford Pinchot, Dr. David Starr Jordan and others. All agreed that this locality was a spawning ground for all, or nearly all, the great game and market fishes of southern California. The following are some of their letters:

DECEMBER 27, 1912.

GAME COMMISSION OF THE STATE OF CALIFORNIA,
Sacramento, California.

GENTLEMEN: I understand that there is a movement on foot to set aside the waters within three miles of San Clemente and Santa Catalina islands as a fishing refuge and to prevent all seining within it, with the object of furnishing undisturbed spawning grounds, and thus increasing the supply of food fishes. To me this plan seems admirable in every respect. For a number of years I have been fishing about these

A Record Leaping Tuna; weight, 175¼ pounds; time, 2 hours, 30 minutes. The Tuna is one of the gamest of the sea fish.

islands and may fairly be said to be familiar with the general conditions in their neighborhood. I am confident that this matter is of the greatest importance for the conservation of the sea fishes of California, but what is of vastly more account, Dr. David Starr Jordan, I learn, is of the same opinion.

I hope that the efforts of the anglers of southern California to protect the food fishes of their region will be successful, not merely because of the importance of the proposed action for angling for sport, but equally as to its importance to the professional fishermen in the future, many of whom, as you know, do not look beyond the present.

Very sincerely yours,

GIFFORD PINCHOT.

UNIVERSITY OF CALIFORNIA,
MUSEUM OF VERTEBRATE ZOOLOGY,
BERKELEY, CALIFORNIA, December 27, 1912.

PROFESSOR CHAS. F. HOLDER,
Pasadena, Cal.

MY DEAR PROFESSOR HOLDER: I am greatly pleased to learn that a movement is on foot to set apart Santa Catalina and San Clemente islands as fish and game preserves. If consummated, this will mean the saving of not only the species of fishes peculiar to those waters and now threatened with extermination, but preservation of the land fauna as well. The latter, as you well know, includes many species of birds and a few of mammals, which are of great interest to the naturalist, because they show differences from corresponding species on the mainland. In other words, the islands have been, and are, speciation centers.

It is of the greatest importance, therefore, from the scientific as well as the aesthetic standpoint, that the fishes and other animals of the islands be conserved from any danger of extermination, or even undue disturbance.

I hereby assert my hearty approval of the plan to make Santa Catalina and San Clemente islands fish and game refuges. Count on me to support the proposition in every practicable way.

Very truly yours,

J. GRINNELL,
Director of the Museum.

DEAR SIR: During my recent visit to Santa Catalina island, I was deeply impressed with the threatened danger to the commercial and valued sport-giving fisheries at the island.

I quite agree with the stand taken by Dr. David Starr Jordan and Mr. Gifford Pinchot and others, that this island for three or four miles off-shore is the spawning ground of the valuable food fishes of southern California, and particularly of Los Angeles, and that this region should be protected absolutely from all kinds of nets or lines handled for commercial or market purposes. In a word, the waters should not be disturbed by the market men within this limit. The spawning ground of tuna, white and black sea bass, whitefish, rock bass, sardines, and at least fifty more kinds of fish.

Another important feature is the kelp beds about the islands. These are the refuge and spawning beds of many valuable fishes and should remain inviolate. Santa Catalina island should be as undisturbed as your water supply, as it is a great food fish supply of southern California and Los Angeles.

Our society has saved the palisades of the Hudson from vandals, and we hold that we can aid you in calling the attention of the whole people to this gross devastation of a source of supply by market fishermen, who are ignorant of the situation and of course look out only for the day.

Believe me, very truly yours,

GEORGE F. KUNZ.
President of the American Scenic and Protective Society.

Pelagic fishes like the tuna, albacore and bonitos doubtless spawn on the surface, but I am confident that they spawn in-shore in the lee. In fact, I have taken spawn from nearly all these fishes within two miles of Santa Catalina. It is stated by some that the albacore does not spawn here, but this is a mistake as the spawn has been taken from albacore off Avalon by intelligent fishermen who will make affidavit to that effect, and Dr. Jordan states that all the fishes spawn here.

DECEMBER 5, 1912.

DR. CHAS. F. HOLDER,
Throop College of Technology,
Pasadena, Cal.

DEAR SIR: I trust that you may be successful in having Santa Catalina and San Clemente islands set aside as game preserves. These two islands and the smooth waters off their shores are the spawning grounds, above all others, of the greatest

Record Yellow Tail; weight, 53 pounds, 3 ounces. The Yellow Tail is not only one of the good game fishes, but is also a fine food fish.

game fish in the country. The white sea bass, the great jewfish, the spearfish, swordfish, tuna, bonito, albacore, the Japanese tuna (yellow fin tuna), all spawn on the rocky and other places about these islands, as well as a multitude of smaller fishes valuable to the angler or to the markets.

Many of these fish spawn in the kelp which surrounds these islands. The netting carried on in shore disturbs these fishes at spawning time, and it is said that there has been a very marked falling off of these species. As Avalon, on Santa Catalina, is the great center of big game fishing, the disappearance of any of these species makes a great loss to the people who have investments there as well as to the visitors who come there for fishing purposes.

It is desired to prohibit the use of seines and all nets for market purposes within three miles of the shores of either of these islands. This allows the professional fisherman the entire Santa Barbara channel, Santa Rosa, San Miguel, and the rest comprising the Santa Barbara group.

I trust that you and our friends will be successful in getting the statute passed which shall protect these islands and set them apart as spawning grounds for the great game fishes of southern California.

Very truly yours,

DAVID STARR JORDAN.

My belief is that owing to its peculiar location, its smooth water, etc., Santa Catalina is a natural spawning ground, hence a natural source of supply to the waters of southern California, and as such should be zealously protected from any disturbance of nets.

I asked that the reserve consist of *five miles* off the shore of the islands of Santa Catalina and San Clemente, the latter owned by the government, and all the authorities agreed with me. The Tuna Club, however, requested that San Clemente be omitted. In 1913 this law passed making Santa Catalina and three miles off shore a fish reserve, stopping all netting in its waters, but allowing market fishermen the use of the hand lines or rod. This met with opposition from the marketmen, and in the mean time varied fish industries had sprung into being—sardine canneries, tuna (albacore) canneries, market fishermen for big fish, and others, all of whom had conflicting interests and all of whom objected to Santa Catalina and San Clemente being made a reservation as it was the most convenient place to get the fish and to catch sardines.

The law establishing a fish reservation at Santa Catalina became operative in August, 1913, and read as follows:

(PENAL CODE.)

634½. Every person who takes, catches, or kills any fish except with hook and line in the manner commonly known as angling within three miles of shore line of Santa Catalina island, is guilty of a misdemeanor. Every person found guilty of any of the provisions of this section must be fined not less than twenty dollars nor more than five hundred dollars, or be imprisoned in the county jail of the county in which the conviction shall be had, not less than ten days nor more than one hundred and fifty days, or be punished by both such fine and imprisonment; and all fines or forfeitures imposed and collected for any violation of any of the provisions of this section must be paid into the state treasury to the credit of the fish and game preservation fund. Nothing in this section prohibits the United States Fish Commission and the Fish and Game Commission of this State from taking at all times such fish and in such manner as they deem necessary for purposes of propagation or for scientific purposes.

The effect of this was magical. I have just returned (July 2, 1914), from an inspection of the kelp beds and waters of Santa Catalina with Mr. R. D. Duke, attorney of the California Fish and Game Commission, and not in twenty-five years have I seen so many fish there, of all kinds except the tuna. If these fish are allowed to spawn and remain undisturbed, in a few years these waters will be replenished and will

assume their original productiveness and will constitute such a prolific supply for all southern California that there will be a pronounced reduction in the price of fish in the markets of Los Angeles.

It would be difficult to find an intelligent man in America who would not agree with this statement. It is self-evident and important to everyone, yet, owing to the diversities of interests, the canners and the market fishermen of Los Angeles desire to wipe these laws out, on the ground that they want to take fish as near port as possible. The canners desire to haul for sardines at the island as they need them as bait to catch the albacore in mid-channel. Hence certain ones have attempted to test the law and have been arrested. Mr. Duke seized three seines in the trip referred to.

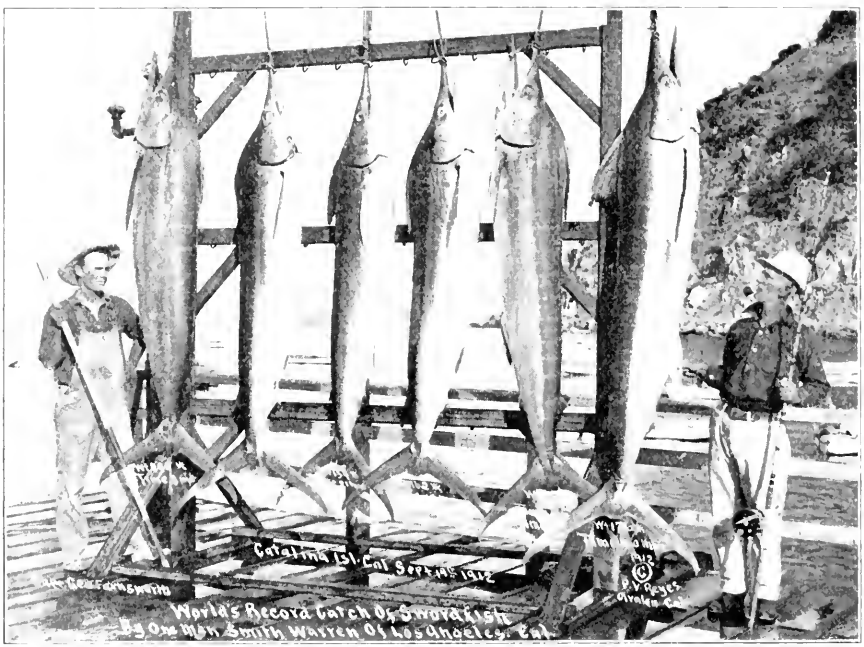
In the summer of 1913 the market men of San Francisco began a campaign to throw open the markets to all game. A society was organized and over 30,000 signers to a referendum petition on the non-sale of game law were obtained. Encouraged by this they circulated in June, 1914, an initiative petition calling for the placing on the market for sale of all game and fish, despite the fact that every intelligent man in California knows that this would produce an army of market hunters and fishermen which, in a few years, would wipe out all the game and fish of the state. Fortunately they failed to obtain the requisite number of signatures and the plan was given up.

The San Pedro market men (500 in number) asked this association to annul the Santa Catalina reservation. The present writer on learning that it was proposed to literally throw everything open, took the matter up with the association and succeeded in inducing them to allow the three-mile law to remain undisturbed. Some of the boatmen of Avalon and the canning interests requested a proviso enabling them to take bait at Santa Catalina, bait being presumably sardines. Such a provision was included in the initiative, allowing men to haul seines under the direction of the Fish and Game Commission. If the bill were passed and the letter of the law observed this might not interfere with the large fishes. It is not advisable, however, to interfere continually with the spawning sardines, the natural food of the food and game fishes, and it is a question whether, out of two hundred boats which might visit this reservation, some would not break the law under cover of obtaining bait. That they might is shown by the fact that Mr. Duke seized three set nets at Santa Catalina in the last week in June, 1914. In spite of this, some boatmen at Avalon desire to net for bait (sardines) and would take the chance. I have no question as to the good faith of the gentlemen at the head of the canning companies.

Such is the condition of affairs in southern California so far as the large marine fisheries are concerned. The leaping tuna that has practically been driven away, appeared in limited numbers, after ten months of the "three-mile law," as did many other fishes that have not been seen for fifteen years.

The outlook for the valuable interests of the boatmen of Avalon was distinctly encouraging, yet the alien market fishermen of San Pedro would, without the slightest hesitation, wipe out a law which every intelligent citizen knows is righteous, productive of good, and absolutely necessary.

As a citizen and taxpayer of California I have been proud of the economic development of California and have aided it as I could. I believe in developing all the sea products, intelligently, saving for the people everything that can be used; but it is very evident that the people cannot trust the army of alien market fishermen to conserve American interests. They do not understand the meaning of the word. The people must conserve wild life, fish and game, or it will disappear. The alien market man and some Americans have no interest or patience in this. Ignorance and avarice often go hand in hand and the people of California must protect themselves from this combination, or their



World's Record Catch of Sword Fish at Santa Catalina Island, September 14, 1912. The largest one weighed 202 pounds.

most valuable products will go to waste or to the enrichment of the few. It is not the object of this paper to suggest remedies, but to point out that it has taken years to obtain the primitive reforms we have or stop the extinction raids of aliens and it is significant that after ten months' trial these men would revoke one of the best laws for the conservation of the fisheries any state has had.

It is not California alone that confronts this problem. The valuable shad fisheries of the east are threatened. The *entire* season's catch of shad in the Chesapeake Bay in 1914 did not equal that of *one day* in 1900. The market men were told by the United States Fish Commission, that if they would allow 10 per cent of the migratory fish to go up the rivers, this would insure them a livelihood and a catch the following year, but the men were so densely ignorant, their brains so clodded with avarice, that they preferred to take the last shad and face

ruin, just as the duck shooters for the market preferred to get the last duck, and shoot themselves out of business in their campaign of extinction.

What is the remedy? It is evident to any one having any brains, that such persons are a public and private menace. They strike at the state's most valuable asset, its food supply; and they should be stopped by the strong hand of the people, who should in turn stand behind the game laws and see that they are not tampered with by initiative and referendum petitions. The legislature is the only place to make or unmake game laws, as there all classes can go and present their side and fight in the open for what they consider their rights. The Fish and Game Commission needs more funds. At present its only income for the vast scheme of propagation of trout and other fish comes from fines and licenses. It should, at least to my mind, have a large appropriation for this. But the most important feature is protection. It is a waste of time and money to make laws and not have adequate funds for their enforcement. The state should have a fast, sea-going launch at San Pedro to guard the waters of Los Angeles County, and half of the maintenance should be provided by the county. The Santa Catalina fish reserve with its sixty miles of coast line and its valuable fishes should be policed along its sea board by the citizens of Avalon as well.

San Clemente Island, belonging to the government, has no protection and will be looted in the same way unless patroled. None of these islands have light houses. Smugglers have used them for years. A revenue cutter should be stationed at Los Angeles port permanently. Officials in the east are unable to understand the extraordinary growth of this region. It was an impressive moment, when one of the most distinguished men in the east asked of a friend of the writer, if the Gulf of California was navigable. Los Angeles has been neglected. It should have had a garrison and fort ten years ago. The government has overlooked its fisheries. Its abalones and crawfish are almost gone. People attack the fish and game commissions instead of trying to aid them. In fact, the time has come when it is the duty of the people of California to familiarize themselves with their own possessions and take a hand in the business. If they do not the horde of ignorant aliens which will come in through the canal in the next decade, a legion that never heard of "game laws" or "conservation," will sweep California of every living thing, fish, foul and hoof, that by any twist of the imagination can be construed as food.

It should be understood that the efforts of the Tuna Club are directed toward penalizing, as far as size of line and weight of rod is concerned, it own members, and is not designed to restrict the ordinary fisherman. Any one is still at liberty to use any kind of tackle he desires, but such regulations as are used by the Tuna Club are certainly productive of the finer class of sportsmanship and are beneficial as means of preventing large catches.—EDITOR.

BIRD LIFE AS A COMMUNITY ASSET.

By JOSEPH GRINNELL, Museum of Vertebrate Zoology, University of Calif[illegible]

Students of natural history have become fully aware that as the country is settled marked changes take place in its bird life. A few of our species, such as the linnet and mockingbird, have become more numerous than they were in the early days. But very many more have become noticeably scarcer; some have disappeared altogether. Bird life as a whole has diminished in quantity to an alarming degree.

Those who have made a scientific study of our bird life have come to the conclusion that it has a distinct value to human interests. This value consists first of all in the well established economic bearing of birds upon agricultural interests; 90 per cent of our birds occupy an important position in maintaining the balance of nature, by which they serve to check abnormal increase in plant-eating insects and excessive multiplication of weeds.

Then there is the dollars-and-cents value of game birds—not in their market value, because we believe that market hunting will soon be a thing of the past—but because their pursuit, whether by the shotgun exponent or camera hunter, involves large commercial dealings through transportation and equipment. It is believed that a very large value pertains to bird life as an object of pursuit for whatever purpose, because this pursuit leads to wholesome pleasure and hearty outdoor exercise on the part of many people who live otherwise sedentary lives.

There is, again, that refreshment to the mind resulting from contemplation of birds as possessors of pleasing form and plume, cheerful manner, and attractive song. This brings an active appreciation on the part of the majority of mankind. In this rôle, birds at large have an important esthetic value.

Another point to be considered is the principle that to allow complete extermination of any living thing is out of harmony with an enlightened consideration of the future. Our successors will not approve of our thoughtlessness in completely destroying the California condor any less than we deplore the wanton destruction of the great auk by our ancestors. In other words, it is now generally recognized as ethically wrong to jeopardize the existence of any animal species.

Yet one more value of our bird life, and one which I urge as being worthy of most serious consideration, namely, the inherent value of birds in educational work with children. We hear nowadays of all sorts of systems—the Montessori, for example—which are designed to hasten the development of alertness and precision in exercising the senses. Can any objects be better adapted for just such purpose than birds—with their multifarious colors and color patterns, their variety in form, their quickness and peculiarities in movement, their range of voice. And, of all the systems of early education, this is the primitive one, the one most in accord with the normal development of the child, because of long standing, ancestrally.

When we come to weigh together all these valuations—economic, esthetic, educational—is there justification for anyone's claiming that attention to conservation of bird life is of trivial importance? Is this subject not most emphatically worth the consideration of thrifty, busy people?

I must insist that conservation of bird life is of equal import with that of any of our other natural resources. It is dollars-and-cents economy, not only to stop waste but to take steps to maintain an optimum of value as regards *this* asset—in other words, to maintain a large principal, upon which an undiminished income can be realized as time goes on.

What steps are to be taken to keep our bird population so that it may serve its highest usefulness to mankind? I believe that it *is* feasible to maintain it, and I am not arguing from a sentimental standpoint, either, but from a utilitarian standpoint.

Some of the factors correlated with the settling up of the country, and which are adverse to the persistence of an abundant native bird population are—first, in my opinion, the ravages of the house cat. No matter how well fed your tabby may appear, she is by nature a nocturnal marauder, gifted through keenness of hearing, eyesight, scent, and unquenchable instinct to search out and destroy young and old birds. I am confident that an enormous annual toll upon bird life in our

Downey young of Pintail (*Dafila acuta*); Los Banos, Merced County, May 21, 1914. The Pintail breeds commonly in many places in California.

suburban districts is exacted by the house cat. In the country, where it is known that many cats have gone wild, they constitute a big factor against the birds. There is abundant proof to support this assertion in the experience of those of us who tramp the hills and bottom lands in quest of facts and laws of wild life interrelationships.

The second most important factor over a large part of the country is the invasion by the English sparrow. This interloper appropriates food and shelter rightfully belonging to the native birds, and sooner or later crowds them out. Southern California is now in a critical period, in that the English sparrow has but recently arrived. If we are to prophesy subsequent history from that which has been repeated over and over again in the eastern states as this bird traveled from east to west, we are doomed to be overrun by English sparrows, unless drastic measures against them be taken at once. Now, while they are still few in numbers, is the time to combat this nuisance effectively.

A third factor is the reduction in food supply due to the reclamation and cultivation of wild lands. This affects our native species of birds inevitably, but it can be counterbalanced to a considerable extent by the

use as ornamental shrubs and garden flowers of such kinds of plants as will produce suitable food for the birds. The fourth factor against the birds is the thoughtless destruction of them, for fun, as by the not infrequent gunner who shoots swallows and swifts because they afford a favorable target; to eat, as by the Italian immigrant, who sees in the smallest bird simply its value as a mouthful of food, to be netted or shot in as great numbers as possible; and by the uninstructed small boy, who robs bird's nests far and wide merely for the exhilaration of discovery and appropriation. Lastly, the exploitation of birds for commercial purposes, to be sold in the market as food, or, worse yet, so that their feathers may serve to adorn hats—still exists to a much larger extent than many of our citizens suppose. The lure of the dollar justifies any means to obtain it that can be devised on the part of certain unthinking members of society. It may not be that the wings of the terns destroyed along our beaches are used in millinery *here*. They may be shipped to London and used there as "foreign" birds. But we, in our turn, are catering to bird destruction somewhere else if we buy in our local millinery stores plumes, or wings, or feathers of so-called "foreign" birds.

Every one of the above adverse factors is such as can be either eradicated entirely or can be mitigated to a very large degree. The cat question must be solved by the licensing and control of pet cats and the extermination of homeless ones—precisely the same treatment which is now accorded the dog in most of our cities.

The English sparrow must be dealt with systematically and rigorously. Call the English sparrow a foreign *weed*, if you will, the undue spread of which must be continually fought. We maintain an army of caretakers along our streets and in our parks so that the attractive flowers and shrubs are not choked out. Is it not exactly as good sense to maintain one or more properly qualified employees in each city to see to it that by trapping or shooting or poisoning—whichever method proves most effective—the English sparrow population is kept down below the point where it is distinctly deleterious to our native birds, even though complete extermination of the pest may never prove possible? The diminution in natural bird food and disappearance of springs can be compensated for privately, and publicly as in parks, by providing food and watering places, just exactly as a lawn or a flower bed may be supplied at regular intervals with concentrated fertilizers, and daily sprinkled. To my mind, the attractiveness of our bird life—in other words, the esthetic feature in its value—warrants consideration for the same reasons as the flower garden. Care and attention must be bestowed on both.

Finally, to lessen or remove the factor of thoughtlessness, or ignorance, or commercialism, we have state and federal regulations. These are, at the present time, approaching the ideal. We need, and for the most part now secure, conscientious enforcement of this legislation on the part of our officers of the law. But efforts toward enforcement have often been observed to be futile unless the people at large have been led to see the wisdom in these laws. Hence we must have popular education as to the features and value of our bird life. One natural channel for such education, by which adults as well as children are to be convinced of the facts in the case, is the school, where bird study should be incorporated as an essential element in the grade curriculum.

Our bird life is a valuable public asset and deserves sane consideration as such.

CALIFORNIA FISH AND GAME

A publication devoted to the conservation of wild life and published quarterly by the California State Fish and Game Commission.

Sent free to citizens of the State of California. Offered in exchange for ornithological, mammalogical, and similar perodicals.

All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, California.

OCTOBER, 1914

OUR PROGRAM.

THERE are two ways of enforcing laws—one is to punish violators, and the other is to educate people to a realization of the need and value of the law so that public sentiment demands its observance. The former method was used in the time of Nero and still needs to be used for the laggers of civilization. The relative value of the "rule with an iron hand" and the "rule with reason" has been too often discussed to use space for it here. The thing to be noted is that the California Fish and Game Commission is beginning a campaign of education in an endeavor to so educate public opinion that protective laws may in the future become relatively unimportant. Most of the violators of the game laws, if brought to a real appreciation of the law itself and the need for it, would obey rather than disobey the law.

A department newly formed might well be called a bureau of education and publicity. Dr. Harold C. Bryant, Assistant Curator of Birds in the University of California Museum of Vertebrate Zoology, has been placed in charge of the work. Dr. Bryant is well equipped for his new duties, for not only has he had a long university training, but he has spent several years in research work on the game birds of the state and through extensive traveling is well acquainted with conditions throughout California.

The function of this bureau will be to find ways and means of protecting foreign and domestic game birds within the state and to dispense information relative to game by means of correspondence, public illustrated lectures, and by the issuance of bulletins dealing with the status of fish and game. A study will also be made of the habitats, habits and breeding seasons of the different game birds and mammals of the state so that a basis for sane game laws may be afforded.

As one means of educating the public to the need and value of game conservation the Commission is beginning the publication of a quarterly bulletin devoted to the interests of the fish and game itself, to those who pursue it, and to those who simply take an interest in it as a valuable endowment of the state. Every effort will be made to not only make the publication of interest to every one, but to further, in every way possible, the present day movement for the conservation of wild life. The wild game resources of the State of Maine are said to bring an influx of thousands of people into the state each year and to increase the business of the state to a sum not less than fifteen millions of dollars. California's game resources can be made just as, if not more, valuable to this state. This can only be done, however, by conserving these resources for the use of, not only ourselves, but of those who come after us.

This publication will stand for every measure which will help in conserving our game resources. That fundamental law of game conservation, "the preservation of the needed breeding stock," will be one of the ideals toward which we will work. Such measures as may be urged from time to time may seem rather harsh to some, but it must be remembered that it is high time we were becoming alarmed in regard to the status of our game. We will always endeavor to stand for those measures which are absolutely necessary and which we are sure will accomplish the desired end.

As one of the best measures of conserving California's game we believe in state game refuges and will urge the establishment of game refuges throughout the state.

We believe, also, that the breeding and propagation of game birds and mammals should be encouraged. At the present time there is a demand by hotel keepers for pheasants and they are glad to pay from $2.00 to $3.00 a piece for them. The market supply is very small at pres-

ent in this state. Encouragement along these lines would furnish many people with a profitable occupation, and would do much to ease the conditions following the passage of a non-sale law.

Although this quarterly will be the medium of publication used by the State Fish and Game Commission and will often directly express their views, yet, they will not be responsible for the personal opinions expressed by signed writers in the periodical.

The Commission is anxious to give publicity to the work which they are doing. Reports, financial and otherwise, will be appended so that full knowledge as to the source and amount of their revenues and the nature of their expenditures may be known.

The material required for several of the departments is dependent very largely on people interested in game conditions in different parts of the state. The success of these departments depends very largely upon the interest which people will take in furnishing material for them. If deer are rapidly decreasing in your county, will you not write up a note and send it to the editor? If you discover the nest of a grouse or other game bird, will you not take careful notes as to position of nest, kind of material, number of eggs, and date on which found, and offer it to us for publication? Heretofore, much valuable information regarding our game has been lost forever simply because no notes were taken and no permanent records made. Remember that records of occurrence and nesting depend upon three important items—exact location, date and observer. Keep on the lookout for interesting observations and good photographs for "California Fish and Game."

THE FEDERAL MIGRATORY BIRD LAW.

Conservationists have been watching the fate of the federal migratory bird law. Court decisions exactly opposite in character have been received from different parts of the country. The attitude of the California Fish and Game Commission is expressed in the following telegram recently sent to Mr. H. W. Henshaw, Chief of the United States Biological Survey, and his reply:

SEPTEMBER 18, 1914.

H. W. HENSHAW,
Chief, Biological Survey,
Washington, D. C.

What provision made for enforcement Federal Migratory Bird Regulations in California? Unless different action requested by federal authorities this Commission will enforce regulations drastically with sixty-five wardens. United States Attorney ready for prosecutions. Wire our expense.
(Signed) FISH AND GAME COMMISSION.

WASHINGTON, D. C., September 19, 1914.
FISH AND GAME COMMISSION,
Mills Building,
San Francisco, Cal.

Greatly appreciate cooperation enforce migratory bird regulations vigorously. Appointment new inspectors dependent on examination held last week.
(Signed) HENSHAW.

COMMENDATION.

The following are quotations from a letter received from Mr. Henry Chase, the well known author of books on the conservation of fish and game:

Owing to a life interest in the cause of preservation of our fish and fauna, it is a source of great satisfaction to me to learn that the California Game Commission has established an official bureau of information and publicity. Especially is this true at the present time when I am informed that through your initiative and referendum laws there is danger of your wild life being totally exterminated by the enactment of unwise measures. And at this juncture I congratulate both the Commission and the state in placing such a bureau in so capable hands as those of yourself. This is, indeed, encouraging. * * *

I recognize that the people of California, as a class, are a well informed commonwealth, but proper knowledge on the subject of game preservation is not possessed by the people as a whole in any state in the union. Hence, the urgent necessity of such a bureau as yours.

In your letter the plans you outline for your bureau form a perfect model according to my notions and experience. * * * The scientific truths, combined with a practical knowledge of the working or proper laws, are the essential things, undoubtedly. You have many practical game officers in your state who are thoroughly familiar with local conditions and whose knowledge in this respect will be of much value to your bureau.

I am certain the program you have mapped out is the correct one and is being pursued in other states. Correspondence, press articles, bulletins, pamphlets, and lectures are the ways of reaching your public; also cloth posters in the forests, fields, and public places are valuable aids.

I wish you an abundance of success and good luck, and am sure you will have it, too, and be surprised at your own accomplishments in due time. In the mean time I will do what I can to keep you in touch with other bureaus.

GAME PROTECTION AND PROPAGATION IN AMERICA.

If courses in game protection and conservation should be given in our universities, and colleges, and there is no question but that they should be a part of the curriculum, it would be difficult to find a suitable textbook. The best thing we have yet seen which would be available for such use is a recent book by Henry Chase entitled "Game Protection and Propagation in America" (J. B. Lippincott Company, Philadelphia and London, Sept., 1913, v, 1-238). Mr. Chase, with his long experience as a game warden, is well qualified to write "a handbook of practical information for officials and others interested in the cause of conservation of wild life."

One of the strongest chapters in the book is the first one, entitled "Educating the Public—a Foreword." In this chapter Mr. Chase points out that the most pressing need of the hour to forward the great movement of conservation of wild life is *education*. He states further: "The federal authorities are always happy, and it is their duty, to co-operate with those of the states in their work for better game protection. So it is manifest what should be done. Connected with the game department in each state there should be a bureau of education and publicity, presided over by an expert. With these bureaus co-operating with each other and with the national one, a campaign of education along correct lines can be conducted which will accomplish more and better results in a few years than has been done altogether in the past. This plan would be no experiment with which to waste state funds either. It has now had the benefit of years of trial; it has been systematized; it has a well-defined and definite course to pursue; and has not been found wanting in efficacy. Unquestionably, nothing can be of more value to the cause of game protection at this time than a systematic campaign of education conducted officially by the game department in every state in the union, and an extension in the work on that line now being performed by the federal bureau. It is earnestly to be hoped that such a campaign may be started forward."

Certainly Mr. Chase has gotten at the root of the matter, for when the value of birds and the need of their protection and preservation is really appreciated, protective laws will be comparatively unimportant.

The following chapter headings give a good idea of the scope of the book:

Why Protect the Game?; Relations of Birds and Mammals to the Natural Resources; Present Meaning of the Term "Game Protection"; Brief Survey of Game Legislation in America; "Sane, Simple and Scientific Game Laws"; Federal Protection of Migratory Birds; Protection of Birds by International Treaties; State Laws and Their Enforcement; Field Work of Game Officers; The Right of Private Property in Game; Restocking Game Covers; Propagation of Game Fish; Feeding Game During Severe Winters; Hunting Accidents.

An appendix furnishes a typical constitution and by-laws for game clubs.

To any one seeking knowledge of game protection and propagation in America no better source can be found than this excellent treatise by the well known author of "Powers, Duties and Work of Game Wardens," "Modern Doctrine of Game Protection," and "Private Preserves in America."—H. C. B.

A PLAN FOR USING THE REVENUE FROM LICENSES.

Mr. Henry Chase, writing in "Forest and Stream," August 29, 1914, suggests that the revenue from fish and game licenses should be divided into the following three funds:

1. A certain sum to be used in more effectual enforcement of proper protective law.

2. A portion for re-stocking the waters with fish and the covers with game.

3. A balance set aside for establishing game refuges.

He goes on to say: "A new refuge established annually, in course of time will bring immense tracts of land into the possession and under the control of the state, and be the ultimate savior of both the game and fish if all other expedients should fail. This is the most vital part of the whole program."

LIVE GAME PRICES.

The demand for propagated live game birds and mammals for use in parks and as food for the table is steadily increasing and is aptly shown by the following prices quoted by "The Game Breeder," August, 1914:

Deer, $20.00 and up.

Wild turkeys, gobblers, $16.00; hens, $20.00.

Ringed-necked pheasants, $5.00 and $6.00 per pair for Mongolian and Prince of Wales cross.

Ruffed grouse, $5.00 to $10.00 per pair.

Quail, $15.00 to $20.00 per dozen.

Mallards, $3.00 to $3.50 per pair.

Black ducks, $3.00 to $3.50 per pair.

Wood ducks, $10.00 to $15.00 per pair.

Grey partridges, Hungarian and English, $7.00 to $8.00 per pair.

Wild duck and pheasant eggs, $20.00 to $30.00 per hundred.

OUR VANISHING WILD LIFE.

There are always many people who are hungry for definite knowledge on certain subjects in which they are particularly interested. As a rule there is so much literature on a subject that it is hard to know where to begin. We are glad that there has recently appeared a work which can be considered a summary on the subject of wild life conservation. We refer to Dr. William T. Hornaday's recent book: "Our Vanishing Wild-life," Scribner's, New York, 1913. The book is really a campaign document and it can be compared, as far as influence is concerned, with Stowe's "Uncle Tom's Cabin," at the time when another great forward movement was in progress. A friend of conservation has placed this volume in almost every library in the state that did not yet have it so that it is now obtainable even though you do not purchase it for your own private library.—H. C. B.

A DEPARTMENT OF COMMERCIAL FISHERIES.

On account of the recent rapid increase in the value and importance of the commercial fisheries of California, the Fish and Game Commission have deemed it advisable to create a department to handle the main problems connected with these fisheries. The primary object in view is to conserve and at the same time assist these industries and as far as possible to encourage the development of fisheries that have been neglected.

Only a few years ago the California sardine which visits our coast in countless numbers, was little used and almost despised, with no other reasons than it would not ship well in the fresh state and that it was so very plentiful and cheap. Private enterprise without the help or encouragement of either the Federal or State Fish Commissions, has now developed a sardine canning industry in California that is growing with leaps and bounds. Three canneries are now operating with a combined capacity of one hundred tons of sardines a day and the capital invested is approximately $100,000. By the end of the present year the number is to be doubled. Another of our neglected resources was the long finned tuna or albacore of Southern California, which, up to three years ago was little used as food. There are now eleven canneries putting up this fish and there is capital invested to the amount of $300,000 in canneries and an equal amount in boats and fishing gear. The pack for 1913 was 128,000 cases and it is estimated that the 1914 pack will reach 300,000 cases of a wholesale value of over $2,000,000.

These are but examples of what can be done with other varieties of fish and molluscs now neglected on our coast.

Among the duties of this new department will be the gathering of statistics and data relative to the take of different varieties of fish, the methods of fishing, handling and marketing. Also gathering information about the little used sea foods which may become of commercial importance, the utilization of waste fish and fish offal for fertilizer, fish oil, glue and chicken feed, will be subjects for investigation as will also be the habits, migrations and spawning times of the different varieties of fish, so that in case it becomes necessary, they may be protected by restricting the fishing or by establishing closed seasons.

It is expected through the activities of this department to gather and place on file accurate information on these different subjects, from which it will be possible for the Fish and Game Commission more intelligently to foster and encourage these industries; to propose

beneficial legislation and on the other hand to prevent legislation that may unjustly cripple any of the fisheries and to so regulate the taking of fish that the supply may not be exhausted.

California has in its immense stretch of sea coast a source of marine food supply that we are just beginning to appreciate. That this source of food, one of the state's greatest assets, can be developed to an infinitely greater degree than at present, there can be no doubt. To develop and conserve these resources is one of the greatest future tasks of the Fish and Game Commission.

This new department will be in charge of N. B. Scofield assisted by H. B. Nidever.

Lake on north branch of Big Pine Creek (elevation 10,000 feet), Inyo County, California. Recently stocked with Loch Leven Trout.

CONSERVATION IN OTHER STATES.

HUNGARIAN PHEASANTS IN OHIO.

In spite of California's apparent failure to acclimatize the Hungarian partridge, some of the eastern states seem to be having remarkable success. The Ohio commission reports that six thousand pair have been distributed over the state, a few pairs going into every county. Reports have been obtained which show that about two thirds of the birds put out mated and nested the first year.

POLITICAL RING CRIPPLES GAME COMMISSION IN MINNESOTA.

The Rines organization, in control of the last legislature in Minnesota so crippled the Game Commission that only a favorable decision from the Supreme Court or the volunteer service offered by the wardens can save the wild life of Minnesota from the vandals, poachers and pot-hunters. The politicians were successful in preventing the 30,000 dollars license money being used for warden's pay.

2,075 DEER KILLED IN NEW BRUNSWICK.

The Chief Game Warden of New Brunswick has made his annual report of

the number of deer killed in that province in 1913. The figures are as follows: moose, 1,499; deer, 2,075; caribou, 454; a total of 4,028. These figures are interesting in view of the statement in a history of New Brunswick published in 1825 to the effect that the last moose had vanished from the forests of that province. These figures also show what can be done by proper methods of game protection and the same holds true in regard to forest protection. New Brunswick's revenue from game licenses is more than sufficient to pay its present fire and game protection organization—Fish and Game Conservationist and Warden's Journal, Hinsdale, Illinois.

THE EUROPEAN WAR AND GAME.

According to an editorial in "Forest and Stream," the European war is even having an effect on game laws. In Western Canada certain people are asking for a relaxation of the game laws on the grounds that game is now needed for food.

ILLINOIS ADOPTS THE REFUGE IDEA.

Illinois is planning to establish game refuges in each of the 102 counties of the state. Four have already been provided. Land is rented for a long period of time and a game warden is posted to kill vermin and prevent hunting.—"Recreation and Outdoor World," August, 1914.

A SHOOTING LICENSE LAW FOR TEXAS.

At the next legislature Texas will endeavor to put through a resident shooting license law. At the third annual convention of the Texas Game and Fish Protective Association this move was recommended. — "Recreation and Outdoor World," August, 1914.

MARYLAND WILL TRY FOR A NO-SALE LAW.

A no-sale bill on partridges (quail) "pheasants" (grouse) and woodcock has been introduced in the Maryland legislature with some hope of success.—"Recreation and Outdoor World," August, 1914.

LIFE HISTORY NOTES.

DUCKS' NEST IN GRAIN FIELDS.

There has been considerable speculation as to the effect of the increased cultivation of land on our breeding ducks. Most people take the view that, as the marshes are reclaimed, there will be fewer and fewer ducks breeding within our state. This is doubtless the truth of the matter but something may also be said on the other side. Certain field crops apparently furnish nesting sites for ducks. A letter from Mr. William N. Dirks, Superintendent of the State Game Farm, states that a number of ducks' nests were found this last spring while the grain was being cut on the ranch of Mr. Herman Hess, near Alvarado, Alameda County, California. The following nests with their complements of eggs were discovered:

May 5—

Sprig	11 eggs
Mallard	11 eggs
Cinnamon teal	11 eggs
Cinnamon teal	11 eggs

May 9—

Mallard	14 eggs
Cinnamon teal	11 eggs
Cinnamon teal	2 eggs

May 12—

Cinnamon teal	12 eggs

The eggs which were not broken by the mowing machine were taken to the State Game Farm at Hayward, and from them were hatched thirty-four cinamon teal, one sprig and five mallard. Some of the eggs were in the incubator only two days and none over ten days.

RING-NECKED PHEASANTS IN ALAMEDA COUNTY.

On April 22, 1914, a man who was cutting grain on a ranch near Agnew discovered a nest of a wild ring-necked pheasant, which contained seventeen eggs. Four eggs were broken by the machine. The others were taken to the game farm, where, after remaining in the incubator for two days, all of the thirteen were successfully hatched.

STILTS PROVE TO BE WISE BIRDS.

Recent investigations in the vicinity of Los Banos have shown that the black-necked stilt, *Himantopus mexicanus*, are able to protect their eggs from the encroachments of rising irrigation water. As a rule these birds build a crude nest of weed stems in a small depression on the ground. However, when the water starts to raise, the birds built up the nest as the water rises and so keep the eggs from harm. Nests have been found built up to a height of seven or eight inches above the ground. In the same vicinity many ducks' nests are destroyed because these birds do not have sense enough to protect themselves as do the stilts.

PREDACEOUS ANIMALS DESTROY DUCKS' NESTS.

During the past summer investigations of the duck breeding grounds near Los Banos showed that predaceous animals were destroying large numbers of ducks' nests. As many as eight raided nests were discovered in a single afternoon. The lowering of water in this vicinity allows animals to approach the nests and destroy them. The eggs were found broken into and the contents had been sucked out. The cinnamon teal, the commonest nester in this vicinity, appeared to suffer the most. Raccoons are common mammals in the vicinity and it is probable that they were the depredators, although the raids may have been due to coyotes.

WILD LIFE IN RELATION TO AGRICULTURE.

WILD GEESE NOT A MENACE TO RICE CROPS.

FISH AND GAME COMMISSION,
San Francisco, Cal.

GENTLEMEN: Replying to your inquiry of March 4th, regarding the alleged damage done by wild geese to growing crops, especially to the new industry of rice farming, in northern California, I will say that these reports—so often in evidence about this season—do not come altogether from the farmer or rice grower, but from the market hunters, who, when the time comes for the arrival of the geese on their way from the northern nesting grounds, display a sudden interest in the welfare of the farmer and the rice grower. The amount of damage done to young grain by wild geese depends upon the stage of growth. Should the grain be sufficiently strong to resist the geese and they are unable to pull out the kernel, in that event the geese nip off the tops of the young grain only, which aids or promotes the growth, and, as the farmer himself says, makes it stool out heavier. However, should the grain be just showing above the ground, the geese may destroy the grain by pulling out and eating the seed. Most of the grain found in the stomachs of geese is eaten in stubble fields after harvest. Every flock of geese that is seen in growing grain is said to be eating such grain, when, as a matter of fact, an examination of the food so eaten will disclose that the geese are feeding upon a noxious grass, the name of which I do not know, except by the name of "goose grass." It has a seed rich in oil and is very fattening, sheep doing exceedingly well upon this feed. It is this food that gives the strong odor to geese at this time.

As to the injury done in the rice fields—I have never seen a goose in a rice field; have never seen a grain of rice in the stomach of a goose, and I do not think any one else ever has. I invariably observe the contents of the stomachs of all the birds I kill. I have shot in the vicinity of the rice fields in the Gridley and Biggs country ever since rice growing began. I have it on the authority of Mr. E. C. Adams, of Biggs, who is the government rice expert, appointed by the Department of Agriculture, and who lives in the center of the rice fields, that geese never eat rice in any form. He states that he has never seen a wild goose on a rice field at any time. Before the harvest the rice that is eaten by the mallard and sprig ducks is that portion broken down by the hundreds of thousands of blackbirds which infest these localities. After the harvest the ducks eat the grains that have been threshed out and left behind. Ducks and geese can not eat it when growing, because it is unripe and green and very tall. As soon as it ripens the water is drained off. It is then harvested, bundled and cocked up to be threshed. At this time only, the ducks eat the grain left on the ground.

You will remember that I investigated many of these complaints last August and September, in and about Biggs, and could not find the duck guilty at that time, simply because the ducks could not eat a long, green, slender head of unripe grain. The ducks were there simply because there was an abundance of water and a plentiful supply of other food—bugs, beetles and water growth of many varieties. I endeavor to run down all the alleged charges of destruction of grain by wild geese whenever possible.

On February 13th I received a communication from an inspector under the United States migratory bird law, to investigate a complaint made by an attorney of Sacramento, who stated that he represented clients whose lands were being damaged by the depredations of wild geese. I addressed a letter to the attorney, requesting him to give me the names of his clients, together with the names of the localities where this damage was being done, so that I might personally investi-

gate and report intelligently on the actual damage done. He replied to me, saying that the geese were not now doing any damage whatever. He also failed to give the names or localities where this alleged damage was being done.

This is not only my individual opinion, but I am sustained by possibly the greatest practical authority on wild geese today, A. W. Stewart, of Grand Island, who has been a student of their habits for many years in the fields, and, in fact, can almost talk their language.

Respectfully,

GEORGE NEALE,
Assistant Commissioner.

Sacramento, Cal., March 13, 1914.

DEER AND APPLE TREES.

It may be that deer damage apple trees in some places, but the following note can be taken as negative evidence in this regard. Mr. Davis, of Seven Cedars, southwest Trinity County, always hunts at a distance from home, although many deer are to be found on his own place where he has 800 apple trees. He says that he likes to have the deer on his place and so never kills them near home.

REPORTS

SEIZURES, FISH AND GAME.

July 1, 1914, to August 31, 1914.

Fish.

Striped bass	185	pounds
Trout	75¾	pounds
Salmon	257	pounds
Steelhead	150	pounds
Miscellaneous fish	209	pounds
Crabs	1,496	

Game.

Deer meat	190	pounds
Deer hides	3	
Ducks	2	
Quail	10	
Doves	4	
Rabbits	1	

SEARCHES.

Illegal fish and game	27

Violations of the Fish and Game Laws, July 1, 1914, to August 31, 1914.

Offense	Number arrests	Convicted	Acquitted and dismissed	Sentence suspended and probation	Pending	Days imprisonment	Fines imposed	Fines paid
Game.								
Hunting without license	33	30	2		1	10	$540 00	$500 00
Deer, close season, killing or possession	12	10	2	1			950 00	150 00
Female deer, killing or possession	6	5	1				275 00	175 00
Rabbits, close season, killing or possession	4	4		1		25	60 00	35 00
Doves, close season, killing or possession	5	5		1			125 00	100 00
Ducks, close season, killing or possession	1	1					25 00	25 00
Quail, close season, killing or possession	8	8					215 00	145 00
Tree squirrels, close season, killing or possession	1	1					25 00	
Night hunting	1				1			
Total game violations	71	64	5	3	2	35	$2,215 00	$1,130 00
Fish.								
Angling without license	5	5					$125 00	$125 00
Fishing for profit without license	1	4		1			40 00	10 00
Wholesale dealing in fish without license	2	2					40 00	40 00
Young of fish, catching or possession	4	4					100 00	100 00
Taking trout, other than with hook and line	1	1		1				
Underweight striped bass, possession and sale	3	3					60 00	60 00
Buying and selling salt water perch	2	1	1				10 00	10 00
Using explosive for killing fish	1	1					250 00	250 00
Shipping excess bag limit of trout, one day	1				1			
Excess bag limit clams, possession, one day	1	1					20 00	20 00
Taking crabs in Eel River other than on Thursdays	2				2			
Undersized crabs, possession	1		1					
Total fish violations	27	22	2	2	3		$645 00	$615 00
Grand total	98	86	7	5	5	35	$2,860 00	$1,745 00

LION BOUNTIES.

Statement of Lion Bounties Paid by Fish and Game Commission from October, 1907, to June 30, 1914.

	1907	1908	1909	1910	1911	1912	1913	Thereafter to June 30, 1914	Total
Alameda		1							1
Amador		3		1	2	2			8
Butte	2	11	5	2	4	3	2	1	30
Calaveras		1	4	1		1		1	8
Colusa		3		3	3	1	1	2	13
Del Norte		10	12	4	11	11	23	4	75
El Dorado	2	7	2	1	8	9	6		35
Fresno		1	3	1		4		1	10
Glenn		13	6	6	1	4	5	1	36
Humboldt	10	113	67	71	42	50	41	24	418
Inyo						1			1
Kern		8	10	12	5	9	10	2	56
Lake	2	14	11	13	9	10	7	2	68
Lassen			1		2	1	2		6
Los Angeles		7	1	2	2		2	1	15
Madera		3	5	1		1	1	9	20
Mariposa	2	4	3	6	2	1	4	7	29
Mendocino	5	44	18	11	16	17	24	11	146
Merced				1					1
Modoc			1	1	1				3
Monterey		14	11	7	1	3	9	3	48
Mono								2	2
Napa				1		2			3
Nevada		1	1	1					3
Orange			1	1	1		1		4
Placer		5	4	1	2	7	3	1	23
Plumas		2		3		1	2		8
Riverside		2	5			4	2		13
San Benito		1	2	1	2	11	3	2	22
San Bernardino		5	2	1	2		2	1	13
San Diego		3	5	5	8	3	1	1	26
San Luis Obispo		11	5	9	4	4	5	4	42
San Mateo				1					1
Santa Barbara		7	24	7	3	5	11	1	58
Santa Clara			4			1	1	1	7
Santa Cruz				1					1
Shasta	1	25	32	31	29	28	22	5	173
Sierra		1				3	2		6
Siskiyou	1	31	35	45	25	25	22	13	197
Sonoma			2	4	1	4	1	1	13
Stanislaus			2		1				3
Sutter						1			1
Tehama	3	31	19	25	10	22	27	2	139
Trinity	9	86	34	32	22	15	14	10	222
Tulare		6	8	11	4	5	3	3	40
Tuolumne		6	10	5	2	4	1	1	29
Ventura		1	6	4	6	2		1	20
Yuba		1			2				3
Totals	37	482	361	333	283	275	240	118	2,099

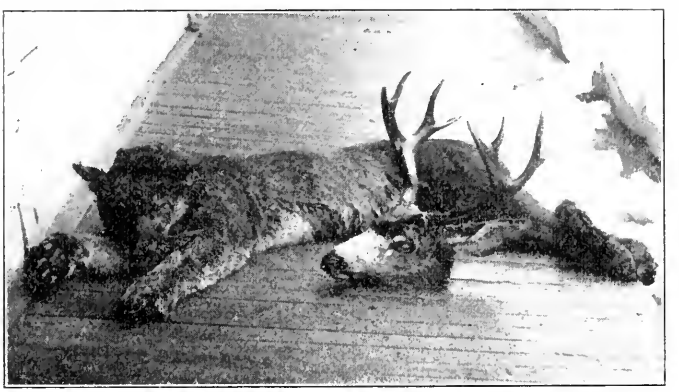
LION BOUNTY CLAIMS.

Applicants for the bounty of twenty dollars ($20.00) paid by the Fish and Game Commission on mountain lions killed in the State of California, are hereby notified that no claim will be considered unless the following requirements are complied with:

Either the *scalp*, or skin with scalp attached, of the mountain lion upon which a bounty is claimed must be sent to the office of the Fish and Game Commission, *San Francisco, all express or mail charges prepaid.* The skin should be either dried, tanned, or otherwise cured before shipment, as green skins spoil quickly, becoming very offensive and losing all value. Offensive green scalps or skins, *or those sent charges collect will not be accepted.*

All hides and scalps received by the Fish and Game Commission will be destroyed unless full directions are given for return to claimant, or for other disposition. A tag with name of claimant, together with shipping directions thereon should be *attached* to hide or scalp. All return shipping charges must be paid by claimant or other person receiving package.

A claim must be made for *each* animal, upon a form provided by the Fish and Game Commission, whereupon must appear the names and addresses of the claimant and *three* witnesses. This claim must be acknowledged before a notary public or justice of the peace, and must bear the county clerk's certification to the genuineness



Mountain Lion treed and shot by E. J. Curran of Sawyer's Bar, Siskiyou County, California, and the four-point buck killed by the Lion.

of the justice's signature. If sworn to before a notary public, this will not be required. Affidavits of witnesses are not required.

The claim must be accompanied by an account of the pursuit and killing of the lion, giving in detail the method used, number of deer carcasses left by the animal, and such other facts as may be of assistance in determining the damage done to deer and other game. Claim blanks will be sent on application.

By order of the Board.

FISH AND GAME COMMISSION.

Mills Building, San Francisco.

FINANCIAL REPORT CALIFORNIA FISH AND GAME COMMISSION.

Disbursements July 1, 1913, to June 30, 1914.

General Fish and Game Patrol, Administration, Etc.

San Francisco Division		
Salaries of deputies and employees	$37,404 50	
Traveling expenses, rentals, office supplies, etc.	17,096 84	
		$54,501 34
Sacramento Division		
Salaries of deputies and employees	$25,834 00	
Traveling expenses, rentals, office supplies, etc.	13,050 14	
		38,884 14
Los Angeles Division		
Salaries of deputies and employees	$12,227 00	
Traveling expenses, rentals, office supplies, etc.	4,953 98	
		17,180 98
Fresno Division		
Salaries of deputies and employees	$11,746 00	
Traveling expenses, rentals, office supplies, etc.	6,894 85	
		18,640 85
Miscellaneous Expenditures		
Traveling expenses—commissioners		880 02
Prosecutions and allowances		8,486 68
General printing, license lithographing, etc.		6,458 28
Sub-total—fish and game patrol, administration		$145,032 29

Sub-total fish expenditures—40 per cent—$58,012.916.
Sub-total game expenditures—60 per cent—$87,019.375.

Fishery Expenditures

Superintendent of Hatcheries and Assistants		
Salaries	$4,072 50	
Traveling expenses, supplies, etc.	1,009 81	
		$5,082 31
Sisson Hatchery		
Salaries	$13,476 23	
Traveling expenses, supplies, etc.	7,881 64	
		21,357 87
Tahoe and Tallac Hatcheries		
Salaries	$2,650 17	
Traveling expenses, supplies, etc.	679 73	
		3,329 90
Price Creek Hatchery		
Salaries	$1,791 67	
Traveling expenses, supplies, etc.	1,016 53	
		2,808 20
Ukiah Hatchery and Snow Mountain		
Salaries	$904 25	
Traveling expenses, supplies, etc.	419 90	
		1,324 15
Wawona Hatchery		
Salaries	$487 50	
Traveling expenses, supplies, repairs, etc.	247 70	
		735 20
Klamath Spawning Stations.		
Salaries	$2,094 50	
Traveling expenses, supplies, repairs, etc.	1,322 76	
		3,417 26
Brookdale Hatchery		
Salaries	$320 00	
Traveling expenses, supplies, repairs, etc.	77 55	
		397 55
Sacramento Experimental Station		
Rental		12 00
Screen and Fishway Surveys and Supervision		
Salaries	$6,607 33	
Traveling expenses, supplies, etc.	2,632 30	
		9,239 63

Fish Patrol (Launches, etc.)

Salaries	$2,649 00	
Traveling expenses, supplies, repairs, etc.	1,768 91	
		$4,417 91

Fish Distribution (car and messenger)

Salaries	$1,751 02	
Traveling expenses, supplies, repairs, etc.	1,907 87	
		3,658 89

Fish Transplanting (Pack-train, Messenger, etc.)

Traveling expenses, supplies	167 51

Miscellaneous Expenditures

Anglers' license commissions	1,148 30
Market fishing license commissions	532 75
Crawfish inspection	1,100 00
Sub-total fish expenditures	$58,729 43

GAME EXPENDITURES

Hayward Game Farm

Salaries	$2,698 50	
Traveling expenses, repairs, supplies, etc.	3,978 86	
		6,677 36

Miscellaneous Expenditures

Hunting license commissions and refunds	14,680 70
Mountain lion bounties	4,100 00
Sub-total game expenditures	$25,458 06

Fish and Game Research and Publicity

Salaries	$600 00	
Traveling expenses, supplies, etc.	491 04	
		$1,091 04

Sub-total fish expenditures (40 per cent)	$436,416.00
Sub-total game expenditures (60 per cent)	654,624.00
Total expenditures	$230,310 82

RECAPITULATION.

Total fish expenditures	$117,178.762
Total game expenditures	113,132.058
Grand total all expenditures	$230,310.820

STATEMENT OF EXPENDITURES FOR THE MONTH OF JULY, 1914.

GENERAL ADMINISTRATION

Commissioners' traveling and other expenses	$50 75	
Salaries of administrative assistants	975 00	
Traveling expenses of administrative assistants	38 25	
Rentals, office and other supplies	381 39	
		$1,445 39

GENERAL FISH AND GAME PATROL

San Francisco Division

Salaries of deputies and employees	$2,557 50	
Traveling expenses of deputies and employees	1,467 78	
Rentals, office and other supplies	230 63	
		4,255 91

Sacramento Division

Salaries of deputies and employees	$2,207 00	
Traveling expenses of deputies and employees	1,625 92	
Rentals, office and other supplies	103 63	
		3,936 55

Los Angeles Division

Salaries of deputies and employees	$1,190 00	
Traveling expenses of deputies and employees	460 21	
Rentals, office and other supplies	144 99	
		1,795 20

Fresno Division

Salaries of deputies and employees	$973 00	
Traveling expenses of deputies and employees	467 55	
Rentals, office and other supplies	77 47	
		$1,518 02

Miscellaneous Expenditures

Prosecutions and allowances		306 70
General printing		23 07
Total, general administration and patrol		$13,280 84
Probable cost general administration and game patrol (60 per cent)	$7,968.504	
Probable cost general administration and fish patrol (40 per cent)	5,312.336	
	$13,280.840	

Fishery Expenditures

Administration

Salaries of superintendent of hatcheries and assistants	$427 50	
Traveling expenses, superintendent hatcheries and assistants	49 75	
Office and laboratory supplies, etc.	47 59	
		$524 84

Fishery Research and Publicity

Salaries	$145 00	
Traveling expenses	77 55	
Supplies, etc.		
		222 55

Screen and Fishway Surveys

Salaries	$500 00	
Traveling expenses	218 70	
Supplies, etc	13 94	
		732 64

Fish Transplanting (Pack-train, Messengers, etc.)

Salaries	$309 00	
Traveling expenses	1,292 94	
Repairs and supplies	19 55	
		1,621 49

Fish Distribution (Car and Messengers)

Salaries	$310 00	
Mess allowance and traveling expenses	186 00	
Repairs	596 13	
Supplies	121 68	
		1,213 81

Fish Patrol (Launches, etc.)

Salaries	$229 00	
Mess allowance and traveling expenses	46 80	
Repairs		
Supplies (oil, etc.)	109 79	
		385 59

Sisson Hatchery

Salaries	$1,092 75	
Traveling expenses		
Construction and repairs	20 55	
Fish food and ice for meat	606 27	
General supplies	225 61	
		1,945 18

Tahoe and Tallac Hatcheries

Salaries	$415 00	
Traveling expenses	67 65	
Construction and repairs	4 22	
Supplies	139 01	
		625 88

Ukiah Hatchery and Snow Mountain.

Salaries	$282 50	
Traveling expenses		
Construction and repairs	75	
Supplies	52 60	
		335 85

Wawona Hatchery.

Salaries	$120 00	
Traveling expenses	30 00	
Construction and repairs		
Supplies		
		150 00

Miscellaneous Expenditures.

Printing and lithographing of fishing licenses, notices, application blanks, etc.		$82 81
Anglers' license commissions and refunds		913 65
Market fishing license commissions		39 00
Crawfish inspection		100 00
Total fishery expenditures		$8,893 29

GAME EXPENDITURES.

Hayward Game Farm.

Salaries	$207 50	
Traveling expenses	62 60	
Rent		
Construction and repairs		
Feed for birds	1 00	
General supplies	49 38	
		$320 48

Game Research and Publicity.

Salaries		
Traveling expenses		
Supplies, etc.	$10 80	
		10 80

Miscellaneous Expenditures.

Printing and lithographing of hunting licenses, notices, application blanks, etc.		
Hunting license commissions and refunds		578 40
Mountain lion bounties		220 00
Total game expenditures		$1,129 68
Grand total of all expenditures		$23,303 81

RECAPITULATION.

Total of fish expenditures	$14,205 63
Total of game expenditures	9,098 18
Grand total	$23,303 81

STATEMENT OF EXPENDITURES FOR THE MONTH OF JULY, 1914.

Salaries, traveling expenses, rentals, supplies, etc.—	
General administration	$1,445 39
San Francisco District	4,255 91
Sacramento District	3,936 55
Los Angeles District	1,795 20
Fresno District	1,518 02
Salaries, traveling expenses, supplies, etc.—	
Hatchery administration	524 84
Fishery research and publicity	222 55
Screen and fishway surveys, etc.	732 64
Fish transplanting	1,621 49
Fish distribution car	1,213 81
Fish patrol launches	385 59
Sisson hatchery	1,945 18
Tahoe and Tallac hatcheries	625 88
Price Creek hatchery	
Ukiah and Snow Mountain	335 85
Wawona hatchery	150 00
Klamath spawning stations	
Game farm	320 48
Game research and publicity	10 80
Prosecutions and allowances	306 70
Hunting license commissions and refunds	578 40
Anglers' license commissions and refunds	913 65
Market fishing commissions	39 00
Crawfish inspection	100 00
Mountain lion bounties	220 00
Printing and lithographing	105 88
Total expenditures	$23,303 81

BALANCES, AUGUST 1, 1914.

In State Treasury—		
Fish and Game Preservation Fund	$24,687 24	
Support and Maintenance Hatcheries Fund	20,399 06	
		$45,086 30
In Bank—		
Fish and Game Preservation Fund	$7,411 00	
Support and Maintenance Hatcheries Fund	5,240 00	
		12,651 00
		$57,737 30
Less July, 1914, bills		23,603 81
Balance		$34,133 49

STATEMENT OF EXPENDITURES FOR THE MONTH OF AUGUST, 1914.

Salaries, traveling expenses, rentals, supplies, etc.—	
General administration	$1,451 00
San Francisco District	4,238 54
Sacramento District	3,497 08
Los Angeles District	1,687 44
Fresno District	1,172 32
Hatchery administration	374 50
Fishery research and publicity	306 85
Screen and ladder surveys	681 78
Fish transplanting	1,775 68
Fish distribution car	749 14
Fish patrol launches	265 29
Sisson hatchery	2,117 63
Tahoe and Tallac hatcheries	336 07
Price Creek hatchery	
Ukiah hatchery and Snow Mountain	1 00
Wawona hatchery	
Klamath spawning stations	
Game Farm	426 56
Game research and publicity	
Prosecutions and allowances	181 62
Hunting license commissions and refunds	235 80
Anglers' license commissions and refunds	407 00
Market fishing commissions	11 25
Crawfish inspection	100 00
Mountain lion bounties	80 00
Printing and lithographing	136 02
Total expenditures	$20,262 54

BALANCES, SEPTEMBER 1, 1914.

In State Treasury—		
Fish and Game Preservation Fund	$28,501 65	
Support and Maintenance Hatcheries Fund	15,701 19	
		$44,202 84
In Bank—		
Fish and Game Preservation Fund	$11,400 00	
Support and Maintenance Hatcheries Fund	6,770 00	
		18,170 00
		$62,372 84
Less August bills		20,262 54
Balance		$42,110 30

PATROL SERVICE.

SAN FRANCISCO DIVISION.

Carl Westerfeld, Commissioner in Charge.
Ernest Schaeffle, Executive Secretary. J. S. Hunter, Assistant Secretary.
Head Office, 734 Mills Building, San Francisco.

W. H. Armstrong—Vallejo
Earl P. Barnes—Eureka
Theo. M. Benson—Fortuna
Edward Boyle—San Francisco
J. L. Bundock—Oakland
M. S. Clark—San Francisco
M. L. Cross—San Francisco
Earl Downing—Pleasanton
I. L. Koppel—San Jose
A. M. Fairfield—San Francisco
H. E. Foster—San Francisco
R. B. Heacock—Seabright
J. H. Hill—Watsonville
A. F. Lea—Cloverdale
Henry Lencioni—Healdsburg
B. H. Miller—Ukiah
W. J. Moore—Napa
P. H. Oyer—Pacific Grove
Chas. R. Perkins—Fort Bragg
Frank Shook—Salinas
Paul Smith—Requa
Vernon D. Thomas—San Rafael
H. B. Nidever—
—Launch "Quinnat," Vallejo
J. Christensen—
—Launch "Quinnat," Vallejo

SACRAMENTO DIVISION.

F. M. Newbert, Commissioner in Charge. Geo. Neale, Assistant.
Forum Building, Sacramento.

George Neale—Sacramento
T. W. Birmingham—Red Bluff
C. H. Blemer—Sacramento
Frank F. Cady—Susanville
S. J. Carpenter—Maxwell
Euell Gray—Shingle
W. J. Green—Sacramento
J. W. Harris—Greenview
G. O. Laws—Weaverville
S. J. Mandeville—Truckee
Geo. J. Merritt—Manteca
R. C. O'Connor—Grass Valley
D. E. Roberts—Murphys
Chester A. Scroggs—Loomis
R. L. Sinkey—Woodland
Richard Squire—Lodi
Jas. S. White—Redding
E. D. Ricketts—Live Oak
Frank S. Parke—Sutter Creek
Geo. Courtright—Straw
L. J. Warren—Taylorsville
L. A. Streuber—Gazelle

FRESNO DIVISION.

Carl Westerfeld, Commissioner in Charge. A. D. Ferguson, Assistant.
347 Forsythe Building, Fresno.

A. D. Ferguson—Fresno
O. P. Brownlow—Fresno
F. A. Bullard—Dunlap
S. L. N. Ellis—Fresno
David H. Hoen—Fresno
Tipton Mathews—Wasco
J. E. Newsome—Newman
E. W. Smalley—Hanford
Geo. F. Grant—Columbia

LOS ANGELES DIVISION.

M. J. Connell, Commissioner in Charge. H. I. Pritchard, Assistant.
Consolidated Realty Building, Los Angeles.

H. I. Pritchard—Los Angeles
H. J. Abels—Santa Maria
I. A. Bordner—Los Angeles
J. H. Gyger—Elsinore
E. H. Ober—Big Pine
W. K. Robinson—El Toro
Webb Toms—San Diego
James A. Vale—San Bernardino
A. J. Stout—Mono Lake

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

CONTENTS.

INTRODUCED GAME IN NEW ZEALAND.

By J. S. HUNTER, Assistant Secretary, California Fish and Game Commission.

While we in America have been busy during the past few decades killing off the game, which by nature we were so abundantly endowed, the farsighted people of New Zealand have been busy introducing into their southern islands game animals and are now enjoying the fruit of their farsightedness.

In California, we have driven to practical extermination several species of the elk and antelope, at one time so common that their flesh was of little value. Our deer have also become greatly reduced, but on account of their range being more extended and their inhabiting country densely covered with brush, they have held out far better than the elk and antelope.

New Zealand is extremely deficient in native land animals, two species of bats comprising the entire list.

In 1862, there were secured by certain citizens of New Zealand a number of red deer from the British Isles. Three reached Wellington alive. Several months later these were liberated in the Wairarapa. They had increased to such an extent by 1887 that permits were granted for the killing of a limited number. At the present time, it is estimated that there are fully 10,000 in that section. From time to time, new

blood has been introduced, and it is probable that on this account they have not suffered from inbreeding, but it can practically be said that the vast herd are the descendants of the original three animals.

Another plant of red deer was made in northern Otago in 1870 when seven were liberated. In that section they have increased so that there are now many thousands. Another herd, known as the Nelson herd, was liberated in the early sixties and has likewise increased to a wonderful extent.

Red deer can be found in many different sections of the islands and excellent shooting can be obtained in almost any part. It is estimated that there are in excess of 40,000 now in the islands.

Fallow deer have also been introduced and are now hunted extensively in many sections. Several other varieties of big game have been introduced. The Ceylon deer, white and blacktailed deer, moose, the Caucasian mountain goat, the chamois, and our most noble of all deer, the wapati or American elk—all of these species are reported to be increasing and will eventually be abundant enough to warrant open seasons.

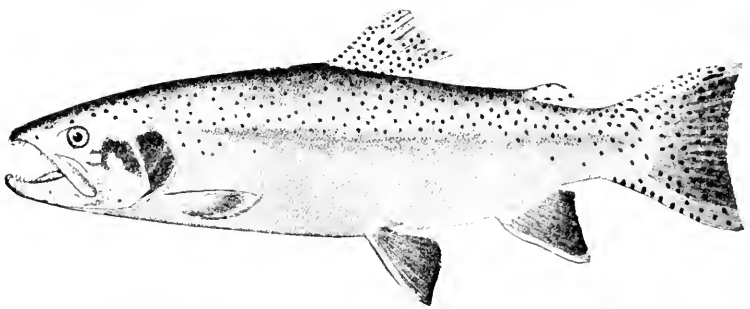


FIG. 9.—Rainbow trout (*Salmo iridcus*). Tons of rainbow trout are now caught in New Zealand during each open season. They were introduced into the islands in 1881.

New Zealand's efforts in acclimatization have not been confined to game alone. California rainbow trout were introduced in the early eighties. The credit for the first plantings belongs to Mr. Hugh Craig, a former New Zealander, but not a resident of San Francisco. In 1881, while living in San Francisco, Mr. Craig was acting as the corresponding secretary for the Auckland Acclimatization Society. It occurred to him that our native trout should do well in the New Zealand streams. Arrangements were made with Col. A. V. La Motte, who was then with the United States Bureau of Fisheries, and now with the California Commission, to secure 10,000 eggs. These eggs were divided into two shipments. Of the first shipment, very few hatched, and what few did, died within a few hours. When the second shipment was received, no mistakes were made and all of the eggs hatched. The fry were liberated in the Waitakere, a stream a few miles from Auckland. Mr. Craig paid for all the expenses of these shipments out of his private funds. Two years later, the attention of the Hon. Thos. Russell was called to the shipments of trout and he authorized Mr. Craig to pay not exceeding $1,000 in further shipments. Arrangements were then made for shipments of rainbow, Tahoe and Dolly Varden trout and salmon. No

reports have been received by Mr. Craig of these; but the native California trout have succeeded beyond their most sanguine expectations. Trout are now found throughout all of the streams of the northern islands and have been introduced from these streams into the streams of the southern island. In a lake known as Roto Rue, a short distance from Auckland, during the open season, an average of more than four tons a day is taken and on certain days when fishing is heavy, as many as fourteen tons have been caught. Many weighing over forty pounds are frequently taken. Dr. David Starr Jordan remarked at one time that so many fish were taken from this lake that the surface of the water was very much lowered.

The earliest plant of fish in which Mr. Craig took part was a shipment of catfish in 1876. Mr. D. J. Stabler, director of the California

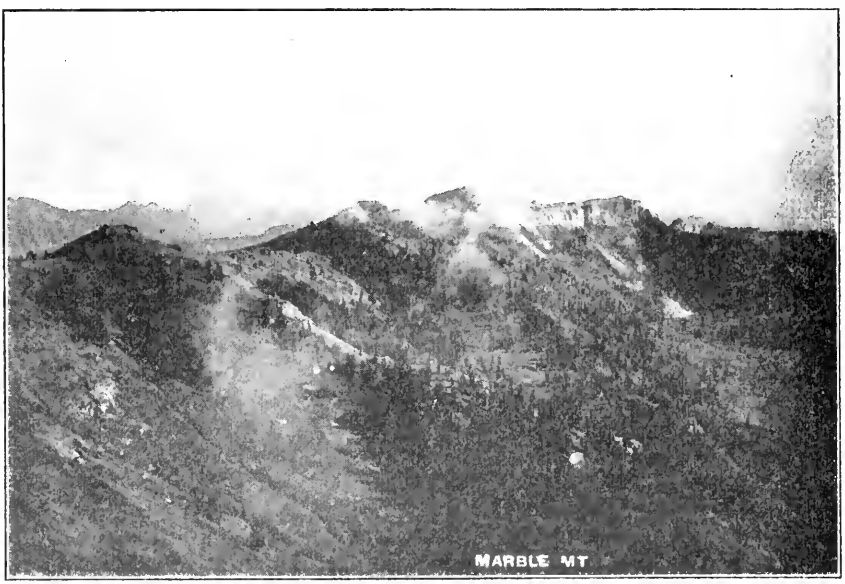


FIG. 10.—Marble Mountain in western Siskiyou County; a great game country.

Sportsmen Society, suggested that he send to his New Zealand people a shipment of catfish. With the assistance of Mr. R. R. Redington, a very prominent sportsman of the early days, two cans of catfish were taken near Stockton and were shipped to the islands. Only five reached New Zealand alive and were liberated in St. Johns Lake, five miles from Auckland. A later shipment of smaller fish, 250 in number, were planted in the same lake. These shipments created considerable comment and unfavorable criticism. One member of the Acclimatization Society cabled, at an expense of $5.60 per word, requesting that no more catfish be sent as they did not want them. Four or five years later, a boy was fishing with a rod and caught a six-pound catfish. He became frightened when he saw the ferocious looking head of the catfish coming out of the water and dropped his rod and ran, but later returned and

took the fish home and it was eaten. That was the beginning of catfishing in the islands. Now, in that section, catfish are taken in great numbers and are greatly enjoyed.

While Mr. Craig was acting as secretary, numerous shipments of our native deer, valley and mountain quail, bobwhite quail and other species of game birds were sent to the islands, and now in the sections where liberated, they can be found in large numbers.

We are indebted to Mr. Hugh Craig of San Francisco and to Mr. Ben Wilson, General Manager of Department of Tourists and Health Resorts at Wellington, New Zealand, for the information so kindly furnished.

AN OBJECT LESSON IN GAME CONSERVATION.*

By HENRY CHASE, Author of "Game Protection and Propagation in America."

The history of the deer of Vermont is, indeed, an interesting and absorbing subject. It is not only of interest locally to the people of that state, and absorbing to those who are striving for the conservation of our wild life, but it is both interesting and absorbing to the people of this nation. Particularly is this latter statement true as to the American sportsmen. It furnishes an object lesson in game conservation to every state in the union, for the bare statement of the true facts and figures cannot be gainsaid as a real demonstration, and what Vermont has accomplished for its deer any other state may do for its local game by intelligent and positive action. Above all it conclusively proves that the game of a state may be preserved and increased by wholesome protective laws which are properly enforced.

Before proceeding with our narrative of facts, however, it is important to recall and constantly bear in mind that Vermont, with a total area of 9,565 square miles, is among the smallest states of the union—only New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey and Delaware being smaller—and yet in 1900 over 600 deer were killed in each of its counties of Windsor, Washington and Rutland, the county of Windsor alone reporting 870 deer lawfully taken during the open season. The same year the great state of Pennsylvania, with a total area of 45,215 square miles, or about five times as large and with equally good deer territory within its borders, reported to Dr. Palmer of the U. S. Biological Survey, that only about 500 deer had been taken in the entire state.

When the hardy New England pioneers from Connecticut and New Hampshire first arrived in Vermont about the middle of the eighteenth century they found the ancient Green Mountains, which form the backbone of the state, filled with game of every description, and the clear, sparkling waters therein teeming with speckled brook trout and other varieties of food fish. So plentiful, in fact, were the game and fish that they furnished the principal articles of diet on the tables of the early settlers, while the pelts of the numerous fur-bearing animals supplied them with warm clothing with which to withstand the long

*Reprinted from Forest and Stream, by permission.

and rigorous winters. Prof. Samuel Williams, in his Natural and Civil History of Vermont, prepared by him in 1807 and which is considered an authority on this subject, says: "The deer is one of our most common animals. * * * The deer are numerous in Vermont and on account of their flesh and skin are of much value." (Page 102, *id.*)

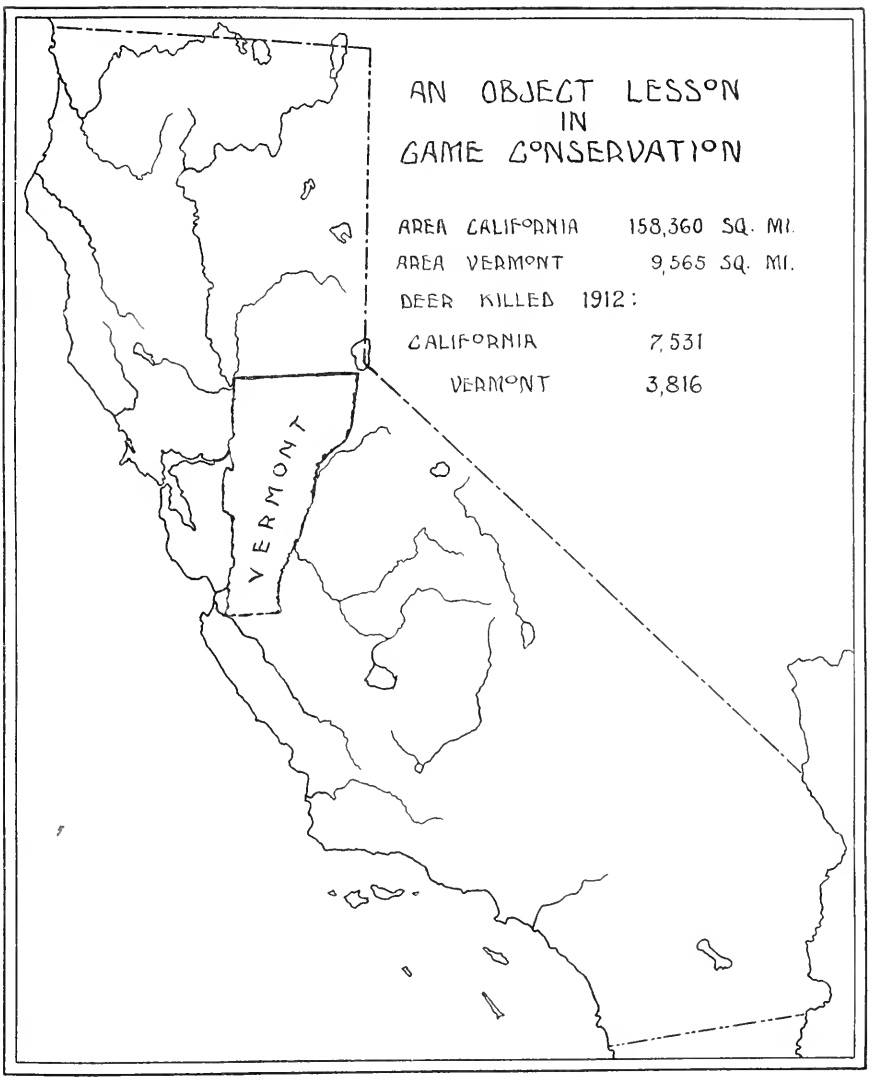


FIG. 11.—An object lesson in game conservation.

"Our forests afford shelter and norishment for the moose, bear, wolf, deer, fox, wildcat, raccoon, porcupine, woodchuck, skunk, marten, hare, rabbit, weasel, ermine, squirrel, mole and mouse. In our rivers, ponds and lakes the beaver, muskrat, mink and otter are found in large numbers." (Page 98, *id.*) It seems that the people of this state never made any consistent effort to protect any of this game in the early days,

except the deer alone. In 1842 Thompson's famous history of Vermont was published, and it is significant to note what the author of that work says regarding the deer of his time. He says: "When the country was new this deer (the Virginia, or whitetail deer) was one of the most common and valuable quadrupeds found in our forests, and upon its flesh were the first settlers of the state, to a very considerable extent, dependent for food. Indeed, so eagerly was it hunted, and still so anxious were the people for its preservation, that a law for its protection from the 10th of December to the 10th of June was one of the earliest acts of our legislature. But notwithstanding all that has been done for their preservation, their numbers have been constantly diminishing within the state, till they have become exceedingly scarce, except in a few of the most unsettled and woody sections." (Part 1, chap. 2, p. 51.) At present we would be inclined to think our ancestors were using poor judgment in not prescribing a close season permanently at that time and thus save the remnant of their deer supply. But they did not do so and the natural consequences, with which we are now so familiar, followed as a matter of course and the deer were practically exterminated.

But to go back for a moment. The constant pursuit of these animals in those early days with flintlock rifle, crude trap and fishing rod soon converted these people into a hardy, resourceful race of skilled marksmen and brave people. From the standpoint of the sociologist their chief characteristics were their independence and inherent love of liberty, which they prized above everything except life itself. Their habit of wandering afar in pursuit of their quarry, without let or hindrance, and unrestrained by local custom or law, naturally tended to develop this spirit of independence and liberty to its utmost.

From all we are able to gather at present day, while we know the deer were plentiful in those early times, yet they were never so numerous in the history of the state as they were in 1909. This is significant in itself. Excepting an act passed in 1812 to protect the muskrat of the state, no protective measures were enacted but the one above mentioned by Prof. Thompson, passed in 1797, providing for a six months' close season for deer. In the mean time the people of the state placed in their first constitution, adopted in 1777, a provision to secure and safeguard their rights of free hunting and fishing—the liberty to hunt on all uninclosed land and to fish in all boatable waters. That provision still continues a part of the constitution of Vermont. (See section 40, chapter II, Constitution of Vermont.)

Now, it seems that the above constitutional rights of the people were deemed by them so sacred and valuable that for many years after the adoption of this provision it was a bold legislator who dared to propose any sort of measure to protect the game. The result was the inhabitants of the state were left unrestrained by law for many years to hunt and fish when, where and howsoever they pleased, and gradually, but surely, the deer were almost wholly exterminated. In some parts of the state a few escaped the hunters and survived, but over far the greater part were completely wiped out. This condition continued for many years. The first collected and revised edition of the statutes of the state was authorized by the legislature of 1837 and is known as the "Revised Statutes." It contained one chapter, number 90, on the "preservation

of game and the destruction of noxious animals." Section 1 of this chapter made it an offense, punishable by a fine of $10 to kill "any wild buck or doe, fawn or any other kind of deer, between the tenth of January and the first day of the following July." The remainder of the chapter consisted of provisions offering bounties on wolves, panthers, bears and foxes. Until during the late seventies the above included about all the game laws that existed in Vermont. In 1876 the first real step was taken toward rehabilitating the deer. In that year the legislature provided for a close season on deer until September 1, 1880.

This act caused an agitation among the sportsmen of the state to consider ways and means of reestablishing the deer in their former haunts, and some worthy men in the southern counties immediately took decisive action. But what did they do? What was that action? Did they plan a private shooting preserve for their own profit and enjoyment? Not they. No such idea ever entered their minds. They were true sportsmen and good citizens, seeking only to benefit their brethren and promote the best interests of their commonwealth. Hence, their names deserve to go down in the history of sportsmanship as real brothers of the great outdoor guild. They were Dr. Middleton Goldsmith, Martin G. Evarts, Wm. Y. W. Ripley, James C. Dunn, Wallace C. Clement, Percival W. Clement, Waldo P. Clement, Edward H. Ripley, Frederick Chaffee, Samuel E. Burnham, Henry W. Cheney, Dr. A. Kilburn, Levi G. Kingsley, Walter C. Landon, Henry A. Sawyer, Redfield Proctor and Albert F. Davis, all of Rutland; Mason S. Colburn and Charles F. Orvis of Manchester, and ex-Governor Fairbanks of St. Johnsbury.

"Prior to 1878," says ex-Game Commissioner Thomas in one of his biennial reports, "to see a deer in Vermont was certainly a rarity, and if one was seen it was of so much importance it was published by the press throughout the state." This gives an idea of how scarce the deer were at that time. During the above year these sportsmen raised a fund among themselves with which they procured 17 deer. Ten were purchased from the keeper of the state's prison at Dannemora, New York, and the others secured elsewhere by purchase and gift. In the months of April and May these deer were liberated in the Green Mountain forests of Rutland and Bennington counties.

Well these sportsmen knew, however, that only half of the problem had been thus solved. Care, watchfulness and protective legislation were necessary to afford these deer an opportunity to establish themselves in their new homes, so the solicitude of the donors never abated until they had obtained a close season which continued for 19 years. During this time public sentiment was aroused in favor of protective measures, a penalty of $100 fine was exacted from any one who killed one of these animals and all of the leading sportsmen of the state made it their individual duty and obligation to see that this law was enforced rigidly. The result, as the figures will show, seems astonishing to the uninitiated.

In 1897 an open season was declared for the entire month of October. Only bucks were allowed to be taken, but each hunter was permitted to kill two deer. No serious attempt was made by the game officials to secure statistics for that season, but it was apparent to all that this law did not furnish an adequate measure of protection, so at the next session of the legislature in 1898 the open season was changed to the last 10

days of October and only one buck was allowed to each hunter. These provisions continued until 1905, when the legislature of the previous year had changed them to the last week in October containing 6 working days, Sunday excepted, and this open season of 6 days was in force until 1911. In 1908, however, the deer had become so numerous in the state that a persistent demand was made on the lawmakers to permit the killing of does as well as bucks. The demand came principally from the farmers who complained that the deer were destroying their crops, so the measure was approved and allowed for two consecutive years—1909 and 1910. The legislature of the latter year, however, changed the open season to allow the killing of bucks only from November 15 to November 25, both dates inclusive, but this act did not become effective until 1911. During the session of 1912 the open season was again changed for bucks only from November 10 to December 1, both dates inclusive.

Now, let us see what the figures show for this period. The old saying is "that figures don't lie," and in this case they speak volumes. The early figures are undoubtedly too small, but subsequent to 1902 they are conservatively accurate. In 1906 a statute was enacted requiring each hunter who killed a deer during the open season to report the fact to the nearest warden and exhibit to the latter the head of such deer. For the years 1898, 1899, 1900 and 1901, 555 deer were reported killed; for 1902 and 1903, 1,513; 1904 and 1905, 1,322; 1906 and 1907, 2,234; 1908 and 1909, 7,519; 1910 and 1911, 6,787; 1912 and 1913, 3,816 deer. This makes a total for the period when open seasons have been permitted since the sportsmen above named liberated 17 deer in 1878 of 23,746 deer, or in round numbers about 25,000. Unquestionably, this estimate is conservatively low, for it is impossible to keep track of every deer that is lost to a state. Estimating that each deer possesses an average market value of $10, here was an asset to Vermont of one quarter of a million dollars.

Not only was the state practically overrun with deer in 1908–09 and 1910, but the overflow drifted extensively into the states of New Hampshire on the east, New York on the west, and Massachusetts on the south—the latter state being particularly fortunate in this respect, its counties of Berkshire and Franklin being well stocked from Vermont deer.

Here, then, is certainly an object lesson to other states, and warning to Vermont itself not to again become careless and indifferent regarding this valuable state asset. And in that respect it is alarming to note the falling off in the figures of the last two years and at the same time extending the open season. The tide is turning and Vermont should not permit such a long open season at this time.

The specific lessons we learn from this history with respect to game legislation are these:

1. Only full grown bucks should be permitted to be taken in the open season. In order to accomplish this, and at the same time protect human life, the law should provide that only deer with horns a certain specified length may be killed.

2. Not more than one such deer as above should be allowed to each hunter. The time for wholesale slaughter of deer is past, and at present only short open seasons can be permitted if the deer supply is to be

conserved. In such cases who but a game-hog or mercenary butcher wants more than one deer?

3. Require by law that each person killing a deer shall report that fact to some designated official or game officer. This is absolutely essential in order that the game department may recommend proper legislation affecting deer.

4. Make the open season comparatively short and base the length of same on the official figures as above obtained. If such figures show a steady increase the season may be lengthened with safety; if a falling off, then it should be shortened.

THE WOOD DUCK IN CALIFORNIA.

By Joseph Grinnell and Harold C. Bryant.

(Contribution from the Museum of Vertebrate Zoology of the University of California.)

It is universally accepted that the wood duck (*Aix sponsa*) is the handsomest of all the ducks of the United States. Its near relative, the mandarin duck of Asia, is its only near competitor for honors, and as far as brilliancy of coloration is concerned even this species may be given second place. The wood duck's habit of making special display of its bright colors but adds to its ever evident beauty and grace when on the water.

In California the wood duck was formerly well distributed throughout the low country west of the Sierras. Now it is a rare local resident of the Sacramento and San Joaquin valleys and westward to the coast, frequenting the timber-bordered streams and freshwater sloughs, especially in the oak belt. Although permanently resident within the state, the species appears to a slight extent migratory toward the north in April and to the south in October. It is rare in southern California where as a rule favorable conditions are lacking. The southernmost record is Ramona, San Diego County.

So conspicuous and distinctive is this duck that field marks are hardly necessary even for the uninitiated. The crested head crossed by white stripes, the pure white under parts and the bright metallic colors always betray the male. Although lacking the bright coloration of the male, the female displays much more color than the females of other species and in addition can be recognized by a white eyering which extends back of the eye as a white streak.

Wood ducks seldom stray away from the secluded, wooded streams and sloughs which constitute their habitat. "A mossy log in a pond is a favorite resting place for the ducks, but as you walk through the woods in spring a pair will often fly from a branch overhead, uttering their shrill, plaintive cry as they dart through the trees." (Bailey, Handbook of Birds of the Western United States; Houghton, Mifflin Co., N. Y., 1902, pp. 55-56.)

The wood duck is to be ranked among the early nesters. Most ducks nest on the ground, but this species selects hollows in trees which may be either living or dead. Often the nest is built above the water, but sometimes at a considerable distance from it. Occasionally the entrance to the nesting cavity is forty or fifty feet above the ground. The nest is sometimes placed several feet below the entrance to the hollow. Twigs,

grass and leaves are used as building materials and the lining is of down. A deserted woodpecker's nest enlarged through decay is ofttimes used. The hollow end of a broken-off branch is said to be frequently selected. Sampson (Condor, 3, 1901, p. 95) found a wood duck's nest located in a deserted home of the red-shafted flicker, about twenty-five feet above the ground in a white oak tree, at Forest Lake, San Joaquin County, April 29, 1900. The nest contained twenty-one eggs. As a difference in size and coloration was noticeable in the eggs, it is probable that the nest had been occupied by two females.

Messrs. R. S. Wheeler and W. B. Sampson found a set of fifteen eggs of this species in 1896 at a point on the San Joaquin River a short distance above Lathrop, San Joaquin County. The nest was in a hollow tree close to the overflow from the river, and the tree was infested with ants, which, however, did not appear to have in any degree disturbed the ducks. Wheeler has also reported the nesting of a pair of wood ducks in a barn on the Sacramento River, near Isleton, Sacramento County. The birds entered the barn through a hole in the boards and built their nest in the hay. The farmer who owned the hay guarded the nest and allowed the eggs to hatch.

Mr. Joseph Mailliard tells us of having found in 1872 or 1873 a nest of the wood duck in a hole in a dead tree on the bank of Gallinas Creek, Marin County. One of the parents was frightened from the nesting cavity. The nest contained not less than eight eggs, though no accurate record was kept of the circumstances.

This duck returns to the same nesting site year after year. Incubation lasts for a period of four weeks; the female alone attends to this duty, the male usually being found standing guard on a nearby limb. Some observers say that the male deserts the female during this period. The young either tumble out of the nest and are led to water, or, as several observers have asserted, are carried to the water one by one in the bill of the mother. The call of the young is said to be a mellow *pee-pee-pee*.

"The wood duck is conspicuous for the swiftness, ease and elegance of its flight. It can pass through woods, and among the branches of trees, with as much facility as the wild pigeon. While flying it is rarely ever heard to utter any cry." (Baird, Brewer and Ridgway, North American Birds; Little, Brown & Company, N. Y., 1884, p. 14.) This species is to be found in pairs or at most in small flocks.

The wood duck does not limit itself to the aquatic insects and plants found along the stream near its regular abode, but often forages about the woods in search of other food. Belding (MS) says that on the Feather River it feeds in corn and wheat fields after harvest and also on wild grapes and acorns.

Joseph Mailliard saw quite a number feeding on acorns at Paicines, San Benito County, October 13, 1900. The stomach of a female taken near Laytonville, Mendocino County, in November, 1913, contained a large number of acorns. A female taken near Santa Rosa contained sprouting acorns. Acorns would appear, therefore, to form a very general article of diet. Stomachs of the eastern wood duck examined by the United States Biological Survey (McAtee, U. S. Dept. Agric., Bureau Biological Survey, Circ. 81, 1911, p. 1) show that over fifteen per cent of the food is made up of wild rice and celery and over six per cent of pond weeds. A stomach examined by the writers obtained

in Sutter County contained twelve back swimmers (Notonectidae) and a quantity of sand.

At the present time the wood duck exists wild in such small numbers that it should not properly be considered a game bird of the state. Nevertheless, its flesh is declared to be delicious; and since it has proven itself readily domesticated there seems no good reason why it cannot be raised in captivity as a commercial proposition and sold on the market. At present there is a brisk demand from breeders and pleasure parks for this, the handsomest of the duck tribe.

Early writers report the wood duck as common in California. Townsend (Proc. U. S. Nat. Mus., 10, 1887, p. 194) says that it was observed on the lower McCloud River at various times from October 1 until March 1, often in quite large companies, and was seen in April and May at Red Bluff, where it frequented the sloughs in the timber belts along the Sacramento River. Heermann (Pac. R. R. Rep., 10, 1859, p. 68) gives it as "Abundant, breeding in the hollow trees bordering the streams of California." Mailliard (Condor, 13, 1911, p. 49) says: "As late as twenty-five years ago it was no uncommon thing to see wood ducks scattered in small groups along such a stream as the Paper Mill, or Lagunitas Creek, in Marin County, or anywhere along the Santa Rosa Laguna in Sonoma County, even where quite a number of people lived in the vicinity and where there was a good deal of travel along the streams. Often the ducks were found in small tributaries and diminutive ponds along these waterways." The last one killed in this vicinity was taken on October 23, 1898. Mr. A. Jackson reports that a limit of wood ducks could be obtained along the Napa River fifteen years ago. Although he has recently hunted in the same locality, not a single wood duck is now to be seen there. Streator (Ornithologist and Oologist, 11, 1886, p. 90) records the species as rare near Santa Barbara, but says that birds were occasionally met with beyond the Santa Inez Mountains about ten miles from that city.

Practically none are to be found in these old haunts at the present time. An individual is occasionally reported as being seen in the locality above mentioned by Mailliard and in the vicinity of Gridley, Butte County; but further than this and an occasional one reported by a collector or market hunter, the species is now almost unknown. Dr. W. F. Badé reports that he saw numbers of wood ducks on the Sacramento River on a trip from Tehama to Chico in 1905. When the same trip was taken in 1911 not more than six were seen. The more recent records of its occurrence are as follows: Ramona, San Diego County, November, 1905 (Sharp); Redlands, San Bernardino County, October 2, 1909 (Willett); Banning, Riverside County, April, 1907 (Willett); Stanislaus County, fall of 1910 (Mailliard); Oxnard, Ventura County, November 6, 1905 (Grinnell); Reedley, Fresno County, April, 1910 (Tyler); near Laytonville, Mendocino County, November, 1913 (F. C. Clarke). Mr. J. S. Hunter, Assistant, State Fish and Game Commission, has stated to us that whereas this species came to the market in considerable numbers several years ago, not more than two or three have been seen during the past few years. Wood ducks to the number of 440 are recorded as sold in the markets of San Francisco and Los Angeles in the season of 1895-1896. The records of sale in the markets of San Francisco during the season of 1910-1911 show a total of six birds.

From the foregoing evidence it can be seen that the wood duck, although existing in California in considerable numbers in the early days, is now nearly extinct. A number of the eastern states have found it necessary to give it complete and permanent protection in order to save it. California's only hope of saving this species is to do likewise. Although the wood duck is migratory in most states, it remains with us throughout the year and so gives us added responsibility. The federal regulations regarding migratory birds, which went into effect in the fall of 1913, placed a close season of five years on the wood duck. At the end of this period renewal of total protection will doubtless be necessary.

Berkeley, July 3, 1914.

A CALIFORNIA INDIAN HUNTING LEGEND.

By A. L. Kroeber, Assistant Professor of Anthropology, University of California.

The myths and legends of the American aborigines are in great measure explanations of nature and their own customs. One story will set forth why the sun rises daily in the east and pursues his path across the heavens; another, why the stars twinkle at night, or the raccoon has a ringed tail; while a large class of traditions, related with particular ardor by the old men, are intended to instruct subsequent generations in the origin of this or that dance, ceremony, or habit of native life.

Hunting and fishing play so large a part in the existence of nearly all Indian tribes that one might expect to find innumerable stories explaining the beginning of these occupations. As a matter of fact, the reverse is true. The customs were so fundamental to the various tribes that they rather took them for granted as being something normal. Literally, thousands of legends could be cited in which the characters are depicted as engaged in hunting for their daily subsistence; but this arrangement seems so obvious to the aboriginal mind, that traditions containing a definite explanation of how human beings learned or came to hunt, are exceedingly rare. The following tale, which is one of the exceptions to this rule, may therefore be of interest, particularly as it hails from one of the few California tribes still preserving something of the ancient habits of life. They are the Karok Indians living along the Klamath River in Humboldt and Siskiyou counties, above and below the mouth of the tributary known as the Salmon River.

The tradition is typically Indian in that practically all of the characters mentioned in it are animals. These, however, speak and act very much like human beings. The universal Indian theory of the world is, that there was a period before the human race was in existence, when the earth was peopled only by spirits and animals. These lived and acted very much like human beings; in fact, were often endowed with even greater powers, in that they possessed a miraculous magical ability which enabled them to shape the world to its present condition. Later these spirits withdrew to the sky, or to the world beyond the ocean, and the animal-men either joined them or were transformed, at the time of the birth of the human race, into their present shapes. The end of the present tale refers to this period of transition where man was getting ready to succeed the animal.

Here is the story:

Long, long ago the Catowl lived by killing deer. Every morning when he started to hunt he whistled for his two dogs. Immediately they came rushing to him, and at his command ran up into the hills. The Catowl then strolled leisurely down to the river and watched. After awhile he would see a deer come swimming down with the current, into which the dogs had driven it farther up-stream. Clambering on a rock where the river was narrow and the current swift, the Catowl waited until the buck was abreast of him and then jumped on his antlers. There he ensconced himself comfortably, sailing down the river in great jubilation until the buck was tired and had reached a convenient landing place. There the Catowl would leap ashore, dragging the game after him by its horns, and then cut its throat. From the landing it was but a short way to his house; thus he lived in ease and plenty.

Now one morning, having followed this usual pursuit and being engaged in skinning his prey by the river, he noticed that it was an unusually fat animal, and his mind was joyful with anticipations of a particularly juicy meal.

Looking up, he saw a gigantic and forbidding figure standing by him. The brush grew up one side of the stranger's face, and water ran down the other; a tremendous knife was stuck in his belt, and altogether he seemed most terrifying to the little Catowl. When the monster opened his mouth and said, "I will carry your buck up to the house for you," the Catowl, although suspecting nothing good, did not dare to refuse. So he helped the visitor take the deer on his back, and started to show him the way home. The giant, however, had his own ideas of what was right, and when they came to the parting of the trails he merely walked on with his load. He was considerate enough, however, to throw the kidneys to his host.

"Well, well," thought the Catowl to himself, "that was unfortunate." But having nothing else to do, he went on to his house and made shift with the scrap which the giant had thrown to him.

In the morning he determined to try for better luck. Again he whistled for his dogs and waited at the river. Another fine buck came swimming by, and again the Catowl, after his free ride, killed him. With the carcass all ready to be carried home—lo, the same horrible stranger stood before him and insisted on being the burden bearer. The Catowl demurred in his heart, but was too small to refuse, with the result that he again lost the whole of his venison except for the kidneys.

The third morning, Coyote, known as a great wanderer and mischief maker, and withal a boaster, although resourceful in many tricks, dropped in at the Catowl's home. He said: "I hear that some one has been coming and taking away your deer from you."

"Yes, he is doing that regularly," answered the Catowl.

"Well, leave it to me," intimated Coyote, "and I will dispose of him."

"I very much wish you would," the Catowl told him.

"Where are you in the habit of killing and skinning your deer," the Coyote asked him nonchalantly.

"Just below here by the river," said the Catowl. "If you will step down there and wait for me, I will bring the deer right to you."

So Coyote went down to the landing place, hid in the brush, and waited. Before long a big buck came swimming down the river, battling his hardest, but nearly exhausted. On his antlers he carried the little

hunter, who soon jerked him up on the bank, cut his throat, and began to skin him. Coyote, the great hero killer, was waiting courageously for the mysterious stranger to appear, but when he saw the nice looking venison his appetite overcame his anticipated bravery, and he whispered to his friend: "I am terribly hungry; throw me some of the soft meat from the belly, and I will chew it while I am waiting." The Catowl tossed it to him, and again and again Coyote repeated his request until he had had his fill.

At the exact moment when the carcass was ready to be taken away, the stranger appeared. Immediately Coyote's vaunted bravery began to leave him. He had instructed the Catowl to act as if nothing unusual were impending, but slyly to help him by pulling back as much as he

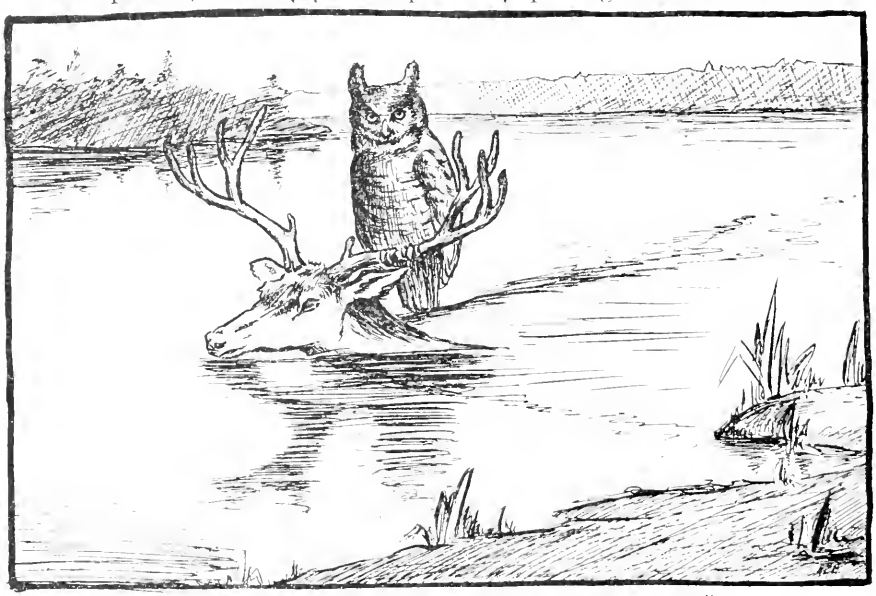


FIG. 12.—"On his antlers he carried the young hunter."

dared while assisting the giant in loading the carcass on his back. At that moment, while the monster was thus impeded and squatted on the ground, Coyote would advantageously jump him. Now, the Catowl obediently followed the stern command to assist the giant in getting the deer on his back, but at the same time remembered Coyote's directions and dragged the load backwards.

"Why are you holding me back? Let go!" growled the big stranger. Here was the advantageous opportunity, and the Catowl delayed the giant a moment longer. But Coyote's heart had sunk completely, and he was afraid to stir or even show himself, with the result that the stranger arose and carried away his prey.

When he was well out of sight, Coyote came sneaking up to the house after the Catowl. "That is a very powerful fellow, and what is more, he is endowed with magical power," he said, "but now that I have sized him up, I will surely kill him tomorrow." In this vainglorious fashion Coyote glossed over his cowardice, but as the event proved, he had seen enough to really nerve him to the task the following day.

In the morning the same procedure took place. Coyote's greedy hunger once more got the best of his warlike resolutions, and while waiting for the giant he gorged his belly with pieces of meat which his friend obligingly gave him. This time, however, when the giant was stooping and the Catowl impeding him from behind, Coyote actually leaped from his hiding place, plunged his knife into his body, and killed him. Then the Catowl saw, what the keen Coyote had observed the day before, that the giant's formidable knife was nothing more than a piece of bark shaped to resemble a weapon. In spite of his size and forbidding appearance, the stranger had been comparatively harmless.

Coyote, however, was not satisfied with dispatching him, and determined to rid the world for good and all of him and his kind. So he said to the dead body, which, according to the habits of the people of those days, was likely to return to life again:

"You will not be an evil being any longer. You will no more roam the earth in human shape and make trouble. From this time on, when you live again, you will swim in the water and be a mud puppy."

Suiting his action to the words he threw the dead body into the creek, where after awhile Coyote's prediction proved true, and the giant turned into the little ugly but harmless reptile.

Still intent on pursuing his reform to the utmost, Coyote said to his friend, "Now carry your dinner up to the house. I will join you there later, but first I will go to see where our dead friend came from." So he followed the giant's tracks, which he found went up a creek, and after reaching the top of the hill he saw smoke in the distance. He headed for this and came to a large Indian house. Inside, children were playing and laughing. Coyote peeped in and saw several boys, but was even more pleased with the view of great quantities of venison hanging up. "Well, first I will kill the little fellows, and then for a feast," he said to himself. He stepped into the house and tried to finish the boys. He dashed them against the ground, threw them into the fire, but nothing seemed to hurt them. As he was knocking them about or holding them down in the flames, they were still laughing and whispering to each other: "There is no danger of our dying by burning while our hearts are hanging up under the roof."

Coyote's sharp ears having heard this remark, at once he said to himself: "Why, of course, that is so." Letting the children lie, he clambered up, threw down their hearts, tossed these into the fire, and as they were consumed the boys rolled over dead. So the world was rid of this brood of evil doers.

Now the monster-slayer thought himself entitled to a full reward. He ate all the venison he could and then loaded himself with more to the limit of his carrying capacity. When his pack became too heavy he rested and ate some more of it. Then he thought of an ingenious scheme. "Why should I travel farther when I can enjoy a good sleep? I will take two of the nicest strips of the meat and hang one over each of my ears. Then when I wake up I will not even have to reach over for another meal, but will merely shake my head, swing one of my earrings in front of my face, and snap it up."

With this ideal of ease and satisfaction before him, Coyote made his arrangements. As he sat there in contented anticipation, looking drowsily across the creek, he saw the Bald Eagle sitting watching him on a dead tree. Always delighted to tease and taunt, Coyote called out to him: "Here, old Deep-set Eyes, come over here and eat this,"

and he held up a choice piece of venison. Of course he had no intention of giving away a single scrap of his treasure, and the Eagle, who knew the fellow from long ago, was well aware that he was only being made game of. He was exceedingly angry, but, like a wise man, said nothing. In fact he never stirred from his perch on the stump, but his mind was working intently. "Go to sleep, go to sleep," he kept muttering quietly towards Coyote, concentrating his thoughts intently on this event. Between the Eagle's magic wishing and Coyote's natural disposition under the circumstances, the trickster soon dozed off.

When he was sound asleep the Eagle silently flew down and carried away his meat. He even carefully took off Coyote's earrings. Having safely stowed away his prize in a tall tree, out of sight and reach of Coyote, he went back to his old perch. There he quietly sat, leisurely eating a fat piece of venison.

After a time Coyote awoke, and remembering his beautiful scheme, turned his head sidewise and snapped, but his jaws closed on empty air. He swung his head toward the other side and snapped again, but with no better result. "Well, what has happened now?" he thought in bitter disappointment. Looking up, he saw the Eagle chewing.

"That must be my meat," he said to himself, "and, after all, he must have taken it away from me." Somewhat crestfallen but still unabashed, he crossed the creek, and sitting down at the foot of the dead tree, called up to the Eagle: "Please throw me down some; let me have at least one piece." But revenge was as sweet to the Eagle as his venison, and he made no reply except leisurely to finish the piece he was engaged at—while Coyote watched him, tantalized — and then finished by throwing down at the disappointed waiter the empty pack basket in which Coyote had carried the load.

By this time Coyote was really hungry again, so he thought: "I

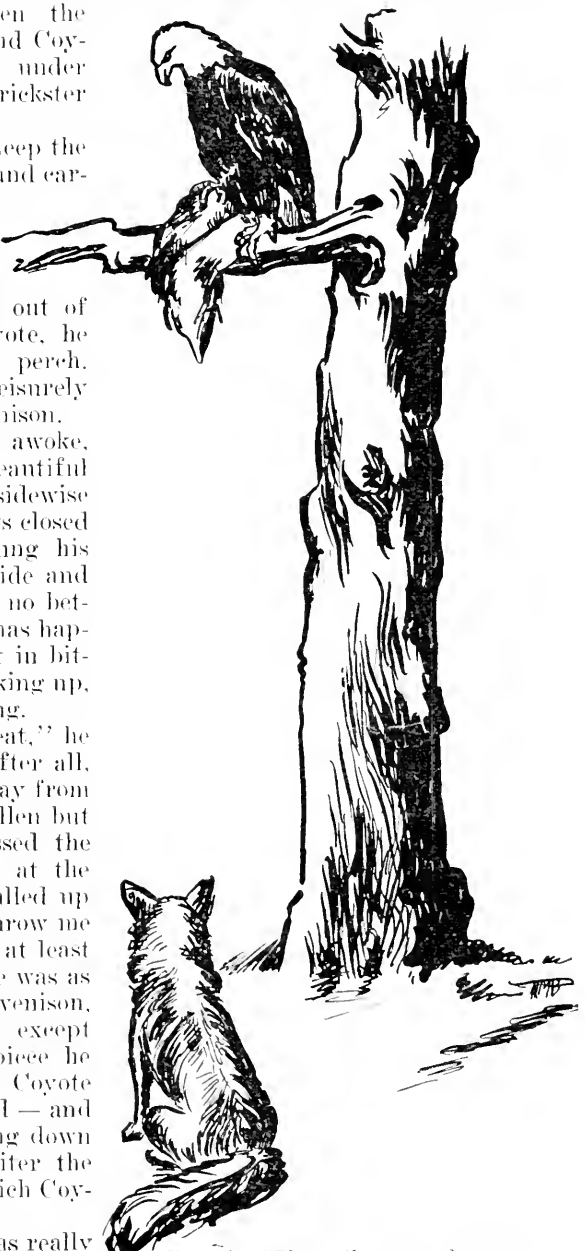


FIG. 12.—"Please throw me down some; let me have at least one piece."

will go back and visit the Catowl." He returned to the latter's house but it was empty. "Where can he have gone?" he thought. He looked around and finally saw him on a tree, also eating. Evidently the little fellow, knowing his companion's gluttony, had thought it best to get all his provisions out of the way. "Throw me some of it, I am hungry, too," Coyote shouted up to him. But the Catowl, ungratefully enough, considering the assistance he had received, pretended not to hear his friend and deigned only to continue his own meal. At last Coyote, exasperated, had resource to his own magical powers.

"Have it your own way now," he said, "but from this time on it will be different. You will no longer kill deer or eat venison. All you will do hereafter will be to catch lizards and mice." And so it was thenceforth, and that is why the Catowl of to-day no longer hunts deer.

Now, not long after, there was a powerful spirit living in the ancient village of Amaikyara. This little Indian town, although sadly deteriorated, is still invested with the odor of sanctity among the modern Indians, on account of the many important events believed to have taken place there in the period of long ago. The spirit who at that time had his abode in the sweat-house there, was a father to all the animals that are in the world, directing them and planning for them just as if he had himself created them. Now, he had lived in this sweat-house from time immemorial, but he knew that the human race was very nearly ready to come into existence. So he thought to himself: "What shall I do now that human beings have almost grown up? How shall I provide for this event before I go away?"

At last he decided that he would make bows and arrows for them to use, and that these would enable them to gain a subsistence. So with his magic power he manufactured bow after bow, a whole row filling one side of the house. Then he called all the hunting people of that time, who are now the hunting animals—the Dog, the Wolf, The Panther, the Wild Cat, the Eagle, the Hawk, the Chicken-hawk, the Owl, and last, and in some ways most insignificant, Coyote. The Bear, it will be noticed, was not included, and is not considered an animal of prey by the Indians.

"Come into my sweat-house, all of you," the spirit summoned them. And when they had entered, he said: "Now, as night comes on, go to sleep. As you awake in the morning, each of you can take a bow. The first one to awake will have first choice, and the last one to awake will have to take what is left. Whatever bow you receive will be yours forever to hunt with, and your powers for killing game will be proportionate to the quality of weapon you obtain in the morning."

Then one after the other stretched himself and dropped off to sleep. But Coyote was cogitating, trying to devise a way of beating all the others. "I believe I will not sleep at all; then I will surely be the first. Moreover, I will sit up instead of lying down, and will take my station by the door. Then if I should doze off and one of the others precede me, he will awake me as he goes out, and I will be at least second." So he did this, but before long his innate unmanliness and lack of character manifested themselves and he felt himself becoming drowsy. "I must keep awake at all hazards," he thought, so took two small sticks and with them propped up his eyelids, thinking that this would help him.

So the night wore on, the others all sleeping peacefully, and at last Coyote dropping off, too. So powerfully did sleep overmaster him that he pushed the little sticks clear through his eyelids without feeling them. The spirit, however, was superior to the animals and did not sleep at all. All night he sat watching and thinking: "Who will be the first to wake up and have the greatest power?"

At last, just before the first faint streak of dawn, one of the sleepers stirred. It was the Dog, man's best friend, as the sequel shows, who silently arose, picked out the finest of the bows, and stole out of the house. The next to awake was the Panther, who had second choice, and also left the house. Then followed the Wolf, the Wild Cat, the Eagle, the Chicken-hawk, the Hawk, and the Owl. Each of them took the bow which would give him the power for securing his food and went away.

At last, when the sun was high up, Coyote awoke from his slumbers. Quickly he snatched the sticks from his eyes and looked around; it was already broad day. Only one bow was left, and that a poor, worthless, little thing. There was nothing for him to do except to take this.

So he went off, but on account of the scant powers which his miserable weapon conferred, he could kill no large game. Whatever he tried he failed at. At last there was nothing left that he could hope to catch except gophers. So he sneaked to a flat, and with drooping ears, sat on his haunches near their holes, leaping upon them as they stuck out their noses, and now and then succeeded in killing one. When his catch was slim, he snapped up such grasshoppers as he could find. Coyote is still doing that to-day, and such, according to the Indians, is the contemptible ending of a career that, in spite of its resourcefulness, was marred by meanness of spirit.

The Dog had a very different career. His bow giving him the best powers, he was content not only with pursuing deer and game, but steadily chased the Wolf, the Panther, and the other animals of prey, trying to take away from them their bows and their powers. Wherever he went, he was on their trail, trying to overtake them, much to their annoyance.

At last he came back again to the sacred village of Amaikyara where he had won the prize. But things had changed. The old spirit had withdrawn to the other world across the ocean, people, real human beings, were living there now, and in amazement they watched the Dog come towards them. Singling out the head man, the Dog addressed him:

"Let us be companions; I will be your mate. From now on I shall no longer be able to speak; I shall no longer be like you; but I should like to go through the world with you. Take this bow from me, learn to use it, and you and I together will hunt. The Wolf has come to me and told me that he is no longer my friend. There is enmity between us, but friendship between you and me. The Wolf has threatened that whenever he can catch me in the mountains he will kill and devour me, but you and I will help each other like friends."

Then the man promptly accepted the gift which meant so much to him, and since that time human beings have shot the arrow and have had dogs to help them in chasing deer. So the relation between these two beings was established. But the Dog had one thing more to say. It was the last time he spoke. He said to the man:

"You prize this bow I have given you, and it is worth much to you for food; but there is another thing about it which you do not yet know, though you will learn it to your sorrow. For hunting, this weapon is excellent, but for other things it is not good. There will be times when it will kill me. There will be times when your descendants will be killed by it. One man will be killed by another. There will be fighting and war, and human beings will die. As long as the human race exists people will obtain their food with the bow, and also will die from its arrows in battle."

Thus this all-important Indian weapon was, according to Indian belief, invented and given, and until the introduction of firearms by the white man, the Dog's prediction of its value and its danger was fulfilled.

THE NEW ANGLER'S LICENSE.

By ERNEST SHAEFFLE, Executive Secretary, California Fish and Game Commission.

During the years 1911, 1912 and 1913 the Fish and Game Commission of this state produced at the hatcheries and distributed in the public waters of the state, where the public could fish for them at lawful seasons, about 35,000,000 trout. These figures are less impressive than the actual condition that has been brought about, which is that, with the constantly increasing population and better and better means of getting about, the state is having good fishing each season—fishing, in fact, that is improving in most regions. While it is impossible for any one to determine the degree of improvement over natural conditions brought about through artificial propagation, it seems to be true that the work of the hatcheries and the very general distribution of trout that has been made in this state during the last twenty years has placed fish in streams previously barren, and kept up and even increased the stock in other streams more favored by nature.

It is, of course, evident that such an extensive programme of hatching and distribution as has been carried on in the state, particularly during the last few years, must have cost a great deal of money. As a matter of fact, such work, with the attendant necessary scientific investigations and police patrol, has cost the state in the neighborhood of $60,000 a year, or a total of approximately $180,000 for the three year period just ending. For this great work the state has made no direct appropriations, although prior to 1911 the state appropriated each year amounts ranging from $30,000 downward. Since 1911 it seems to have been the idea that the hatcheries could be kept up and the increasing distribution made out of the proceeds of money paid by hunters for the privilege of hunting. In addition to the resources of the hunting license fund, there has been each year about $25,000 derived from the sale of market fishing licenses, and collected as fines imposed on lawbreaking commercial fishermen. These amounts were, of course, entirely inadequate and it has been necessary to borrow around $30,000 a year from the hunting license fund to carry on the fish work needed and demanded by the public.

This condition brought about the enactment at the 1913 legislature of a law imposing a tax upon those who fish for pleasure, who may be called either "sportsmen anglers" or simply "anglers," which is the older and perhaps better term. This law was first proposed several years ago, but not until the last legislature could the need for

it be shown so conclusively as to bring about its enactment. The law provides generally that all persons over eighteen years of age must obtain a prescribed license before fishing for game fishes, that the license must be displayed upon demand of any officer authorized to enforce the fish and game laws and, further, that it shall contain an agreement signed by the owner that any game fish in the owner's possession shall be exhibited to a deputy fish and game commissioner upon demand. The law also designates the species that shall be known as game fishes. They are the tuna, yellow-tail, jewfish or black sea bass, albacore, barracuda, bonita, rock bass, California whiting, also known as corbina, and the surf fish, yellowfin croaker, spotfin croaker, salmon, steelhead and other trout, charr, whitefish, striped bass and black bass. All of the fish not mentioned in this list may be taken by pleasure fishermen without licenses, although it is presumed that the average person will not be content with taking non-game fish, but that he will prefer at least to do some fishing during the year for the more desirable varieties.

The legislature, having due regard for the rights of the rising generation, has specifically provided that no person under eighteen, no matter of what sex or nationality, shall need an angler's license. This fact knocks in the head the statement that the angler's law is intended to restrict fishing and that it is a direct injustice to the boys.

The new licenses are handled in the same manner as the hunting licenses, with which procedure every one is now familiar. They may always be obtained at the offices of the county clerks and, in most counties, of deputy county clerks located in each town. In most of the large towns they will be found on sale in gun and hardware stores. They may also be had at the offices of the Fish and Game Commission in Sacramento, Los Angeles, San Francisco and Fresno, while people in out of the way districts will have every opportunity to obtain them from the deputy commissioners, usually known as "game wardens."

Incidentally, the first issue of the new license is regarded as being the most artistic license of the kind ever issued. It bears on the face a representation of a familiar fishing scene reproduced from a photograph, while on the back is given a synopsis of the laws relating to game fishes. This plan of giving an outline of the laws on the license seems to be new in the United States, but has been used in Germany for a great many years. It is not only convenient, but should guarantee that every person fishing will have with him at all times complete information in regard to the fishing laws.

Naturally enough, a question has arisen as to what need there is of this new license and as to what use is to be made of the revenues derived from its sale. In the brief outline at the beginning of this article it is shown that the propagation of fish has been paid for in large part since 1911 by the hunters and that without direct appropriation such a questionable course would need to be continued in future. It is clearly an injustice to expect the hunters to pay for work the results of which are enjoyed by the fishermen, a great many of whom never hunt. It would also seem that so long as a license scheme is followed in this state, those who fish, as well as those who hunt, should pay for the sport that appeals to them the most.

In this connection, a few figures concerning the hunting situation in California may be interesting. During the fiscal year ending June 30, 1913, 160,000 individual hunting licenses (in round numbers) were issued in this state. For the same period, as nearly as can be ascertained, the state of New York issued about the same number of hunting licenses, while Illinois sold around 185,000. No other state in the union came within fifteen or twenty thousand of the sale in California, from which it is evident that California is now either the second or third state in the union in its hunting class and this, in spite of the fact that both Illinois and New York, as well as a number of other Eastern and Middle West states have much greater populations. What is even more significant is the fact that in Great Britain with a population of over 45,000,000 there are now only about 68,000 licensed hunters, or less than one half the number in California. Comparison of British and Californian conditions would be interesting, but comparison is fruitless as the conditions have no similarity.

It is impossible to give an estimate of the number of fishermen in this state, but it is supposed that the number is at least equal to that of the hunters. If this estimate is correct, the state will have in 1914 close to 350,000 people, most of them of adult age, tramping through the woods and along the streams, and each one of them expecting to take home at night a mess of game or fish. Obviously, most of these people would be sorely disappointed if it were impossible to add to the natural supply of fish, or to so control the taking of game that no person should have more than his share. With the hatcheries the state now has and with those that can be built during the next few years, out of the proceeds of the sale of the angler's licenses, it will be possible to more than keep pace with the catch of fish, always provided, however, that we do not have too many dry years like 1912 and 1913. A dry year like 1912 destroys more fish than could be taken by twice the number of fishermen that we have in the state, besides affecting the streams themselves so that the proper natural conditions are not regained for several seasons.

A very necessary use to which the fishing and hunting license money must be put in this state is the patrol or policing of the streams and of the hunting grounds. With so many people, of so many nationalities hunting and fishing it is inevitable that a great number of infractions of the law will occur. While every effort is made to prevent such infractions by the dissemination of information in regard to the laws themselves and of the necessity that causes them to be placed on the statutes, certain people seem bound to fish during breeding seasons and to so ignore the rights of others as to load themselves up with more than the bag limit allowed one person. As there seems to be no other way to deal with these people they are arrested by the game wardens and turned over to the courts, in somewhat lessening numbers, however. As an example, the arrests made in the *biennial* term ending ending June 30, 1912, totaled 2,063, while the arrests for the *calendar year* 1912 were 1,235, which indicated a considerable increase. For the fiscal year ending June 30, 1913, however, the cases have dropped back to 1,085 which, assuming that the game wardens have been as vigilant as in the past, seems to show

that the laws are being more closely observed. It may also be stated in passing that the California game wardens make more arrests each year than are made in any other state, with the exception of New York, which has over 50 more wardens than California, three times the population, with less than one third the area.

THE CATFISH IN CALIFORNIA.

By George Neale.

The introduction of catfish into California can be considered one of the great achievements of the California Fish and Game Commission and of more importance from an economic and commercial point of view, perhaps, than the introduction of the striped bass.

The bullhead or horned pout (*Amciurus nebulosus*), known here in California as the yellow or mud cat, and the blue catfish (*Amciurus natalis*), were introduced into our waters in the year 1874. One

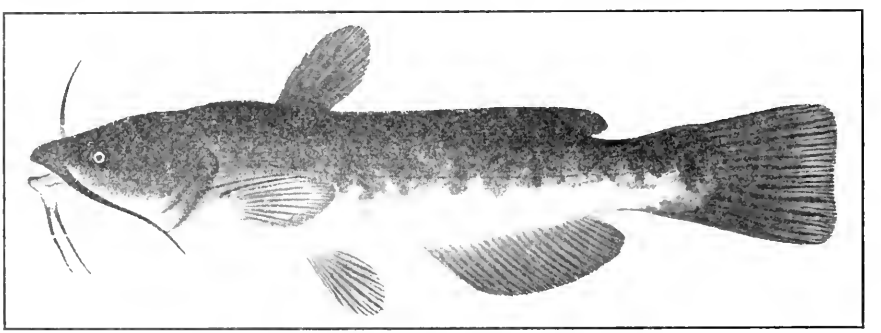


Fig. 11.—Common bullhead (*Amciurus nebulosus*).

hundred and forty-four were obtained from the Schuylkill River, Pennsylvania, and later others were received from the Missouri River. All of these were planted in the San Joaquin River near Lathrop, San Joaquin County.

The catfish at once became acclimated to our waters, as have nearly all other introduced fishes. They increased to remarkable numbers. The flood waters of the Sacramento and San Joaquin delta have distributed these fish to such a degree that there is no body of water in either the Sacramento or San Joaquin Valley, stream, creek, slough, lake, or lagoon that does not contain these fish in some quantities. They inhabit waters turbulent or placid, muddy or clear; and a temperature of 75 degrees which proves deadly to other species, except perhaps the carp, is quite congenial to them. The catfish is perhaps the only fish that is immune from the muddy flavor noticed in fish of other warm waters. Left to themselves catfish have become distributed from brackish salt water near the coast to the upper Sacramento, near Red Bluff, and specimens have been taken far above this point. They have been successfully transplanted to every portion of the state, from the Mexican line to Oregon.

The time and place of spawning depends upon conditions, climatic and otherwise, as is the case with all other spawning fishes. The spawning season at low altitude is generally from April 1 to

July 31. A female of the blue variety, of over two years of age, or about 9½ or 10 inches in length, will spawn about 250 eggs, increasing to about 2,500 for a five-pound female. The time of incubation is short, taking but a few days from the egg to the tadpole-looking embryo. Catfish have a very high or perfect percentage of fertilization. The spawning bed is usually selected in still, muddy water where the young can feed on small water larvæ, etc. On investigation I have found mosquitoes in the embryo stage in large quantities in the stomachs of the young fish.

Catfish are migratory in the sense that they invariably travel from their natural abode up stream to spawn at the first rise of the rivers in the spring. These migrations take them to the unreclaimed and overflowed lands in the Sacramento and San Joaquin region, which at that time become huge natural spawning beds and hatcheries.

The catfish can live anywhere, so long as it has sufficient water to cover it and an available food supply. This fish will eat almost anything, from a mutton chop, bone and all, which I once found in one, to a minnow, dead or alive. Catfish are highly predatory, inasmuch as they will eat the spawn of any other fish. Fortunately, our other good food and game fishes do not spawn on their pastures. Otherwise they would prove disastrous to the spawn of other fish.

The importance of the catfish as a food supply is unquestionable. The quality of its flesh and its fine shipping properties have probably been the means of its near extermination. There is no fish much superior for the table. The only thing that can be charged against the catfish is its appearance.

In the year 1900 these fish were no doubt at their maximum numbers. During 1900 the shipments of dressed catfish from Sacramento alone were enormous. Shipments were even made to the native home of the catfish, Missouri and Mississippi River points. They supplied the markets of Chicago, Salt Lake, Denver, Portland, and other middle and eastern points.

In the year 1905 there were shipped by two firms alone from Sacramento, 730,771 pounds of dressed catfish, representing about two thirds of their net weight. These statistics were gathered by Mr. Wilcox of the Bureau of Fisheries, Washington, D. C., and the writer. Since that year there has been a steady decline in shipments until now very few, if any, are exported from California.

It was a common occurrence ten years ago for a person to catch a hundred fish in a day's angling, whereas today it is a rarety to catch sufficient for a meal, and even then they are too small to clean.

The only method of catching these fish is by the fyke or ring net, which is a set net, the small mesh seine, or with hook and line. So we must look to one or more of these methods for correction. The fyke net is the most deadly net in use today, and, fortunately, its use is permitted only in the San Joaquin River and tributaries. This net is set near the bank of the river or slough, and sometimes entirely fills the slough with its width. Its mouth is always open, day and night. It fishes while the owner is asleep. That which enters never escapes. In years of experience I have seen every fish in our river in its maw—salmon, steelhead, striped and black bass, perch, and all other varieties. I have seen it catch everything from a

coon and mink to a turtle. Its use should be prohibited here as it is in nearly all other states.

Until the year 1909 no restrictions were placed on the capture of catfish. They could be caught in any manner, in any quantity, in any net, with any size mesh, and in any and all seasons. With no restrictions and the great demand from all over the United States for them it is no wonder our waters are depleted.

In the year 1909 a law was passed protecting these fish, making it unlawful to sell fish of less than eight inches dressed, exclusive of head. Two years later, having taken nearly all of the eight-inch fish, a powerful lobby of the fish trust succeeded in passing a law reducing the sale limit to seven inches, which is the present law, with a close season of two months. Now, as a catfish of seven inches dressed, or eight and a quarter inches alive, has not yet spawned or reproduced itself, what can be the logical result? Extermination is the only answer.

CALIFORNIA FISH AND GAME

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Sent free to citizens of the State of California. Offered in exchange for ornithological, mammalogical, and similar periodicals.

All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, California.

January 30, 1915.

"The effectiveness of game protection is governed by the interest of the people and the spirit of those who hunt and fish."—*W. L. Finley.*

A GOOD START.

WE are glad to be appreciated. Words of commendation and encouragement continue to pour in from many who have seen the first number of "California Fish and Game." Mr. Henry Chase has again proved himself our staunch friend by publishing an article in "Forest and Stream" in which he speaks of our quarterly as "a veritable mine of accurate information, data, scientific facts, and interesting reading." This is exactly what we wish "California Fish and Game" to be. We hope that as time goes on we will come nearer and nearer this ideal.

May we again ask the hearty support of every one in the state who is interested in that great resource—California's wild life? Help us in our endeavor to really *conserve* this valuable resource.

THE NON-SALE OF GAME.

Our friends, who took an active interest in the endeavor to pass a non-sale law at the general election on November 3, will wish to hear a word regarding the defeat of the measure. The following is a summary of the vote obtained from the Secretary of State:

58 counties:

No	361,446
Yes	353,285
Majority	8,161
Total vote cast	714,731

Southern California went two to one in favor of the measure. In the northern part of the state the following counties only returned a majority in favor of the bill: Humboldt, Santa Clara, Calaveras, El Dorado, Lassen, Nevada, Fresno, Kern and Tulare. Alameda and San Francisco counties polled a very strong vote against the non-sale. All in all, the majority against the measure was surprisingly small. Any one of the opposing factors might have been instrumental in bringing about this small majority.

California is not the first state to turn down a good law, nor will this be the last good measure to be defeated. At this time we have no qualms of conscience, however, for we feel that we took the right side of the question and did our utmost to bring about a favorable vote.

The report of Mr. W. P. Taylor, Secretary of the California Associated Societies for the Conservation of Wild Life, shows that about $3,700 was wisely spent in a well-conducted campaign to bring about the passage of the non-sale law. It is estimated that this organization brought campaign matter to the attention of at least one million citizens of the state; that over one hundred lectures were given and about ten thousand personally signed letters were sent out. Similar work to that carried on by the California Associated Societies for the Conservation of Wild Life, was taken over by the Wild Life Protective League of America in southern California. Just as effective work was doubtless carried on by this organization in the south. When we can point to the work of these two organizations alone, we feel as though conservationists have worked hard to uphold the most needed step affecting game here in California. Mr. F. M. Newbert, President of the California Fish and Game Commission, interested himself personally in the campaign and was instrumental, with the help of his friends, in having published a beautifully illustrated booklet entitled "Your Fish and Game." Credit is also due many others who gave of their time and money to help make the campaign a success.

We attribute the failure of this measure to the following three things:

1. The unfortunate wording of the bill, allowing many voters to vote against

the bill when they believed that they were voting against the sale of game.

2. The misapprehension of many who thought that the measure favored gun clubs.

3. The vindictive attitude of several prominent newspapers in the state.

The cleverest move of our opponents was to try and shift the responsibility for this bill on the gun club, making it thus appear that the bill would favor the private gun preserves. Owing to the general feeling toward gun clubs, many voters were deluded enough to vote against the measure. As a matter of fact, the bill was first drafted and supported by men who were not members of gun clubs and who were not even hunters, but men who were interested in preserving the wild life of the state as a natural resource.

We are glad to report that only 14 newspapers, with a combined circulation of 214,442 persons, opposed the non-sale of game; whereas, 170, with a combined circulation of 617,416, favored the bill.

Soon after the election, the "Sacramento Bee," published an editorial to the effect that those who backed the non-sale bill, having been defeated by a fair vote of the people, should let the matter drop and cease to make a further attempt to pass similar legislation. We hardly agree that this has been a fair vote of the people, and we certainly do not believe that game conservationists should now cease to attempt legislation which will be instrumental in saving California's wild life.

Every one must agree, no matter how he may have voted, that the non-sale campaign just closed was a campaign of education and that it will have a lasting effect on future game legislation.

GAME RESOURCES VIVIDLY PORTRAYED BY MOVING PICTURES.

Some remarkable moving pictures depicting the wild life of the west are now being shown throughout the state. Mr. Edward A. Salisbury, director of the Educational Film Company of Los Angeles, has spent almost two years and many thousands of dollars in obtaining moving pictures of birds and animals in their own homes. The pictures were taken in the Klamath Lake region of northern California and southern Oregon. In each instance the attempt was made to obtain photographs of animals so as to show their whole life from birth to maturity. Great patience had to be displayed in procuring the pictures. Blinds were built in which the operators waited hour after hour with muffled camera. In all, about thirty thousand feet of film was taken. Only seven thousand feet of that is being shown. The rest of it is to be used in educational and scientific work.

The seven reels being shown are as follows:

1. Life history of steelhead trout—Part I. Fish in trap; artificial spawning of female; eggs hatching; trout fry; distribution.

2. Life history of steelhead trout—Part II. Typical fishing scenes; nesting mallard duck, Virginia rail, Wilson snipe, and mudhen.

3. Treeing and roping wildcats and mountain lions.

4. Farallone cormorants, great blue herons, and white pelicans on their nesting grounds.

5. Birds and animals of prey—Nestling bald eagles and turkey buzzards; porcupine and skunks.

6. Quail and pheasant hunt, showing typical hunting scenes.

7. Hunting geese for the San Francisco market.

Not only are these pictures of interest to the hunter and fisherman, but they vividly portray wild life to the nature lover. The last reel, showing hunting geese for the market, shows the type of slaughter which has too long gone on in this state, and brings convincing evidence of the necessity for better conservation.

That these pictures are really preaching conservation is evident from the following quotation taken from an editorial in the Fresno Herald:

"Since it now appears that the state has overlooked the importance of Amendment No. 18, prohibiting the sale of game with the exception of wild geese, under certain conditions, the appeal of the Salisbury films becomes all the more insistent. As his pictures teach, such wild waterfowl, now considered delicacies upon California tables, will become as extinct in this state, if the indiscriminate

and ruthless killing goes on each year, as the passenger pigeon, common at one time in all sections of the United States and hunted by the million because of its epicurean flavor when served up baked to a delicious brown. Conservation of bird and game life is no less an issue in California to-day than conservation of human energies and resources. The man who says, 'Why not kill 'em? Plenty of ducks and quail, aren't there?' is simply stupidly ignorant of the hazard and risk that surround every duck and quail egg. He knows nothing of the chance against every duckling and young bird ever reaching maturity and the great overwhelming odds against its ever reaching the mating or the nesting stage and reproducing its species, as long as men with pump guns dig pits for themselves."

LAST PASSENGER PIGEON DIES.

The last surviving passenger pigeon died at the Cincinnati Zoological Garden on September 1, 1914. This particular bird was a female and was hatched in captivity twenty-two years ago. The specimen has for many years been the only living bird to represent the millions of these birds that formerly existed in the eastern and middle states. A standing reward of a large sum of money for the past five years has failed to bring forth any clue as to the existence of any living passenger pigeon.

The immense numbers of passenger pigeons which at one time existed in the eastern United States was one of the greatest zoological wonders in the world. Alexander Wilson, one of the pioneers of American ornithology, tells of a breeding place of these pigeons in Shelbyville, Kentucky, which was several miles in breadth and was said to be more than forty miles in extent. Over one hundred nests were to be found in a single tree, and the ground was strewn with broken limbs of trees, eggs and dead squabs. In speaking of a flight of these birds he says that during one afternoon he estimated that the continuous flock overhead contained at least 2,230,272,000 pigeons.

After there became a market demand for these birds, market hunters destroyed them by the thousands and carloads were shipped to the market in New York and other large cities. "At the great nesting places both Indians and white men felled the trees in such a way that the larger trees in falling broke down the smaller ones and threw the helpless squabs to the ground. The squabs were gathered, their heads pulled off, their bodies thrown into sacks, and large droves of hogs were turned in to fatten on those which could not be used." From ten to thirty dozen were often caught at one time in a bird net.

By 1878 the birds were greatly reduced in numbers and the last great slaughter for the market occurred in Michigan during this year. It has been estimated that three hundred tons of birds were sent to the market in 1878. Birds were still to be seen on the market in Chicago as late as 1886, and small flocks were seen in 1895. But later than 1906 we have no record.

It is no wonder, therefore, that the death of a single bird should have caused so much interest the world over. The bird itself was presented to the National Museum, where it will be useful in teaching a lesson to coming generations. The death of this pigeon typifies the complete extermination of a valuable resource of our country. It should forever teach us that our wild life is ours only in trust and that we owe much to succeeding generations. Our own wild pigeon, the band-tailed pigeon, with much the same habits as the passenger pigeon, received no protection until the Federal Migratory Bird Law was passed. We trust that this needed protection has not come too late to save this valuable species as a member of our fauna.

HOW THE MIGRATORY BIRD LAW WORKS.

The Assistant Chief of the United States Biological Survey recently reported to us that the Weeks-McLean Migratory Bird Law has already proved its worth, in spite of the very inadequate appropriation for its enforcement. In many places in the east and middle west more ducks have nested the past year than have been seen in those particular localities for ten or fifteen years. The elimination of spring shooting in many places has produced remarkable results. It is also

reported that certain birds like the wood duck, which were absolutely protected for a term of years by the new law, have increased wonderfully even in the short time during which the law has been in operation.

The enforcement of the Migratory Bird Law has brought about results which are far beyond even the most sanguine hopes of the supporters of the measure. It is needless to say that conservationists everywhere are delighted with this demonstration of a law which was said to be impracticable.

MARKET DUCKS IN SAN FRANCISCO AND OAKLAND.

Not nearly so many ducks were received at San Francisco and Oakland on the first day of the season this year as were received last year. The following table shows the distribution by species of those received at San Francisco. The larger part of these ducks went to the market.

Number of Ducks Received at San Francisco and Oakland, October 15, 1914.

San Francisco:	
Mallard	242
Gadwall (gray)	66
Widgeon	20
Pintail (sprig)	716
Teal	353
Spoonbill	16
Scaup Duck (Bluebill)	1
Redhead	2
Canvasback	--
Total—San Francisco	1,416
Oakland	438
Total	1,854

A total of 438 ducks were received at Oakland, making the total number of ducks received at San Francisco and Oakland, 1,851. About 500 more were received in private bags.

As can be seen from the following comparison, more ducks came to the San Francisco market during November of this year:

	October	November
1913	19,380	20,918
1914	12,611	28,425

It has been estimated that about 1,000 ducks are taken from the Alvarado marshes each week end. On December 6th at least 1,125 birds were obtained in this district.

The latest move of the market hunter in his endeavor to get his ducks to market is to ship them to a fictitious address. By some arrangement the limit of ducks is delivered to the correct place, no matter what the address is. Even though the former game transfer companies have been put out of business, the Fish and Game Commission still has problems to solve as to the manner in which the violator can be caught.

26,000 MILES OF RUNNING STREAMS IN CALIFORNIA.

It has been estimated that if all of the water in the streams and lakes of California were to be confined in a stream sixty feet wide and thirty feet deep, that the stream would reach around the world twenty times. In other words, the stream would be over 500,000 miles long. There are 24,000 miles of running streams in this state in which fish can live. Does it seem reasonable, therefore, to believe that a force of seventy-two deputies is sufficient to properly patrol our streams alone, without taking into consideration our game covers at all.

NEWSPAPER PUBLICITY.

The San Francisco "Call" has kindly offered to assist in bringing to the citizens of the state reliable information regarding game. During the coming months Dr. H. C. Bryant, in charge of the Bureau of Education and Publicity of the California Fish and Game Commission, will supply a series of articles dealing with the game fish, birds, and mammals of California. The first article which describes the distribution, habits and status of the California valley quail, was printed in the "Call and Post" under date of November 25th. Other articles will appear from time to time.

RECOMMEND CHANGES IN GAME LAWS.

The California State Fish, Game, and Forest Protective League met recently at Santa Cruz. President Charles A. Redding of San Rafael presided. The meeting was given over to a discussion of needed changes in the fish and game laws. The following were some of the recommendations made:

That the bag limit for ducks be reduced from 25 to 15 a day.

That the shooting season for ducks be reduced to conform with the federal law.

That the bag limit for quail be reduced from 140 birds a week to 30, and from 20 birds a day to 15, and that the season be reduced from four months to two months.

That the deer season be reduced to six weeks. That the open season in the Coast Range extend from August 1st to September 15th, and in the Sierra Nevada Range from September 15th to November 1st.

That the bag limit for deer be changed from two to one; that spike bucks or younger fawns be protected, and that the running of deer with dogs be prohibited in close season.

That fifty acres of land at Cypress Point on the Seventeen Mile Drive near Monterey be set aside as a national reserve.

"THE GOOD OLD DAYS."

As far as abundance of game is concerned, we can certainly point to "the good old days" as being better than the present. We recently saw a letter which made the statement that in the season (September 15–March 15), 1882–1883, two men, shooting for the market six days each week, killed 27,000 ducks. This record shoot took place in the Sacramento Valley. Every one conversant with the conditions at the present time will willingly concede that no such shoot as this is possible anywhere in the state at the present time. The writer of the letter, himself one of the hunters, is now a game conservationist and is very much opposed to even the smaller slaughter of game by market hunters at the present time.

We wish that we were able to place in front of our readers exact figures as to former kills and those possible at the present time. We believe that such figures would be convincing proof of the immediate need for the better protection of our game birds and mammals.

THE ALIEN HUNTER.

It is a well known fact that the alien hunter violates fish and game laws much more often than any one else. The alien has long been the most important problem which the Fish and Game Commission has faced. The following note regarding a Supreme Court decision on the Pennsylvania law prohibiting aliens from possessing firearms is therefore of interest. The note appeared in "Current Items of Interest," July 22, 1914:

"The Pennsylvania law prohibiting aliens from possessing guns, which, since its passage in 1909, has been sustained by the various state courts, was upheld as a constitutional measure by the United States Supreme Court on January 19, 1914. The law was designed to check the great destruction of birds by low-grade immigrants."

A CORRECTION.

Owing to the short time allowed for the publication of the first number of "California Fish and Game," a number of errors crept in. One of the worst ones is to be found on page 9, in Mr. Holder's article on "Attempts to Protect the Sea Fisheries of Southern California," where the statement is made that the group of islands of which Santa Catalina Island is one, are "one hundred thirty miles" off Los Angeles County. In justice to Mr. Holder it should be stated that this phrase should belong with the Santa Barbara Islands, as most people are well aware that Santa Catalina is nowhere near this distance off Los Angeles County.

HATCHERY AND FISHERY NOTES.

SUPERINTENDENT'S REPORT OF FISH DISTRIBUTION.

SISSON, CALIFORNIA,
October 27, 1914.

HON. BOARD OF FISH AND GAME COMMISSIONERS, *State of California.*

GENTLEMEN: I respectfully submit herewith a brief report of the operations of the Department of Hatcheries.

The distribution of trout from Sisson hatchery is rapidly nearing completion. The season has been remarkably successful. The fry were all in excellent condition, and we have received many compliments from applicants who received allotments of fish this season. Following is a brief statement showing the number of fish reared and distributed by the differ-

ent hatcheries and stations operated during the season of 1914:

Sisson Hatchery.		
Loch Leven trout	1,674,000	
Eastern brook trout	1,053,000	
Rainbow trout	1,057,000	
Steelhead trout	2,250,000	
Black spotted trout	1,780,000	
Large lake trout	18,000	
		7,832,000
Quinnat salmon	21,294,000	
Silver salmon	95,000	
		21,389,000
Total		29,221,000

Tahoe Hatcheries		
Black spotted trout	2,882,000	
Large lake trout	95,000	
		2,977,000
Price Creek Hatchery.		
Steelhead trout	406,000	
Quinnat salmon	3,948,000	
		4,354,000
Ukiah Hatchery		
Steelhead trout		550,000
Wawona Hatchery.		
Black spotted trout	200,000	
Large lake trout	22,000	
		222,000
Total trout distributed		11,987,000
Total salmon distributed		25,337,000
Total		37,325,000

Screen and Ladder Investigation.

To date there have been 130 surveys for fish ladders made. Sixty legal notices have been served and blue prints for ladders furnished the owners of dams. We have received reports that 59 ladders have been installed and dams and falls removed.

Five hundred and twenty-three surveys have been made for screens to be installed in canals and ditches diverting water from the streams of the state. Four hundred forty-one legal notices have been served on the owners of canals and ditches, and we have received reports that two hundred fifty-six screens have been installed.

The number of screens installed and ladders constructed, above given, does not represent the number actually in, as we have been unable to obtain exact reports from every district. I have given only the number that have been actually reported as being completed.

Respectfully yours,

W. H. SHEBLEY,

Superintendent of Hatcheries.

FIG. 15.—Members attending meeting of Pacific Fisheries Society held at Seattle, June 10–12, 1914.

THE PACIFIC FISHERIES SOCIETY.

On June 10, 1914, a number of prominent men interested in fish and fisheries met at the University of Washington, Seattle, to form a new organization—the Pacific Fisheries Society. Mr. Carl Westerfeld, member of the California Fish and Game Commission, was elected president. Mr. Henry O'Malley and Professor Trevor Kincaid, vice-presidents, John N. Cobb, secretary, and Russel Palmer, treasurer. The following compose the executive committee: Dr. B. W.

Evermann, Director California Academy of Sciences, San Francisco, Cal.; C. McLean Fraser, Director Biological Laboratory, Nanaimo, British Columbia; Dr. Charles Frederick Holder, Pasadena, California; Leslie H. Darwin, Washington Fish and Game Commissioner, Seattle, Wash.; M. J. Kinney, member of Oregon Fish and Game Commission, Portland, Oregon; Ward T. Bower, Pacific Coast Agent U. S. Bureau of Fisheries, Seattle, Wash., and M. D. Baldwin, Esq., member Montana Fish and Game Commission, Kalispell, Montana.

Dr. Hugh M. Smith, United States Commissioner of Fisheries, was present and read an interesting paper on "The Pacific Policy of the Bureau of Fisheries." Mr. John N. Cobb, editor of the Pacific Fisherman, contributed a most interesting article on "Neglected Pacific Fishery Resources." A number of other important papers were read. Those present were entertained by trips to the nearby hatcheries and by an expedition on Puget Sound on board the U. S. Fisheries steamer "Albatross." On the latter trip the different sorts of scientific apparatus carried by this steamer were exhibited and explained.

The object of the Pacific Fisheries Society is to bring together each year those particularly interested in fish and fishing on the Pacific Coast. It is hoped that this organization will become on the Pacific Coast what the American Fisheries Society is on the Atlantic Coast. The next annual meeting will be held in San Francisco, probably at the same time as the meeting of affiliated scientific societies.

FIG. 16.—Dead and dying ducks at Tulare Lake, September 21, 1913. Sick birds remained in a paralytic state for several days before death occurred. Photograph by F. C. Clarke.

A PERMANENT RECORD OF FISH PLANTING.

There is now being prepared at the Sacramento office of the California Fish and Game Commission an exhaustive record of fish planting in California. A survey has been made of all of the water sheds of the state and maps show where there are waterfalls, rapids, etc., and where fish ladders and screens have been placed. The exact amount of water in each stream and those which go dry in summer are indicated. Accompanying data shows exactly where the different kinds of fish have been planted and the success obtained. Consequently the Commission will be better able to know exactly where fish planting will be most successful. Mr. Charles L. Gilmore, Engineer of the Commission, is compiling the

work under the supervision of Mr. Frank M. Newbert, president of the California Fish and Game Commission.

TUNA DISAPPEAR.

Much disappointment has resulted in southern California cannery circles on account of the sudden halt, about September 18th, in the catch of tuna or albacore. At that time the fish, which had previously been running in large schools for more than two months, disappeared, and have not been seen since. Whether they have gone north or off shore, or escaped to the waters of the coast of Lower California remains a mystery. Several experts from the United States Bureau of Fisheries have been on the ground nearly all summer for the express purpose of solving this problem, and they are said to be as much at sea on the question as the amateurs. In the mean time the packers are hoping that the theory that the fish have gone up the coast and that they will pay the local waters a call on the way back, is true.

The season, while it lasted, was exceptionally good, some two-man boats bringing in as high as ten tons in two days. The white men made a better showing this season than the Japanese, which is rather surprising and unusual, as it was the Japanese who first taught the whites how to catch the tuna in commercial quantities. PACIFIC FISHERMAN, October, 1914.

FISH LIVE TWO MONTHS IN ICE.

The "Pacific Fisherman" reports that a Swiss scientist has succeeded in keeping fish alive which were frozen in ice for two months. Success was attributed to the fact that small pieces of ice were placed in the water before it was slowly frozen, and to the fact that the ice was thawed very slowly. This suggests a means of transporting live fish. Whether such a method would prove practicable is still to be ascertained.

FIG. 17.—Fish ladder over Clough Dam on Los Molinos River, Shasta County, California. Similar fish ladders have been placed over practically all the important dams in the state, thus giving fish access to the headwaters of the streams.

SALMON STORED IN ICE.

Last year tons of salmon were stored in ice. This was so successful that this year many more tons were thus preserved to await a better price after the season had closed.

NEW RULING RELATIVE TO FISHING IN NAVIGABLE WATERS.

WAR DEPARTMENT,
WASHINGTON, October 28, 1914.

To whom it may concern:

The attention of those engaged and of all others who propose to engage in fishing

in the navigable waters of the United States, in or tributary to San Francisco Bay, in the State of California, is called to the following provisions of section 10 of the River and Harbor Act of March 3, 1899, as follows:

That the creation of any obstruction not affirmatively authorized by Congress to the navigable capacity of any of the waters of the United States is hereby prohibited: * * * and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or inclosure within the limits of any breakwater, or of the channel of any navigable water of the United States unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning the same.

All persons are hereby notified that the use of nets floating or drifting with the tide or current for the purpose of catching fish in the waters of San Francisco Bay, San Pablo Bay, Carquinez Strait, Suisun Bay and the Sacramento and San Joaquin rivers and all navigable tributaries of the aforesaid waters, is considered an unreasonable obstruction to navigation, excepting as hereinafter specified, and that fishing with nets is prohibited in the following fairways which are reserved for navigation:

The fairway of the ferry boats between Vallejo Junction and Vallejo; Benicia and Port Costa; Benicia and Martinez; Mallard Slough and Chipp's Island.

Approaches to wharves and docks and steamboat landings.

Steamboat channel from McNear's Point to Beacon No. 1, and dredged channel from Beacon No. 1 to Beacon No. 6, at mouth of Petaluma Creek.

From Point Pinole to Oleum Wharf between the buoys on the north side of the dredged channel and the 18-foot contour on the south side of the bay.

Mare Island Strait.

From Oleum Wharf to Port Costa, 1,000 feet out from the face of the docks and wharves.

Between Port Costa, Army Point and Suisun Point, except east of the Nevada Dock to Steamboat Wharf at Martinez, south of ferry course.

Between Suisun Point and New York Slough, from the left bank to the center of the deep water channel.

The use of nets in those waters elsewhere than in the above described fairways, for the purpose of catching fish, is considered permissible under certain conditions and restrictions, and, until further notice, the Secretary of War will interpose no objection to such use, so far as the interests of navigation are concerned, provided the following conditions are observed:

(*a*) That all nets, floating or drifting with the tide or current, laid out in the above named waters be laid from the bank towards the channel; that all nets in the same vicinity when laid out from the same bank shall not cover more than one half the width of the channel; that nets laid out from both banks must not overlap in any case; and that where the channel is so narrow that more than one half its width is required for the passage of vessels, nets shall be picked up and removed in time to permit the passage of an approaching vessel without hindrance or delay.

(*b*) That the shore end of every net shall have attached to it a float, painted white, and large enough to carry, in an upright position, three feet above the surface of the water, a white flag 18 inches by 24 inches by day, and a white light by night, visible all around the horizon.

(*c*) That a fishing boat with one or more men in it shall always be in attendance while the net is in use and shall always be at the channel end of the net.

(*d*) That a license shall be obtained for the use of the net as required by the laws of the State of California, and that every person using or operating a gill or floating net in any of the above named navigable waters of the United States shall cause to be placed upon the corks of each end of such net and upon the cork nearest the center thereof, the number of his state fishing license for the current year, said number to consist of figures not less than one inch in height, and shall also cause to be placed and maintained on each side of the bow of the boat used to operate such net, the same number, said number to consist of figures not less than nine inches high and five inches wide with strokes one and one quarter inches wide and spaced two and one half inches apart and to consist of white figures on black ground or black figures on white ground.

Failure to mark boats and corks with the license number as above prescribed will be considered a violation of these regulations.

(*e*) That when the net is laid from the right bank, which will be considered the right-hand bank going down stream, towards the channel, the fishing boat shall carry a permanent black flag by day and when the net is laid from the left bank the fishing boat shall carry a permanent red flag by day; the size of such flags shall be 18 inches by 24 inches or larger, and they shall be carried not less than four feet above the gunwale of the boat. This arrangement of colors conforms to that for buoys marking channels and navigators will govern themselves accordingly, namely, red flags to be left on the starboard hand and black flags on the port hand by vessels going up stream.

(*f*) That lights shall be displayed as prescribed by law. (See Act of Congress approved June 7, 1897, entitled "An act to adopt regulations for preventing collisions upon certain harbors, rivers and inland waters of the United States)." When the net is laid from the right bank towards

the channel the fishing boat shall show a red light to vessels coming up stream and a green light to vessels coming down stream. When the net is laid from the left bank towards the channel the fishing boat shall show a green light to vessels coming up stream and a red light to vessels coming down stream. On being approached by or approaching another vessel such lights shall be exhibited in sufficient time to prevent collision. This arrangement conforms to the rules for the running lights of vessels under the supposition that the fishing boat is heading towards the net and will require a clear way in that direction. Navigators governing themselves accordingly and following the usual rules for avoiding collisions will avoid the net.

(*g*) That when fog occurs, signals shall be given from the fishing boats as prescribed by law. (See Act of Congress approved June 7, 1897, referred to above, Art. 15, Secs. 2 (*d*) and 2 (*f*). To show its position or location four short blasts of a fish horn shall be given at intervals from the fishing boat until the approaching vessel is in sight, when signals shall also be given from the fishing boat by a flag or light indicating on which side the vessel should pass.

HENRY BRECKINRIDGE,
Acting Secretary of War.

CONSERVATION IN OTHER STATES.

THE ANNUAL MEETING OF THE NATIONAL ASSOCIATION OF GAME COMMISSIONERS.

The annual meeting of the National Association of Game Commissioners was held at the National Museum, Washington, D. C., on October 2–3, 1914. Members from seventeen states and representatives from four associations and bureaus were present. Mr. W. L. Finley, of the Oregon Commission, was the only member present from the Pacific Coast. A number of interesting papers and addresses were given. At the close of the meeting the following resolutions were adopted:

WHEREAS, It has been conclusively determined that many species of birds are subject to various diseases due to the presence of specific germs and animal parasites, and

WHEREAS, Experience has demonstrated that shipments of international, interstate and even of lesser distances have resulted in serious extension of disease, either directly from the birds, or indirectly through infection of ground or water supply, be it

Resolved, That this association urge upon individuals and sportsmen's clubs intelligent consideration of the dangers which may attend every shipment of birds, notably quail and ducks, and particularly do we urge upon the state and federal governments a complete, strict and effective quarantine of all importations of live birds.

Resolved, That the governor of each state be and he is hereby requested to appoint ten delegates to each annual convention of game commissioners. Such delegates shall take part in the meeting but shall have no vote.

Resolved, That the incoming president when elected be and he is hereby directed to raise certain general committees, and special committees, by groups of states, and commit to them the problems of Game Conservation for solution and report at the next annual meeting.

Resolved, That we are impressed with the benefit that may come to the cause of game and wild bird protection through the help of the three hundred thousand Boy Scouts of America, and recommend that wherever that may be possible, the Boy Scouts be enlisted in the great work, and we thank them for work already done in this direction.

WHEREAS, Extended experience has proved that fish, mollusks, and other aquatic animals are amenable to artificial propagation, and that the per acre yield of food from the waters and from the land under water can be enormously increased by methods essentially identical with those so successfully employed in agriculture, and

WHEREAS, The constantly increasing demand for food can be permanently met not merely by discovery and destructive exploitation of new fishing grounds, but that this demand for food can only be met permanently and economically by increased production after the methods and practices of agricultural science, and

WHEREAS, The future continuance and necessary extension of our fisheries, will require the development of methods of increasing production, and

WHEREAS, Production must underlie commerce in fisheries products, be it

Resolved, That this association is of the opinion that the work of the Bureau of Fisheries is and properly should be closely allied with problems of production as well as distribution of aquatic food products, and that the activities are and should be more closely allied with the type of activities carried on by the Department of Agriculture; therefore, be it further

Resolved, That this association appoint a committee to confer with the Secretary of Commerce and Labor, and the Secretary of Agriculture and the Commissioner of Fisheries with power to represent this society in considering the problem involved.

ORGANIZATION OF SPORTSMEN IN PENNSYLVANIA DO FINE WORK.

At a recent convention of the United Sportsmen of Pennsylvania it was voted to employ a state organizer with a salary of fifteen hundred dollars. He will travel through the state, organizing local camps and furthering the work of the organization. The association publishes a monthly magazine, "The Pennsylvania Sportsman." Competent lecturers are

furnished on application and the lectures given are free to all.

"The standard working policy of the association is such that it requires a local camp of twenty-five members or less to plant at least two cans of fish a year, give out or distribute at least two bird boxes a year, plant or distribute at least fifty trees, and feed the wild game during the winter at least $2.00 worth of feed. Camps of fifty members are required to do twice the above amount of work, and larger camps accordingly. Each local camp, of course, can do as much more work as they may wish. They must report at the annual convention what work has been done." (Fish and Game Conservationist and Warden's Journal, September, 1914.)

THE ECONOMIC PRESERVATION OF BIRDS.

Members of the British committee for the economic preservation of birds have issued a statement recommending the following six suggestions as a working basis: (1) Absolute protection during breeding season for all breeding wild birds of whatever kind. (2) Absolute protection for all birds found upon inquiry to be either verging upon extinction, highly localized, or of determined benefit in agriculture centers. These birds to be known as "Birds of Class I." (3) Regulations to be enforced by government or local authorities under government for species that have commercial value and are not in danger. These birds to be known as "Birds of Class II." The government of the countries of origin to tax the sale of these species and thereby recover the cost of enforcing regulations. (4) The permanent maintenance of an international committee of scientific experts to determine year by year which species belong of right to the respective classes. (5) An international agreement to refuse importation to the world's markets, museums and private collections of all species that are found to belong to "Class I." (6) All species in "Class II" to be exported under license. The committee would place at once in "Class I" the following birds: The family of chatterers, the cattle egret, the resplendent trogon, the lyre birds, the rifle bird of Australia, the regent bower bird, the flamingo, the spoonbills, the trogopans, the Impeyan (monal) pheasants, the red bird of paradise of the Waigu Island, the Prince Rudolf, Lawes', Prince Wilhelm's, Rothchild's, Princess Stephanie's and Meyer's bird of paradise. —SCIENCE, August 21, 1914.

MORE MOVIES OF THE SALMON INDUSTRY.

During the latter part of August, E. J. Dwyer took a series of moving pictures of the salmon industry on the Fraser River for the province of British Columbia. These will be used by the province in advertising British Columbia.—PACIFIC FISHERMAN, September, 1914.

DISEASE ATTACKS MOUNTAIN SHEEP AND GOATS.

The United States Department of Agriculture has undertaken the investigation of a serious disease which is affecting the mountain sheep, or bighorn, and the mountain goat in Idaho.

The forest officers think that it is the same disease which caused the mountain sheep to die in great numbers during 1882–83. The nature of the disease is not known, though it results fatally and sheep affected with it seem to have rough and mangy coats and are very much emaciated. Three bureaus of the department are engaged in the study—the Bureau of Biological Survey, the Bureau of Animal Industry and the Forest Service. A competent veterinarian has already gone to Idaho to start the work.—FOREST AND STREAM, November 21, 1914.

MOVING PICTURES OF WILD LIFE IN OREGON.

Mr. W. L. Finley, in charge of the educational work of the Oregon Fish and Game Commission, has obtained some very fine moving pictures of wild birds and animals. Last summer he spent several weeks in the Klamath Lake region obtaining pictures of birds on their nesting grounds. Mr. Finley has just returned from a trip east where he attended the annual meeting of the National Association of Game Commissioners at Washington, D. C., where he showed his pictures. The pictures were shown at several other places in the east and also at the University of California, where many people were turned away on account of the limited capacity of the

lecture room. It is the intention of the Oregon commission to have these moving pictures shown throughout that state and also to have them exhibited at the Panama-Pacific Exposition. The day when people flocked to see a stereopticon lecture has passed. "Movies" are now the only thing which will attract them. We are glad to see many of the state fish and game commissions keeping abreast of the times.

THE DIN OF WAR AND THE FEATHERED TRIBE.

The following recently appeared in the Oakland "Tribune." We do not know on what authority the article was published but it sounds quite plausible. War and game conservation hardly go well together.

"The feathered tribe of Belgium and northern France has been dispersed by the din of war.

"In all districts of the Marne it was noticed after the battle that the birds had disappeared. The Argonne forests also have been nearly depopulated of all kinds of game by the continual turmoil in those regions. Driven to detached woods and thickets where their dangers would have been increased in time of peace, they now find security.

"Apart from their enforced exile, birds are not the least fortunate of beings in these times, game shooting being prohibited in France.

"The markets furnished evidence that some poaching was going on, however, and the minister of war issued a warning that the sale of no other than imported refrigerator game would be tolerated. Early in the war soldiers supplemented their rations by taking a hare or a pheasant here and there, but this was stopped by order.

"Scarcity of game in the market is no hardship, for it is a small part of the alimentation of Paris. The arrivals amount annually to only 1,000 tons of native and 150 tons of imported game, while the arrivals of domestic poultry, alone, aggregate 21,000 tons.

"Belgium sends 50,000 larks to Paris each season, while the game importations from other countries are: Austria, 2,500 deer, 80,000 partridges, 50,000 hares; Italy, 25,000 quail; Australia, 100,000 rabbits, 20,000 hares and 50,000 larks; England, 40,000 pheasants and 30,000 partridges.

"No doubt considerable game that did not get away from the continually beaten war zone has been destroyed, and the sportsmen who have shooting preserves in these parts of the country are pessimistic as to the future; they think it will require several years to repopulate those regions. On the other hand, the prohibition of one season's shooting in the territory not affected by hostilities, it is thought, will result in immense benefit to game in general, and that next year and for many years to come all kinds of game will be more plentiful than ever before."

LIFE HISTORY NOTES.

DUCKS DIE ON TULARE LAKE.

The usual epidemic among ducks was noted again early this season on Tulare Lake. Mr. E. W. Smalley reports that not nearly so many birds died this year at last. Many of the reports regarding the epidemic were grossly exaggerated. Mr. Alex Wetmore, of the United States Bureau of Biological Survey, spent several days investigating conditions on the lake. Mr. Wetmore spent several months studying the similar epidemic which appears on Salt Lake, Utah, each year. We hope that we may be able to give our readers the results of his investigations at a later date.

Mr. F. C. Clark carried on some valuable experiments last year at Tulare Lake and has laid an important foundation for further work. The epidemic seems to be caused by a poison in the water. But to know this is not enough. We want to know exactly what it is that kills off the ducks on Tulare Lake and whether there are any means by which the trouble can be alleviated. Further investigations are planned for the coming year.—H. C. BRYANT.

TWO RECORDS OF THE NESTING OF THE WILSON SNIPE IN CALIFORNIA.

The Wilson snipe (*Gallinago delicata*) is a common bird in our marshes during the winter season. It even occasionally

remains until July, but the birds are not to be seen in the lowlands in late summer. Many hunters have wondered why they were unable to find nests of this bird. The reason for it is explained by the following two records given me by Mr. George Neale.

A nest containing two young was discovered by Mr. Neale early in August, 1912, on the Burton Creek meadow at the north end of Lake Tahoe, Placer County, California.

Mr. Charles Flohr, an old-time hunter, told Mr. Neale several years ago that on September 1, 1899, he discovered a nest containing three young in the Sierra Valley, Plumas County, California.

The Wilson snipe apparently nests very late and consequently its habit of staying well into the summer is accounted for. Those birds which remain so late probably nest around the lakes and ponds in our high mountains.—H. C. Bryant.

PRESENT STATUS OF THE PRONG-HORNED ANTELOPE.

Although antelope meat was the commonest meat to be purchased on the markets in San Francisco in the '49er days, yet the year of 1914 finds us with only a few scattered herds in the state. The following information regarding a small herd me by Mr. A. D. Ferguson. Between in western Fresno County was furnished thirty and forty years ago the herd numbered two hundred to three hundred. In 1898 they had been reduced down to about thirty-two. In 1909, one hundred and thirty-eight were counted.

Mr. J. G. Tyler of Fresno reports that on October 31, 1914, he noted seven prong-horned antelope about fifteen miles east of the mouth of the Little Panoche. One of the number appeared to be only a little over one-half grown. Twenty-eight were seen in this general vicinity last spring.—H. C. Bryant.

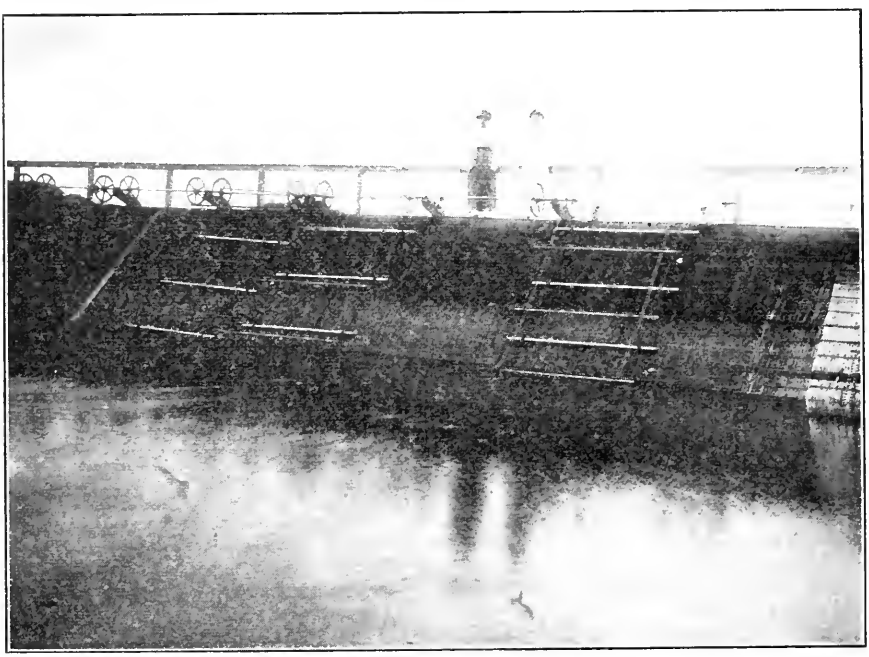

Fig. 18.—A partial view of the largest fish screen in the state. This screen, installed by the Sacramento Valley West Side Canal Company, in Glenn County, is seventy feet long and fifteen feet deep.

QUEER SPECIMENS OF DEER FROM THE WHITNEY REGION.

Mr. S. L. N. Ellis of the Fresno Division reports to us that during August, 1914, two very interesting specimens of deer were obtained near Mount Whitney. One appeared to be an hermaphrodite. This deer had very rudimentary and

strangely formed horns. The other specimen was a doe with horns. Mr. Ellis says that this is not the first time that a horned doe has been taken in this region. The horns of this particular specimen were very gnarled and rudimentary. The hides and horns of both of these deer are to be seen in the office of the Fish and Game Commission at Fresno.

DEER SEASON TOO EARLY.

Practically all of the deer killed in Santa Cruz County during the past season were still in the velvet. Evidently the season in this locality opens altogether too early. All of the hunters in this county are insistent in their demands that the law be changed as soon as possible.—J. H. Hill.

A PORCUPINE IN THE FOOTHILLS OF THE SIERRAS.

A clipping from the Folsom "Telegraph" states that Harry Hilbert of that place killed a porcupine weighing fifteen pounds on November 13, 1914. It is seldom that a porcupine wanders down into the lowlands. Their true home is in the higher altitudes.

WILD LIFE IN RELATION TO AGRICULTURE.

PENNSYLVANIA PAYS TRIBUTE TO FROGS, TOADS AND SALAMANDERS.

Slowly but surely we are finding out that practically every form of life is of some use. For over fifty years we have been studying the food of birds and the more we study the more we discover that birds are to be considered friends of the farmer rather than foes. Some years ago Professor H. A. Surface, Economic Zoologist of Pennslyvania, published a bulletin of 208 pages describing the food habits of snakes. The results of further researches have led him to publish, recently, a similar bulletin on the "Economic Features of the Amphibians of Pennsylvania" (Zoological Bulletin, Vol. III, May-July, 1913, pp. 67–152). A key to species enables the amateur to determine any species of toad, frog or salamander; and there are tables under each species described, showing exactly what has been taken from the stomachs of the amphibians collected. Stomachs to the number of 1,456, representing 24 different species, were examined to obtain the data given.

"The results of investigations show that the amphibians, as a rule, feed upon a class of food similar to that of a toad, a creature whose food has been investigated quite thoroughly. * * * Its value as a consumer of destructive insects and closely related creatures has been established beyond question. * * * In a similar way, the terrestrial amphibians are to be regarded as friends of agriculture, and they deserve protection accordingly.

"In addition to the fact that the amphibians as a whole are constructive rather than destructive to man's interest, some species, as those of the frogs, serve as food for man. * * * In many parts of this country procuring and selling frogs has become a paying industry, so much so that several species have been greatly reduced in numbers. In Pennsylvania, as a result, legislation has been enacted which makes it illegal 'to catch, take, or kill any bullfrogs, only from the first day of July to the first day of November.' A further economic feature of the amphibians is found in the fact that their young or tadpoles are taken extensively as food for fishes, thus contributing indirectly to the nourishment of mankind, and they are also used as bait by fishermen. In fact, their use as bait has threatened the reduction or extermination of tadpoles and frogs to such an extent that a bill was introduced into the last legislature providing that not more than 20 tadpoles could be used as bait in one day. However, the bill failed to become a law."

So it can be seen that not only are the despised frog, toad, and salamander proved friends of the agriculturist, but they are of such value that legislation has been enacted in order to prevent their complete extermination. It may also be of interest for our readers to know that in Switzerland the edelweis, a flowering plant, and several species of butterflies

are now protected by law because their existence was threatened by tourists and collectors.—H. C. Bryant.

DIRECTIONS FOR PREPARING AND SHIPPING GAME AND NON-GAME BIRDS OR STOMACHS FOR SCIENTIFIC PURPOSES.

As a usual thing the collections of public museums lack good series of game birds and in many cases they contain but few representations of non-game species. Hunters should therefore aim to ship specimens in good condition to such institutions, and particularly so in the case of rare or unknown species, as such specimens are of great scientific value.

Examination of the stomach contents of either game or non-game birds is necessary to determine whether or not the species are valuable to agricultural interests. Such examination is also an aid in determining what materials serve as food and should be provided on preserves if game birds, particularly waterfowl, are to be attracted by means of food plants.

Stomachs.—When removed, stomachs or gizzards with gullet or crop, if filled with food, should be tagged with the name of the species, the locality and date of capture and the name of the collector. Any information as to the food materials available to the birds and the relative abundance of different kinds of food should be given. If a number of stomachs of one species are collected, all having the same data as to locality and date of capture, they may be put together with a single tag. The specimens should be put in a can or bottle with a tight-fitting top and a 4 per cent solution of formaldehyde (made by mixing one part of the stock solution of formalin obtainable at drug stores with nine parts of water) or 80 per cent alcohol (pure grain or denatured) poured over them so that they are well covered. The preservative should remain on for at least four or five days. For shipment the preservative may be drained off and the can or bottle tightly closed, or the stomachs may be wrapped in oiled or paraffined paper and this in turn inclosed in a stout manila wrapping.

Specimens.—The throat should be plugged with a rather tight-fitting wad of cotton or waste thrust in the mouth and into the upper throat to prevent any blood from an internal wound emerging and soiling the feathers. Any blood on the surface at the time the specimen is prepared for shipment should be scraped off with a knife, but the specimen should not be wet. Specimens should be inclosed in a stout pasteboard or, preferably, a wooden box. If the specimens are to be in transit during cold weather or for only a short distance (so that they will arrive within twenty-four hours after being shot), they need not be drawn, but otherwise the entrails should be removed and the body filled with green grass. Full data as to the date and locality of capture and name of collector should accompany specimens.

Shipment.—Stomachs or specimens, if marked "perishable" and the contents described on the shipping tag, may be shipped either by parcels post or express.

The Museum of Vertebrate Zoology of the University of California, Berkeley, is in a position to receive and identify any species of game or non-game bird, and in connection with its work on the game birds of the state would be glad to receive stomachs of any of the species in question. Material may be sent to the Museum by parcels post or by Wells Fargo & Company's Express.—T. I. Storer, Museum of Vertebrate Zoology, Berkeley, California.

REPORTS.

VIOLATIONS OF THE FISH AND GAME LAWS.

September 1 to November 30, 1914.

Offense	Number arrests	Fines imposed
GAME.		
Hunting without license	84	$1,370 00
Deer, close season, killing or possession	13	305 00
Deer hides, evidence of sex removed	1	50 00
Female deer, killing or possession	10	500 00
Excess bag limit deer, killing or possession	1	30 00
Doves, close season, killing or possession	1	10 00
Ducks, close season, killing or possession	14	205 00
Excess bag limit ducks, killing or possession	8	105 00
Night shooting	14	125 00
Quail, close season, killing or possession	20	575 00
Rail, plover, curlew, close season, killing or possession	6	150 00
Shore birds, close season, killing or possession	1	25 00
Wild pheasants, killing or possession	2	50 00
Non-game birds, killing or possession	16	124 00
Excess bag limit cottontail, killing or possession	1	25 00
Excess bag limit sage-hen, killing or possession	5	125 00
Swans in possession	1	40 00
Total game violations	198	$3,814 00
FISH.		
Angling without license	6	$120 60
Fishing for profit without license	7	30 00
Using Chinese shrimp or bag nets for catching shrimp, and having dried shrimp in possession	16	60 00
Underweight striped bass in possession	4	50 00
Undersize black bass in possession	1	
Undersize catfish—sale	1	10 00
Excess bag limit trout, taking or possession	1	25 00
Taking trout other than with hook and line	1	20 00
Sacramento perch, taking other than with hook and line	2	40 00
Fishing for salmon with nets, Saturday and Sunday	2	30 00
Salmon, close season, taking, possession or sale	4	150 00
Using illegal nets, small mesh	2	50 00
Pollution of streams	1	
Undersized Pismo clams in possession	6	100 00
Crabs in possession, close season	9	20 00
Black abalones, possession, close season	5	50 00
Crawfish, possession, close season	1	20 00
Undersized lobsters, possession	2	40 00
Total fish violations	71	$815 00
Grand total, fish and game violations	269	$4,629 00

SEIZURES—FISH, GAME, AND ILLEGALLY USED FISHING APPARATUS.

September 1, 1914, to November 30, 1914.

Fish.

Striped bass	272½	pounds
Salmon	2,895	pounds
Black bass	95½	pounds
Trout	56	pounds
Sturgeon	190	pounds
Catfish	50	pounds
Sacramento perch	3	pounds
Crawfish	431	pounds
Crawfish traps	8	
Crabs	60	
Abalones	275	
Pismo clams	98	
Dried shrimp and shells	250	pounds
Nets and lines	61	

Game.

Ducks	1,676	
Quail	51	
Doves	14	
Plover	15	
Rail	10	
Curlew	1	
Brant	15	
Sagehens	24	
Shorebirds	4	
Non-game birds	95	
Cottontails	113	
Deer meat	433	pounds
Hides	1	

Searches.

Illegal fish and game	28

FINANCIAL REPORT

STATEMENT OF EXPENDITURES FOR THE MONTHS OF SEPTEMBER AND OCTOBER, 1914.

GENERAL ADMINISTRATION.

	September		October	
Commissioners' traveling and other expenses	$132 85		885 31	
Salaries of administrative assistants	965 00		975 00	
Traveling expenses of administrative assistants	79 50		18 70	
Rentals, office and other supplies	269 93		594 73	
		$1,447 28		$1,673 74

GENERAL FISH AND GAME PATROL.

San Francisco Division.

Salaries of deputies and employees	$2,531 50		$2,839 50	
Traveling expenses of deputies and employees	964 61		1,062 61	
Rentals, office and other supplies	192 43		202 15	
		$3,688 54		$4,104 26

Sacramento Division.

Salaries of deputies and employees	$2,227 00		$2,553 00	
Traveling expenses of deputies and employees	1,126 87		1,266 65	
Rentals, office and other supplies	112 34		175 69	
		$3,466 21		$3,995 34

Los Angeles Division.

Salaries of deputies and employees	$1,160 83		$1,656 59	
Traveling expenses of deputies and employees	269 20		663 05	
Rentals, office and other supplies	130 83		159 42	
		$1,560 86		$2,478 97

Fresno Division.

Salaries of deputies and employees	$928 50		$1,176 67	
Traveling expenses of deputies and employees	372 97		547 62	
Rentals, office and other supplies	48 17		84 73	
		$1,349 64		$1,809 02

Miscellaneous Expenditures.

Prosecutions and allowances		$336 75		$458 33
General printing		39 32		213 15
Total, general administration and patrol		$11,888 60		$14,732 81
Probable cost general administration and game patrol (60%)		$7,133 16		$8,839 686
Probable cost general administration and fish patrol (40%)		4,755 44		5,893 124
		$11,888 60		$14,732 81

FISHERY EXPENDITURES.

Administration.

Salaries of Superintendent of Hatcheries and assistants	$437 50		$340 00	
Traveling expenses, Superintendent of Hatcheries and assistants	213 71		139 62	
Office and laboratory supplies, etc.	53 94		65 00	
		$705 15		$544 62

Fishery Research and Publicity.				
Salaries	$275 00		$295 00	
Traveling expenses	104 05		157 34	
Supplies, etc.	20 60		12 68	
		$399 65		$465 02
Screen and Fishway Surveys.				
Salaries	$377 00		$325 00	
Traveling expenses	203 15		132 45	
Supplies, etc.	------		1 83	
		$580 15		$459 28
Fish Transplanting (Packtrain, messengers, etc.)				
Salaries	$99 00		$284 75	
Traveling expenses	147 95		100 63	
Repairs and supplies	6 10		10 60	
		$253 05		$395 98
Fish Distribution (car and messengers).				
Salaries	$319 33		$318 33	
Messenger allowance and traveling expenses	186 00		181 50	
Repairs	44 67		19 45	
Supplies	91 28		195 16	
		$641 28		$714 44
Fish Patrol (Launches, etc.)				
Salaries	$259 00		$225 50	
Messenger allowance and traveling expenses	63 60		57 30	
Repairs	------		10 30	
Supplies (oil, etc.)	74 30		96 39	
		$396 90		$389 49
Sisson Hatchery.				
Salaries	$1,205 00		$1,338 00	
Traveling expenses	------		------	
Construction and repairs	95 50		2,038 24	
Fish food and ice for meat	439 80		230 02	
General supplies	142 95		55 91	
		$1,883 25		$3,662 17
Tahoe and Tallac Hatcheries.				
Salaries	$194 00		$10 00	
Traveling expenses	------		------	
Construction and repairs	8 11		------	
Supplies	33 69		------	
		$235 80		$10 00
Price Creek Hatchery.				
Salaries	------		$137 50	
Traveling expenses	------		50	
Construction and repairs	------		------	
Supplies	------		231 32	
				$369 32
Wawona Hatchery.				
Traveling expenses	$20 35		------	
		$20 35		
Miscellaneous Expenditures.				
Angler's license, commissions and refunds		$1,235 60		$726 70
Market fishing license commissions		25 00		85 75
Crawfish inspection		100 00		100 00
Total fishery expenditures		$6,476 18		$7,922 77

GAME EXPENDITURES.

Hayward Game Farm.				
Salaries	$206 00		$216 00	
Traveling expenses	7 15		9 70	
Rent	37 50		37 50	
Construction and repairs	.....		24 93	
Feed for birds	43 00		50	
General supplies	61 10		91 94	
		$354 75		$380 57
Game Research and Publicity.				
Salaries	$162 00		$605 00	
Traveling expenses	49 15		308 79	
Supplies, etc.	169 05		48 35	
		$380 20		$962 14
Miscellaneous Expenditures.				
Hunting license commissions and refunds		$3,787 20		$1,557 10
Mountain lion bounties		240 00		240 00
Total game expenditures		$4,762 15		$3,139 81
Grand total of all expenditures		$23,126 93		$25,795 39
Total of fish expenditures		$11,231 62		$13,815 894
Total of game expenditures		11,895 31		11,979 496
Grand total		$23,126 93		$25,795 39

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

CONTENTS.

AN ATTEMPT TO SAVE CALIFORNIA ELK.

By BARTON WARREN EVERMANN,

Director of the Museum, California Academy of Sciences.

The complete extermination of any species of animal or plant in any part of its habitat is always a matter of regret. Even if the species be a noxious one, we nevertheless dislike to see it entirely wiped out in any locality in which it was naturally found. If it be a useful species, well known to the laity as well as to naturalists, its extermination is deplored; and when the species becomes extinct, when not a single individual is left anywhere upon the face of the earth, it is regarded as most regrettable. The world will never cease to regret the practical extermination of the buffalo. It will never cease to deplore the actual extinction of the great auk and the passenger pigeon. We all now know the fate of those three interesting species; and when we see other species of interesting animals threatened with extermination, we are naturally filled with alarm. We have learned how thoughtless many people are; how disposed they are to destroy things; how strong the inclination is with many to toss a stone at the frog or turtle resting on a rock or log in the pond; to kill every snake they see. "What a fine morning this is! Let's go out and kill something." That spirit is all too prevalent.

Among the important species of California animals now threatened with extinction is the California valley elk (*Cervus nannodes*). This elk originally roamed in great numbers over the great interior valley of California. It was doubtless most abundant in the San Joaquin portion of the Sacramento-San Joaquin Valley, but its range probably included the entire valley and the adjacent foothills. It was certainly abundant as late as 1854. The early records contain many references to its abundance. One of the earliest records is to be found in the manuscript report of the Viscaino explorations made in 1602. Speaking of the animals in the vicinity of Monterey the statement is made: "Among the animals there are large, fierce bears, and other animals called elks, from which they make elk leather jackets."

Among the most interesting later accounts is that by Mr. Edward Bosqui, the only living charter member of the California Academy of Sciences. In his "Memoirs," to which my attention was called by Mr.

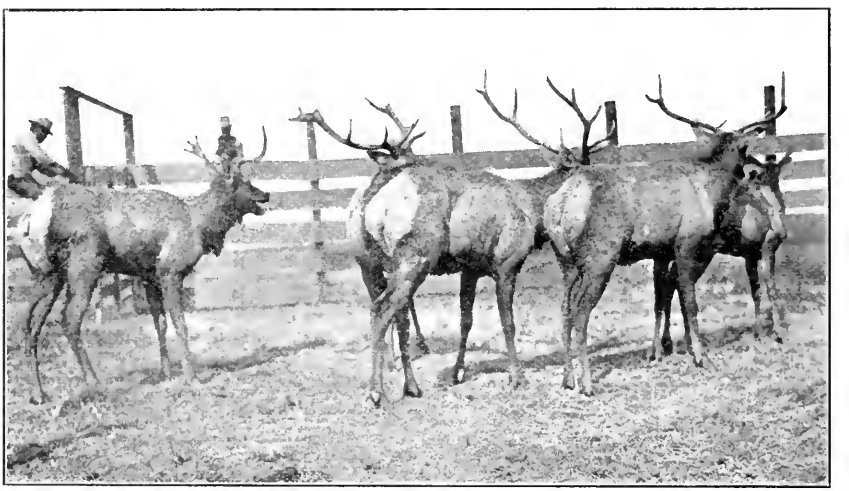

FIG. 19.—California elk, in corral near Buttonwillow, ready for shipment. Photo by John Rowley.

M. Hall McAllister, Mr. Bosqui states that, in December, 1850, while walking from Stockton to Mariposa, he saw, as he approached the foothills, "bands of elk, deer, and antelope in such numbers that they actually darkened the plains for miles, and looked in the distance like great herds of cattle."

On his return from Mariposa to San Francisco in June, 1851, when on Dry Creek some seventy miles from Mariposa, east of the present town of Turlock, Mr. Bosqui states he was one morning "suddenly awakened by the heavy tramp and noise of large animals, and on looking through the fog which prevailed I could see indistinctly, not thirty rods away, giant-like figures of elk passing, so to speak, in procession before me. They were tossing their great antlers about and snuffing excitedly. Suddenly, with one accord and with an impulse that shook the ground like an earthquake, they swept out of sight. It was a procession of phantoms such as one might conceive in a night-

mare, and left an impression on my youthful mind never to be forgotten." (Edward Bosqui, "Memoirs," pp. 62 and 66.)

Speaking of Moraga Valley (in Contra Costa County just back of Oakland) Mr. Bosqui says: "The hillsides were covered with clover and wild oats, and up to 1850 all the country in and about Moraga Valley had been the native haunts of wild game—deer, antelope, bear and elk. Fragments of bleaching elk horns could be found scattered over the valley, and many entire and perfect specimens of the great antlers, although bleached by the sun, I picked up and preserved at the time of our residence there," which was in 1858 and after. (Bosqui, "Memoirs," p. 163.)

In a very interesting book entitled "Death Valley in '49," by William Lewis Manly, to which my attention has been called by Mr. John Rowley, I find a number of interesting references to the California valley elk. In the spring of 1850, Mr. Manly traveled from San Jose

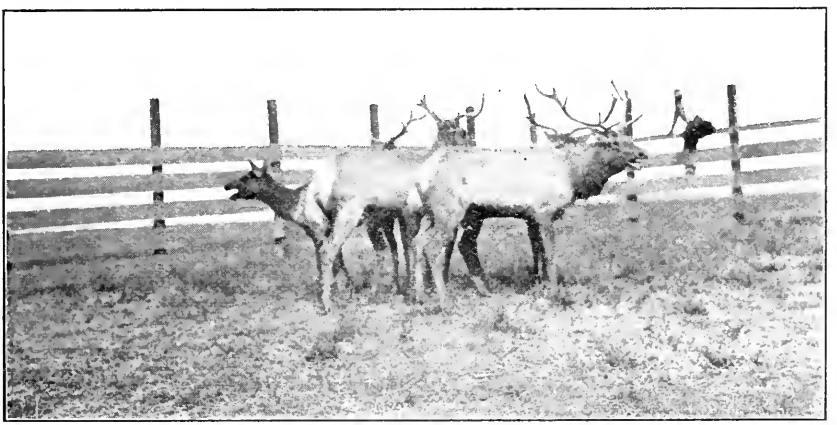

FIG. 20.—Bucks and does, just after entering the small corral. Photo by John Rowley.

into and across the San Joaquin Valley, presumably through Livermore Pass. He says: "The next place was a small house made of willow poles set in the ground and plastered over with mud. This rejoiced in the name of "Mountain House." This wayside inn looked more like a horsethief's glory; only one or two men, a quarter of elk hanging on a pole and no accommodations for man or beast. * * * On the summits of the mountains as we passed through we saw, standing like guards, many large buck elk. It was now fifteen miles to the San Joaquin River, and a level plain lay before us. When our road turned into the river bottom we found the water too deep to get through safely so we concluded to go on and try to find some place where we could cross. On our way droves of antelope could be seen frolicing over the broad plains, while in the distance were herds of elk winding their way from the mountains towards the river for water. When far away their horns were the first things visible, and they much resembled the dry tops of dead pine trees, but a nearer view showed them to us as the proud monarchs of the plains" (page 391). After crossing the San Joaquin just below the mouth of the Merced, they proceeded up the

latter stream, and probably near where Turlock now is, Mr. Manly says: "As we came near groves of willows, big, stately elk would start out and trot off proudly into the open plains to avoid danger. These proud, big-horned monarchs of the plains could be seen in bunches scattered over the broad meadows, as well as an equal amount of antelope. They all seemed to fear us, which was wise on their part, and kept out of rifle shot. As we were not starving as we were once, I did not follow them out on the open plain, for I thought I could get meat when we were more in need" (page 392). On the east side of the valley they camped in a low ravine among low hills where game was plentiful. When they awoke in the morning, "Hundreds of big-horned fellows were in sight but none in rifle shot, and there was no chance for us to get any nearer to them" (page 395).

Inquiries addressed to a number of early residents of the state have elicited additional information of interest and value. Perhaps the most

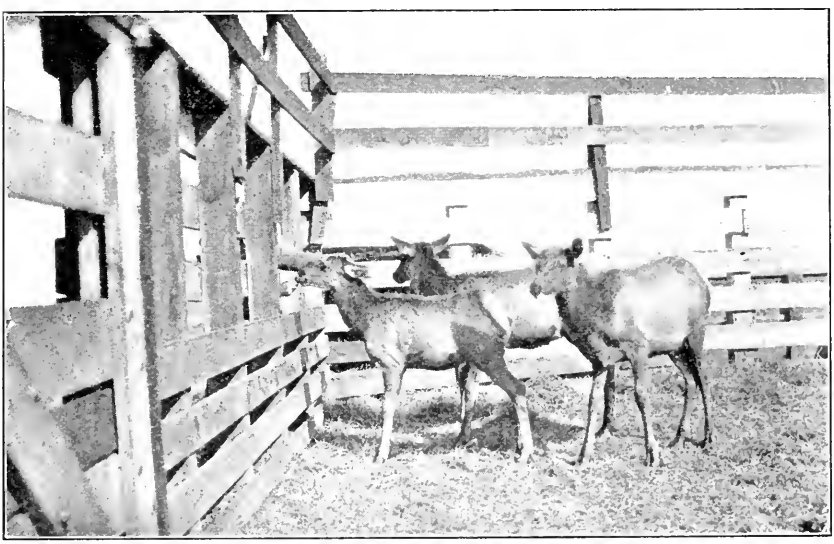

FIG. 21.—Although the elk were very wild when first caught, within a few days they would take feed out of one's hands and permit their heads to be rubbed and their ears pulled. Photo by John Rowley.

interesting letter received is that from Mr. H. C. Banta of Oakland, who writes: "I arrived in the state in 1854, overland from Missouri, locating on the west bank of the San Joaquin River near the present Southern Pacific railroad bridge on the Stockton route. For several years I followed market hunting, geese, ducks, elk, etc. In 1854 I found elk plentiful in the foothills west of the San Joaquin, as well as in the tule swamp. Bob Dikeman and Lee Phillips were my hunting companions, and we practically finished up all the tule elk in that section between Martinez and San Joaquin City. The elk were originally ranging over the hills (along the east slope of the open foothills) as far south as Newman, going north as far as Grand Island. They were originally driven from the hills and valley land into the tules by the vaqueros rounding up wild horses and cattle, as well as by hunters. In

1854 they were nearly all driven to the tules, but the finding of horns of six to eight prongs, all over the hills proved how plentiful they had been.

"I found no difference in size between these elk and the Oregon, Washington, Wyoming, and Colorado elk, and felt sure that the bulls would weigh 700 to 800 pounds. They struck me as weighing about as much as an average steer and their horns were fully as big as any elk I have ever killed or seen in other states. Dikeman shot the last cow and calf about 1863, just west of the Sargent ranch on the North Fork of the San Joaquin near the Mokelumne River. The rest of the animals, so far as I know, ranged in the tules and willows between Buena Vista and Tulare lakes, and only on the south side of Tulare Lake, ranging also west into the foothills. I never heard of any except south of the Sacramento River, and as far south as Buena Vista Lake.

"I killed some antelope on the San Joaquin in 1856, running one well-grown fawn down (6 months old), but both horse and fawn died from effects of the run. The antelope were scarce at this time, and finally drifted around Tulare Lake. I never heard of them coming further west than Byron Springs * * * I killed elk at Tulare Lake in 1856 and found them the same as those that ranged up as far as Martinez. Antelope, tule elk and wild horses were plentiful in the Tulare Lake country and in the vicinity of the present site of Fresno at this time. * * * We hunted in the tules with a sloop, using a ladder lashed to the mast for a lookout. When elk were sighted we would break our way through the tules to them, usually finding them on grass land between sloughs. In one instance in Whisky Slough I cleaned up a band of eight single-handed, keeping out of sight. Five were taken with the rifle and I returned to the boat, loaded my shotgun with heavy charge of buckshot and on returning, found the three remaining yearlings still in the vicinity near the carcasses. Following them, I got all three single file, and, as they turned their heads, I got all three at one shot, at an angle, being kicked over by the charge in the bargain. I never heard of another instance of this kind."

There is some evidence that seems reliable that elk once occurred in Santa Cruz and San Benito counties. Mr. J. W. Miller of Watsonville writes that one of the old settlers of that region, Mr. Frank Mauk, says that when he was a boy his father and oldest brother hunted elk in Santa Cruz County, also in the Salinas Valley. Mr. Bontell, a stage driver in San Benito County, says that elk were plentiful in that county in 1864, their favorite range being section 16, range 11 east.

In a letter recently received from Mr. Mauk he says: "In the early fifties my people lived some six or eight miles from Gilroy at the mouth of Bodfish Cañon. I remember quite well of my father, my brother George, Captain Adams (afterwards sheriff of Santa Clara County), and a Texan ranger named Bob Poore, coming over the mountain to the Pajaro Valley to hunt elk and returning with wagon loaded. At times the trip extended down to the Salinas plains. In 1882 I took charge of the railroad station at Pajaro (now Watsonville Junction). My watchman was a Frenchman named Joe Pillesier, who came to California in 1843 or 1846. He married a daughter of Salvador Vallejo, a brother of General Vallejo. Mr. Pillesier often spoke of the sport he had in killing elk here, saying that on occasions the vaqueroes would

ride among them and the cattle, single one out, ride him down and hamstring him with a machete. Shortly before the General died, he spent an afternoon with me and spoke of the big elk that used to be found here and rather bitterly of the Americans killing them so wastefully."

Professor John Rockwell, who arrived at San Francisco in June, 1850, has stated to Mr. M. Hall McAllister that a few days after his arrival he joined a party of young men who sailed up the bay to found a city to be called "New York of the Pacific." After passing Suisun Bay they entered the mouth of the Sacramento River and landed their supplies on a point of land on the south shore, making their camp in a small arroyo about a quarter of a mile back from the river. About daylight the next morning they were aroused by the rush and tramping

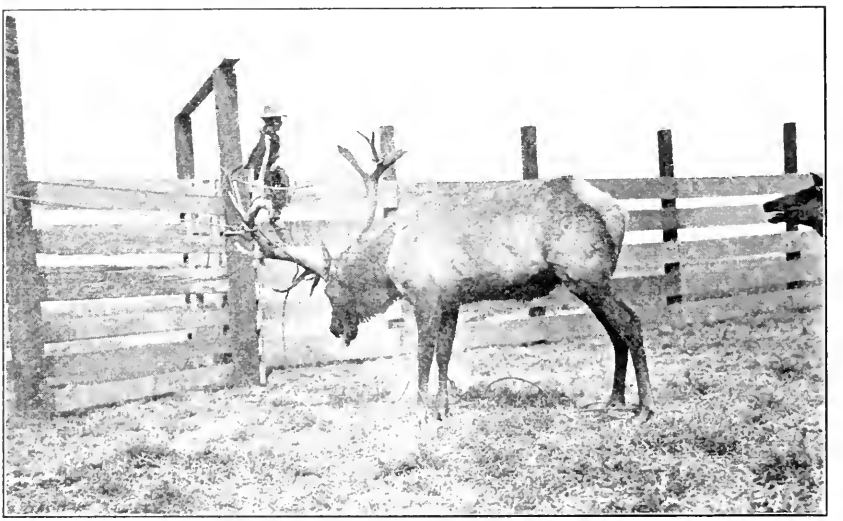

Fig. 22.—Bull elk in corral near Buttonwillow. His antlers will be sawed off, preparatory to shipment. Photo by John Rowley.

of a large herd of animals. Crawling out of their tent they saw the plain around them covered with a great herd of elk. The animals were rushing back and forth seemingly unable to make out their intruders. The party opened fire on the elk, bringing down one or two, when the herd rushed off at great speed toward Monte del Diablo.

Mr. Payne J. Shafter of Olema, Marin County, has given the following information to Mr. McAllister regarding elk in that county. He says: "Don Juan Garcia (the old keeper of the Country Club) told me that in about 1850 a Spanish priest with a band of Indians went over on Point Reyes and drove a herd of about seventy-five elk on to a peninsula in Limantour Bay. The priest had them nearly all killed for their hides and tallow—bulls, cows, and calves, the last elk of Marin County." Mr. Shafter further says that when he first came to Marin County, in 1862, many antlers in good condition were gathered on Point Reyes and kept as souvenirs. Also that Frank Miller, an old hunter and trapper, told him that, in 1852, he with another hunter named Bell had seen over a hundred elk swim across Tomales Bay and go north

toward Mendocino County. This story is corroborated by Jack Briones, a keeper of the Point Reyes Club, who recently told Mr. McAllister that his father had told him the same story. Point Reyes seems to have been a favorite resort for elk.

Captain MacKenzie, who was for many years captain of the steamer San Rafael, running to San Quentin Point, and later to Sausalito, informed Mr. McAllister that in the early days, probably in 1850, he made a trip in a small sloop to the mouth of Petaluma Creek, and while exploring the marshes in that vicinity he came upon a great herd of elk.

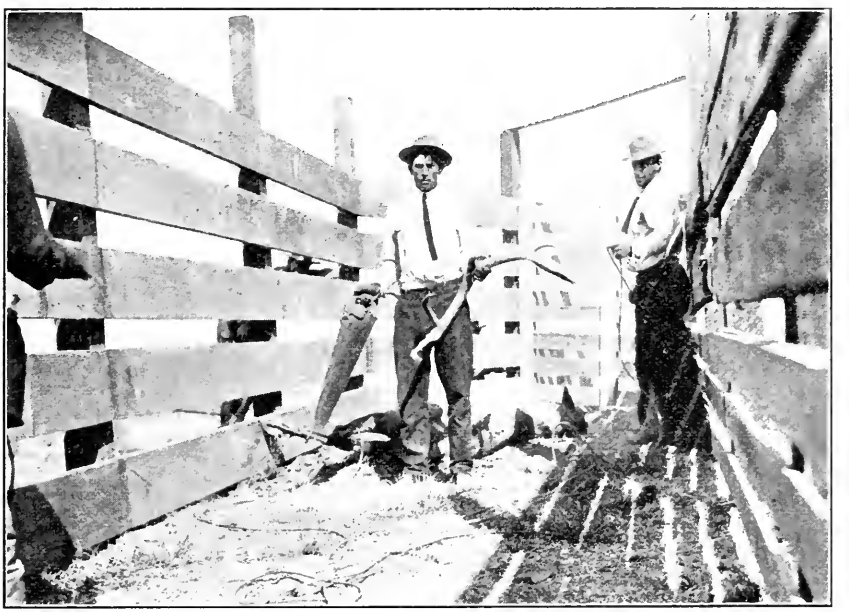

FIG. 23.—It was necessary to saw off the antlers of the big bucks to keep them from injuring each other in the pens and cars. Photo by John Rowley.

They were in great numbers. Several were killed before the herd made off, rushing headlong over everything like a herd of stampeded horses or cattle.

Mr. McAllister has obtained some valuable data from Jim Paine, the old Suisun Marsh hunter, who, with his partner, Seth Beckwith, in the seventies and eighties, furnished the San Francisco market with the finest and most toothsome canvasbacks. Paine claims that he killed the last tule elk ever seen on the Suisun marsh. It was, he thinks, in the fall of 1868. He was sculling up the Cordelia Slough after a day's shooting, when, near what is now Teal station, he saw a large cow elk plunge into the slough just ahead. Sculling alongside, he killed the animal with a heavy load of duck shot.

Mr. Chas. A. Allen, the veteran naturalist and collector of Nicasio and San Geronimo, Marin County, has given us the benefit of his experience. He has collected in Marin County for forty-two years. In his earlier years he found elk antlers very plentiful about Point Reyes from Bolinas north to the mouth of Tomales Bay. The elk

seemed to inhabit a strip of territory some five or six miles wide. They appeared to have limited their range to the open lands along the coast. Forty-two years ago all the ranch buildings had elk horns nailed up on the barn or other buildings. Evidently the elk had entirely disappeared from Marin County before 1872, the year of Mr. Allen's arrival there.

Whether the Marin County elk were of the same species as the San Joaquin Valley elk is not certainly known. It may be that the elk of the heavily forested, humid region along the coast from Marin County northward is a distinct species. The facts can be determined only by comparison of material from the two regions. But whatever may be the facts as regards this matter, it is clear that elk were very abun-

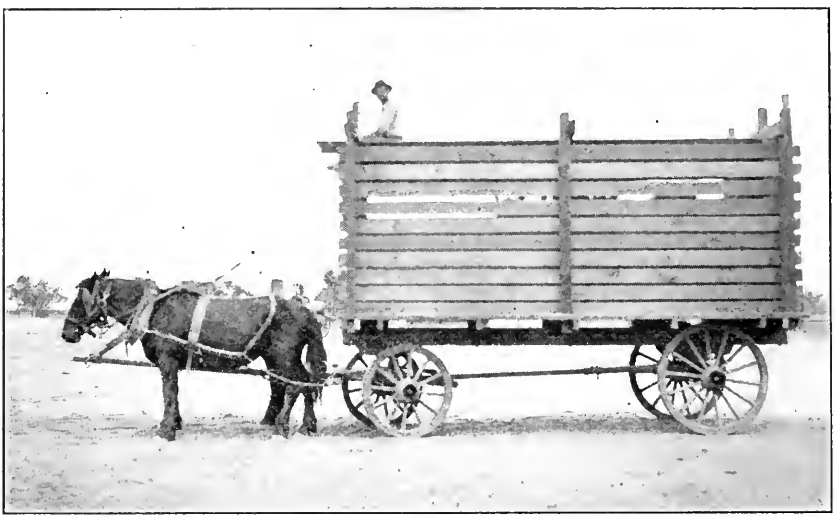

FIG. 24.—The crate used in transferring the elk from the corral to the railroad cattle-pens. Photo by John Rowley.

dant in the San Joaquin Valley and adjacent foothills, certainly as late as 1850 to 1854. From that time they decreased rapidly. In the early seventies it is said the herd had been reduced to a few individuals—one report says to a single pair—and they were on the Kern County ranch of Messrs. Miller and Lux. It is said that the imminent extinction of the species came to the attention of Mr. Henry Miller of the Miller & Lux Company, and he immediately gave strict orders to all the employees of the company that the elk must not be disturbed under any circumstances, and that everything possible for their protection should be done.

That has been the policy of Messrs. Miller and Lux to this day. The animals were protected. The herd increased. In 1914 it was estimated to contain about four hundred animals. The state game law makes the killing of any elk a felony, punishable by imprisonment for a term not exceeding two years. Although the elk roam at will over the Miller & Lux ranch, doing—the company estimates—from $5,000 to $10,000 worth of damage every year to the alfalfa and Egyptian corn fields and to the fences, they have not been disturbed. That the species was not

exterminated is due, without doubt, to the intelligent interest taken in its preservation by Mr. Henry Miller. It must be admitted, however, that Messrs. Miller and Lux are willing, in view of the very considerable loss the elk are causing them each year, to have the herd reduced somewhat by moving some of the animals to suitable reservations in other parts of the state.

With this object in view, on the sixth of last April, Mr. LeRoy Nichel, on behalf of Miller & Lux, offered to turn over to the California Academy of Sciences all or such portion of the herd of California elk now roaming over their Kern County ranch as they might be able to catch, provided the Academy would undertake to distribute them to various federal, state, and private reservations in the State of California.

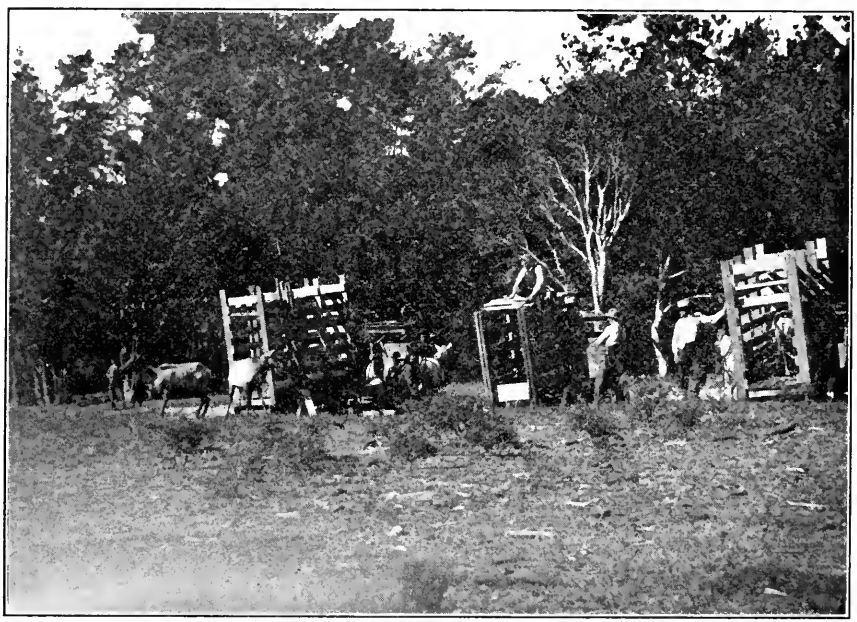

FIG. 25.—At Monterey the elk were transferred from the car to large crates, in which they were hauled to the Del Monte Park, where they were liberated October 30. Photo by F. C. Swain.

In 1905 a few elk were taken from this herd and placed in the Sequoia National Park, where they have done fairly well. These and the original Kern County herd are the only elk of this species in existence.

The development of the oil fields and the expansion of agricultural operations in the Kern County region have brought many dangers to the elk herd in that locality. To aid in saving the species from possible extermination it was proposed to place a few elk in each of the various reservations and parks in the state in the hope that they might thrive there and become the nuclei of new herds.

This was the hope of Messrs. Miller and Lux. One of the conditions of their offer was that the animals should be put only in places affording a favorable environment and where they would probably breed.

The offer of Miller & Lux was accepted by the Academy, and plans were made for carrying out the undertaking.

On April 25 and 26, in company with Mr. M. Hall McAllister, through whom Messrs. Miller and Lux made the offer to the Academy, I visited the Kern County ranch for the purpose of consultation with the superintendent as to the best time and method for catching and shipping the animals and regarding all preliminary details. At that time a visit was made to the alfalfa fields in which the elk feed and to the sagebrush plains to which they retire during the day or when disturbed, and about 100 of the animals were seen.

After giving the matter careful consideration it was decided to undertake the catching and shipping of the elk in October. Early in that month Messrs. Miller and Lux constructed a corral one fourth of a mile long and one eighth of a mile wide in an alfalfa field into which the elk were observed to come every night to feed. A wing one fourth of a mile long was run out from each corner of the end toward the foothills. Woven fence wire was put upon the wings at once, but only the posts for the corral proper were placed at that time. After the elk had come down into the field several nights and gotten used to the posts, heavy woven fence wire was placed on the two sides and the rear end of the corral, and the following night about 150 elk came into the corral; then the wire was placed on the posts at the entrance and the animals were trapped. (See figs. 19 and 20.)

The wire fence was very strong and at least eight feet high; nevertheless, some broke through or jumped over it. A good many people came out in automobiles and otherwise to see the elk, and so frightened them that about 100 broke out the first afternoon. Those that remained became quite tame in a few days. (See fig. 21.) Various, diverse and unexpected difficulties came up every day and it was not possible to predict what success would be attained in the undertaking. The animals might break through the corral or jump over the fence and escape; they might escape when being loaded into the crates for hauling to the railroad cattle pens; or escape from the cattle pens; or refuse to eat; or run amuck and kill or injure themselves; or die in the cars while in transit to the parks; any one of a score of things might happen to cause failure.

However, it is gratifying to know that, in spite of all difficulties and uncertainties, Messrs. Miller and Lux succeeded in capturing and placing in the cars for shipment a total of fifty-four elk. These were disposed of as follows:

1. To a thousand acre private reservation of Mr. J. M. Danziger, Los Angeles, six elk.

This reservation is in the Santa Monica Mountains, near Los Angeles. The environment, it is believed, will prove very favorable.

2. To a six hundred acre private reservation of Mr. E. L. Doheny, Los Angeles, ten elk.

This reservation also is in the Santa Monica Mountains, only a short distance from the Danziger ranch, and is under elk-proof fence.

3. To a seven hundred acre park of Mr. S. C. Evans, Riverside, four elk.

This park adjoins the city limits of Riverside and furnishes ideal conditions.

4. To the San Diego City Park, twelve elk.

The conditions here are not entirely as favorable as one would desire, but it is believed the elk will do well. This park was regarded as a favorable location in which to try the experiment of keeping the elk in relatively small enclosures.

5. To the Modesto City Park, two elk.

6. To the California Redwood Park Association, ten elk.

This association is the governing body for the Big Basin reservation,

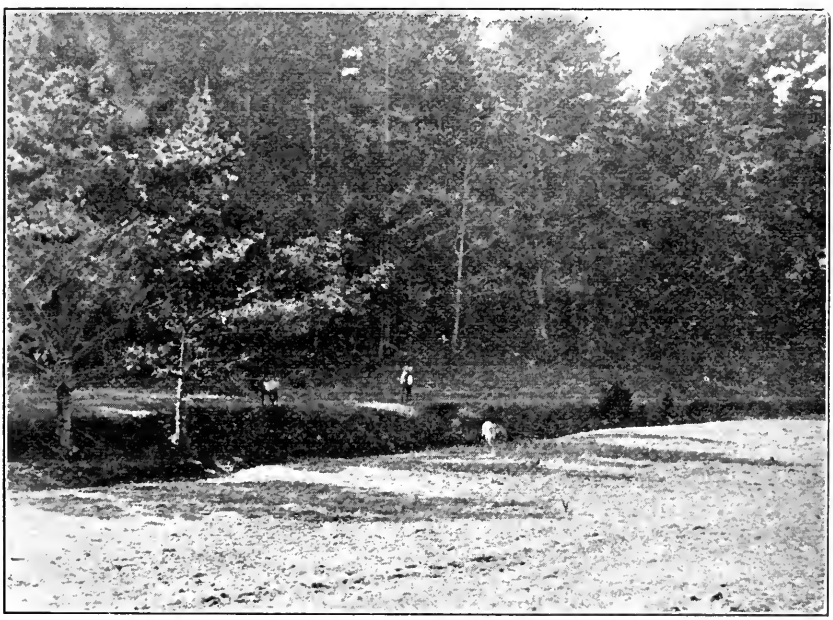

FIG. 26.—After leaving the crates in Del Monte Park, the elk ran 200 to 300 feet, stopped, went a little farther to a small creek, then crossed to the other side and began feeding. Photo by F. C. Swain.

which comprises some 55,000 acres. It is believed the conditions obtaining there will prove favorable.

7. To the Del Monte Park, ten elk.

These elk were turned loose in the large reservation of the Pacific Improvement Company near Monterey. (See figs. 25 and 26.) The environment, it is believed, will prove favorable.

Recent reports received from the various parties to whom the elk were sent state that the animals are doing well in all cases.

The Academy has orders, which it has not yet been able to fill, for about 100 additional head. An effort will be made to fill these orders next year.

It should be stated that all matters pertaining to the capture and delivery of the elk on board the cars were in the hands of Messrs. Miller and Lux. (See fig. 24.) The actual shipping of the animals was attended to by Mr. A. L. Bolton, assistant curator of mammals, who

performed the rather trying duties with good judgment, skill and entire success. Not an animal was lost or injured after being placed in the cars and all reached their respective destination apparently in excellent condition. (See figs. 25 and 26.) Mr. John Rowley, curator, department of mammals, and Mr. Herring, taxidermist, were on hand at Buttonwillow during the entire time, and saved for the museum of the California Academy of Sciences all the animals that got killed or fatally injured. On the whole, the experiment of distributing the elk to various parts of the state is regarded as having been a success, and it is believed it will do much toward the conservation of this interesting species of big game.

CALIFORNIA'S FUR-BEARING MAMMALS.

By Harold C. Bryant,

Game Expert, California Fish and Game Commission.

The fur-bearing mammals of California have decreased rapidly in the last twenty years and there are, as a result, only a relatively few men who are professional trappers. Once a state which supplied thousands of valuable furs each year, California now counts for but little in the fur markets of the world. And yet even now, with but a remnant left, the sale of furs brings into this state each year a sum not less than $250,000. At the present rate of decrease, however, there is little hope that this sum can long continue to pour into our coffers, even though the price of raw furs continues to rise.

California possesses practically all of the best fur-bearing species of animals. Look over the list: Gray squirrel, beaver, Pribilof fur seal, mountain lion, lynx, coyote, gray fox, red fox, ring-tailed cat, raccoon, black bear, weasel, river otter, sea otter, badger, skunk, wolverine, fisher, and mink.

Already two of the best of the fur-bearers, the sea otter and beaver, have had to be totally protected in order to save them. The grizzly bear is entirely extinct within the state, and the Guadalupe fur seal very nearly so. The beaver of our mountain districts has been entirely exterminated and there are but a few hundred survivors to be found along the Sacramento, Colorado, and San Joaquin rivers.

Although once exceedingly numerous along the coast, the sea otter is now nearing extinction. Two or three were killed just before the law protecting them went into effect in 1913, but few have been reported as having been seen since that time. Bidwell, in Rogers' "History of Colusa County," states that when the county was first settled it was not uncommon to see thirty or forty grizzly bears in one day. There has not been an instance of the killing of a real grizzly in California for the last four years. Apparently "Monarch" was the last surviving member of the species. He died in Golden Gate Park, San Francisco, about three years ago.

The slow decrease of the fur trade has been noted by nearly everybody and yet no attention has been paid to the possibility of conserving the fur bearers as a natural resource to be administered like other natural resources of the state. The chances of being able to do this

grow less with each year, and it is high time that an investigation be instituted so that facts and figures can be at hand to support the legislation necessary.

A search in the early history of California reveals the fact that this state for many years took a very prominent part in the world's fur trade. Companies were formed and ships outfitted on purpose to develop the fur resources. Trade centered in the skins of the sea otter, an animal which furnishes the finest fur known, fur which at the present time sells for fabulous sums. The average price paid in London in 1910 was $1,703.33.

From 1786 to 1790 trade in sea otter skins in California was controlled by the Spanish government and was in the hands exclusively of the padres and Indians. In an old manuscript written by the commandante at Santa Barbara to the governor, dated November 9, 1789, the following numbers of sea otter skins were reported shipped: From Purissima, 74; Santa Barbara, 79; San Buenaventura, 81; besides 32 fox skins. This represented shipments from the southern coast regions only. In 1790 the government monopoly ceased and the padres were deprived of a market. They welcomed therefore the opportunity to trade afforded by American ships at the beginning of the nineteenth century. From 1800 to 1812 a number of American ships annually visited the coast, trading cloth, muskets, and other materials for sea otter skins.

Sturgis (MS) gives the following figures regarding the number of ships in the fur trade in the northwest, the number of sea otter skins and the price brought in the Canton market:

Year—	No. of ships.	No. sea otters.	Sale price.
1799	7	11,000	$25
1800	6	9,800	22
1801	10	13,000	21
1802	8	14,000	20

Even as early as 1785 the capture of sea otters had become of such importance that on October 24, 1785, regulations for the collection of skins were issued by Governor Fages of California. The order was sent to Ignacio Vallejo at San Jose commanding that "anyone who goes out to trade with the Indians for otter skins" shall be punished. The price at the time was $1.00 to $7.00 (Bancroft, 1885 *a*, pp. 439–440).

In 1786 La Pérouse, a Frenchman, making a special investigation in Monterey was told that 20,000 skins could be furnished each year, and many more by establishing new posts north of San Francisco. He makes the statement that before this year otter skins were worth "no more than two rabbit skins," and that the Spaniards did not suspect their real value. (Bancroft, 1885*a*, p. 438.)

In 1801, which was perhaps the most flourishing period of the trade, there were sixteen ships on the coast, fifteen of which were American and one English. Upwards of 18,000 sea otter skins were collected for the China market in that year by the American vessels alone. (Bancroft, 1884*a*, p. 373.) In 1802 "more than 15,000 sea otter skins were collected and carried to Canton."

The first battle of San Diego was precipitated by the trade in otter skins. Bancroft (1885 *a*, pp. 10–12) gives the following account of the affair:

"Several American trading craft made their appearance on the California coast this year (1798), creating not a little excitement in some instances by attempts at smuggling, in the success of which the people were often hardly less interested than the Yankee captains. The *Lelia Byrd* was fitted out at Hamburg by Captain Richard J. Cleveland of Salem, Massachusetts, who had just made a fortune by a four years' voyage or series of commercial adventures in the Pacific, during which he had touched the northern coast of America, but not of California, in partnership with William Shaler, and sailed in November, 1801. Shaler was master and Cleveland second in command. The vessel was loaded with a great quantity of merchandise, which it was hoped to sell profitably on the west coast of America, no matter how, when, or where. * * * They succeeded (1802) not only in selling goods to the amount of $10,000, and obtaining what supplies they needed, but also bought *1,600 otter skins* just arrived from California at prices which assured the success of the trip.

"Sailing from San Blas, January 25, 1803, after careening and 'boot-topping' the vessel at the Tres Marias, our adventurers sailed in February for San Diego, where they were given to understand there was a lot of otter skins that might be obtained advantageously. * * * On the evening of March 17th, the *Lelia Byrd* passed the fort at Point Guijarros without being hailed, and anchored in San Diego harbor. Next day Commandante Rodriguez with an escort of twelve men came on board to comply with the formalities required by superior instructions. * * * He took a memorandum of the provisions which the visitors pretended to need and promised to supply them the next day. At the same time he indicated the necessity under law of an immediate departure, and returned to shore, leaving Sergeant Joaquin Arce with five men as a guard, and giving the Americans permission to land without visiting the presidio. * * * From Arce it was learned that Rodriguez had about a thousand skins, several hundred of which he had confiscated recently from the *Alexander*, Captain Brown. Shaler made every effort to buy the skins, but in vain, because, as Cleveland puts it, 'Rodriguez dared not indulge his desire of selling them to us.' A visit was made to the shore, including an inspection of the battery at the point.

"On March 21st Rodriguez came on board, received his pay for supplies, and took his leave after wishing the visitors a pleasant voyage. Preparations were completed for departure in great disappointment, but it was determined to make a final attempt to obtain the skins. It was known that the soldiers had small quantities which they would gladly dispose of if they could do so without detection. Two boats were accordingly sent under cover of the night to different parts of the bay shore. One returned with a few otter skins, but the other was seized by the watchful commandante, the mate and two men being bound and left on the beach under a guard of three men. Next morning Cleveland went ashore with four men, each armed with a brace of pistols, rescued the captives and brought them off. Sails were set at once and the somewhat hazardous attempt was made of running out past the guns of the fort. The hoisting of a flag and the firing of a blank cartridge from the battery had no effect, and when a nine-pound ball came across her bow the *Lelia* still kept on her course, with the Spanish

soldiers forced to occupy the most exposed and conspicuous positions. As she passed the fort two broadsides from her six three-pounders were discharged." Neither the fort nor the ship were seriously injured. The most interesting and regrettable part of the whole story is that the one thousand otter skins, which the commandante would not sell, finally rotted and were thrown into the sea.

There are said to have been weeks in 1812 in which the Russians established at Bodega killed seven or eight hundred otters in the bay of San Francisco alone. The skins at that time were worth at Kiakta or Mainakin on the borders of Persia and China, to which they were sent, from eighty to a hundred dollars each, so that the profits of early Russian adventurers in California were enormous (Hittell, 1885 *a*, p. 626). The total number of sea otter skins definitely recorded as having been taken by the Russian company in California is 13,000. This probably does not accurately record the total number taken. In San Diego, between 1840 and 1845, a skin was worth about a price equal to that of four or five bullock hides. Sea otters in those days were commonly found feeding along the kelp beds and they were shot with rifles from boats.

Vallejo (MS. 1, pp. 105–6) says the otter were so abundant in 1812 that they were killed by boatmen with their oars in passing through the seaweed; and the Russians killed 15,000 a year for five years, and 5,000 a year down to 1831. This account is probably grossly exaggerated (Bancroft, 1885 *b*, p. 430).

Another account, written in 1816, states 2,000 a year were caught. By this time decrease was noticeable, for Bancroft (1885 *a*, p. 420) says: "The Indians still caught now and then an unfortunate, slow-motioned sea otter that came in their way and the padres shipped the small store of skins, or sold them whenever they found a chance. The Russians took a constantly and rapidly decreasing number of otters each year, a number which was greatly exaggerated in the ideas of the Spaniards."

Hittell (Bancroft, 1884 *a*, p. 373) states that the number of sea otter skins taken on the coast annually after 1880 was 5,500, worth in San Francisco $440,000, or $80 each.

There was also established an important trade in fur seals. Captain Wm. Smith went to the Farallones in 1808 with a party of Kadiaks, stayed there two years, and caught 130,000 seals, besides many otter. He took them to China on the *Albatross* and obtained $2.50 for sealskins and $30 or $40 for otter. (Bancroft, 1885 *b*, pp. 95–96.)

Hittell (1885, p. 285) states that the Russians collected as many as 80,000 seal skins at the Farallones in a single season.

In 1810–11 the *Albatross*, one of the vessels engaged in the fur trade, touched at the Santa Barbara Islands, where were found few seals but many sea otters. During the same years, according to the log of the captain's clerk, W. A. Gale, this ship took from the Farallones 73,402 fur seals. In addition they took from the coast 248 beaver, 21 raccoon, 6 wildcat, 153 land otter, 4 badger, 5 fox, 58 mink, 8 gray squirrel, 1 skunk, 11 muskrat, and 137 mole skins. Sea otter skins to the amount of 639 and 631 otter tails were also taken. The estimated value of this catch at Canton prices was $157,397.

From 1812 to 1840 the Russians kept up an establishment at the Farallones as well as at Ross. The chief object was to secure fur seals, 1,200 or 1,500 skins being taken annually for five or six years.

After 1818 seals diminished rapidly until only 200 or 300 per year could be caught and the business was no longer profitable. About 200 sea lions were killed at the same time, the skins and sinews being used in making boats. No fur seals were taken on the Farallones after 1834. (Bancroft, 1885 *b*, p. 633.)

Soon after the year 1825 trappers began making their appearance in the great valleys of California. In 1826 "Jedidiah Smith crossed the Mojave Desert to San Gabriel Mission and trapped the length of the San Joaquin Valley. Repeating the daring adventure in 1828 he was forced by suspicious authorities to leave the country. * * * Smith's heavy catch of furs revealed to Dr. McLoughlin the rich possibilities of the Sacramento and San Joaquin valleys and opened the way for the exploration of the district by the Hudson's Bay Company. In the autumn of 1828, McLeod was sent south along Smith's trail for that season's hunt. He trapped the mountain streams with excellent success and was returning to Fort Vancouver with pack horses loaded with beaver and land otter skins when he was caught in the ascent of Pitt River by an unexpected fall of snow and obliged to cache his furs and hurry on in order to save his men and animals. McLeod was severely censured for this misfortune, and the following year the California district was intrusted to McKay. He ventured even to the Bay of San Francisco and took 4,000 beaver along its reedy shores, but the fur was inferior in quality to that of the mountain beaver and brought only $2 a pound. The next season Peter Skeene Ogden was transferred to this field, and under his energetic management the Great Valley was thoroughly explored and developed. For ten years (1829–1838) a Hudson's Bay Company brigade made its annual traverse, south in the autumn and north in the spring, between Fort Vancouver and French Camp—the post on the San Joaquin. The cavalcade was a picturesque one, formed in Indian file and led by the chief trader. Next him rode his wife, a native woman, astride—as is common with the females—upon her pony, quite picturesquely clad. * * * Next the clerk and his wife, much in the same manner; and so on to the officers of less importance, and the men; and finally the boys, driving the pack horses, with bales of fur, one hundred and eighty pounds to each animal. The trampling of the fast-walking horses, the silvery tinkling of the small bells, rich handsome dresses, and fine appearance of the riders, whose number amounted to sixty or seventy, made a really patriarchal array. (White, Ten Years in Oregon.)"

"American trappers were not slow to avail themselves of the new hunting grounds revealed by Smith, Pattie, and Walker, and year by year larger parties appeared in the Great Valley. They no longer attempted to pack their furs over the mountains, but sold them to traders at the coast ports, and the traffic grew to considerable proportion, from $15,000 to $20,000 a year. [In 1841, according to Wilkes, the export of beaver was two thousand skins at $2 each; sea otter, five hundred skins at $30 each; elk and deer, three thousand skins at from 50 cents to $1 apiece.] Every trapping party was required to have

a license, and the fees brought in a tidy revenue, highly gratifying to the officials." (Coman, 1912, pp. 208, 210, 211, 214, 216.)

John A. Sutter, a German-Swiss trapper, built an adobe fort three miles above the junction of the American River with the Sacramento, and organized a considerable fighting force. He had the governor's commission to defend the frontier against gentiles and horse thieves. His first business venture was in the fur trade, for beaver were still abundant up the Fork. However, he soon had an opportunity to buy at a bargain agricultural implements, seeds, plants, and draft animals from Bodega, and was thus enabled to develop his estate and to give up trapping as a livelihood.

The Hudson's Bay Company continued operations in the San Joaquin and Sacramento valleys until 1841 or later. Headquarters were at Yerba Buena (San Francisco). Trapping stations were established at French Camp in San Joaquin County and at French Camp in Yolo County.

Writing in 1840, Lanman calls attention to the declining fur trade in the following words: "But the fur trade appears fated to decline upon the eastern as well as the western portion of the Rocky Mountains by the diminution of the animals from which it seeks its profits. This diminution has been obviated in some measure by the Hudson's Bay Company, who have preserved these particular tracts undisturbed. But where those precautions are not used the American or British trader advances to the territory and strips it of its wealth, so that in a short time there will be but little left upon the soil for commercial enterprise."

Beaver and otter were reported as becoming scarce on the Sacramento River as early as 1837.

By 1885 the fur trade had so declined that Hittell (1885 *b*, p. 564) states: "The days of fur hunting, which once was a great business in California, are gone, and it can not be long until wild fur-bearing animals will be curiosities in the country." Since that date a steady decrease has been noted and his prediction is almost fulfilled.

Having now shown the fur trade as it existed in the past in California, let us now look for a moment at the fur trade of the world today, that we may better appreciate the money value of fur-bearing mammals. The immensity of the fur trade is best shown by the following quotation taken from a report by J. Walter Jones to the Commission of Conservation of Canada (pp. 73–83): "The volume of the fur trade is simply amazing to one who has not studied the question. We have figures of Brass of Berlin, who has been in the business for many years and who for thirty-five years has been collecting fur statistics. He estimates the total production of the world as 360,000,000 marks, or $100,000,000. I have been assured that America alone spends $100,000,000 a year on manufactured furs at retail prices. The whole world pays, roughly speaking, for manufactured furs at retail prices about $350,000,000 annually. In Australia the value of pelts is about $6,000,000, while Africa and South America produce pelts worth about $2,000,000 a year. Warm countries, of course, do not produce furs. For Persian lamb—the product of the karakul sheep—America pays wholesale approximately $14,000,000. In America the pelts as sold in our houses—not the prices the trader gets, but the prices after they

come to the wholesale house—amounted to $24,000,000 a year. Asia and Europe each pay about a similar amount.

"In America a greater number of muskrat skins are obtained than of any other fur-bearer, except the rabbit, several million skins going to the market yearly. Of other American animals we might mention the skunk, about one and a half million skins of which are sold yearly; the opossum, about a million; the mink, about six hundred thousand; the raccoon, six hundred thousand; otter, about two hundred thousand; marten, one hundred and twenty thousand; lynx, ninety thousand; beaver, eighty thousand, and fisher, ten thousand."

It can be estimated from figures given by Ernest Thompson Seton in his "Life Histories of Northern Animals" that the revenue to North America for the last seventy-five years, from the sale of the

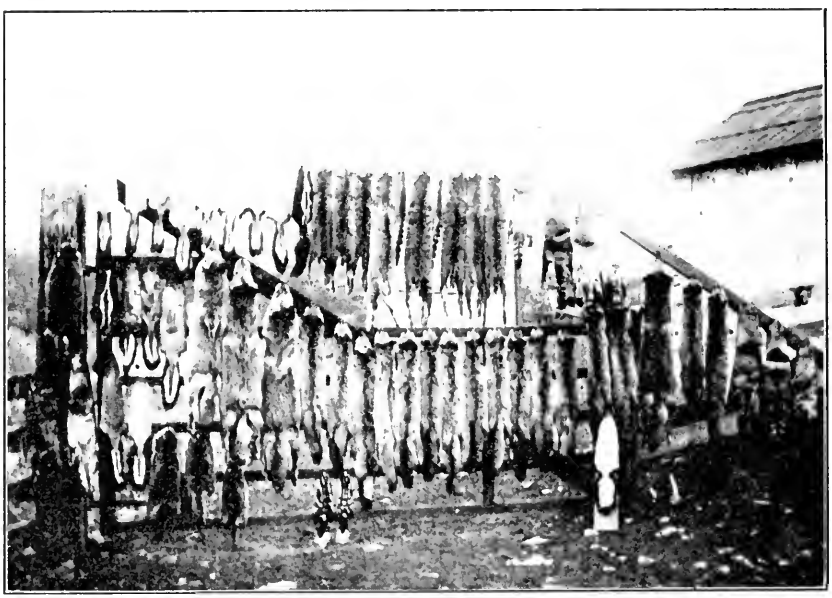

FIG. 27.—A trapper's valuable catch of furs in the Sierras. This was the catch at one location only. Photograph by Geo. Williamson, Jr.

skins of the commoner fur-bearing mammals, has been $222,735,000, and to the United States $113,950,000. This means that there has been an average annual income to North America of about three million dollars and to the United States of $1,500,000. The average annual fur production of North America in recent years is estimated at $24,000,000. The sale of skunk skins, alone, brings in an income to the trappers of the United States of about $3,000,000 annually.

According to a St. Louis fur importer, approximately twenty-five million fur-bearing mammals were caught in North America last season. These pelts had a cash value of about twenty million dollars.

The total North American catch of last year (1914) has been approximated as follows: Muskrats, 15,000,000; opossums, 2,800,000; raccoons, 2,400,000; skunks, 2,152,000; minks, 630,000; civet cats, 500,000. Vari-

ous other kinds, including foxes, wolves, otters, beavers, fishers, wildcats, lynx, bear, white weasel, martens, wolverines, and mountain lions, amounted to 1,500,000 skins.

Hence it must be seen that in its fur-bearing mammals the United States has an extremely valuable asset, and one which, when the income is estimated, ranks ahead of some of the other natural resources. California formerly ranked high as a fur-producing state. (See figs. 27 and 28.)

The skins of fur-bearing mammals have, since earliest history, furnished men with clothing. In fact, so important were they in the early history of North America that they formed not only a medium of exchange among the Indians, but also among the early settlers.

As far as money value is concerned, furs furnish the most valuable of all the products to be derived from wild animals. At the present time, although furs have ceased to be a necessity and have become a luxury, yet the demand for them is steadily increasing. Furs have become scarce not only because less are produced, but also because more are demanded.

A number of factors have been instrumental in increasing the demand. Population has greatly increased and the relative number of people in sufficiently good circumstances to be able to purchase furs has also increased. The added interest in fashionable dressing to be seen in our cities and the growing use of the automobile, with its luxurious fittings and need of warm clothing, have also been instrumental in increasing the use of furs.

This increased demand for furs has rapidly depleted our supply. Hunters and trappers have penetrated the most secluded haunts of the fur-bearers and a decrease is to be noted everywhere. Nor has the hunter and trapper been the sole agent in the decrease, for the advance of civilization has cleared away the forests, drained the swamps, and continually de troyed the natural homes of fur-bearing animals. The London sale of furs by C. M. Lampson & Company shows that all of the more valuable furs have decreased in numbers from 20 to 95 per cent. Along with this decrease of the numbers of pelts of the more valuable fur-bearers has come an immense increase in the numbers of pelts of the commoner mammals, such as the muskrat, skunk, and lynx. In the offering at the London sales of January, 1914, more pelts of every species except the mink and the civet were offered than were offered in 1913. The increase in the price of pelts during the last twenty years has averaged about 25 per cent for the staple fur-bearers of Canada.

There are two important ways in which we can meet this steady decrease among the fur-bearers. First of all, we can encourage the breeding of fur-bearers in captivity; and, second, we can pass laws which will protect them in the wild during the summer season when their fur is not prime, or we can entirely close the season, thus reducing the number taken each year. By the use of both methods can we alone hope to supply the present demand for furs.

Those who have attempted in recent years to domesticate fur-bearing mammals have found that it is a profitable industry. Already fur farming has progressed beyond the theoretical and experimental stage in Canada and the eastern United States.

It was not until success was obtained in breeding the silver and other color phases of the fox that fur farming was undertaken along extensive lines. Of course, as the price of furs has steadily increased the incentive to rear fur-bearers in captivity has been augmented. The pioneer fox breeders have acquired wealth in their business and have, therefore, inspired in others the desire to enter the same business. As a result of the demand for breeding stock, the price of animals has increased to such an extent that it is beyond the means of the average man. Consequently corporations and partnerships involving a capitalization of as high as ten million dollars, have been formed for farming the silver fox. The industry has even spread to Russia, where the sable and several species of fox are now extensively farmed.

The success of fox farming has also brought about the attempt to breed in captivity some of the less valuable fur-bearers, such as the mink, raccoon, and skunk. Of late years the value of skunk fur has steadily increased until now the sale of that fur brings into the United States about three million dollars each year. The numbers sold in London jumped from 426,610 in 1899 to over 2,000,000 in 1911. Prime skins at the present time bring from $1.50 to $3.50. It is believed that the prices will increase rather than decrease.

The 1915 price list from Funston Brothers & Company, a large fur house in St. Louis, shows that the prices paid for the more valuable furs have been greatly reduced. The prices paid for black and silver fox skins were $800 to $1,000 in 1914, but are only $400 to $600 in 1915. The prices for mink, fisher, marten and coyote skins have been reduced about one half. This marked reduction is attributed to the war and will, no doubt, be for a limited time only. When the war is over and the European markets again open there will doubtless follow just as sudden an increase in prices.

There seems to be little danger that the fur-farming industry will fail to be a permanent one. Not only is fur farming an attractive and interesting occupation but it will continue to be remunerative. In spite of the past year, when the period of financial stringency would naturally react most seriously on such a luxury as furs, the price of furs has increased instead of decreased. This has been also in spite of the fact that, in 1913, two or three firms in Leipsic, Germany, failed and threw upon the market at reduced prices $4,000,000 worth of furs. Mr. J. Walter Jones, who has carefully investigated the fur-farming industry in Canada, reports that there are not more than 1,600 silver foxes in captivity in the world. Probably the world's yearly production of real silver fox skins does not exceed five thousand. Fur dealers maintain that silver fox skins will never sell for less than $100 each, and since the rate of increase of silver foxes in captivity is only about one hundred per cent yearly, it appears that at least the farming of foxes will continue to be profitable. Another reason why fur farming will doubtless continue to be profitable is because a better grade of fur is obtained. Ranch bred stock are animals improved by domestication, and being killed carefully and at exactly the right time, the fur is prime and the skins are never torn or injured.

The United States Biological Survey is now carrying on experiments in breeding fur-bearers. Two stations are maintained, one at Prichard, Idaho, and the other at the National Zoological Park, in Washington,

D. C. Those interested will be able to profit by the results of these experiments.

We have long had laws to protect our fish and game but the fur-bearers have been entirely neglected. Meanwhile they are disappearing so fast that the danger point has been reached. Attention to this resource is highly necessary at this time, both because of economic reasons and because there is danger of its passing beyond our control through its entire extinction. The fur-bearing mammals can be made to pay a large dividend if the capital stock of breeding animals is increased.

In most of the provinces of Canada, and in many of the eastern states, all of the more important fur-bearing mammals are protected during the summer season, when their fur is of practically no value.

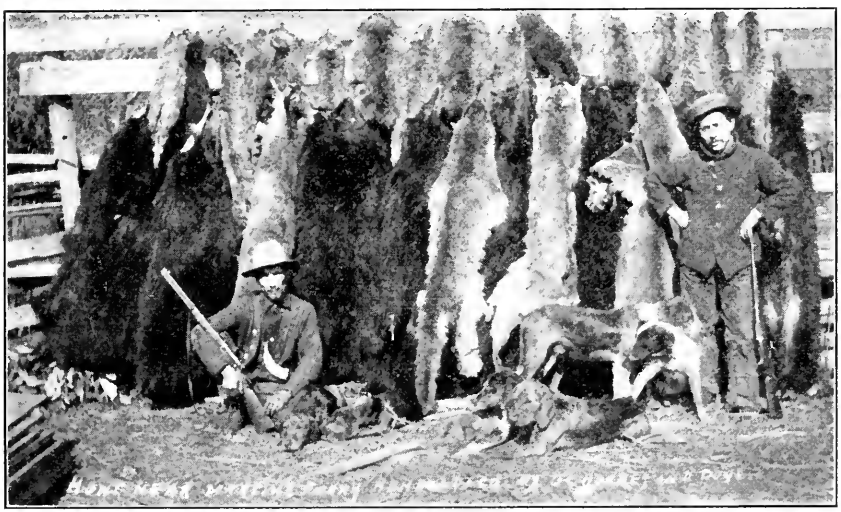

FIG. 28.—Skins of fur-bearers obtained on a hunt with dogs near Martin's Ferry, Humboldt County.

The open season is usually limited to five months—November 1st to April 1st. In many places a license has to be procured before fur-bearers can be trapped. In Canada the demand for live animals for breeding purposes has become so great that laws have been passed prohibiting the hunting of fur-bearing animals during the breeding season.

Each state as it has attempted to protect the fur-bearers has been confronted with difficulty, for many of the fur-bearing mammals are predatory and their depredations on domesticated animals and birds are in many cases serious. In most instances trouble has been avoided by providing that animals found destroying poultry and live stock could be killed. In many cases where depredations are reported the rancher himself is to blame for not better protecting his poultry and farm animals and as people come to a knowledge of the value of fur-bearers as a national resource there will be more interest in their preservation.

In eastern states the protection afforded fur-bearing mammals appears to be effectual and adequate. In many places where beavers

have been protected for a number of years an increase is to be noted. California should investigate the success obtained in other states and should profit by their experience.

A state trapper's license is very desirable for two reasons: First, it eliminates the man who traps for the fun of it, and who is not interested in preserving the furs; and, second, it furnishes information as to the number of trappers and the amount of trapping done. The latter is particularly important in furnishing data on which to base further protective legislation.

In the beginning of this paper a glimpse of the early fur trade in California was given so as to afford a comparison with conditions at the present time which are fairly well known by everyone. There followed statements which showed the extent of the world's fur trade, and then, possible methods which could be employed to develop the fur industry in California by conserving the fur-bearers. In conclusion, the urgent necessity for early attention to the problem of conserving the fur-bearers should be emphasized. Now is the time to better conditions, not after it is too late. It has taken millions of years to produce the animals which we have now and yet we sweep them out of existence in a hundred years, or less. Man is able to create great industries which become a resource to a country, but where is the man or the group of men that can create a resource that compares in the slightest degree to any of the great natural resources? Man-made creations are capable of restoration but an extinct form of life can never be restored. In this ethical viewpoint we perhaps find the strongest argument of all. But add to this the economic viewpoint and we have an argument in favor of wild life conservation that defies every assailant. Will the people of California heed the handwriting on the wall and properly discharge their duty to the wild life itself, to their state, and to humanity?

Summary.

A casual investigation has shown that there has been a large decrease in the number of fur-bearing mammals in California. This decrease becomes very apparent on comparing the present status of these animals with that of the past. In the early history of California there is much which relates to the abundance and great money value of the fur-bearers. History shows that several companies were formed and many expeditions undertaken in order to develop the fur trade. From 1800 to 1812 a number of American ships annually visited the California coast, trading cloth, muskets, and other material for skins. The toll taken of such valuable fur-bearers as the fur seal, sea otter, and beaver led to their practical extermination. The fur trade in this state began to decline about 1820, but the Hudson's Bay Company kept up their trade until about 1840. Since that time the procuring of fur has been limited to trappers in the mountain districts. The time has now come when several of the fur-bearers need absolute protection; others need to be protected during the breeding season, and still others during the time when their fur is of no value.

We have long had laws to protect our fish and game but the fur-bearers have been entirely neglected. Meanwhile they are disappearing so fast that the danger point is reached. Attention to this resource is highly necessary at this time, both because of economic reasons and

because there is danger of its passing beyond our control through its entire extermination. Two methods of conserving the fur-bearers are possible and practicable. Several species can be conserved by rearing them on fur farms, thus allowing a monetary harvest to be reaped. The remnant which is left in the wild can be made to hold its own and to increase by giving the mammals proper protection by law. Both of these methods are being employed with success in other parts of the United States. California must fall in line and protect fur-bearing mammals if she desires to conserve this asset to the state and make it a source of income and a heritage to pass on to future generations.

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WARDENS AND WARDEN WORK.*

By T. S. Palmer,

Assistant in Charge Game Preservation, United States Department of Agriculture.

It is a pleasure to me to meet the wardens. While it is some years since I have been in Vermont, I feel that I am not entirely a stranger to this state, or its conditions.

During the past three months I have had an opportunity to meet and compare something like 500 wardens, or would-be wardens in different parts of the United States, and I believe that I have examined orally not less than 200 men who were already in state service, or who aspired to such positions. It occurred to me that it might interest you to know what is required of wardens in different parts of the country, and also what is being done to raise the standard of warden work, in the various parts of the United States.

So far as I am aware there are no foreign countries, with possibly a few exceptions, that have any officers like our wardens. Canada has officers usually known as game guardians or game protectors, whose duties are somewhat similar; Australia has officers known as rangers, who look after her game; and in some British colonies of South Africa there are officers whose duties correspond somewhat with those of wardens in the various states. Neither in England, nor in Scotland, so far as I can learn, are there any such officers, and the work of looking after the game falls largely on the employees of private estates, the gamekeepers. In Germany the work devolves very largely upon forestry officers, who besides being wardens are required to do regular forestry work. Somewhat the same conditions prevail in Hungary and in Austria.

The warden service in the United States is very largely an institution peculiar to this country, and it behooves us not only to know what is being done, but to keep in touch with the advances made in this work. Not long ago, in one of the examinations, in the middle west, I asked one of the candidates what was his idea of a warden. (This man was not yet in the service, but hoped to be.) He replied, "I know what a warden is. He's a man that wears diamonds in his shirt front and draws his salary!" In some sections of the country this has probably been true of wardens. In some states a warden's position has been looked upon as a last resort. A man who was out of a job, or was unable to get work, or who had failed in different callings, could always get an appointment as a warden. Naturally the pay for such work was not always satisfactory, to the state, to the people, or, in many cases, to the wardens themselves.

In order that we may meet on common ground, let me say that I distinguish very carefully between warden work as a job and warden work as a profession. If you are serving the state of Vermont merely for the pay, and have no other motive, you had better quit at once, both for your own sakes and for the sake of the state. But if you are in the service of the state to protect its game, to assist in the management of the great natural resources of the state for the benefit of the

*Address delivered at the Second Annual Convention of the Sportsmen of Vermont, March 4 and 5, 1914.

public, and for the benefit of coming generations, then certainly you are worthy of your hire and are engaged in a noble profession.

Not many years ago there was no provision for the payment of wardens in any of the states. They were supposed to secure what recompense they could from a portion of the fines for violation against the game laws. The "moiety system," so called, has never been a success in any of the states where it has been tried—it was merely a first step. Then provision was made for paying salaries at so much per day or per month, but these salaries were small. A warden was not supposed to be worth as much as a common laborer. Salaries of $30 or $50 a month were regarded as ample for the arduous duty of protecting the game and risking a man's life in enforcing the laws. Later on, more onerous duties were imposed, more was expected of the wardens, and in some cases fairly respectable salaries were provided. Today, speaking generally, wardens' salaries range from $60 a month, or $2.00 a day (fortunately very few states pay as little as that but usually at least $75.00 a month, or $2.50 a day), up to $125 a month or $1,500 a year.

Among the things which we are looking forward to, to make warden work a profession and not a job, are:

1. Stability of compensation so that a man can count on receiving a regular salary.
2. A living wage.
3. Reasonable opportunity for promotion, when a man has attained increased efficiency and experience; and,
4. Retirement on a reduced salary (as in Massachusetts), when a man has served the state for a number of years.

Stability of compensation is important to obtain good service. A man can not be expected to work one day for the state and the next day for a private employer, and give good service to both. Neither can a warden be expected to give good service to the state for a less wage than a man receives for digging a ditch in the street. Warden work, under modern standards, requires a high degree of intelligence and a good many qualities which can not be had for nothing. Even with these things we can not get the best results if a man has nothing to look forward to after ten years' service except a number of enemies, the enmity of his neighbors and the possibility of being shot while in discharge of his duty.

Let me tell you in a few words what some states are doing to secure the best results in warden service. In the first place, to get the best men, five states have what is known as a "civil service" law. This is nothing more than the application of the merit system to appointments for warden work. A civil service law does not make good wardens, it simply sifts out the fit from the unfit. New York was the first state to apply the merit system to the game warden service by the ordinary test of a written examination as a prerequisite to appointment.

Wisconsin went a step farther and required not only a written examination, but an oral examination and certain physical tests. Every candidate for the position of warden reads the game law and if he has a retentive memory and is reasonably bright he can easily learn the various open and closed seasons, etc., but he may have had no experience in the field and may know nothing about the application of the law.

An oral examination brings out these facts. A warden may tell you about trapping, how to handle a gun, or how to handle a boat, but take him out in the woods or on the water and you will soon see whether he is repeating something he has learned or whether he has had actual experience. Consequently in some states the physical test is considered very important.

Recently the medical test has been added also. In New Jersey this test is severe because warden work in that state is hard and rather dangerous, and as there are many applicants there is no reason why any man should be appointed who is not absolutely sound physically. Wardens are required to undergo the same tests for strength and endurance as applicants for the positions of firemen and policemen, and then to take some tests especially applicable to the warden service.

Without going into too much detail let me describe the examination for deputy wardens held in Illinois last December. Sixty positions were to be filled, and the salary, $100 a month and expenses, was evidently attractive, for there were 359 applicants, or an average of six candidates for each place. The examinations were held in the armory at the state capital, Springfield. The candidates were required (1) to give brief statements of their experience, (2) to tell something of their education, and (3) to answer ten questions on the game law and warden's duties. While some were writing out answers to questions, others were formed in line around the room, and were examined as to their physical condition. The services of seven physicians were required for this part of the examination. Stepping up to the first physician each candidate was measured and weighed; a few steps beyond he found another physician who sounded his heart and lungs; a little farther on another who tested his eyesight and hearing, and so on. After the men had finished their written and medical examinations they were taken upstairs to the state museum and passed in line in front of a series of cases in which were arranged thirty or thirty-five mounted specimens of common birds, fish and game. They were given one minute in front of each case to identify at sight the fish or birds which they were required to protect. They were then given an oral interview separately of three to ten minutes as to their general knowledge of conditions in the state, the protection of game, and warden's duties. The examination lasted from 9 in the morning until 10 at night—not continuously for each man, but it required thirteen hours to handle the whole number of candidates.

The next day some of the men were taken out into the field and examined in handling a gun, in running a motor, and in various other outdoor tests. On the basis of this examination appointments were made to the sixty positions, and under the civil service law of Illinois only the highest man can be certified for a position. As the examination was required both of wardens already in the service who were holding temporary positions and those outside the service who wanted to be wardens, it was necessary for a warden who wished to hold his position not only to take the test, but to stand at the head of the list.

Two months later, in February, a second examination was held for the position of district warden, corresponding somewhat to that of county warden in Vermont. The chief duty of the district warden is to supervise the work of the local deputies and his salary is $1,500 a year. There were six positions to be filled, and sixty-six candidates, or

eleven applicants for each position. The examination was much the same as that for the deputies, except that it was much more severe. Among the questions asked were questions of policy, regarding the handling of men, how to distribute wardens to secure the best enforcement of the law, how to work out certain problems in different parts of the state, etc. These Illinois examinations were the largest of the kind ever held in this country for the purpose of selecting men to serve as wardens.

Three weeks ago it was my privilege to attend the warden's school in Wisconsin, which lasted three days. Wisconsin has gone a step farther than some of the states in providing promotion for men who perform their work satisfactorily and pass a suitable examination. The first step is to grade the men. Those who enter the service as protective wardens receive $2.50 a day, or $75 a month; those who elect to enter the service for what is called "outlying fishing" work, which consists of looking after the commercial fisheries on Lake Superior and Lake Michigan, get $3 a day, or $90 a month; and those who wish to enter transportation work, inspecting the shipment of game or fish, also receive $3 a day, or $90 a month.

Last summer the state warden inaugurated a correspondence school for wardens. On the first of each month he sent each of his men five questions which the deputies were requested to look over and answer to the best of their ability. Failure to return the answers counted on the record. The warden then sent out copies of the correct answers and each deputy was asked to compare them with his own. The fifth month the state warden invited the deputies to submit five questions which they would like to ask relative to the game laws. Instead of attempting to answer them, he brought this collection of several hundred questions to the annual convention and had the men discuss them, and in this way thoroughly covered the ground by a general consideration of the more practical questions which arise in the state.

Each year the state assembles the deputies and holds a promotion examination, open to those who have been in the service more than six months. Each man with a satisfactory efficiency record, who attains the requisite marks on the examination is entitled to a liberal promotion. Every man is anxious to secure a promotion and every member is on hand, ready to do his best. A man's record for the year counts 50; the written examination counts 30; and the oral interview counts 20 per cent. The efficiency record does not depend upon the number of arrests made but is divided into five parts, of which the number of arrests and convictions is only one, and in some cases a very small part. A good deal of prominence is given to the success of a deputy in building up sentiment in his community in favor of fish and game conservation, for the law of Wisconsin requires the warden to instruct the public as to the protection of fish and game. Another thing that counts is prompt and efficient service, and still another is promptness and care in making out reports.

The men that brought in the largest number of arrests were subjected to very careful scrutiny in the oral examination, and it soon developed that this was a very uncertain basis for promotion. Many men, thinking that the number of arrests was the test that counted, had evidently been looking for all sorts of minor offenses, many of them doubtful

cases and none of them particularly difficult. Others had given all their attention to minor fishing cases (although the only support for the warden service was derived from the receipts from hunting licenses) and a few had given attention to difficult cases, such as dynamiting fish, or detecting illegal shipments of fish or game. As a result the number of arrests, in many cases, proved disappointing to the men themselves, because they found that quality rather than quantity of work counted in making up the record.

On the basis of the promotion examination every deputy in Wisconsin who passes successfully may receive an increase of fifty cents per day, which will amount to nearly $200 a year and he may be promoted from $900, the lowest salary, as high as $1,400 a year.

New York also has a system of promotion, but the increase in salary is $100 a year. The examination is not open to the entire department, but only to those men who have attained a certain grade in their efficiency record during the year.

The civil service conditions that have been mentioned are required by law in six states—New York, New Jersey, Wisconsin, Illinois, and recently in California and Massachusetts. They have been adopted as the policy of the game commission in Delaware and are likely to be introduced as the policy of the commission in Michigan and Kentucky. When Delaware passed a hunting license law and received a fund sufficient to pay regular salaries to wardens, the game commission insisted that a written examination was first to be held for the position of chief warden. As soon as the chief warden had been appointed he was instructed to confer with the department of agriculture and prepare an examination made up of written, oral and outdoor tests suitable for deputies. When the appointment of the deputies had been made the commission secured the services of two experienced game protectors from another state to work for a few weeks with the new men so that Delaware has had good service from the very first and has secured some very surprising results.

So much for the methods of selecting wardens. Massachusetts, as already stated, has gone a step farther and has provided that its officers, including wardens, who have served for fifteen years, may retire on a certain percentage of their salary. In other words, the state treats its wardens as some large railroads and other business concerns treat their employees. The time may come when other states will follow this example, but at present Massachusetts is the only one that has taken this decisive step.

Turning for a moment from the warden to his superior, let us see how conditions have changed in recent years. Not many years ago the state warden, or commissioner, in one of the western states was called in by the governor, who was about to prepare his message to the legislature, and was notified that unless he could find some way of making his department self-supporting the governor would be obliged to recommend the abolishment of fish and game warden work. The warden submitted a plan for a hunting license system, which was adopted at the next session of the legislature, and from that day to this the service in that state has been self-supporting. The game department is now self-supporting in about half of the forty-four states that have game commissions—chiefly through the income from hunting licenses.

Recently Prof. T. S. Adams, of the tax commission of Wisconsin, in a public address on taxation, declared: "The game warden department of Wisconsin is paying dividends to the state." That department is not supported by ordinary appropriations; it has never cost the taxpayers of the state a dollar for the protection of game, and last year, after paying all expenses, it had a surplus of about $60,000. A commissioner who can handle his department and make it a revenue producer for the state is entitled to reasonable compensation. So it has come about that while a few years ago $1,000 was considered a reasonable salary for a commissioner, considerably larger salaries are now paid in some states. In New York $10,000 is paid to each of the three members of the conservation commission; several states pay from $3,000 to $5,000, and a majority of them now pay $2,000 or more. In some states the warden is not only a police officer, whose chief duty is to enforce the game laws, but he must be skilled in game propagation, just as he is supposed in some states to be skilled in fish propagation; and he may be required also to assist in forestry work, if necessary; to aid in fire warden work, or to take part in educational work.

Let me digress a moment to speak of some of the duties of federal wardens who are called on to do a variety of things. We have some wardens who are in charge of the national bird reserves (of which there are now sixty-four) to see that the birds are not molested during the breeding season. We have wardens whose duty it is to take care of big game, especially buffalo and elk, on some of the game preserves of the west; and we have wardens whose duty it is to feed the elk. In Wyoming we feed sometimes as many as 7,000 elk, feeding each winter from 500 to 700 tons of hay. It is also the duty of some of the wardens to accompany and care for the shipments of elk made to different states for the purpose of establishing new herds. Finally, we have men cooperating with state officers in the protection of migratory birds and in the enforcement of the laws regulating interstate commerce in game.

The warden of today must be an all around state officer, familiar with his territory, familiar with the habits and haunts of the various kinds of birds, game and fish under his protection, and familiar with the people in the community. He must be in touch with conditions elsewhere, must keep informed as to new inventions for hunting, improvements in firearms; new devices for outwitting the game laws, and novel plans for game conservation, so that when called upon to express an opinion as to what is necessary to meet certain conditions, he may at least know what is being done in other states in the enforcement of the fish and game laws. New problems are rising fast, but unless a warden is familiar with them he is not earning his salary. To meet this difficulty some of the states, like Vermont, have established annual conventions for the purpose of bringing the wardens together to compare notes, to get acquainted with each other and to learn what is being done in this and other states in the various lines of conservation work.

I have gone over these points hurriedly to call attention to the steady progress in the administrative part of warden work; to let you know that progress is being made in recognizing the value of warden service through fair salaries, and the hope of still better salaries through pro-

motion. The one thing I want to impress on you is, that in order to succeed, a warden must regard his work as a profession, must realize that it demands unremitting attention and study, and that it is essential for him to keep fully abreast of the times.

THE TENNESSEE POSSUM HAS ARRIVED IN CALIFORNIA.

By Joseph Grinnell.

Contribution from the Museum of Vertebrate Zoology, University of California.

On February 25, 1914, there were received at the Museum of Vertebrate Zoology of the University of California two live possums (*Didelphis virginiana* of scientific parlance) (see fig 29). These were kept alive at the museum a few days and then killed and preserved as scientific specimens, these now bearing the museum numbers 20799 and 20800.

The circumstance of particular interest was that the animals were captured wild here in California, where possums were never known to have been native. They were secured and sent to us by Deputy Fish

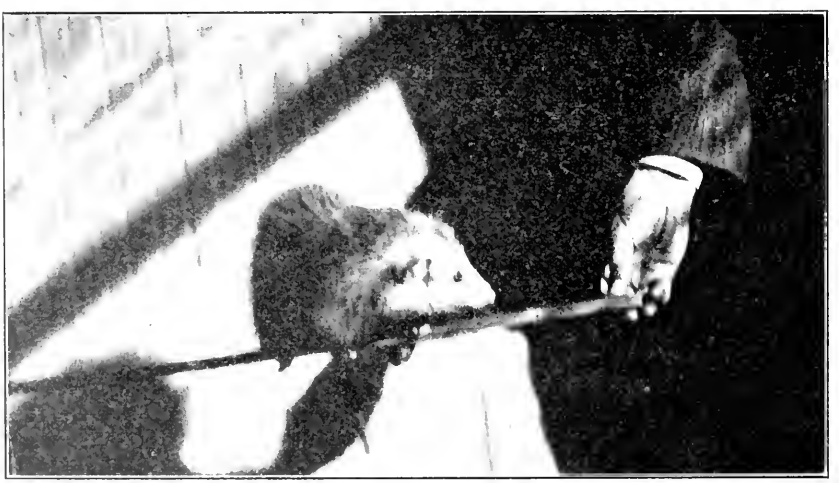

Fig. 29.—A Tennessee possum caught near San Jose in February, 1914. This animal is becoming well established in Santa Clara County, where several escaped from captivity about four years ago.

and Game Commissioner I. L. Koppel, of San Jose. The exact locality of capture was on the Wade Ranch on the banks of the Guadalupe Creek, near Agnew, Santa Clara County, where they were taken February 5 and 23, 1914.

At our request, Mr. Koppel has made extensive inquiries in regard to the occurrence of possums in the vicinity of San Jose. According to Mr. Koppel's findings there have been at least two cases of importation and liberation, both "about four years ago." Mr. J. R. Kocher, a jeweler in San Jose, residing at Tenth and San Antonio streets, imported seven from Jackson County, Tennessee. Two of these got away at his residence; the other five he sent to a negro caterer in San Jose, by the name of Jake Overton. These were kept in a coop at 856

South Eighth street, San Jose, until three "got out," making five that got away out of this one shipment.

Another party is reported to have more recently had shipped to him another lot of possums, about three of which are rumored to have gotten loose. At any rate, we are safe in assuming that the initial introduction took place early in the year 1910.

Up to the end of 1913 possums to the number of fully 100 have been reported as captured, thus many more than can be accounted for as liberated. Ten, at least, of these have been caught in San Jose alone. Others have been found in various parts of Santa Clara County from Sunnyvale to Wrights and Gilroy. On Guadalupe and Coyote creeks tracks have been seen of families of a dozen each. A male was caught down along the creek at Wrights Station. About January 20th three were caught with dogs along the creek at the same place. About March, 1913, at the Standard Oil Company's plant at San Jose, near Los Gatos Creek, a large female was killed, with eight young in her pouch. The young were raised on milk. A male was caught later in the same locality.

Of the two possums sent to the museum, the large male was found on a stump the day before it was shipped. The female was caught in a brush pile previously.

About September 1, 1914, Manuel Silva, on the McClay Ranch, near Evergreen, caught a female that had seven young, about the size of gophers in her pouch. On the S. F. Patton Ranch, on the Mt. Hamilton road, a possum was poisoned recently, and dogs caught another one near by.

Information received on September 23, 1914, is to the effect that on the Wade Ranch, on the Alviso road near Agnew, a female possum was captured by Mr. Wade and given to Mr. Farry of Agnew, where some twelve days later she became the mother of ten beautiful young, two of which, at the present time, are sojourning at the state game farm.

On October 5, 1914, on the George Fiehman Ranch near Milpitas, a fox terrier caught two possums about one fourth grown; and on October 8, 1914, the dog caught three more about one half grown, showing that at least two litters were represented. These five possums, together with two procured from Mr. Farry of Agnew, were sent by Mr. Koppel to Superintendent W. N. Dirks, at the state game farm at Hayward. On October 20, 1914, Mr. Koppel caught a large male possum on the George Fiehman place and shipped it at once to the game farm. This possum was as large as Fiehman's dog. All together, at least nineteen have been caught on the Fiehman ranch.

It is reported by Mr. Koppel that five of the possums got away at the game farm on October 13th.

It is believed that fully two hundred possums are accounted for to the present date as killed or captured, and in spite of this, the species appears to be spreading and multiplying at a rapid rate.

It would appear that the possum has found in this part of California congenial climatic conditions, at least sufficiently near those of its native habitat in the southeastern United States so that it is thriving. It is rather doubtful if we are to consider ourselves lucky in having acquired this addition to our mammal fauna. In fact, it is quite possible that we may live to greatly regret the circumstances which secured its introduction into our state.

The following account abbreviated from Rhoads (1903) will give a vivid idea of what we may expect of the animal:

The possum spends the day in hollow trees, logs, deserted burrows of other animals, drains, sewers, brush piles, hay stacks, and outbuildings. It prowls abroad at night, foraging for fruit, nuts, eggs, birds, and rodents, reptiles and insects. When other food is scarce it eats carrion, and may even become a cannibal. It lives and multiplies in thickly settled regions, this doubtless because of its omnivorous diet, its fecundity, its habit of "playing possum," and its nocturnal habits.

The birth rate of the possum is marvelous. As many as sixteen young are produced at a time; at birth they are three fourths of an inch long, naked, and with rudimentary hind limbs. Each youngster is securely attached to a teat within the abdominal pouch of the mother. From this pouch they emerge when about the size of small rats, and cling by tail and feet to the body of the parent. There are said to be as many as three litters per year.

The fondness of the possum for fruit, eggs and poultry can scarcely be offset by the facts that some people consider it good to eat and that it is somewhat of a scavenger and destroyer of vermin. Its over-abundance, however, may be checked by trapping, and it is not likely that the possum will spread far beyond the thickly settled parts of the state where it can find a living around orchards, gardens and barns.

It will be extremely interesting to watch the history of this, our latest immigrant.—*Museum of Vertebrate Zoology, University of California, Berkeley, October 26, 1914.*

THE HALIBUT FISHERY OF THE PACIFIC COAST.*

By Edward P. Rankin,

General Assistant, Scientific Department, U. S. S. Albatross.

The purpose of this paper is to present a brief description of the gear and the methods used by halibut fishermen; in it are set forth a few observations, made throughout the halibut investigation, which was conducted off the coast of Oregon by the United States Bureau of Fisheries, during part of April, May, June, July, August and September, 1914. The work was carried on, part of the time from the fisheries steamer *Albatross*, on which expert fishermen were employed; and part of the time from Newport, Oregon; consequently, the methods have been viewed from all sides. The information here given regarding the fisheries is the result, both of actual fishing operations in which the writer took part, and of interviews with skippers and fishermen of various halibut boats.

Hippoglossus hippoglossus, the common halibut, is a member of the flounder family, and one of the most valuable of food fishes; its body is extremely flattened from side to side, oval in outline, almost white on the lower side, and dark gray or grayish-brown on the upper side. In this connection, it must be remembered that this fish swims on its side; in consequence, its back and its belly are in the same horizontal plane. This is all due to the distortion of the head, because of which both eyes are situated on the same side, the "blind" side being the lower. The very young halibut has the appearance normal to other

*Printed with permission of U. S. Bureau of Fisheries.

fishes, and swims on its belly; but soon the skull becomes so twisted, as to bring the two eyes on the same side—usually the right; from that time on, the fish assumes the horizontal position. The mouth, armed with strong teeth, is small in proportion to the size of the body as compared with most other fishes, but it is proportionally large in comparison with other flounders.

In point of size, the halibut is one of the largest fishes, ranking with the swordfish, the tarpon and the tuna. Specimens weighing four hundred pounds, or more, have been taken, but they are not commonly seen; Jordan and Evermann, in "American Food and Game Fishes" (1905, p. 524), mention that "Nilsson records one from the coast of Sweden that weighed 720 pounds." A fish weighing between eighty and one hundred pounds measures nearly five feet in length; its "depth," *i. e.*, the distance from back to belly, is about one third of its length. A fish that has attained a weight of three hundred pounds is about seven feet long, and perhaps three feet deep.

It has not yet been learned when spawning occurs, nor is it known under what conditions this takes place. On September 1, 1914, in a female halibut caught on the *Albatross'* gear, the eggs were looser, somewhat larger, and seemingly more nearly approaching "ripeness" than was the case in any female halibut previously taken during the investigation. Apparently, the time for spawning was approaching, but the evidence is too slight to form the basis for any theory.

Concerning the food of the halibut, little is known, for the reason that eight or nine tenths of those caught are found to have disgorged the stomach contents. Some evidence, bearing on this question, was obtained as a small result of the investigation. Strictly carnivorous, the fish has a varied diet, sometimes exhibiting positively cannibalistic tendencies. In the stomach of one halibut was found a starfish; another contained a small octopus; while from still a third one, a young ray was removed; crustaceans, such as shrimps, are also indulged in at times. But fishes, of various kinds and sizes, seem to constitute the bulk of the halibut's food. A small halibut, partly digested, was found in a larger one; and in each of several halibut were the bony remains of fish which must have been somewhat of a "mouthful" for the captor. One halibut, in particular, weighing about 130 pounds, contained, all at the same time, a hake (*Merluccius productus*), a silver salmon (*Oncorhynchus kisutch*), and a red rock-fish (*Sebastodes ruberrimus*), the so-called "rock-cod." Each of these fish weighed fully ten pounds, and had been swallowed only a short time before the halibut was caught.

Distinctly an inhabitant of the bottom of the sea, the halibut roams leisurely about, but probably does not remain long in one locality. This is inferred from what fishermen report; that, after they have fished one place for perhaps a day, they are obliged to shift to another location five or ten miles away, because the fish have disappeared from the old ground. Bottom of coarse sand or fine gravel, on which sea-pens and anemones abound, seems to be preferred by the fish, while muddy or barren bottom is either shunned or passed over rapidly. In addition to the character of the bottom and the abundance of food, *temperature* is a factor influencing the wanderings of the halibut; rarely is the fish found in waters warmer than 45° Fahrenheit, but is most commonly taken in waters considerably colder.

Ranging from Behring straits southward as far as the latitude of San Francisco, halibut are, however, found in commercial quantities only from the latitude of central Oregon northward. By far the greatest amount of halibut is taken in the waters of southeastern Alaska; yet not inconsiderable quantities occur in the region of Cape Flattery, Washington, and off Newport, Oregon. Fairly successful fishing is done off Smith river, in the northern part of California.

The boats engaged in the halibut fishery vary greatly in size, from small ones having a cargo capacity of 50,000 pounds to large ones capable of holding 200,000 pounds of halibut. Each boat—unless it is a very small one indeed—carries from two to twelve dories (flat-bottomed rowboats of special design), from which the fishing is done. Among fishermen, the number of dories carried by a boat is used as an indication of her size; thus, "She carries four dories," or "She carries twelve dories." This phrase indicates, also, how many fishermen are employed on a boat, for each dory is manned by two fishermen.

The gear used in fishing for halibut consists of lines, set with hooks, which are allowed to lie on the ocean bottom. These are called the "ground line." Each line is about 225 feet in length; seven or eight of them, fastened end-to-end, constitute a "skate" of gear, which has a total length of nearly 1,600 feet—almost one third of a mile. To the ground line are fastened, or "bent," short lines, called "gangings" or "gangions," at intervals of about nine feet; each gangion is five or six feet long and has a hook attached to its free end. Hence, there are about twenty-five hooks to a line; and a complete skate, of eight lines, will have two hundred hooks.

For bait, fresh salmon is said to be particularly desirable. Since this can not always be readily obtained, the fishermen have various substitutes for it. Frozen fresh herring is frequently used; and, as a last resort, salt herring. If a boat's supply of bait becomes exhausted, the men resort to the expedient of cutting up, and baiting the hooks with fish other than halibut which have been taken on the lines. Red rockfish (*Sebastodes* sp.), "black cod" (*Anoplopoma fimbria*), and "ling cod" (*Ophiodon elongatus*) all serve as this emergency bait, which is technically known as "gurry." Oddly enough, neither halibut flesh nor ray flesh, when it is used for bait, is taken by the halibut!

When the boat has arrived on the fishing banks, soundings are made until favorable bottom is located; a small sample of the bottom is picked up by soft soap or tallow in the lower surface of the sounding lead. Meanwhile, the gear is baited, and everything made ready for a "set." Frequently a trial set is made, to determine the prospects for a good haul; one skate of gear is usually put down and allowed to lie for a couple of hours. If the results of this are good, the other dories are lowered; if they are not good, the boat's berth is shifted and reshifted until a favorable fishing place is located.

In "setting" a skate of gear for fishing, the procedure is as follows: To a small keg, which serves as a buoy, is attached one end of a long line, the buoy line, whose length depends on the depth of the water; the keg is then thrown overboard, and the line is allowed to run out. The other end of the buoy line is "bent on" to a small anchor, to which one end of the ground line is also bent. Being put overboard, the anchor sinks to the bottom, carrying down with it the ground line. Then, while one man slowly rows the dory in a direction previously

determined on, the other throws out the gear, a few feet at a time. When the end of the line is reached, the line is hauled taut for a few seconds in order to make it lie straight on the bottom of the ocean. An anchor is bent on and, with a buoy line attached, is lowered to the bottom; a buoy, fastened to this second buoy line, is heaved overboard. This act completes the setting of the gear. For any but trial sets, generally three skates of gear, or, not infrequently, more than that, to a dory, are used. In that event they are usually fastened end-to-end, although occasionally they are set separately.

The gear is allowed to remain down—to "soak" is the technical term—for at least two hours; but a "soak" of three or four hours is advocated by many fishermen. The length of time is regulated somewhat by the kind of bait used; fresh herring is not left down much over an hour and a half, because it tears off easily; salt herring is given a soak of three, four, or even six, hours, to allow time for the salt to dissolve out of it; fresh salmon will stand a three-hour soak well. However, no definite rules can be laid down, and each fisherman is guided by circumstances and by his own experience. At the end of the alloted time, one man busies himself with hauling in the line; the other disentangles any snarls, removes fish and bait from the hooks, and coils down the line in the dory. This done, the boat is signaled for; she having come alongside, the fish are taken aboard in a sling, and then the dory is hoisted. All hands immediately turn-to, to dress the fish, which are iced down in the hold. A catch of 500 pounds of halibut to the dory is considered "good fishing."

When ten or twelve dories are operated, they are spaced from half a mile to a mile apart, and the lines are set parallel to each other. Consequently, a considerable area of ground is fished over. It is estimated that, in one "set," a boat running twelve dories can cover thirty-six square miles of fishing ground. And commonly two sets are made in a day.

Several trips are made during the season, which, because of the severe winter storms, lasts only from spring to early fall. Operations are continued, either until the boat contains all the fish she can carry, or until supplies are needed; thereupon the boat returns to port and disposes of her catch, which is either distributed to local dealers, or shipped in ice to more distant markets.

PUBLIC FISHING vs. PRIVATE HUNTING.

By F. M. Newbert, President California Fish and Game Commission.

The state legislature, in 1911, enacted section 4085½ of the Political Code, which grants to the county boards of supervisors the right to condemn a public highway for the purpose of fishing along the banks of any stream stocked by the state which does not run through cultivated land. Prior to the passage of this act there was much determined opposition offered to the bill by certain people who held that such a law would have the effect of breaking down the powerful trespass law in force in the state. It was also argued that the bill meant confiscation of property rights and was in direct conflict with the constitution. However, the bill was passed and signed by the governor.

In this act there is no confiscation of property without just remuneration. The county must purchase such a right of way after due process of condemnation. Further, the people of this state have been taxed from 1871 to 1909 for the upkeep of the hatcheries and for the importation and distribution of valuable food fishes. It is estimated, on reliable authority, that fully 95 per cent of the fish now in our streams are the result of the work of the Fish Commission in the importation, artificial propagation, and distribution of fish. Since the people have had to pay for the hatching and distribution of practically all the fish in the streams, it certainly follows that they should have the sole and exclusive right to partake of them, subject to such rules and regulations as they themselves enact into laws through the medium of their representatives. Inasmuch as they have signified their intention to protect property from wanton destruction and to give just remuneration to those whose real estate is needed in the further advance of community interests, it also follows that they may call upon any person to allow free access of the public to the fishing streams they have stocked, and to remunerate him for the loss of the needed part of his estate.

This is certainly just and equitable when the required strip lies wholly upon wild lands not in any manner devoted to agricultural pursuits. In the peaceful entering upon wild lands for the purpose of fishing, the disciple of Isaac Walton carries no more dangerous weapons than his rod, line and hooks. The danger of maiming or otherwise injuring stock is reduced to a minimum, and the loss to the individual through the forfeit of his sole and exclusive right to fish in that stream is nil.

On the other hand, we have the time-worn and vexing question of private game preserves or hunting grounds. The erroneous idea prevailing among some people regarding these institutions is founded upon a lack of information concerning them. The people at large have not taken the time to correctly inform themselves upon this subject. It is claimed that private hunting grounds may be done away with and the self-same argument used in the matter of public fishing is advanced against them. But the positions of the two questions are not analogous in any particular. Can we exercise the right of eminent domain against the private hunting ground, or can we condemn it in the interests of the great mass of hunters, and yet be just and equitable to the owner of the land? We must take into consideration the natural elements entering into the question, and, in so doing, we would commence with the most prominent bone of contention, the "duck club."

The greater portion of duck club grounds furnish the best stock pastures in the state. On the duck-shooting grounds of the Sacramento and San Joaquin valleys you will find more grazing stock to the acre than anywhere in the uplands. While this territory is covered with water the year round it is not flooded merely to make it a rendezvous for the waterfowl. Nature herself is responsible for these immense areas of water. The water is from six inches to two feet in depth over the whole area and you will see stock feeding upon the succulent aquatic grasses and plants that spread their heads above the surface. The whole area is enclosed in a stock-tight, barbed wire

fence to keep the pastured stock from wandering. But when the annual floods come, pasturing is at an end and the duck club becomes a thing of the past.

Now the owner of valuable lowland grazing areas must certainly have the right to utilize those lands for whatever purpose he desires as long as he does not infringe upon the rights of adjoining property owners. If he wishes to prohibit hunting altogether he may post his land according to law, as does the upland owner. The latter certainly does not care to allow indiscriminate hunting by irresponsible hunters and suffer the possible chance of injury to his grazing stock. This upland owner is very desirous of maintaining the law that enables him to keep hunters off his land, yet he raises his voice in anathemas against the "duck clubs." His execrations are born of thoughtlessness If a law is good for the upland farmer, why is it not good for the lowlander? If this lowland farmer wishes to rent the hunting privileges of his land and to so safeguard his interests that he can hold his lessees responsible for all damage done by them, is it possible to prevent him from so doing?

This lowland farmer leases to a club the sole and exclusive right for them to enter upon his premises for the purpose of hunting. There is written in that lease an iron-clad clause to the effect that the members of the club, jointly and severally, are responsible for any damage accruing to either his real or personal property contained in the premises. Since this owner has granted to a few responsible people the all and exclusive right to hunt thereon, does it follow that he should extend that privilege to every applicant? If such were the law, how would the owner be remunerated for the loss of stock? Could ten days in the county jail for a stock-killer bring back to this outraged owner one thoroughbred animal?

Consider the position of the upland farmer without the protection of the trespass law. We will take, for example, a hunter who goes out to one of these upland ranches wherein stock is pastured. Within an hour he bags the limit of quail. He immediately returns to town and spreads the good news. Can you hazard a guess as to the number of nimrods present upon that ranch the next morning and can you estimate the probable death rate among the cattle caused by those hunters who "thought the calf was a covey of quail just rising?" If we take away the right of the upland farmer to post "NO HUNTING" signs and the protection of the trespass law, no rancher in any game country could keep even so much as a milch cow or a single horse in his pasture. But he enjoys the protection of the same law that prevents indiscriminate hunting upon the property of the lowland farmer.

The erroneous idea of what duck clubs really are has made some people conjure up in their minds a veritable ogre. People who have never thought of them save that "they were a curse to the country" believe they are vast stretches of water and tule of unknown depth with here and there a bleak little island for the hunters to stand upon. They can see, in their mind-picture, attendants busily strewing wheat, rice and other grain over the water to attract the waterfowl which fly over in a sun-obscuring cloud and alight upon the water. They also see the hunters shooting from early morn until

late at night, day after day, while attendants feverishly reload the guns and bring refreshments to the busy shooters. It is a wonder that these people can call this sport, when such grilling work would call for the greatest of hardihood and endurance.

It is not generally known that practically every duck club in this state has written in its by-laws a prohibition against shooting more than two days in any one week during the open season and none at all during the closed season. A violation of this clause or of the bag-limit law will cause a member's expulsion from the club and the forfeit of his membership. The capital he has invested in his membership would, in many instances, cause a considerable personal financial flurry.

Many duck clubs own their own grounds and they, in turn, lease the grazing privileges. Now could we, by any form of law, prohibit these men from owning that property? Could we force them to allow free access to their land to every man with a gun, simply because they themselves hunted there? Is it possible to confiscate that property simply because it is hunted over about two months in the year and grazed the remainder?

Suppose the state appropriated $500,000 for the purchase of duck grounds. When this purchase was consummated who would enjoy this expenditure of the taxpayers' money? Answer: The retired capitalist and the market hunter. Stop and think it over.

OUT-OF-DOORS.

Away from the busy city and the ceaseless clang of the street,
And the piles of brick and mortar and the tramp of hurrying feet;
Away from the crash and clatter and the worrying, wearying strife,
Come, ride with me o'er boundless plains and thrill with the joy of life,
Where blue is the vault of heaven, and the Master that man adores
Is everywhere in Nature, in His own great Out-of-Doors.

The forests sing their welcome; they bid us a moment give,
To come and commune with Nature, and learn what it is to live,
Where, watchful, the mighty mountains eternal vigil keep,
Or where swiftly swirling waters will lull our unrest to sleep;
Where by the evening campfire, "'Tis joy to forget old scores,"
Remembering only that we are men in God's great Out-of-Doors.

Selected.

CALIFORNIA FISH AND GAME

A publication devoted to the conservation of wild life and published quarterly by the California State Fish and Game Commission.

Sent free to citizens of the State of California. Offered in exchange for ornithological, mammalogical and similar periodicals.

All material for publication should be sent to **H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, California.**

April 10, 1915.

Everyone owns a share in the natural resources of this state. The protection and conservation of game is, therefore, to the interest of every citizen.

"CONSERVATION THROUGH EDUCATION."

There seems to be no end to the sentiment favoring our motto: "Conservation through education." When the federal bird law was being discussed in congress, Representative Linthicum of Maryland said:

"We should begin a campaign of education, teaching not only the pleasure to be had from a closer acquaintance with our bird friends, but also the benefits which farmers derive from their presence. To many it has never occurred that man is the only living creature who takes life for sport or pleasure; others take life, but when they do so, it is always for food or in self-defense—never for pleasure alone. Legislation alone will never assure that complete protection toward which this measure is a step. Real protection will come through educating our people as to the value of birds, that they may realize the part played by them and other inhabitants of our fields, forests and streams as economic factors in our everyday life. Unless backed by strong public cooperation, legislation will accomplish little."

ORGANIZATIONS DEFENDING WILD LIFE.

The growth of sentiment in favor of wild life conservation is showing itself in a number of ways. One noticeable thing has been the growth of a number of societies having for their object the protection of wild life. Besides such older active organizations as the Cooper Ornithological Club and Audubon Society, there are now four other societies more recently formed whose distinct purpose is to stir up interest and actively work for better wild life conservation. A list of these more recent organizations, with the names and addresses of their presidents and secretaries, is given below.

California State Fish, Game, and Forest Protective League—J. B. Hauer, president, 216 Pine street, San Francisco; J. Sherman Woolf, secretary, Monterey.

California Associated Societies for the Conservation of Wild Life—Dr. William F. Bade, president, 2223 Atherton street, Berkeley; Dr. W. P. Taylor, secretary, Museum of Vertebrate Zoology, Berkeley. Established 1912, composed of many prominent organizations, such as the Sierra Club, California Academy of Sciences and the State Humane Association.

The Wild Life Protective League of America, Department of Southern California—Charles F. Holder, president, 475 Bellefontaine street, Pasadena; Major F. R. Burnham, D.S.O., secretary, Fresno. Established 1914.

California Wild Life Defenders—Henry C. Hall, president, Corte Madera; Harry Harper, secretary, Capitola. Established 1914.

The last-named organization is the latest to take the field. Its secretary, Harry Harper, was formerly secretary of the California State Fish, Game, and Forest Protective League. The motto of this new organization is: "For Our State. For Its Streams and Forests. For Its Song Birds and Flora. For All Its Wild Life—and So, at the Last—For Our State."

The California Federation of Women's Clubs, with 30,000 members in the state, has organized a committee for the conservation of wild life, with Mrs. Harriet Williams Myers as chairman. This shows that the women of California can be depended upon to support wise conservation measures.

All of the above organizations have taken an active part in supporting certain measures relative to fish and game proposed during the last session of the legislature.

IS BIRD PROTECTION WHOLLY SENTIMENTAL?

Many people seem to believe that bird protection is wholly sentimental. Look far enough into the subject and you will find that it is largely economic. The Rockefeller Foundation has just paid $225,000 for 85,000 acres in Louisiana, which is to be used solely as a refuge for migratory birds. Surely there is more than pure sentiment behind such a gift as this.

The property so recently purchased by the Rockefeller Foundation is near Marsh Island, which, in 1912, was secured by Mrs. Russell Sage for the same purpose, and adjoins a 60,000-acre tract which its owner, Mr. E. A. McIlhenney, has devoted to bird protection. When the Foundation carries out its intention of acquiring the nearby land these refuges will become one great bird preserve of 500 squares miles, covering a frontage of seventy-five miles on the Gulf Coast.

CITY PARKS AS GAME REFUGES.

There are three vivid examples in this state of what may be done in the way of bird protection. A visit to Golden Gate Park, San Francisco, Peralta Park, Oakland, and Southside Park, Sacramento, will show thousands of water fowl congregated on the lakes in these parks. Even though Lake Merritt, in Oakland, is situated almost in the heart of a great city, the ducks there have become so accustomed to protection that they can be approached within a few feet.

In some places the lakes have been made attractive to wild fowl by keeping pinioned ducks. In Southside Park, Sacramento, a number of pinioned geese are also to be found. Last year Mr. Neal secured some eggs of the wood duck and had them successfully hatched. As a result, this, the most beautiful of all ducks, is to be seen on the lake in Southside Park. Although able to fly, these ducks seem to be well satisfied with their home in a city park.

It takes but a very small body of water to furnish a refuge for water fowl. At the County Infirmary, in Oakland, a large reservoir has been made to teem with water fowl each winter by keeping a few pinioned ducks thereon. (Fig. 30.)

Fig. 30.—Ducks on pond at County Infirmary, Oakland, California. As ducks are protected and fed here, they congregate by the thousands. Photograph by E. C. Clarke.

BREEDING DEER FOR THEIR HORNS.

The following extract from a letter by Frank N. Meyer, Agricultural Explorer, Office of Foreign Seed and Plant Introduction, U. S. Department of Agriculture, to his chief, dated Omsk, Siberia, July 17, 1911, which appeared in the *Journal of Heredity* for February, 1915, describes a remarkable industry now thriving in Siberia:

In Birel we stopped with a farmer who had become a wealthy man through the sale of stag antlers, and saw how the women folks were boiling several magnificent pairs. They were all coated yet with the down, which is an absolute necessity to sell them, as the Chinese take only those which are young. This stag-keeping business has its headquarters in and around Birel, and by pure accident we had stumbled upon one of the most interesting industries in this world.

It seems that about forty years ago somebody in Birel made an experiment of keeping some stags in captivity and by sawing the antlers off and bandaging the wounds, showed that a stag can be deantlered and survive the process and be operated upon every year. Up to that time the animals had been hunted until they were well nigh extinct, and the collecting of antlers was a very unsteady sort of business—one never knew whether one would get much or not. Well, the animals multiplied and high-fenced enclosures were established all over the mountains, for these stags need much ground to pasture upon, otherwise they don't remain healthy. And today there are several thousand stags in and around Birel, and the income derived from the sale of the antlers has made some people very wealthy, for every male animal produces about 70 roubles'* worth of antlers every year, and some men have as many as 400 males. The average price paid for the antlers is between eight and twelve roubles per pound, according to the market.

The antlers are sawed off with a fine saw and weigh, fresh, twice as much as later on. They have to be boiled in salted water and very great care has to be taken that the felt-like covering doesn't come off; therefore, they are boiled several times, and each time allowed to dry out again. When sufficiently cooked, they are hung in the wind and allowed to dry thoroughly, and in that state they are bought up by dealers and said to be exported to China via Mongolia. The Chinese, as you may know, believe thoroughly in the rejuvenating and stimulative power of young deer horns, and the stuff, scraped and powdered, forms a valuable ingredient in certain of their medicines. I was also told that a firm in St. Petersburg has taken up this matter and is manufacturing a special medicine from them, under the name of "Spermine."

*A rouble is worth about 51 cents, U. S. currency.

PHEASANT FARMING.

There has recently been published under the direction of Wm. L. Finley, Oregon Fish and Game Commission, a beautifully illustrated bulletin on "Pheasant Farming," written by Gene M. Simpson, Superintendent of the State Game Farm at Corvallis, Oregon. In the introduction Mr. Finley states that the bulletin, which is a revision of a former one, is designed to furnish reliable information as to how pheasants may be successfully propagated. He also pays a tribute to Mr. Simpson, who has been particularly successful in rearing pheasants on the state game farm.

The first chapter discusses the propagation of game birds and defends the rearing and sale of such birds. Chapter 2 describes the different varieties of pheasants. The chapter devoted to "The Chinese Pheasant in Oregon" furnishes information as to the history of the introduction of this bird into Oregon and the success which has been obtained in establishing it. The succeeding chapters discuss the equipment for a pheasant farm, the ideal mother for pheasants, the food of young pheasants, enemies of the game breeder, and advice to the beginner.

This bulletin sums up the very information which the man who is starting a pheasantry desires. As it is the result of long experience, it can be successfully used as a handbook by the pheasant breeder. It is to be hoped that there will soon be enough demand in California for such a publication. As yet the breeding of pheasants in captivity in this state is in its infancy.

A GUIDE BOOK FOR SCIENTIFIC TRAVELERS ON THE PACIFIC COAST.

The Pacific Coast Committee of the American Association for the Advancement of Science is preparing a guide book for the use of visiting members to the San Francisco meeting, August 2 to 7, 1915. The book will be about the size of a Baedecker and will be published by Paul Elder & Company. The exact title will be "A Scientific Traveler's Guide Book to the Pacific Coast," and it will bear the sub-title "Nature and Science on

the Pacific Coast." This book will contain chapters upon the distinctive features of the region, including geology, palaeontology, geography, distribution of land animals, fisheries, marine biology, flora and forests, marine botany, ethnology and archaeology, agriculture, influence of early Spanish settlers, landmarks of history and literature, and the evident effects of an out-of-door life upon the development of the fine arts. These chapters will be critical descriptions written by men who are authorities in the several fields. General maps of the region and maps of the vicinities of the larger cities, directions for reaching the principal points of scenic and scientific interest on the Pacific coast, and directories of educational and research institutions will also be included. This book can be procured from the general office of the American Association or from leading book stores on the Pacific coast. The price will be $1.50.

THE PROTECTION OF NON-GAME BIRDS.

It seems to be impossible for a single session of the state legislature to go by without a bill being introduced to remove from protection such birds as the meadowlark, blackbird, and robin. In back of every such move is to be found a desire on the part of the city sport (we can not say sportsman) to have something more to kill. When such a bill was introduced in the last legislature by a San Francisco assemblyman the following comment appeared in the *Fresno Republican:*

The question of the usefulness or injury of these birds is a scientific one upon which we would rather have the judgment of the zoological department of the university than that of any aspiring restaurant keeper in San Francisco. And so far as the restaurant end of this world shaking problem is concerned, there is a much better and easier way of meeting it. We do not need blackbirds, meadowlarks, and robins for our bird pies. There are billions of English sparrows in the state which are doing no good to anybody. The United States government has devised methods for the easy capture of the sparrows, by trapping, in large numbers. Let the restaurants introduce sparrow pie as a diet if they will. There are plenty of sparrows and the pie is said to be good.

AN OUTBREAK OF QUAIL DISEASE.

The United States Department of Agriculture reports that the third known outbreak of quail disease has been discovered by the Bureau of Animal Industry. Quail disease is a highly infectious malady to which all native quail are apparently subject. The first outbreak occurred in 1907 and a second one occurred in 1912. The one in 1912 was checked through the suspension of importations of birds from Mexico. Birds imported from Mexico, at Brownsville, Texas, on January 5, 1915, were found infected with the disease. All game commissioners and sportsmen who may have purchased birds for restocking this season are requested to advise the Bureau of Animal Industry if any of the birds are known to have died from disease of any kind. A quarantine has been established at Brownsville and every attempt will be made to prevent the spread of this exceedingly dangerous disease.

IS THE HOUSE CAT A DESTROYER OF BIRDS?

Mr. E. H. Forbush, State Ornithologist of Pennsylvania, is collecting data on house cats. He has sent out circulars asking for information as to the depredations committed and the comparative value of this animal as a destroyer of rodent pests. He plans to issue a bulletin on the subject, giving the results of his investigation. Of recent years the house cat has often been branded as an enemy of bird life. It is certainly true that stray cats which have no home and who live in almost a wild state do destroy many birds. Whether all cats will have to be placed in this same category remains to be seen.

PRICES DROP ON RAW FURS.

A St. Louis fur importer is authority for the statement that the losses on American raw furs caught last season alone, will amount to ten million dollars. This is due to the fact that most fur manufacturers are located in Germany and France. All price lists sent out since the first of the year show that only about half of the price paid last year is now being paid for raw furs.

KEEP YOUR FILE OF "CALIFORNIA FISH AND GAME."

We wish to urge all of our readers to carefully guard their file of "California Fish and Game." We hope that, as years go by, this periodical will increase in size and importance. We believe that already the material to be found in the first numbers has been of sufficient interest so that readers will wish to keep the back numbers for reference. Already the first number of "California Fish and Game" is at a premium, there being but a very small number of copies left for filling sets. For several months past "Forest and Stream" has been advertising for a complete set, or for certain old volumes for filling sets. A number of important university libraries have been attempting to complete their files for several years, but the early numbers of the magazine are not now available. The papers now being published in "California Fish and Game" are not only of interest to the general reader, but they are of value to the scientist and, as years go on, the early numbers will become more and more valuable. It is impossible for the Commission to issue very large editions, hence the necessity of conserving back numbers. If the added incentive of financial return is needed, we need but point to the prices paid for early numbers of similar periodicals.

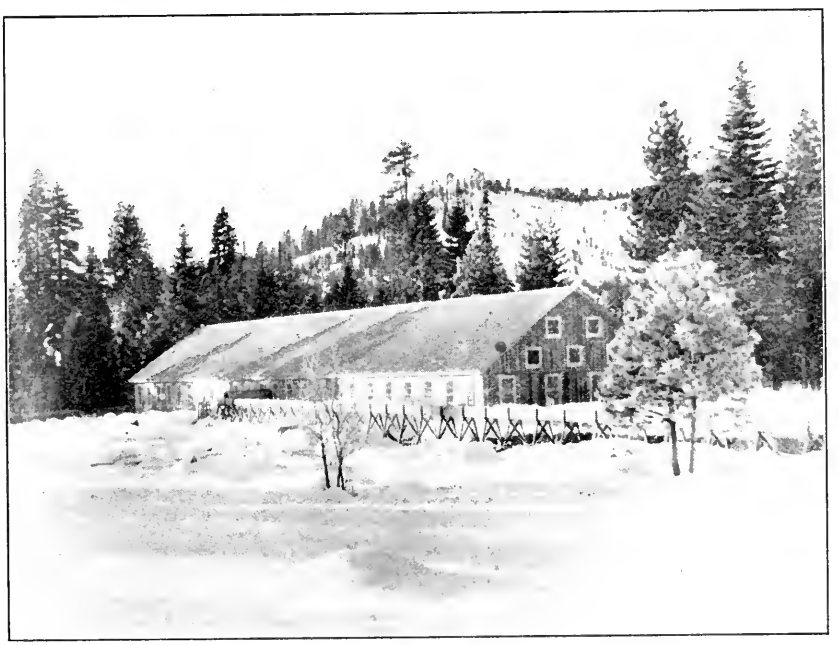

FIG. 31.—New hatchery (E) at Sisson, completed January 1, 1915.

HATCHERY AND FISHERY NOTES.

HATCHERY ACTIVITY IN 1915.

On January 1st the new hatchery building at Sisson Station was completed (see fig. 31). The building is 195 feet long by 42 feet wide and has a capacity of 148 hatching troughs (see fig. 32). It will be used for hatching and rearing both salmon and trout. At the present time the building is nearly full of salmon eggs and embryo fish.

We have received at Sisson Station, from the U. S. Bureau of Fisheries stations at Battle Creek, Mill Creek and Klamath River, approximately 29,000,000 salmon eggs, to date. About half of the eggs received have hatched out and the embryo fish are doing nicely. Prior to the arrival of the first of the eggs, all of the buildings were put in excellent shape for the reception of the salmon eggs, and

with the completion of the new hatchery building everything was in readiness for the season's work. All four of the salmon hatchery buildings at this station will be crowded to capacity this season. As soon as the embryo fish reach the swimming stage, we will commence feeding them, and will hold and feed the fry in the hatcheries and nurseries until they have attained such size as will insure their being well able to protect themselves from their natural enemies, when they will be released in waters suitable for them.

The spawning of the Eastern brook and Loch Leven trout at Sisson Hatchery has been completed. About 1,757,000 Loch Leven and 1,198,000 Eastern brook trout eggs were taken from the fish in the ponds at this station. The eggs are hatching and the embryo fish are in excellent condition. During the coming month we will commence spawning the rainbow trout in the Sisson Hatchery ponds, and the indications are that we will secure a nice take of eggs from these fish.

The preliminary work for opening up the rainbow egg collecting stations, auxiliary to Sisson Hatchery, has been commenced. As the two stations, Camp Creek and Bogus Creek, on the Klamath River, were put in excellent shape for operations last season, very little repair work will be necessary this season. Both plants have been inspected during the past two weeks and were found to be in excellent condition for the season's operations. During the coming month we will send a crew of men to these stations to put in the traps and prepare for the run of spawning fish.

During the past year I have thoroughly investigated the Pit River country, with the idea of increasing our rainbow trout egg collecting operations. I found that rainbow trout ascend the tributaries of the Pit River in considerable numbers. From my investigations I found that Burney Creek seemed to have the largest run of fish, and I, therefore, selected a site suitable for carrying on the work. A lease was secured on the site selected, and I have just completed the final survey for the installation of the racks, trap, etc. Within the next two or three weeks I will have a crew of men on the ground, preparing the station for the season's operations. I believe that the Burney Creek Station will prove to be one of the best egg-collecting stations in the state.

During the spring of 1914 the old Snow Mountain Station, located at Snow Mountain power dam, Mendocino County, was operated by this commission, in an endeavor to ascertain whether it would pay to operate the plant on a large scale. The results obtained from the experiment were very gratifying and we collected a very good take of steelhead trout eggs. Accordingly, I made arrangements during the summer to have the station enlarged and put in first-class condition. The fish ladder over the dam was in poor condition and the traps were old and nearly useless. During the past fall, I had a crew of men engaged in putting everything in readiness for this season's work. The ladder was repaired, traps installed, eyeing troughs and building enlarged and repaired, and a new water supply system installed. The work was completed during the fore part of this month and everything is now in first-class condition. We should collect a large take of steelhead trout eggs at this station this season. Part of the eggs collected will be shipped to the Ukiah Hatchery to furnish fry for stocking portions of Mendocino and Sonoma counties, and the balance of the eggs will be hatched out at Sisson Station for stocking steelhead waters throughout the entire state.

During the month of March the Tahoe Hatcheries will be opened up. Traps will be installed in Blackwood Creek, as in past years, and the seining crew will commence operations at the mouth of Taylor Creek as soon as the black-spotted trout of Lake Tahoe commence to run up the streams to spawn. This work will be under the supervision of Mr. E. W. Hunt.

The Scott Creek egg-collecting station will be operated to its fullest capacity this season. It is the desire of the board to collect a large number of steelhead trout eggs this season, so that the work of stocking the coastwise streams with large, well developed fry, may be carried out on the same lines as in the past two years.

At the Price Creek Hatchery 3,000,000 salmon eggs are now hatching. The fry obtained from this hatch will be distributed in Mad River and the streams flowing into Humboldt Bay, as well as in the

lower reaches of Eel River. The upper reaches of Eel River will be stocked with salmon fry by the Fish Commission's distributing car this season. Owing to the large number of salmon that ascended the river during the early fall freshets, the natural propagation will be larger than usual. The storms raised Eel River before the fishermen had a chance to take many of the salmon from the pools in the lower river, consequently a larger number of mature salmon ascended the river to spawn than usual.

The Fish and Game Commission is planning a hatchery for the district south

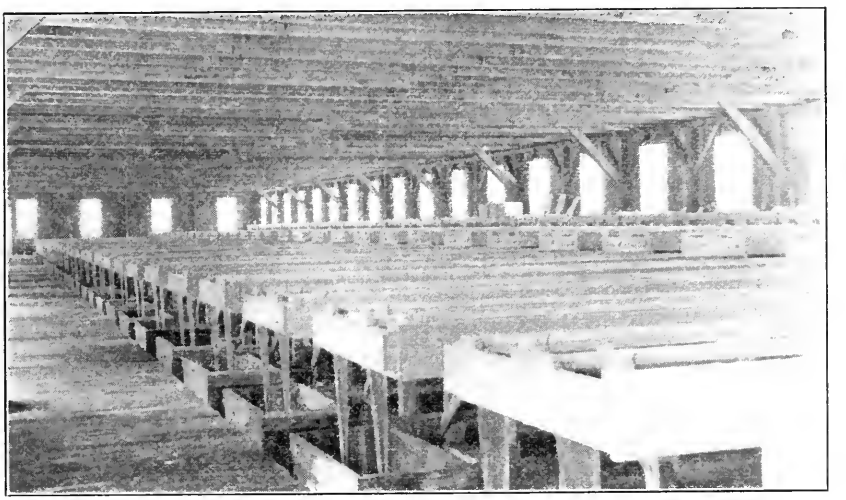

FIG. 32.—Interior of new hatchery (E) at Sisson. This building contains 148 hatching troughs.

of the Tehachapi. It is the intention of the board to establish a hatching station in southern California to propagate enough fish to stock the streams in the southern part of the state, if a suitable site can be found. It will be more economical to hatch and distribute the fry from a hatchery located in the south than to ship the fish from the northern stations. W. H. SHEBLEY.

IDENTIFYING FISH BY THEIR SCALES.

The Fish and Game Commission has been making practical applications of the knowledge gained in the last few years in the study of fish scales. Shipments of fish came to San Francisco and other markets from Portland and Eel River and the old question arose, Were they salmon or steelhead?

The usual characters by which salmon and steelhead are distinguished are the size of head, shape of tail and number of rays in the anal fin. In the shipments these identification marks had been removed. The fish were dressed and the heads, tails, and anal fins removed, very evidently for the purpose of preventing identification. As it was lawful to have salmon, but unlawful to have steelhead in possession, the question was a vital one. A microscopic examination of the scales showed conclusively that they were steelhead, and gives the evidence upon which the violator can be prosecuted.

The concentric rings of growth on the scales of trout and salmon show winter and summer growth, much as do the rings of growth on a tree. Also, the growth in fresh water can be distinguished from the growth in salt water. Steelhead, after hatching from the egg, spend from one to three years in the stream before going to sea, but the great majority of individuals remain two years in fresh water. The salmon, on the other hand, spend one year, or less, in fresh water and then pass out to sea. Scales from the fish in question showed two years' residence in fresh water, which is proof enough they

are steelhead. But the scales give an additional proof, in the presence of "spawning scars." A steelhead leaves the sea and enters fresh water to spawn, and, during this process, leaves off feeding to a great extent and becomes thin through the absorption of the fat of the body. Even the edges of the scales imbedded in the scale pockets of the skin are eaten away, so that when the fish begins feeding again the scales take on new growth and a scar is left representing the ragged, eaten-away edge of the old scale. This constitutes the "spawning scar." Five per cent, or more, of steelhead show in this manner that they have previously spawned. Not so in the case of the salmon. They never show the "spawning scar," for they all die after spawning and growth is not resumed before death. Some of the fish examined in this instance showed these spawning scars, thus giving the additional proof that they were steelhead.

The only salmon with which the steelhead is likely to ever be confused is the silver salmon, or coho salmon. The silver salmon invariably matures and spawns at three years. In the case of the steelhead, spawning individuals will be found ranging from three to six years of age—all of which is clearly shown by the scales. N. B. Scofield.

ANNUAL FISHERY PRODUCTS OF CALIFORNIA.

The fisheries of California take annually 86,900,000 pounds of fish, for which the fishermen receive $1,300,000.

Five thousand men are engaged in fishing for profit in this state.

Fishing gear, including boats, nets and lines used in the state, is valued at $1,270,000.

TUNA INDUSTRY.

The tuna industry has grown until now it is the largest of our commercial fisheries. During the past season, the canners of southern California put up 350,000 cases, which were worth, wholesale, about $1,050,000. The weight of the fish required for this number of cases was 25,000,000 pounds, or more than double the total weight of salmon taken in the state. Besides this, 1,000,000 pounds were salted, dried or fresh. The long-finned tuna, the only variety canned, is a fish of wide distribution and spawns in the tropical waters of Mexico. It comes north in countless numbers, following the schools of sardines upon which it feeds. It is not believed that the present large take of tuna will seriously reduce the supply. At least, no action is contemplated to restrict fishing, as no young or spawning fish are taken in the state waters.

A NEW FISH HATCHERY FOR SAN BERNARDINO COUNTY.

Due to the interest and energy of the San Bernardino Trout Association, San Bernardino County now has a trout hatchery with a capacity of four million fish. The hatchery is located on the south side of Bear Lake and cost about twelve hundred dollars. It was built under the supervision of Mr. E. W. Hunt, superintendent of the Tahoe Hatchery.

The expense of the hatchery is to be borne by the members of the county association, and no money will be solicited outside of the county. The Board of County Supervisors will have charge of the distribution of the fish hatched and will see to it that local streams are well stocked with the output.

The stated purposes of the San Bernardino County Trout Association are as follows:

To finance and build a hatchery in Big Bear Valley and to use the output for the replenishing of the trout supply of the streams in San Bernardino County.

To turn the operation of the hatchery plant over to the State Fish and Game Commission.

To turn the distribution of the fry material over to the San Bernardino County Supervisors.

To promote, protect and further the game and fish supply of the county in every way possible.

To in no way interfere with the work of the State Fish and Game Commission, but by direct means, by its influence and membership to increase its usefulness.

MARKET FISHERMEN DISSATISFIED WITH FISH LAWS.

In southern California the market fishermen are working earnestly to secure the repeal of several sections of the fish and game laws during the session of the legis-

lature. There are two measures especially which they wish repealed. One is the law creating a fish reservation around Santa Catalina Island, and prohibiting the use of all nets within three miles of the shore of the island. And the other is the law prohibiting the use of paranzella, or trawl nets, in the sixth district. The fishermen claim that these provisions practically ruin the market fishing along the coast of southern California.

CONSERVATION IN OTHER STATES.

A NEW DEVICE TO PROTECT BIRDS.

The general interest in bird protection has been productive of the invention of a device by Herr J. P. Thijsse of Utrecht to reduce the destruction of birds by lighthouses. The device has already been placed on two British lighthouses and is said to be giving excellent results. Lighthouses have long been instrumental in destroying great numbers of migrating birds, which have been attracted by the light during stormy weather. In some places thousands of birds kill themselves by flying against the light on each stormy night during the migration season. The new device now being used in Great Britain is reported to be a series of perches on which the storm-driven birds can alight and rest until morning.

MORE WILD LIFE REFUGES.

The Minnesota Game and Fish Commission is planning to establish a chain of wild life refuges in that state. The plan is not, however, that instituted by Indiana and adopted by Iowa, of permitting landholders to post their farms as state game preserves, allowing them to shoot "rabbits" on these "preserves" and supplying them with expensive exotic game birds for "stocking" purposes.—*Recreation*, December, 1914.

HOW TO ATTRACT BIRDS IN NORTHEASTERN UNITED STATES.

Farmers' Bulletin, No. 621, of the United State Department of Agriculture describes means of increasing the number of birds about homes in the northeastern United States. Methods of furnishing birds with nesting places, food, and water are described and figured, and methods of protection are also suggested. Emphasis is placed on the furnishing of food by means of plants and shrubs grown for that purpose. A table of seventy-five different native and introduced plants and shrubs are suggested as available for this purpose and the comparative length of the fruiting seasons of each is figured.

It is the plan of the United States Biological Survey to publish similar bulletins, which will furnish accurate information along these same lines for other parts of the United States. While on the Pacific coast recently, Mr. McAtee everywhere gathered information so as to make possible such a bulletin dealing with the northwestern United States.

California is so well supplied with natural food for birds that there is not the same necessity for furnishing them artificial food plants. Nevertheless, we shall watch with interest these practical attempts to increase the number of birds in limited localities.

BOY SCOUTS BECOME GAME WARDENS.

Under the leadership of M. D. Moser, twenty-one boy scouts of Tacoma, Washington, have been given a course of training in game protection. As a reward for their work the Game Commission of Washington has awarded them special badges. These boys are now doing good individual work, especially among the boys of the city, in protecting song birds. Recently these boys took a census of game birds in the vicinity of Tacoma. A great many game birds were found inside the city limits. Quail were most numerous, but great numbers of pheasants and grouse were also found.

AN EUROPEAN EXPERIMENT IN PROTECTING BIRDS.

The famous ornithologist, Baron von Berlepsch, has for a number of years been carrying on some interesting experiments in furnishing birds nesting sites and food on his estate at Seebach, in Thuringia. So successful has the Baron been in these experiments that his estate is now used as a bird protection experiment station by the government.

Nesting sites are furnished by two methods. Carefully prepared nest boxes are inserted in stone walls and hung up in trees. In addition, suitable shrubbery has been planted in many places on the estate, and this is carefully pruned to form desirable nesting sites. Recently a hedge has been placed in the midst of an extensive grainfield some distance from any wooded area, in order to test the willingness of birds to use such an isolated spot.

Practically all of the nest boxes become occupied within a few years and the nesting sites provided by pruning trees and shrubs are almost all utilized. The "show spot" on the estate is said to be a thorn hedge along the edge of a small wood, where each bush has been pruned for nesting purposes. A recent visitor counted thirty-one nests in examining 300 feet of this hedge. Baron von Berlepsch's experiments have been proving to the world for several years that the bird population on any given area can be increased by furnishing birds additional food and cover.

APPLIED ORNITHOLOGY.

Mr. Herbert K. Job, until recently State Ornithologist of Connecticut, has been placed in charge of a "Department of Applied Ornithology," established by the National Association of Audubon Societies. The function of this new department will be the furnishing of advice and assistance to the public relative to methods of increasing wild birds and propagating wild fowl and game birds in captivity. The department has a fund of five thousand dollars a year subscribed by interested persons with which to carry on its work.

LIFE HISTORY NOTES.

WHISTLING SWANS IN THE SACRAMENTO VALLEY.

A large number of whistling swans (*Olor columbianus*) were seen along Cache Slough and on Grizzly Bay last winter. On December 13, 1914, on Cache Slough, a flock of fifty were seen in flight, twelve of which were immature, distinguishable by their grayish, instead of snow-white plumage. On December 14, on Grizzly Bay, flocks of forty-nine, nine, and another one containing between twenty and thirty individuals were seen. The birds appeared to be unusually tame. The general report from residents in this vicinity is to the effect that swans have been more numerous this year than for several years past. H. E. FOSTER.

CANADA GEESE NUMEROUS IN SACRAMENTO VALLEY.

In the vicinity of Rio Vista, Solano County, there has been a noticeable increase this season (1914-15) in the number of Canada geese (*Branta canadensis*). We have not had so many honkers for many years.

All geese arrived very late this season. Gray geese were the first to arrive, a few flocks being noticed about October 10. No white geese arrived until late in November. In fact, it was about the 10th of December before we had the usual flight of geese. All geese are much harder to decoy than in former years. They all seem to fly in one large flock and do not split up into small flocks.

S. C. CHURCH.

RING-NECKED PHEASANT BREEDS NEAR SAN BERNARDINO.

On April 22, 1914, I discovered a nest of the ring-necked pheasant (*Phasianus torquatus*) near San Bernardino, San Bernardino County. The record was published in the January-February "Condor," page 59. The bird in question (a female was all that I was ever able to see there) was reported by a farmer friend of mine to have a nest in a swampy weed patch on his farm. I at once investigated and was able to approach within a few feet of the bird as she was sitting on the nest. She was covering twelve eggs. I visited the place frequently within the next week or so, but was never able to locate her mate, but as there was a large swamp nearby well grown to tules and nettles it may be that the male was hiding there. Unfortunately a flood so dampened the nest that the eggs never hatched, although the bird kept to the nest almost

constantly for a period of about two months after the nest was discovered and the eggs were well along toward hatching when first found.

At first I thought that the above was the first time pheasants had been known to nest here, but later I discovered that others had hatched broods on several occasions in the past and on one or two occasions, at least, had reared broods. These birds are undoubtedly some that have escaped or been liberated by private individuals. Several have been liberated here in past years for the purpose of allowing them to breed and increase, but in my opinion these atempts have met with failure, mainly for the reason that the birds were liberated in the foothills and drier portions of the valley, whereas all that have been known to breed here have done so in the wet places around swamps or along the willow-covered banks of the streams flowing through the valley. I am convinced that if any organized endeavor was made to stock this section with the birds it would be successful, providing the right kind of ground was used—that is, the more moist and covered sections.

So far as I am able to ascertain, the only birds that have been successful in breeding here are those that have escaped from pheasantries. That even under these conditions, however, the birds are getting a slight foothold here is apparent from the increased number of reports of finding them heard among the sportsmen and farmers. EDWARD WALL.

WHY DUCKS ARE DECREASING.

A comparison as to the number of different species of ducks this year and last would be of no value, unless the conditions which may have caused either the increase or decrease were given consideration.

Should I report to you that ducks were scarce this season without telling you of these conditions it would not establish the fact that ducks were becoming exterminated. A variety of conditions make for many changes in habits of waterfowl, especially migratory ducks and geese. I mean to say, climatic, feed, an abundance of water, early or late rainfalls or storms.

To illustrate my meaning: Should there be no early rainfall in California, and an early cold snap with freezing in the north in October, November, or December, ducks would pass by California and we would see but very few of them, but, should the season be open in the north and with early rains here which would make feed plentiful, these ducks would appear more numerous than ever. Again, should there be a heavy rainfall, as in the case of the present season, enough to insure the growth of the duck feed for next season, then it would insure a large crop of California hatched ducks and an increased number of migratory ducks when the freeze closes the extreme northern feeding grounds.

We must be guided in estimating the number of ducks seen by the conditions existing. If I can know the weather conditions in Oregon, Washington, and British Columbia, knowing the existing conditions here in California, I can surely predict to a certainty the extent of the next crop of ducks, when they will arrive, and the particular species that will take advantage of those conditions.

Another instance: There were 20,000 acres of rice in the Butte Creek country this year and scarcely any water anywhere except that used to irrigate the rice and the waste water running off. Now, the scarcity of water in that portion of the valley forced all the early local ducks into that body of water and they were, apparently, more plentiful in that particular locality than in many years. But had there been early heavy rains these ducks would have scattered over a larger scope of country and then some persons would have said that ducks were becoming scarce.

The choice varieties—mallard, sprig, canvasback—from the Sacramento Valley are nearly all shipped to San Francisco, where there is a good demand and they bring the highest prices; consequently we have most of the common varieties here on sale—widgeon, spoonbill, etc. Occasionally a few other varieties are sold by what we call "pot hunters" who carry their game to town and peddle it. The proportion of home ducks the past season (1914–15) were apparently more plentiful than the migratory ones, for the reason that the migratory ducks, canvasback, bluebill, redhead, etc., require more or deeper water than we have, for our

duck grounds are not permanent lakes but mostly shallow overflowed grounds. If we had had an early rainfall in California, canvasback, redhead, blackjack, and bluebill would have been much more in evidence. However, we did not get the rain until too late. Consequently the big flight went south down the coast and we did not see them.

As to what species have decreased in the last ten years, and what are the causes, can be answered only after analyzing all the conditions mentioned. Should the island districts in the Sacramento-San Joaquin delta, comprising all the

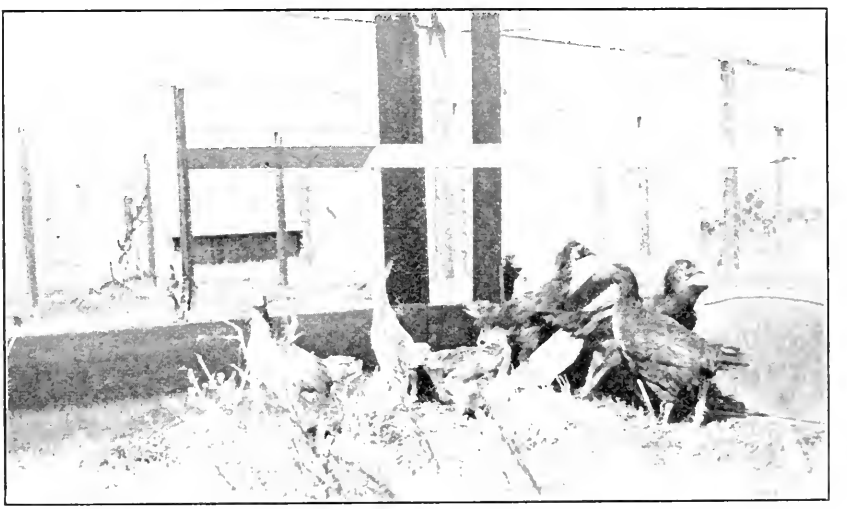

FIG. 33.—Hybrid birds at the State Game Farm at Hayward, California. They are a cross between a ring-necked pheasant cock and a bantam cochin hen.

overflowed and unreclaimed lands from Colusa to the mouth of the Sacramento River, return to the conditions existing before reclamation and remain so for a few years it would change the whole aspect of duck conditions in California, as it did during the floods of March, 1907, when all the islands in this district were flooded and apparently all the ducks in the world were in this area. In other words, it appears that ducks have decreased for the reason stated - lack of good feeding grounds. GEORGE NEALE.

STRANGE HYBRIDS.

As a rule, we think it is out of the ordinary to obtain a cross between birds or mammals divided by the systematist into separate families or genera. Yet, on the State Game Farm at Hayward a remarkable instance of the crossing of widely different birds has taken place. There are now to be seen at the game farm five birds which are the result of a cross between a ring-necked pheasant cock and a white cochin bantam hen. Mr. Dirks reports that out of 229 eggs only 14 proved to be fertile and only 10 of the eggs hatched. The hybrids appear to be of two distinct kinds. Three of the birds are dark in color, whereas two of them are very light in color. The birds have very much the general appearance of pheasants, but cochin characteristics are shown in the feathering on the tarsi. (See fig. 33.) H. C. BRYANT.

SEA OTTERS NEAR POINT SUR.

A letter from John W. Astrom, keeper of the Point Sur Light Station, dated February 2, 1915, gives the following information regarding the number of southern sea otters (*Latax lutris nereis*) found in that locality: "During my service at this station for the past six years I have seen a good many sea otters. Especially during February and March of each year there seems to be more than at any other time of the year. At the present time, if walking on the beach between Light Station and Big Sur River one can nearly

always see two or three sea otters playing on the kelp some distance off shore. A year ago in February, after a heavy blow, I counted fourteen sea otters on one patch of kelp. It appears to me that sea otters are increasing at least around Point Sur the last two years."

Mr. A. Novella of New Monterey writes as follows: "While on a trip down the coast about three months ago I saw thirty-two sea otters on the way down and twenty-six on the way back. I think there are more sea otters on this coast now than for a number of years."

Here we have more evidence as to the value of total protection as a means of bringing back a species which has been greatly reduced in numbers. Reduced nearly to extermination about three years ago, the sea otter is now beginning to show a slight increase. The conservation of no other mammal in the state could bring so large an increased income to our treasury, for the sea otter is the most valuable fur-bearing mammal in the world. Prime skins sold two years ago for over fifteen hundred dollars apiece. Since 1913 the killing of sea otter has been a high misdemeanor, punishable by a fine not exceeding $1000. The enforcement of this law appears to be greatly benefiting the species. H. C. BRYANT.

AN ANIMAL WHICH LIVES WITHOUT WATER.

Two kangaroo rats (*Perodipus ingens* and *Dipodomys merriami* subsp.) captured over a year ago by Mr. H. C. Ohl near Mendota, California, have been kept in captivity in order to study their habits. The most extraordinary feature of these animals is that they are able to live for a long period of time with no water whatsoever. For over six months they have been kept at the Museum of Vertebrate Zoology, University of California, and have been fed entirely on rolled barley. Not a drop of water has been given them and they have not even been fed on green food. According to Mr. Ohl the smaller animal (*Dipodomys*) has refused water since its capture in October, 1913. Last summer the larger one occasionally drank water when it was placed in a hole in a block of wood. It dipped its front feet into the water and then drank what water adhered to them. Both animals seem to be in the best of health despite this treatment, which would have soon proved fatal to other animals. With the above facts at hand, it is not difficult to understand why kangaroo rats are so abundant on the desert in localities miles away from water.

The kangaroo rat is a small nocturnal animal found most abundantly in desert localities. During the daytime it hides in holes in the ground. At night it hops about searching for weed seeds, which it holds in its front feet while eating, much as a squirrel holds its food. The very large eyes and long hind legs which enable it to jump great distances, make identification of this unique animal very easy. H. C. BRYANT.

WILD LIFE IN RELATION TO AGRICULTURE.

ECONOMIC STATUS OF THE SEA GULL.

Sea gulls have increased enormously on the coasts of Great Britain. As a result there has been considerable discussion as to the real value of sea gulls. The Suffolk and Essex Fishery Board has been carrying on some interesting investigations regarding the feeding habits of gulls. Stomach examination has been depended upon for accurate information as to the food taken. Data regarding the circumstances surrounding the taking of the specimen has been recorded in each instance. The food of four different species of gulls and of two terns has been investigated.

Among the most interesting things which came out in the investigation were the results of experiments to show the rate of digestion of fish. It was found that the larger gulls were able to digest fish at the rate of four ounces per hour and smaller gulls at a somewhat slower rate. "Provided the bird's stomach is empty, when the fish is taken, a black-headed gull is able to digest a five-inch sprat within three hours, so that not a trace of any bones can be detected. As a result of experiments with sprats filled with methylene blue, it is certain that a gull shot in the afternoon, may show no traces of three or four fish taken in the morning."

Considering the destruction of all fish and of the food for fish, such as crustacea, crabs, etc., and the destruction of earthworms, carnivorous beetles, and cereals, by gulls as injurious and that the feeding habits of gulls are beneficial in so far as they destroy echinoderms in the sea and on the land, wireworms, injurious beetles and insects, and on occasions remove garbage, the investigation shows but fifty-three points in favor of gulls and 454 points against them. All of the gulls examined were taken on the sea coast. If some of them had been taken on the land a different result would have been obtained. The board in charge of the work has decided to continue the investigation and to devote particular attention to the land feeding gulls in the district, in order to investigate whether the harm done to fish and fish foods was counterbalanced by the benefits derived by the agriculturists.

DUCKS EAT OYSTERS IN WASHINGTON.

The United States Biological Survey has just completed an investigation into the depredations of ducks in the oyster beds of Washington and Oregon. Mr. W. L. McAtee, of the economic division of the survey, was in charge of this work. He reports that greater scaup ducks (bluebills) and white-winged scoters were actually causing damage by eating oysters on Oyster Bay, Washington. In other places damage was reported as negligible. The amount of damage, however, so the investigation showed, is to be reckoned as a few thousand dollars annually, rather than hundreds of thousands of dollars as reported by the oyster men.

Stomach examination showed that scaups took oysters an inch and a quarter in diameter and scoters some slightly over two inches. The only immediate remedy being used is to hire a man to shoot the ducks and frighten them away from the oyster beds.

This investigation, like many another one, has shown that the men concerned always exaggerate depredations by birds. Depredations such as these are more likely to decrease rather than increase, for the duck population is waning rapidly. Geese have now become so scarce in the Sacramento and San Joaquin valleys that practically no complaint is heard of their depredations in grain fields, whereas formerly, when more numerous, men were hired to frighten them from the fields.

WHY PROTECT THE SEA GULL?

Fishermen continually censure the sea gull for destroying many fish and food which would otherwise be eaten by fish. The commuter, also, as he watches the never ceasing line of gulls follow the ferries back and forth, wonders of what use these soaring hoards can be. Their value as scavengers is certainly evident to everyone, but these birds of the sea have also a value to the agriculturist. We recently received a report from a well known ornithologist, to the effect that near Elmhurst, Alameda County, hundreds of gulls were seen feeding in a recently ploughed field and following the farmer as he ploughed. The particular species so benefiting the agriculturist is usually either the California gull or the ring-billed gull. The former was noticeably abundant on San Francisco Bay during the month of January, 1915, when the above observation was made.

ENGLISH INVESTIGATOR DEFENDS THE ENGLISH SPARROW.

That black-listed pest of the farmer and fruit grower, the English sparrow, is now being found to perform some service as an insect destroyer during the nesting season. The results of stomach examinations of nestling English sparrows show that the food consumption of a hundred nestling birds from fruit growing districts in England is nearly two thousand insects in a single day, and that the birds in suburban districts need about one third of that quantity. Excepting for a few spiders and earthworms the whole of the food was found to consist of injurious insects. It is probably safe to say, also, that during the whole of the nesting period the parent bird feeds upon food similar to that which is fed the nestling.

The following conclusions of Mr. Collinge (Journ. Bd. Agri., 21, 1-6) are of interest: "In spite of all that has been written with reference to the depredations of the house sparrow, we do not yet possess that completeness of knowledge that justifies us in condemning it as

an "avian rat," or bird that should be exterminated. That it is far too plentiful no one doubts, but seeing that practically all modern houses provide numerous and safe nesting places for it this is scarcely surprising.

"It is extremely difficult to arrive at any satisfactory and convincing conclusion as to the precise economic status of this species, but after carefully considering the results obtained from an examination of the stomach contents of 404 adult birds, and of 42 and 287 nestling birds, and also from an examination of the fæces, the writer is of the opinion that if this species were considerably reduced in numbers, the good that it would do would probably more than compensate for the harm, especially in fruit growing districts.

"Any investigation of the economic status of most species of wild birds is incomplete, and to a large extent misleading, that does not deal with the question of the nature of the food fed to the young bird or nestling, for during the nestling period the food of the parent birds consists largely of insects, slugs, spiders, and worms, and that of the young almost entirely so, and the amount of food consumed is greater than at any other season of the year."

REPORTS.

VIOLATIONS OF THE FISH AND GAME LAWS.

December 1, 1914, to February 28, 1915.

Offense	Number of arrests	Fines Imposed
Game.		
Hunting without license	57	$870 00
Deer, close season, killing or possession	29	675 00
Illegal deer hides	1	25 00
Female deer, killing or possession	2	100 00
Doves, close season, killing or possession	5	125 00
Ducks, close season, killing or possession	1	
Ducks, excess bag limit, killing or possession	21	260 00
Using live animal blind to shoot ducks	3	70 00
Shooting ducks from power boat in motion	1	15 00
Night shooting	11	300 00
Quail, close season, killing or possession	3	100 00
Quail, excess bag limit	2	25 00
Quail, sale	1	
Quail in possession, trapped without permit	1	50 00
Rail, close season, killing or possession	1	25 00
Grouse, close season, killing or possession	1	25 00
Swan, killing or possession	3	75 00
Wild pheasants, killing or possession	1	
Non-game birds, killing or possession	15	226 80
Total game violations	165	$2,926 80
Fish.		
Angling without license	1	$10 00
Fishing for profit without license	5	10 00
Dealing in fish and game wholesale without license	5	50 00
Underweight striped bass, possession	1	50 00
Dried shrimp and shells in possession	1	20 00
Undersized crabs, possession	9	25 00
Undersized Pismo clams, possession	3	85 00
Illegal nets	7	75 00
Steelhead trout, taking or possession, close season	7	300 00
Undersized catfish, sale	1	
Sacramento perch, sale	1	
Young of fish in possession	1	20 00
Taking shell fish in Monterey Fish Reservation	1	25 00
Abalones, taking or possession, close season	4	70 00
Crawfish, oversize, taking or possession	1	30 00
Total fish violations	51	$800 00
Grand total, fish and game violations	216	$3,726 80

SEIZURES—FISH, GAME AND ILLEGALLY USED FISHING APPARATUS.

December 1, 1914, to February 28, 1915.

Fish.

Striped bass	575	pounds
Salmon	176	pounds
Black bass	83	pounds
Steelhead trout	2,653½	pounds
Catfish	60	pounds
Sacramento perch	9	pounds
Smelt	110	pounds
Crabs	152	
Clams	350	
Abalones	39	
Lobsters (crawfish)	53	
Nets and lines	24	

Game.

Ducks	2,570	
Quail	122	
Doves	9	
Shore birds	1	
Swans	1	
Non-game birds	85	
Rabbits	239	
Deer meat	330½	pounds

SEARCHES.

Illegal fish and game	56

FINANCIAL REPORT.

Statement of Expenditures for the Months of November, December, 1914, and January, 1915.

	November		December		January	
GENERAL ADMINISTRATION.						
Commissioners' traveling and other expenses	$40 65		$12 50		$33 80	
Salaries of administrative assistants	975 00		976 50		975 00	
Traveling expenses of administrative assistants	38 79		100 70		62 10	
Rentals, office and other supplies	261 20		268 61		270 47	
		$1,315 64		$1,358 31		$1,311 37
GENERAL FISH AND GAME PATROL.						
San Francisco Division.						
Salaries of deputies and employees	$2,860 50		$2,914 00		$2,946 00	
Traveling expenses of deputies and employees	1,111 64		935 58		963 46	
Rentals, office and other supplies	159 91		148 57		215 05	
		1,162 05		3,998 15		1,124 51
Sacramento Division.						
Salaries of deputies and employees	$2,613 00		$2,572 50		$2,415 00	
Traveling expenses of deputies and employees	1,131 78		1,124 99		1,154 72	
Rentals, office and other supplies	131 42		135 65		154 76	
		3,876 20		3,833 11		3,724 18
Los Angeles Division.						
Salaries of deputies and employees	$1,137 31		$985 00		$985 00	
Traveling expenses of deputies and employees	119 92		311 26		214 45	
Rentals, office and other supplies	119 70		148 86		126 33	
		1,706 96		1,115 12		1,325 78
Fresno Division.						
Salaries of deputies and employees	$1,270 00		$1,176 00		$1,398 00	
Traveling expenses of deputies and employees	657 72		737 65		907 63	
Rentals, office and other supplies	88 21		121 94		87 13	
		2,015 93		2,035 59		2,393 06
Miscellaneous Expenditures.						
Prosecutions and allowances		398 57		176 42		579 67
General printing		66 28		107 35		711 51
Total, general administration and patrol		$13,541 63		$13,251 08		$14,203 38

Probable cost general administration and game patrol (60%)		$8,124 98		$7,952 448		$8,522 028
Probable cost general administration and fish patrol (40%)		5,416 65		5,301 632		5,681 352
		$13,541 63		$13,254 08		$14,203 38
FISHERY EXPENDITURES.						
Administration.						
Salaries of superintendent of hatcheries and assistants	$340 00		$340 00		$340 00	
Traveling expenses, superintendent of hatcheries and assistants	115 25		130 65		149 90	
Office and laboratory supplies, etc.	29 57		72 20		33 25	
		$484 82		$542 85		$523 15
Fishery Research and Publicity.						
Salaries	$265 00		$265 00		$275 00	
Traveling expenses	148 00		59 30		73 26	
Supplies, etc.	4 94		7 20		2 15	
		417 94		331 50		350 41
Screen and Fishway Surveys.						
Salaries	$241 67		$265 00		$36 67	
Traveling expenses	93 10		70 35		20 00	
Supplies, etc.	4 48		2 18		----------	
		339 25		337 53		56 67
Fish Transplanting (pack-train, messengers, etc.).						
Salaries	$6 00		$65 00		----------	
Traveling expenses	----------		----------		----------	
Repairs and supplies	9 90		----------		----------	
		15 90		65 00		
Fish Distribution (car and messengers).						
Salaries	$207 84		----------		$21 00	
Messenger allowance and traveling expenses	108 50		----------		20 45	
Repairs	21 20		$8 26		----------	
Supplies	84 01		53 26		----------	
		421 55		61 52		41 45
Fish Patrol (launches, etc.)						
Salaries	$216 00		$210 00		$246 00	
Messenger allowance and traveling expenses	38 25		39 15		114 21	
Repairs	81 50		----------		22 00	
Supplies (oil, etc.)	95 23		76 47		97 82	
		430 98		325 62		480 03

FINANCIAL REPORT—Continued.

Statement of Expenditures for the Months of November, December, 1914, and January, 1915—Continued.

	November		December		January	
Sisson Hatchery						
Salaries	$1,821 57		$1,759 25		$1,503 50	
Traveling expenses	1 75					
Construction and repairs	193 41		185 62		12 20	
Fish food and ice for meat	299 41		78 27		155 68	
General supplies	34 66		59 64		114 48	
		$2,356 80		$2,082 78		$1,815 26
Tahoe and Tallac Hatcheries.						
Salaries	$10 00		$10 00		$10 00	
Traveling expenses						
Construction and repairs						
Supplies						
		10 00		10 00		10 00
Price Creek Hatchery.						
Salaries	$180 00		$125 00		$222 50	
Traveling expenses	1 00		3 75		21 85	
Construction and repairs			17 31			
Supplies	13 90		14 15		62 30	
		194 90		160 21		306 65
Ukiah Hatchery and Snow Mountain.						
Salaries	$178 25		$172 50		$93 00	
Traveling expenses	14 16					
Construction and repairs	248 07		201 86			
Supplies			53 75		2 75	
		540 78		131 11		95 75
Klamath Spawning Station.						
Salaries					$125 00	
Traveling expenses					31 30	
Construction and repairs						
Supplies					20 00	
						176 30

Miscellaneous Expenditures.						
Printing and lithographing fishing licenses, notices, application blanks, etc.		506 83		4 86		
Angler's license, commissions and refunds		501 90		1,483 50		776 60
Market fishing license commissions		9 25		9 75		12 50
Crawfish inspection		10 00		10 00		10 00
Total fishery expenditures		$6,240 90		$5,851 40		$4,659 63
GAME EXPENDITURES.						
Hayward Game Farm.						
Salaries	$203 50		$268 00		$200 00	
Traveling expenses	31 85		9 05		70	
Rent					112 50	
Construction and repairs	33 63				157 10	
Feed for birds	55 74		46 05		53 45	
General supplies	74 91		43 27		43 72	
		$399 63		$306 37		$567 47
Game Research and Publicity.						
Salaries	$167 85		$219 90		$624 22	
Traveling expenses	77 85		1 40		53 15	
Supplies, etc.	24 88		39 88		595 40	
		270 58		261 18		1,272 77
Miscellaneous Expenditures.						
Printing and lithographing of hunting licenses, notices, application blanks, etc.		1,330 90		1,513 20		1,652 30
Hunting license commissions and refunds		500 60		440 00		460 00
Mountain lion bounties		$2,501 11		$2,520 75		$3,952 54
Total game expenditures		$22,283 64		$21,626 23		$22,815 55
Grand total of all expenditures		$11,657 55		$11,153 032		$10,340 982
Total of fish expenditures		10,626 09		10,473 198		12,474 568
Total of game expenditures		$22,283 64		$21,626 23		$22,815 55
Grand total						

CONTENTS.

IN MEMORIAM

MANUEL L. CROSS

DEPUTY OF THE CALIFORNIA FISH AND GAME COMMISSION
FOR TWENTY YEARS

BORN IN PENNSYLVANIA, SEPTEMBER 4, 1842
DIED IN SACRAMENTO, CALIFORNIA, MAY 1, 1915
IN HIS SEVENTY-THIRD YEAR

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

MANUEL L. CROSS, GAME WARDEN.

Written in appreciation of his sterling character and splendid service by his Chief, who learned of him.

Manuel L. Cross, for twenty years a warden in the service of the California Fish and Game Commission, died in Sacramento on the first day of May of this year. This testimonial from a fellow worker is a humble effort to place the man and his service to the State before the readers of this publication. It is hoped that his life and work may be the source of inspiration for more earnest effort and more faithful service to the men and women who will continue in the work he regretfully laid down.

Up to the last three years, "Mannie," as he was called by his host of intimate friends, enjoyed splendid health and was able to set the pace for any of his younger associates. Latterly, however, he was a constant but patient sufferer from the malady of the heart which finally caused his death. But even during his illness he was a hard and faithful worker, always up at daylight and through the fish markets and along the wharves where the fish come in before the average city man is out of bed. No task was ever too hard for him nor was any day too long. If the job had to be done, Cross was there to see it through and see it through right.

The very soul of honor himself, he had no use for untruthful or dishonest people, with whom his work often threw him, and woe betide the person who broke a promise to him or failed to keep an engagement. Although possessed of the kindest heart in the world, he could so speak his mind to a dilatory associate as to create a very lasting impression. It was always his work to help in the "breaking in" process and many of us have cause to be grateful for the training we gained under the old man.

While not a scholarly man in the accepted use of the term, Cross had a fine mind, stored with useful information, which he was able to use. Probably no man in the State had a better "practical" knowledge of fish and the methods of fishermen and fish dealers than he. It is interesting, too, that not a man among the hundreds he had arrested during his two decades of service bore a grudge against him or entertained other than the most respectful and friendly attitude toward him. With Cross, an arrest was merely the carrying out of his obligation, in which he believed religiously, and this spirit was bound to impress itself upon the offender. As an Italian fisherman told me once: "I don't like to be arrested; but I violate the law and Mr. Cross he can do nothing different but bring me in. He don't like to do it, because I tell him I very poor man with big family, but he say, 'Angelo, it is my duty and I can do nothing else.' And so I not get mad at him, for I know him long time and he never do anything wrong to fishermen or tell them anything not true."

Cross will best be remembered by the anglers of the State for his work in distributing and "planting" fish. There are but few places in the State where black bass are now to be found that were not stocked by him. And when it is noted that this fish is now numerous and thriving in every bit of water suited to its peculiar needs, from northern Siskiyou to southern San Diego and from the coast to the Nevada line, the magnitude of the work of planting becomes apparent.

For many years Cross had charge of the Wawona hatchery and directed the distribution that has placed trout in hundreds of miles of streams and thousands of acres of lakes in the previously barren areas lying above and beyond the Yosemite Valley. As a hatchery man his work was always above criticism.

And now we will work along without him. The spirit of manly courage, unswerving loyalty, transparent honesty and unfailing courtesy remains with us, however, to the lasting benefit of the service to which we are devoted. I saw him at his sister's home three days before he passed away. When the knowledge had come to him that his time was up, he was fully prepared to go and only sorry that he couldn't see all the boys and tell them of the wonderful experience that had come to him in his last days. "Boy," he said, "I want you to tell all the crowd how it is with me. I used to be afraid to die because I was never sure about things; but now I know that everything is all right and I'm glad to go. You be sure and tell all the boys for me, 'Sheff,' and tell them I've been praying for every one of them."

And so I am giving the message as I promised my old friend as he left on his last "detail."—*E. S.*

THE EQUITY OF THE GAME LAWS.*

By Chas. A. Vogelsang.

Game laws, like other laws, are made for a definite purpose, and that purpose is a wise one. So much controversy and discussion have arisen over the present game laws of this State, and so many widely divergent views are expressed, that one who is neither a hunter nor a fisherman may be permitted to present what may be called a disinterested or non-partisan view of the question, especially as close contact with friends on both sides has given the writer an opportunity to hear each side of the story, and to study the effect of our present game and fish laws.

It is unnecessary to discuss or even dwell upon the legal status of such laws, when before us is the record of thirty-eight states of the Union prohibiting the sale of game. Supreme Courts have pronounced them constitutional, wise, and just laws; our highest legal tribunal, the United States Supreme Court, adding its opinion to the credit side of

*This article first appeared in *Western Field* for August, 1902, under the assumed name of "A. Convert." Mr. Vogelsang was then chief deputy of the California Fish and Game Commission. As it cannot now be charged that he is personally interested the article now appears under his own name. It is interesting to note that the California Fish Commission even as far back as 1902 took a decided stand against the sale of game by stating that this paper treats "fairly and forcibly a much abused and poorly understood subject," and by recommending over their own signatures the careful perusal of it.—*Editor.*

such laws, as if to make "assurance doubly sure"; so it leaves only the equity side of the question to be considered. In other words, are these laws fair? Are they based upon the great American principle of giving the greatest good to the greatest number? It is charged that they are tainted with that which is so abhorrent to every American mind, "class legislation"; that is, legislation against the masses and for the benefit of the wealthy, the "favored few."

This is the indictment that rolls so glibly from the lips of the favor-hunting politician, and that flows so freely from the pens of many of our newspaper writers. It is the stock-in-trade argument of many attorneys when "extenuating circumstances" are scarce and it becomes necessary to give the imagination free rein. Occasionally a Supreme Judge justifies his dissenting opinion by reasoning from such a viewpoint. Occasionally there is found one, like the late United States Supreme Justice Field, of sufficient mental vigor and moral courage to see and admit the error of his reasoning. His dissenting opinion written in the famous case of "*Geer* vs. *Connecticut*" is the Rock of Ages to which other dissenters pin their faith. These followers are unaware, perhaps, that Justice Field, in a conversation two years later with his friend E. S. Pillsbury, the well-known attorney of San Francisco, stated that he was "convinced that the doctrine laid down by him in the Geer case was not good law, and that he regretted that he had ever written that dissenting opinion."

No one who has given the subject a moment's serious consideration can fail to see the need of placing restrictions on the taking of wild game, both as to numbers and as to the length of the season in which they can be taken. The difference arises chiefly as to the degree of restriction, and there are inequalities no doubt. Our legislature is confronted with a serious problem when it undertakes the enactment of game laws. Our State is so large and so diversified, the conditions according to localities so varying as to breeding seasons, that a general law—the only remedy at its hands—can not fit each section to its satisfaction. When a constitutional amendment is added which will permit of dividing the State into game districts, then legislation for the different districts can be enacted. At present the legislature has as difficult a task as has the Federal Congress in passing a tariff bill that will suit to its satisfaction every state in the Union. Under present circumstances it does the best it can.

Many of those who criticise the restrictions do it thoughtlessly, not realizing that as civilization pushes out and extends its borders, taking up the wild lands, just so surely are the breeding grounds and habitat of the wild game reduced. The wild bird flies no faster, has no better means of defense, than it had two hundred years ago, but man has increased his efficiency to kill and take a thousandfold; advancing successively from the bow and arrow to a muzzle-loading gun, then to the rapid-firing breechloader with smokeless powder and belt full of cartridges, until finally there has been evolved the "Game Hog." Should there be any question about the wisdom of, and necessity for, these restrictions?

The charge is directly made that our legislators were guilty of framing laws in favor of the wealthy, the "favored few"; in other words, that they were either so base or so ignorant that they passed the

present game laws. The cry was taken up, and it is being industriously and persistently circulated by some of the editors in the larger cities and is copied by some of the interior papers who are "long on space," that an "infamous," a "villainous" law was passed, and this in the face of the fact that our Supreme Court declared the law constitutional and in no sense discriminating. Surely one has a right to wonder and inquire: Why this sharp distinction in terms? Are these laws so unfair? Do they discriminate against the masses? Are the poor deprived of their right, and obstacles placed in their way to prevent their ever tasting game? Is it the poor who clamor so loudly? Have their wails reached the ears and pierced the hearts of these great philanthropists, or is it possible the philanthropic judge and editor have heard that cry at home, and firmly believing that "charity begins at home," are preparing to receive it? Would it be a fairer, more equitable distribution to allow the few market hunters—most of whom are not taxpayers, and often not citizens—to take that which costs them nothing to develop, either in labor or thought; to shoot and ship to the cities where it can be and is purchased only by the well-to-do or wealthy classes? In truth, it is only these two extremes of society, constituting but a small proportion of our population, who are benefited by the sale of game.

It is true that the non-sale of game deprives those living in the cities who do not hunt but who would buy game if they had the legal right to procure it in that way. But it does not deprive them of the right that any poor man in the country is glad to exercise to acquire his. The city man has that same right reserved to him, and the fact is that all those who at any time purchase game when in the markets have the means and generally the time to acquire it in the same way as the man in the country. In other words, the people who can afford to live in clubs, fine hotels, or swell boarding houses, are deprived of their easiest way to get game—that is, to buy it. Are these people the masses? Are they the sick, the blind, the poor that our philanthropic editors have in mind? Is it in their interest that this pathetic wail is set up? Have the poor suddenly acquired such influence that they can be heard in these high places; that their cries are heeded when they talk of game laws, but go unheard when they ask for better wages to buy bread and clothes for their families? Selfish interests produce strange arguments.

This does not apply to all who write against the present game laws. There are some who honestly believe these laws work an injustice, because they do not understand the subject and follow blindly these clever but fallacious arguments, and because they believe that that which deprives the poor man and favors the rich is wrong. They do not realize that the non-sale of game deprives no man of work or position; that the game dealer employs just as many men whether it be poultry or game he handles; that the same is true of restaurants, hotels, or clubs; and that in the country the industrious, intelligent farmer who owns a few acres and follows the legitimate occupation of raising geese, ducks, turkeys, chickens, or squabs for the market, and who is generally a man of family, and always a taxpayer and a citizen, receives a better return for his products than when game is allowed to

be sold. Besides, when he or his sons so desire, they can take their guns (and they always have them), and go out and find some game which has not been shot or scared away by the market-hunter, who scours the country for that which costs him nothing in order to send it to the comparatively few of the wealthy in the cities who can afford to buy.

They do not realize that the present game laws are to the interest and advantage of such men, and to the disadvantage only of the market-hunter who shoots for the rich. They do not stop to contrast the two types of men—the market-hunter and the poultry-raiser—as citizens; they do not realize that every clerk, every laborer, every business man in the country can have his day afield with some profit and some pleasure; that every mechanic or man employed in business in the city can take a holiday and go into the country when game is abundant and be repaid for his time and expense. They do not stop to think that where one gun and necessary ammunition are sold to a market-hunter, twenty will be sold to men who enjoy hunting, and who will go hunting if there is promise of a fair return. In short, they do not understand that the bone and sinew of our country, represented by the great middle classes, will have an abundance of that which they do not buy, but which they can take in the way they enjoy the most.

It is true that the non-sale of game means that less game will be killed; that it can and will increase and multiply; and in that respect (incidentally) will the rich sportsman be benefited, and along with him will every poor man be a gainer. Indeed, it is doubtful if the wealthy sportsman will be so much of a gainer, since his well-stocked preserve is safe from the market-hunter, who must ply his vocation over that very land on which the poor man must of necessity depend for his pleasure and his share of game. As a matter of fact, many of the preserve sportsmen were against the present laws, because on their lands, over which none but themselves hunt, there was not noticeable the growing scarcity of game, and they objected to the wise provisions that placed a limit on the number they could shoot in a single day—a condition which placed them on the same footing with the man who does not belong to a club or own a preserve.

This brings us to the subject of preserves, and it is one that certain editors, who would like to pose as friends of the poor man, work to a finish. It is one of the subjects they revel in when recounting all the "evils" resulting from a number of wealthy men renting a piece of land, putting up buildings, hiring watchmen and caretakers, and in fact paying quite a sum monthly for the privilege of going several times a season for a shoot. Now this is not intended as a defense of preserves or baited ponds shot over from blinds—a practice that is barbarous! It is rather to invite attention to the fact that game laws have nothing to do with preserves. Will some of the learned judges and great newspaper protectors of the poor point out the connection?

Why tear down the game laws and give still greater advantages and opportunities to the preserve man? There is yet no legal way devised under our system of government that can prevent a man with sufficient means from purchasing or renting more land if he thinks he requires it, and after acquiring, controlling it, and saying how much or how

little it shall be open to the public. It would seem most unwise and even childish, because of real or fancied grievances against the preserves, that the only safeguards of the poor man be torn down, simply because some one must be sacrificed. Meanwhile, the preserve remains untouched.

To follow out this line of reasoning, we should deny to a person having land that is unproductive—and nearly all shooting preserves are—the right to rent it and receive an income from it. He should open it to all comers; he should be so liberal and broad-minded that he must not object if his premises are invaded, his stock wounded or driven away, and his fences destroyed; but he should sit calmly by—and wait for the tax collector. If he dared lease it to a man or number of responsible men who would take care of it and pay him besides, he would be committing an offense. Why not go a step further and advocate that, in a city supplied with street railways on which every one can ride for five cents, it shall be an offense against the public morals, peace of mind, etc., for any person to ride in any other way?

Another of the arguments frequently used is the pointing out of the hardships and suffering imposed upon invalids who "must" have game and are unable to purchase it. If that has any value, then there should be no close season whatever, no restrictive measures, else all the invalids would die during the eight months of close season; otherwise there are but four months in the year when they could exist, and now even that lease of life by our present "infamous," "villainous" game laws has been swept away. Unfortunately, statistics of the mortality are generally omitted. Is it not a fact that the sick of the masses or middle classes would appreciate a young squab, or the young of any other domestic fowl? Can they not be purchased at all seasons of the year, and as cheaply as game (when sold)? Does not that sale benefit the dealer, and also some other man following a legitimate occupation in the country?

Are we not growing more ardent year after year for active, health-giving outdoor life, for the strenuous life in the fields? What greater attraction does the country offer, whether one is camping or at a country tavern, than the promise of a well-filled basket or bag? What resort does not advertise—even when they have it not—its fishing and hunting? Does not that attraction, besides giving new vigor and health to thousands, mean the better circulation and distribution of the city's wealth? Is it not a positive benefit both to the city man and to the brother in the country? The present game laws are accomplishing the purpose for which they were enacted. One has but to travel in the country, anywhere, to see and appreciate the effects. Never in years have the quail and doves been so numerous. Deer are increasing, and there will be plenty for all. And it belongs to all—the people in the country as well as the people in the city. Under the existing laws the greatest good to the greatest number will be accomplished.

"With malice toward none and charity toward all" the foregoing is respectfully submitted, and with the hope that a little more serious consideration of all the aspects of the case will show that our present game laws are not only legal but also equitable.

THE CALIFORNIA VALLEY QUAIL AND INTRODUCED GAME BIRDS.

By GEORGE NEALE,
Assistant, California Fish and Game Commission.

Civilization and population forcing itself westward and into communities where game is or was once abundant, make new measures necessary in order to protect the existing game fauna of California. When these measures are not taken, history shows that certain species, those most easily killed or captured and those whose reproduction is less prolific, will be eventually exterminated.

The band-tailed pigeon is a good example of a species nearing extinction. This bird was once almost as numerous in California as the passenger pigeon was in the eastern and middle states. Only a remnant of the former numbers now remains. The records of the cloud-obscuring flights of the passenger pigeon seem like a fable, except to those who have seen and know. The few remaining mourning doves, once so numerous in California, furnish another example of the passing of species. The western mourning dove, sometimes called Carolina dove, is nearly as strictly migratory as waterfowl. Especially in northern California is the dove not a resident species. It nests throughout the State but its winter home is the southwestern portion of the United States as far as Mexico. The writer has seen the fall migration through New Mexico and along the line of the Mexican Central Railroad from the Rio Grande nearly to Mexico City. It is true that some doves remain in the southern valley portion of the State the whole year, as do a few migratory ducks and other birds.

Our laws have not given the dove proper protection. We have permitted them to be killed in the nesting season and on the nesting grounds, in what we term the open season. If this killing were permitted on the northern breeding grounds of the ducks and other waterfowl, what a protest would be made from California! From my own observation it is a conservative statement to say that the dove and band-tailed pigeon have decreased eighty per cent in northern and central California in the last twenty-five years.

The most flagrant cause of the near extermination of species is to be found in the unthinking or uncaring attitude of the people of the State. An added factor to be considered is the fact that certain species are not prolific in their reproduction, rarely having more than one or two eggs. Hence, in many seasons the whole, or at least part of the total increase of these birds may be destroyed by predatory animals or by human beings. This is true not only of the family Columbidæ to which the dove and pigeon belong but of the family Ardeidæ (egrets, herons, etc.) which are so much sought for by plume hunters, especially in the mating season. These birds are of a confiding nature, easily approached on the nest, and so make an easy prey to the gunner or netter. Consequently, our efforts should be centered in protecting those birds which are under natural disadvantages. But this is not enough: all of our game birds need to be intelligently conserved.

The protection now given many species of migratory birds by the United States Department of Agriculture will no doubt have a beneficial effect in perpetuating those birds not entirely exterminated.

The only game bird that has proved itself able to survive in the face of all the obstacles presented by encroaching civilization is the California valley quail (*Lophortyx californica*). This bird is able to care for himself under any and all existing conditions if given a square deal. It adapts itself readily to all conditions, and is the peer of any game bird in the world. This bird is also capable of taking the conceit out of any champion at the traps, and makes a dog well-trained on other game look like a tyro. It uses judgment in flight, when flushed, which a military expert would call masterly; and even when wounded it shows all the qualities of a strategist. Always willing to match its brains against those of the gunner, it, in most instances, meets with success. In egg production the valley quail excels all other game birds, not excepting the pheasant, partridge, grouse or sage hen, scarcely ever laying less than eighteen eggs at one year old, and at three years frequently laying twenty-two or more eggs. Furthermore, it usually succeeds in hatching and raising all or a very large percentage, and frequently hatches a second brood. This is nearly always the case if the first nest is destroyed. Quail eat almost any seed or wild berry. Noxious weed seeds are destroyed in great numbers; hence they are most useful birds to the farmer, orchardist or vineyardist. I believe the quail ranks highest as an insectivorous game bird.

The quail is one of the only game birds which is attracted by civilization, and if not molested this bird will make its home near a farm cottage. The valley quail is king of all he surveys, pugnacious to a high degree, and will hold his own against any other bird encroaching on his domain. He is always true to his mate, is invariably non-polygamous, and always chooses his own mate in captivity or freedom. This bird has survived a four months' open season with a bag limit of twenty per day, or 140 per week. It has been hunted with the best dogs in the world, chased with something like 121,664 automobiles fully armed, and rapid fire automatic and pump guns in the hands of 159,164 hunters. It is surely a marvel that any of these birds still remain.

The range of the valley quail in northern California is from sea level to 3,000 feet above, rarely ever being found above this elevation. The valley quail is not migratory, except under adverse food conditions. Only at times do they wander far from their feeding grounds, and they invariably return each season to the place where they were raised.

In over thirty years' experience in the field with this bird, from the south line of its range to its northern limits, I have never seen a sick or diseased valley quail. They are strong moulters, and this perhaps insures their being practically immune from disease. Of all the gallinaceous birds, *Lophortyx californica* is the fittest representative of the game bird family. Hence he will continue to prove the survival of the fittest. If the time ever arrives in California when all our game is on the verge of extermination, this grand game bird will be one of the last to disappear.

Our efforts to avert this rapid extermination of bird life by the introduction of new species of game birds into California has not met with success commensurate with the expenditure of money. One reason for this may be the pugnacity of native game species. Wherever other

varieties of game birds not native to California have been introduced on lands where California valley quail live, failure has always followed. This bird will always fight against the usurpation of his territory by other birds. It will attack a cock pheasant as readily as a small bird. Hence there are good reasons why it should be the one dominant game bird.

The following instance of pugnacity on the part of the valley quail has come to my notice. Mr. Hollenbeck of Ryer Island, California, who is a great lover of birds and animals, encouraged a large band of quail to remain on his land by prohibiting shooting. He fed the birds every few days, and they became so tame that they even came inside the house when called. In fact they were so tame as to almost be a nuisance. Knowing Mr. Hollenbeck's fondness for birds, I obtained for him some ring-necked pheasants. The quail, however, have driven away these pheasants, so that they are now to be found only in localities where quail are not found.

There may still be another reason why introduced game has not increased. Many people believe that all that is necessary in the introduction of a game bird into any locality is just a matter of securing the species to be introduced, giving the birds their liberty and awaiting favorable results. But the fact that a Master Hand has not only distributed game birds and animals, but has adjusted the flora and fauna of the universe to certain life zones most suited to their existence, is often overlooked. We must know the conditions and seek to introduce such birds as will thrive under them. No game bird has as yet been introduced into California which has proven to be adapted to the geographical and climatic conditions obtaining here.

One of the principal reasons for our failure in the introduction of game birds in the past has been that none but ground-roosting birds have been selected. As a result they have been attacked by predatory animals. These latter are possibly of a larger variety and more numerous in California than in any other state. The valley quail has at some time had to adapt itself to these conditions. This bird is now a tree or bush-roosting bird, and this makes it practically immune from the depredations of these numerous animals. On the other hand the Hungarian partridge, bobwhite, pheasant and other quails are ground-roosting birds. Therefore these birds are subject to depredations from the many animals which roam and feed at night and can not obtain the foothold which they should in California.

Let us keep in mind our experiences of the past and see that birds more suited to our conditions are introduced—or better still, that such hardy birds as the California valley quail are sufficiently protected to make stocking with foreign game birds unnecessary.

THE SISSON FISH HATCHERY.

By H. C. Bryant,
Game Expert, California Fish and Game Commission

For nearly forty years the State of California has been artificially rearing fish and planting them in the streams of the State. As a result our streams are well stocked with fish. Probably over ninety per cent of the fish in most of the streams of the State at the present time have been reared in State hatcheries. A person who simply reads the biennial reports of the Fish and Game Commission, where he sees statements as to the millions of fish planted in the streams of the State, can not realize the tedious and painstaking work needed to make such statements possible. Experienced workers are needed to bring the fish from the egg stage to the size when they can be safely planted in the streams. Then, too, whereas a small amount of care is needed for

Fig. 34. The Sisson Fish Hatchery, March, 1915.

rearing a small number of fish, added care needs to be exercised when millions are being reared. A trip to one of the hatcheries can alone bring convincing evidence of the work being accomplished.

The State of California owns and operates six hatcheries. The largest and best equipped of these is the one located at Sisson, Siskiyou County. Under the charge of Mr. W. H. Shebley, Superintendent of Hatcheries, the Sisson Hatchery has evolved from a small plant with an output of a few thousand fish to what is probably the largest hatchery in the world. Mr. Shebley received his first training under his father, Mr. J. V. Shebley, who originally owned a private hatchery in Nevada County. While still a boy, Mr. W. H. Shebley, the present superintendent, was hired by the then newly-established Fish Commission to plant fish in different parts of the State. In 1885 he succeeded his father in charge of the Shebley Hatchery. Four years later he became superintendent of the Hat Creek Hatchery on the Pit River and since then he has at different times been in charge of nearly every hatchery in the State. The first hatchery building at Sisson was erected in 1888. In 1893, Mr. Shebley was placed in charge, but even after

that time he managed the planting of fish throughout the State and in most cases superintended the work personally. In the early days he did practically all of the work himself, spawning thousands of fish and caring for the eggs and fry both day and night.

The present article would make more interesting reading could the author have visited Sisson Hatchery twenty years ago so as to have made a comparison with the hatchery as it exists today. The few following comparisons have been made possible by reference to old reports. The site chosen for Sisson Hatchery has left nothing to be desired. Situated near one of the tributaries of the upper Sacramento and near what is known as "Big Spring," an abundance of pure cold water has constantly been available. Not only has the location proved valuable in this respect, but it has the added charm of being beautifully situated, with Black Butte in the foreground and Mount Shasta, covered with

Fig. 35. Artificial spawning of a rainbow trout. The eggs are "stripped" from the fish into a small pan.

eternal snow, a little farther away. Originally one small hatching house, a plain wooden structure forty by sixty feet, equipped with forty-four troughs, and about half a dozen ponds, were constructed. At the present time there are five large hatching houses with several auxiliary "batteries," and fifty-two ponds on the grounds. The state owns seventeen acres. This is well fenced and has a comfortable home for the superintendent, several cottages for employees, barns and other needed buildings. In addition the grounds have been made very attractive by trees, flower gardens, and several small aquaria. Consequently, during the summer season as many as two hundred persons visit the hatchery daily.

A trip through the grounds gives one a surprisingly increased knowledge of the work which this State institution is accomplishing. For instance, let us start in the main hatchery building. After passing

the offices of the superintendent and his secretary, we are confronted with long lines of troughs through which streams of cold water are constantly flowing. In these troughs can be seen thousands and thousands of trout fry, most of them at this time of the year (March) two or three months old. We are told that there are about twenty-five thousand fish to each trough, and the black moving mass convinces us of the truth of this statement. The troughs are all painted white and the water is exceedingly clear, so that the dark-colored fry are very conspicuous.

As we leave this building, we walk between a number of large trout ponds containing fine large specimens of several different species. In one pond may be seen Loch Levens, the original stock of which was imported from Scotland. In another pond can be seen eastern brook

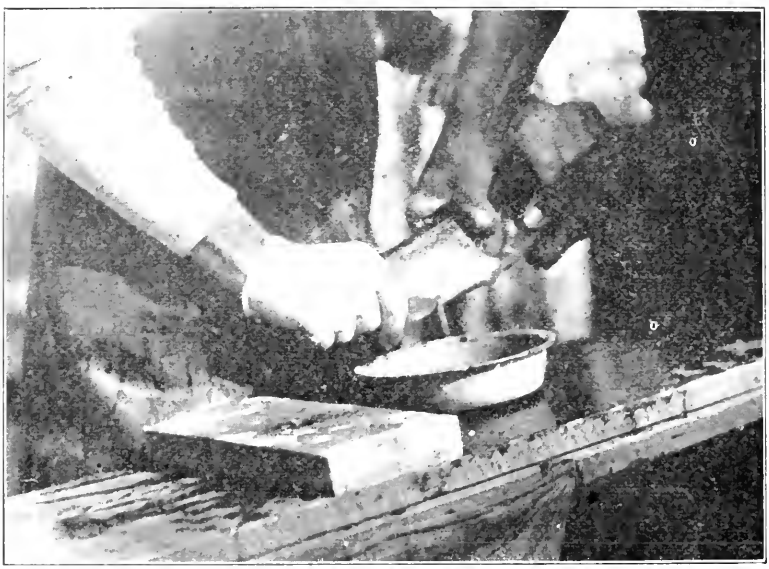

Fig. 36. Eggs of a rainbow trout being fertilized with milt from a male trout.

trout, smaller, but beautifully spotted fish. In still another pond rainbow trout, that fish par excellence of the California fisherman. Some of them are larger fish than most fishermen have ever seen. These fish are kept from year to year in the ponds and from them many of the eggs used for hatching are procured.

In order to prevent screens from clogging with leaves and other debris at the point where the water flows out of the ponds, a peculiar type of screen has been invented. This consists of a cylinder covered with wire netting, continually revolved, the power being supplied by a paddle-wheel attached close by.

There has been much discussion as to whether the "pond system" is a more effective means of procuring the eggs needed for hatching than the "trapping method" now almost exclusively used. This latter method consists of trapping the trout when they are running up stream to spawn, spawning them at the stations where they are caught, and

shipping the eggs to the hatchery. This method, although as a rule proving very successful, is always somewhat unreliable, for the number of fish trapped for spawning purposes is variable from year to year. Pond-reared trout can always be depended upon. Consequently, Mr. Shebley is endeavoring to expand the pond system in order that a supply of eggs may always be procurable no matter what the run of fish is in the streams. By purchasing a few additional acres, the State could increase the pond system sufficiently to maintain a sufficient breeding stock, and thus assure a good take of eggs each year.

We have now reached the spawning house. Here three men are at work spawning rainbow trout. One tank is filled with female fish and the other with males. One man takes out a fish, another man wearing cloth gloves takes hold of it firmly, and a third man "strips" it. (See figs. 35 and 36). When a small pan of eggs is procured "milt" is obtained from a male fish in the same manner and the eggs are set in a dark place for a few minutes until fertilized. Several thousand eggs are often obtained from a single fish. When fish are found "unripe" they are returned to tanks where they are kept for several days after which they are again tested. The operation of spawning appears to the observer as though it would seriously injure the fish. However, this is not the case, for fish have been successively spawned at Sisson for as many as five years.

After the eggs are fertilized they are placed in a wire basket hung in a trough of running water. After a week or more each tiny fish has become large enough so that it can be seen inside of the egg. At the age of three or four weeks, the fish hatch out. Unlike birds, however, they hatch tail first. Attached to the under surface of each tiny fish is a large bag or sac containing yolk. The young fish feed on the material in this yolk sac for two to three weeks. By that time it becomes entirely absorbed and the fish begins to take food for itself During the period when fish are unable to take food, they are rather sluggish and remain very quiet. Later, however, they become very active.

Many of the salmon and trout eggs used for hatching are procured at "spawning stations" at the headwaters of the larger rivers. Racks are placed on the smaller creeks up which the fish run to spawn. (See fig. 37), and large numbers of "ripe" fish are entrapped and spawned artificially. During the fall of 1914 the United States Bureau of Fisheries secured in this manner over 30,000,000 salmon eggs. These were turned over to the California Fish and Game Commission and a very large proportion of the eggs hatched out. Three of the hatchery buildings at Sisson were needed to take care of the eggs and fry.

A visit to the other hatchery buildings discloses millions of salmon eggs and tiny salmon which have just hatched. The eggs of the salmon, in contrast to the dark-colored eggs of the trout, are reddish in color. In order to obtain the approximate number, the eggs are measured into the baskets with a measuring glass the capacity of which is known. In some instances from 30,000 to 35,000 salmon eggs are placed in a single basket. After the eggs have hatched the number of fish in each trough is usually reduced to about 25,000.

A large force of men are employed in keeping the troughs clean. All sediment and debris from the water is swept out of the troughs and all dead eggs are removed by means of a pipette. Both eggs and young fish are parasitized by certain bacteria and care must be taken to see that all infected individuals are removed to prevent spread of the infection.

In order to feed the millions of fish at the Sisson Hatchery, it is necessary to maintain a kitchen where food is prepared. From six hundred to seven hundred pounds of this prepared food is fed to the fish every day during the rearing season. In order to make this amount of food it takes about three hundred pounds of meat. This is obtained from slaughter houses in San Francisco. The food is pre-

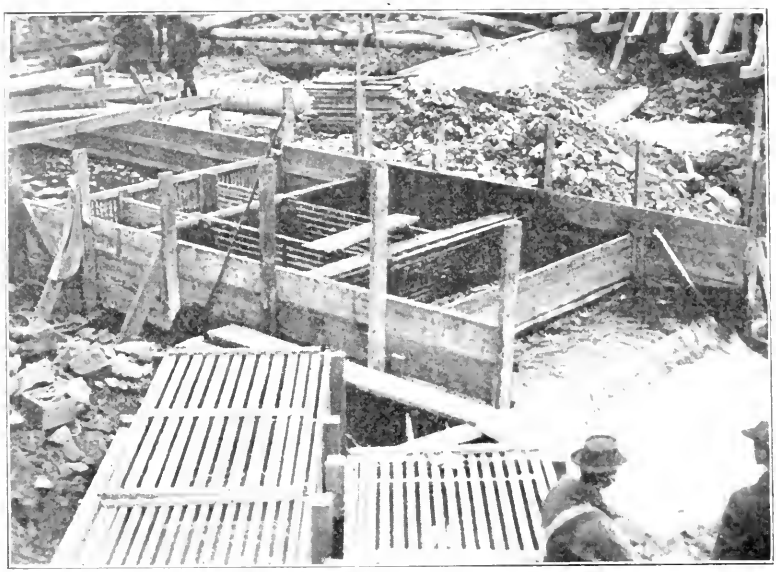

Fig. 37. A fish trap on the Klamath River at Copco, California. Thousands of fine large trout were obtained for spawning here.

pared by taking such scraps of meat as beef heads, livers, lights, and the like, grinding them up, mixing them with corn or other meal, and clabbered milk, and cooking this into a sort of mush. The pond fish soon learn to know the man who feeds them, and they will follow him about from one side of a pond to the other. When the food is thrown into the pond, there is a wild dash for it, and the water flies in every direction. In addition to this food the pond fish often obtain insects which alight on the water, and not infrequently a trout can be seen "jumping" for such delectable morsels. A similar kind of food is prepared for both the trout and salmon fry.

When the fry are old enough to care for themselves, they are placed in "nurseries," small ponds made especially for the small fish. As pond trout and salmon are somewhat cannibalistic, it is necessary that

the fish be of about the same general size in each pond. Fry are kept in these nurseries until ready to be shipped to different parts of the State. The State owns its own fish distribution car which carries the fry to the nearest railway terminus. From the railroad station the fish are carried into the higher mountains by means of auto trucks, wagons and pack animals.

All trout are very much subject to disease, and it is therefore necessary that they be continually watched to prevent an epidemic. Mr. Shebley has devised several methods of treating the sick fish. Some are given an antiseptic bath, others are cured by having the parasitic crustaceans removed from their mouths and gills. Nor is disease the only thing with which a superintendent of a hatchery has to contend. For instance, a number of years ago, Mr. Shebley found many fish dead in the ponds. Examination showed that the stomach of each fish contained a number of little pebbles. Evidently the food which they had taken forced the fish to attempt to procure grinding material and this had eventually caused their death. In another instance the stomachs of dead fish which were examined were found to contain small masses of cobweb. Investigation showed that the meal used in the food was badly infested with meal worms, and the webs made by these worms had formed little balls in the stomach, and so had caused death. Slight carelessness often results in heavy losses. It has only been by careful attention to details and by continued study of the diseases attacking fish that this large hatchery has been made so successful.

The California Fish and Game Commission can point with pride to its accomplishments along the line of artificial propagation of fish. Had no work in other directions been done, the Department of Hatcheries has accomplished results which will justify all the expenditure of the Commission in years past. The degree of perfection to which the stocking of our streams has been brought is truly remarkable. We wish that as great success could be obtained in our attempts to restock our game covers, but so far this newer work has largely failed. Conservationists are searching for the man who can put game propagation on the same plane with fish propagation.

TWO KINDS OF CONSERVATIONISTS.

By W. P. Taylor.

Curator of Mammals, California Museum of Vertebrate Zoology.

Only a little study of the conservation situation in America is sufficient to show we have allowed certain parties at interest to take more than their rightful share of the resources of wild nature which as a matter of simple justice belong, not only to all the people now living, but also to the generations of the future indefinitely. Only a little study suffices to emphasize certain obvious necessities which must be complied with if we are to bring to bear any effective remedy.

It is at this point that there is an unconscious separation of the people into two groups: the apathetic and the active.

It is worse than useless to know the facts and necessities of the game conservation situation if we are not willing to translate inclination and impulse into action.

There are two kinds of conservationists; the conservationist of the folded hands and the conservationist of the clenched fist.

There is much to be done, and it will not be done by the conservationist of the folded hands!

Will you permit one who has been close to the firing line to offer some suggestions to those who have the welfare of our resources in fish and game at heart? First and foremost, read and promote the circulation of Dr. William T. Hornaday's two books "Our Vanishing Wild Life" and "Wild Life Conservation in Theory and Practice." Join some society which is active in the fight to save the game, such as the Cooper Ornithological Club, Sierra Club, California Audubon Society, State Humane Association, the Wild Life Protective League of America or the California Fish, Game and Forest Protective League. Enlist the interest of the societies and clubs of which you are already a member in the study of nature and in the preservation of our natural resources. Organize a local Audubon Society or a Sportsman's Game Protective Association in your home town. If you desire information along any of these lines write to Dr. Harold C. Bryant, Game Expert, California Fish and Game Commission, University of California, Berkeley, California, and you will receive generous and sympathetic assistance.

Certain communities in the mountains of California apparently have no interest whatever in game protection. In other communities in similar situations the conservation tide runs strong. I can not escape the conviction that, in these latter cases, interested and enthusiastic individuals have leavened the whole lump, have transformed their communities from opponents to supporters of preservation of wild life.

Put your hand to the plow, and never look back till what you desire has been accomplished. Write articles for your local papers, tell the boys of sling-shot and air-gun age what kinds of birds it is lawful and what kinds it is unlawful to kill. Get in touch with your game warden, express an interest in his work and an appreciation of his services. Assure him of your hearty co-operation in his labors for the protection of wild nature.

Storm the citadels of indifference, show your friends that whatever preserves the natural attractiveness of our State is good business. Emphasize the dangers of the *laissez faire* policy.

If you are a teacher, commend the protection of wild life to your pupils, and lead them to a love for the out-doors.

If you are a professional man, contribute articles to your professional journals, and initiate and give vigorous support to movements for a better sentiment in your own community.

If you are an editor, upon you, in no small degree, will depend the education of your city along these lines.

If you are a member of a woman's club, secure the interest of your organization in the work of saving the game of California. Communicate with Mrs. Harriet Williams Myers, 311 Avenue 66, Los Angeles,

California, chairman for Wild Life Conservation, California Federation of Women's Clubs, and promise your co-operation.

If you are a sportsman, join with others and form an organization for game protection. Take "law enforcement" as your slogan. Do what you can to set up and maintain high standards among the men who hunt.

If you are a farmer, learn to know your friends among the wild mammals and birds, and see to it that the individuals or species you would condemn as hurtful to your interest are guaranteed a fair trial at least before execution. Provide food plants, shrubbery and nest-boxes for beneficial birds, and reserve a part of your acres as a sanctuary where game may be safe from molestation.

If you are a parent, inculcate in your children the highest possible ideals in the matter of preservation of all our natural resources, and train them up, by precept and example, to avoid individual and social wastefulness.

If you are a plain citizen, then yours is the heaviest responsibility and the highest privilege of all; for you must decide through ballot box and personal influence what shall be done with California's wild game.

I believe that all true sons of California, whether native or adopted, are idealists and love justice and square dealing. We have been accustomed since the days of the rugged Forty-niners to good-natured contests of one sort or another, and fair play is a tradition wrought into the fiber of our commonwealth. All considerations of justice, square dealing and fair play lead with inevitable certainty to the conclusion that we hold those natural resources which still remain to use in trust for the generations of the future; and that while we may legitimately take toll of these possessions, we must not impair the seedstock.

The Taj Mahal of Agra, India, is said to be the most beautiful building in the world. Its construction occupied ten thousand men for twenty-two years. Yet a few vandals could wreck it overnight, so much more rapidly do the forces of destruction work than those of construction.

The building of living species, the end results of the consummate art of Nature, has occupied the Creator for a time so long that we can no more than guess at it. Yet we of this generation can permit of the utter destruction of some of these species.

It is doubtful whether the Taj Mahal could ever be replaced were it to be destroyed, but it is *certain* that living species, once destroyed, can never be replaced. Man, the king of creation, even at this the summit of his glory, cannot undo extermination!

It is as sure as death that we will be held responsible for our acts by the generations of the future. We ought to be held responsible. Let us keep the faith!

RECENT FISH LEGISLATION.

By N. B. Scofield.

The Districting Bill.

(Senate Bill No. 681. Senator Flint.)

A bill has been passed by the legislature and signed by the Governor which makes some radical changes in the fish and game districts of the State. At the present time the State is divided into seven fish and game districts which were created so that different parts of the State could have fish and game seasons that would conform to the different conditions of each. Besides these seven districts many smaller reservations and refuges have in the past been created, such as Cache Slough, Napa River, Mokelumne River, Catalina Island, the two reservations in Monterey Bay and many others. Laws have from time to time been passed regulating the fishing in each of several streams, as in Smith River, Klamath River, Eel River and Sacramento River. A recent court decision has held that as the State has been divided into fish and game districts, as provided by the constitution, for the purpose of making appropriate laws for each respective district, a law to be constitutional must apply to the whole of one of the districts. Under this decision the laws regulating the fishing in a stream or part of a stream, or in any bay or part of the coast waters, or the hunting in any portion of the State other than the whole of one of the seven districts, would be unconstitutional. It therefore appeared necessary to redistrict the State and wherever special laws were required to make of that part a separate district.

The bill as finally passed, dividing the State into thirty fish and game districts, was drawn to take care of these separate and different conditions. There are four main districts, Nos. 1, 2, 3 and 4, which, with the exception of a few game refuges, takes in about all the land of the State and might be called game districts in distinction from fish districts. The districts Nos. 5 to 23 inclusive are fishing districts, which in the main cover the same territory and follow the same lines in conformity with the present laws covering the same. For example, Nos. 5, 6 and 7 are the commercial fishing areas for Smith, Klamath and Eel rivers, respectively. The districts Nos. 24 to 29 are game refuges, some of which are new.

The bill has met with some criticism on the ground that it is a complicated arrangement and a fisherman or hunter will never be sure what district he is in, but when one knows what the present laws are and the boundaries as defined at present he can easily see that the new "districting bill" simplifies rather than complicates. Many special fishing districts have been cut out and the seven main or game districts have been reduced to four. What makes it appear complicated at first sight is that many of the boundaries as they already exist in the present laws are brought together in one bill. It will be found that the laws will be simpler and more easily understood and that under the new system of districts many of the present laws have been eliminated.

The four main fish and game districts are exclusive of the remaining districts and can easily be understood by consulting the accompanying map (fig. 38). The districts 5 to 29, to describe them very briefly, are as follows:

Fig. 38. Map showing new fish and game districts. Many of the districts along the coast have reference only to laws on fish. Although seemingly making laws more complicated, the new districts will in reality improve fish and game administration.

No. 5. The ocean waters and the tide lands of Del Norte County north of Point St. George and including the lower part of Smith River.

No. 6. The ocean waters and the tide lands of Del Norte and Humboldt counties lying between Point St. George and Mussel Point and including the lower end of Klamath River.

No. 7. Consists of the ocean waters and tide lands of Humboldt County lying south of Mussel Point and includes the lower end of Mad and Eel Rivers.

No. 8. The waters of north Humboldt Bay.

No. 9. The waters of south Humboldt Bay.

No. 10. The ocean waters and tide lands of Mendocino, Sonoma, Marin, San Francisco, San Mateo and Santa Cruz counties as far south as Santa Cruz Point and includes Tomales Bay and excludes Bolinas Bay and all lagoons.

No. 11. The waters and tide lands of the Golden Gate and of Richardson Bay.

No. 12. The waters and tide lands of San Francisco Bay, except the portions included in districts 11 and 13; the waters and tide lands of San Pablo Bay, of Carquinez Straits and Suisun Bay; the waters in the main channel of the Sacramento River, Steamboat and Sutter sloughs as far up as Colusa; the waters of San Joaquin River, Old and Middle rivers to the south boundary of San Joaquin County.

No. 12a. The waters in the main channel of Sacramento River from Colusa to Vina.

No. 13. The waters and tide lands of south San Francisco Bay.

No. 14. The waters of the lower six miles of Scotts Creek, Santa Cruz County.

No. 15. The waters of San Lorenzo River and tributaries and Monterey Bay waters and tide lands lying north of a line from Point Santa Cruz to Soquel Point.

No. 16. The waters and tide lands of Monterey Bay lying south of a line extended east from Point Pinos.

No. 17. The State waters and tide lands of Monterey Bay not in 15 and 16 and the State ocean waters and the tide lands to Point Carmel ("Point Lobos") in Monterey County.

No. 18. The State ocean waters and the tide lands from Point Carmel to the north boundary of Santa Barbara County.

No. 19. The ocean waters of the State and the tide lands from the north boundary of Santa Barbara County to the south boundary of San Diego County and includes all the islands and surrounding State waters and the tide lands, except Catalina.

No. 20. Island of Catalina and surrounding State waters.

No. 21. Waters and tide lands of San Diego Bay.

No. 22. Waters of Salton Sea and Colorado River.

No. 23. Land and waters within Lake Tahoe and Truckee River drainage basin.

No. 24. Cleveland National Forest in Orange and Riverside counties.

No. 25. National Pinnacles Monument, a park in San Benito County.

No. 26. Trinity National Forest, a park in Trinity County.

No. 27. State Redwood Park, Santa Cruz County.

No. 28. A portion of the Angeles National Forest in San Bernardino County.

No. 29. A portion of the Angeles National Forest in Los Angeles County.

Bills Relating to Fish.

(Senate Bill No. 155. Senator Kehoe.)

The bill amends section 629 of the Penal Code and relates to the screening of irrigation and power ditches to prevent young trout and salmon and other fish from entering them and becoming lost. The

change in the section provides that the parties concerned be given a hearing, and details the method by which the hearing may be had and the evidence taken.

(Senate Bill No. 688. Senator Mott.)

This bill changes section 628*b* of the Penal Code making the close season for black bass in all districts except 3 and 4 from December 1 to April 30, inclusive; and in districts 3 and 4 from December 1 to March 1, inclusive. It makes the close season for Sacramento perch, crappie and sunfish in all districts from December 1 to April 30. It prohibits the sale of black bass, Sacramento perch, crappie and sunfish. In other respects the section remains the same as at present.

(Senate Bill No. 699. Senator Brown.)

The bill deals with trout and amends section 632 of the Penal Code. Section 632½, which deals with steelhead trout, is repealed and the steelhead, rainbows and cut-throat trout are all classed under the word "trout" with the object of doing away with the question of: What is the difference between a rainbow and steelhead?

The trout limits are not changed. The close season for districts 1, 4, 5, 6, 7, 8, 9, 19, 21, 24, 26, 28 and 29 will be December 1 to April 30, inclusive. This is a change from the present season in that it will open fifteen days later in Del Norte and Humboldt counties and will open one month later and close one month later in southern California. This is a better season and meets with general approval. The close season for districts 2 and 3 and in the included and minor districts is from November 1 to April 30, inclusive. The present season in the counties covered by district 2 opens fifteen days earlier than this for trout other than steelhead and one month earlier for steelhead. The season for all trout opens one month later than at present in district 3. In district 23 (waters of Tahoe and Truckee basins) the season will open June 1, which is one month later than the present law. It will be unlawful to take trout within 500 feet of the mouth of any stream or in the lower two miles of any stream in this district between November 1 and July 31, inclusive. The same provision for the taking, shipping and selling of twenty black spotted, Tahoe trout irrespective of weight, remains in the law but applies to districts 23 and 1.

The bill provides for taking two trout a day with hook and line or spear in district 2 between December 15 and February 14. Under the present law steelhead to the extent of 30 pounds a day may be taken any place in tide water up to January 1, but with hook and line only.

The bill provides for marketing the steelhead caught while fishing for salmon in districts 5, 6, 7, 8 and 9.

(Senate Bill No. 705. Senator King.)

The bill amends section 634 of the Penal Code and relates to salmon. The present laws are arranged to conform to the new districts and several other changes have been made, as follows: The open season is extended five days to September 25 for district 12 and the ocean districts south of Humboldt County. District 12*a* was made to protect the

salmon in the upper Sacramento River and a close season is given it from May 15 to December 31. This arrangement protects the salmon of the fall run while on the spawning beds and protects the latter part of the spring run. For several years the salmon hatchery at Baird on the McCloud River, the only hatchery which takes eggs from the spring run, has not been able to take a sufficient number of eggs from the spring run to supply the one hatchery and the run is becoming lighter each year. It is believed this arrangement will restore the McCloud River run to something of its former importance. The fishing in this upper portion of Sacramento River (district 12*a*) is carried on with seines which are dragged through the holes, taking practically all the salmon in the river, unless the water happens to be too high to operate the nets. This up-river fishing should in time be eliminated. There is no other stream in which salmon netting is allowed for so great a distance. On the Columbia, for instance, the netting is allowed for only half the distance.

For districts 12 and 12*a* and the ocean district below Humboldt County, a minimum mesh of 5½ inches is provided for salmon nets.

The close season for district 5 (Smith River) is from December 1 to September 30. This season protects the latter third of the quinnat and silver salmon runs and also gives sufficient protection to the steelhead run. The present close season for the river is entirely wrong, the close season apparently being meant for the open season. There is a 6½ inch minimum mesh provision as in the present law. Seines are prohibited.

The close season for districts 7, 8 and 9 is made from December 8 to October 6, inclusive. District 7 takes in the lower netting area of Mad and Eel rivers. This season with the netting limit placed at the east line of township 3 is a better arrangement for all concerned than they have had on Eel River for many years. The salmon and steelhead are, for the present, anyway, given ample protection and as the seines are eliminated and gill nets can only work at night, the sportsman angler will not be interfered with and should be satisfied.

The season for district 6 (Klamath River) is left the same, as it is entirely satisfactory. Daylight fishing from August 1 to September 5 is prohibited on the river. This was to stop the bar fishing which was monopolized by a few daring ones to the dissatisfaction of the others, and it was thought this bar fishing kept the fish from entering the river.

A close season is provided for salmon in district 15 (San Lorenzo River and a portion of Monterey Bay) from September 1 to April 14. This protects the salmon while they are running in San Lorenzo River, where it is wished to establish a run of salmon from the "plants" already made, and it allows trolling in the bay part of the district during the summer run.

The bill provides for the importation of Dolly Varden trout and any species of salmon, other than quinnat salmon, during the close seasons in the State, but they are to be invoiced and tagged and otherwise kept track of. The bill also defines salmon and fixes the steelhead as a trout, so that there should be no trouble in the future, under the law, in showing that the steelhead is not a salmon.

(Senate Bill No. 741. Senator Gerdes.)

Adds a new section, No. 628*h*, to the Penal Code prohibiting the planting in the waters of the State any fish, shell fish, crustaceans or mollusks (except oysters) taken within or without the State, without getting a permit from the Fish and Game Commission. The object of this law is to prevent irresponsible persons from introducing species into our waters that might do great harm.

(Senate Bill No. 755. Senator Flint.)

The bill amends section 635 and includes section 374½ of the Penal Code. Deals with the use of explosives for killing fish and adds a few substances to the list of materials that are considered deleterious to fish or plant life.

(Senate Bill No. 768. Senator Scott.)

This bill amends section 628 and incorporates section 628*g* of the Penal Code, and relates to crabs, spiny lobsters, abalones and catfish. It reduces the close season on red abalones from three months to the one month of February, and prohibits the drying of abalones. It forbids the importation of spiny lobsters taken within ten miles of the California boundary. This provision is designed to protect the lobsters of the Coronado Islands, which it is believed migrate back and forth across the border. It adds fifteen days to each end of the present close season on catfish. The section was also revised to fit the new fish and game districts.

(Senate Bill No. 826. Senator Campbell.)

This bill amends section 628*f* of the Penal Code which relates to clams. The bill provides for a limit of 50 Pismo clams for one calendar day instead of 200 (which is the present law). It also reduces the size limit of Pismo clams from 13 inches in circumference to 12 inches for the minimum size to be taken or had in possession.

This bill also places a limit of 1½ inches minimum size on cockles, hard-shell, or little neck clams when measured in the greatest length, exclusive of the curve of shell.

There is also a provision in this bill which makes it a misdemeanor to ship or transport any clams or crabs which have been taken in fish and game districts 5, 6, 7, 8 or 9. The bill also includes Humboldt County laws relating to razor clams.

(Senate Bill No. 836. Senator Beban.)

The bill adds section 628*i* to the Penal Code and allows the use of Chinese shrimp nets in district 13, which is that part of San Francisco Bay lying south of a line drawn from Hunter's Point to the north end of Bay Farm Island. It provides that all shrimp, fish, or shell fish not suitable for sale as fresh shrimp, shall be returned to the water alive. Section 628 of the Penal Code prohibits the drying of shrimps or the possession of dried shrimps in the State. Until four years ago, Chinese shrimp nets were allowed and it was lawful to dry shrimps but unlawful to export them. It was found impossible to enforce the non-export law and the drying of shrimps was carried on on a large scale

on San Francisco and San Pablo bays. Nine-tenths of the total catch were dried, the shrimp meats extracted, and the young fish and shrimp shells sold for fertilizer. Great quantities of young fish were very frequently taken with the shrimps and this destruction was especially great in upper San Francisco Bay and San Pablo Bay, and was caused in most cases by the boats taking shrimps for drying only. The boats fishing for the fresh shrimp market operated in deeper water so as to take the larger shrimps and in consequence they took fewer small fish. But the boats operating for fresh shrimps in the upper bay, while they did not take so many fish, they did take the young of the more valuable food fish, especially young smelt and striped bass. The boats operating in South San Francisco Bay, although they took shrimps only for drying, did not destroy many fish, and what they did take were of unedible varieties.

After a thorough investigation, the Chinese nets were abolished four years ago and it was expected some less destructive method of taking shrimps would be devised, but such has not been the case, and our markets have been for the most part without shrimps.

In re-districting the State it was possible to set aside the south end of San Francisco Bay for the use of these nets, where it has been shown their destruction to young fish is slight and such fish as are taken are mostly of unedible varieties. While it was not possible to stop the export of dried shrimps before, it will be an easy matter to stop the drying under the present law. With shrimp drying stopped, the shrimp industry is not likely to be more than one-tenth as large as four years ago.

(Senate Bill No. 830. Senator Flint.)

This bill changes only the season on golden trout; the other provisions in section 633 of the Penal Code which relate to golden trout remaining the same. It makes the season open on the first day of August instead of the first day of June, thus making the season open two months later; and the season closes on the first of October instead of the first of September, which makes a month longer open season in the fall.

(Senate Bill No. 852. Senator Gerdes.)

Amends section 630*a* of the Penal Code so as to require wholesale dealers and handlers of fish to render a monthly statement to the Fish and Game Commission, setting forth the amounts and varieties of fish they have received or caught. This law will greatly facilitate the collection of accurate statistical data upon which to base protective legislation.

(Senate Bill No. 972. Senator Flint.)

This bill amends section 636½ restricting the use of the paranzella or trawl net in the waters of the State of California. It does not abolish the use of these nets, however, but simply keeps them outside of the three-mile limit, thus keeping them away from shallow water, bays and lagoons, where certain fish are known to spawn and the young of different species congregate.

In confining these nets to the deeper waters the destruction of unmarketable fish is minimized to a great extent. It would not be

proper to abolish these nets altogether as they can operate in the deeper water off shore where other nets cannot be used and they take fish that otherwise would be entirely lost to us. They furnish the markets with large quantities of fresh sole, sand-dabs and flounders at a moderately low price and tend to lower the price of the scarcer fish to the consumer.

(Senate Bill No. 973. Senator Flint.)

The bill amends section 636 of the Penal Code, dealing with nets and lines. The more important changes and additions are: The use of trammel nets in district 17 (Monterey Bay) is stopped. It has been found that these nets are frequently quite destructive to undersized crabs and that twenty per cent or more of the fish taken in them are rendered unfit for food by the hag fish, an eel-like fish that enters the mouth or gill openings of the fish and eats the contents, leaving only the skin and bones. The trammel nets are allowed in districts 18 and 19 where in the present law they are not allowed within one mile of the shore. A minimum mesh of eight inches is provided. Trammel nets have been allowed in the south because under another bill the paranzella and trawl nets have been eliminated in those waters and the trammel net is the only net to take their place. They are allowed inside the one-mile limit, for that is the only place they can be successfully operated. All told they are a very much better net for inshore fishing than the paranzella or trawl nets. Under a strict interpretation of the present laws the use of crab nets and lobster traps is illegal. The bill makes their use lawful. The bill provides for the use of "diver" gill nets in modified form. It has been found that for several of the "drifts" on the Sacramento the present law forbidding the use of diver nets is too severe. By allowing these nets to be submerged twelve feet and no more it will give the drifts a show at the salmon and striped bass, but will not permit of the former bad feature, where several nets at all depths passed over a drift taking all the fish before them. Recently some severe Federal regulations have been imposed on nets in the Sacramento and San Joaquin rivers and in the bays below, on account of their interference with traffic. If diver nets can be used the boats can pass over them without their being raised. Beach nets are eliminated in most of the State. Their restricted use is provided for only where it seemed necessary in order not to cripple any of the fisheries. The beach nets are very destructive to young fish in the shallow water where such nets are usually drawn ashore and their use should be stopped wherever it is possible to use other kinds of nets. The fishermen can continue to use them in district 19 for smelt only and during the months of September to January, inclusive. They will also be used in districts 9, 11 and 13 where they are the only method now employed in taking bait for the rock cod fisheries. Fyke nets without wings will be allowed in district 12 with a $2\frac{1}{2}$ inch minimum mesh. Under the present law fyke nets are not allowed in the Sacramento River.

A provision is added to the section by which the Fish and Game Commission can recover fish from isolated ponds left by receding flood waters or to allow fishermen to take them where otherwise they would be a total loss. Another paragraph provides for the sale of condemned legal nets. The bill prohibits the use of nets for taking fish, mollusks or crustaceans in districts 1, 2, 3, 4, 14, 20, 23, 24, 25, 26, 27, 28 and 29.

(Senate Bill No. 975. Senator Flint.)

The bill amends section 628*a* of the Penal Code, and that part of section 634 pertaining to striped bass and shad has been added to it, making it exclusively a striped bass and shad section. The open season in the bill is extended to September 25, which is five days later than the present law. The season for salmon in another bill has been extended to September 25 to conform with striped bass and shad as the three species are running in the Sacramento and the San Joaquin at about the same time and it has been found by experience that the season for each should conform. A uniform mesh has been established for the three species for the same reason. The minimum mesh is made 5½ inches, which is as small as it can be used and not take bass under the minimum limit, which is three pounds in weight. During the close season for nets, five striped bass per day may be taken with hook and line and during any day of the year five striped bass under three pounds in weight may be taken but may not be shipped or sold. The minimum sale limit remains at three pounds. During the open season for nets, there is no limit for hook and line except the limit for the "undersized" bass. The Saturday and Sunday close season remains as before, as does also the non-export clause.

(Senate Bill No. 1268. Senator Campbell.)

The bill amends section 642, defining the duties of the Fish and Game Commissioners. It makes it their duty to enforce the State laws for the preservation of wild mammals, wild birds, fishes, mollusks, crustaceans and all other forms of aquatic animals and plants, instead of just fish and game as at present. To enable the deputies to better enforce the laws it gives them the right of search, except the clothing actually worn by a person. In other respects the section remains the same.

(Assembly Bill No. 166. Assemblyman Lyon.)

This bill adds a new act to the Penal Code, which prohibits the operation of any kind of a net or seine, except a bait or dip net, within 750 feet from any pier, wharf or jetty in fish and game district 19.

The intention of this bill is to benefit the anglers who fish from the piers along the southern coast.

(Assembly Bill No. 1001. Assemblyman Lyon.)

Amends section 628*c* of the Penal Code. It confines the protection given California whiting, yellow-fin and spot-fin croaker to district 19, the present law being for the State. The bill also provides for the non-sale of these fish in the State.

It also provides a four-pound minimum sale limit for California halibut, a minimum sale limit of 18 inches for barracuda and a minimum weight limit of six pounds for albicore. These weights and size limits

have been considered quite essential in the way of conserving these important food fishes and have been recommended by the fish dealers and fishermen of the southern coast.

(Assembly Bill No. 1533. Assemblyman Ream.)

This bill amends section 637 of the Penal Code which relates to fish ladders. It provides for a sufficient flow of water through the fishway or through or around the dam to allow for the passage of fish or to prevent the destruction of fish below the dam by cutting off the entire flow of water. The bill also provides for a hearing of the owners or parties concerned.

RECENT GAME LEGISLATION.

By Harold C. Bryant.

All hunters and those interested in the conservation of wild life in the State will be interested in the following bills relating to game birds and mammals which were passed by the last legislature and signed by the Governor. All in all, these measures are favorable to game conservation. Only a very few bills consistent with a program of conservation were crowded out, whereas a large number of bills inconsistent with this program were buried in the committees.

Senate Bill No. 1268 amends section 642 of the Political Code. It defines the powers of the Fish and Game Commission and makes it their duty "to see that the laws for the protection and preservation of wild mammals, wild birds, fishes, mollusks, crustaceans, and all other forms of aquatic animals and plants are strictly enforced." Heretofore there has been some doubt as to the legality of the interest taken by the Commission in other than game fish, birds and mammals. This bill also makes it the duty of the Commission to inspect all places where fish and game is held for sale or storage.

One of the most important bills passed was that which prohibits the use of "any animal, or imitation thereof, as a blind" for the purpose of approaching any wild bird, with a view to shooting it or killing it. Although such a law, for several years, has been in force with regard to ducks, yet the killing of geese in this manner has not been prohibited; and hence many market hunters have been able to escape conviction by claiming that they were "bull hunting" for geese when in reality they were hunting ducks. This bill means the death of "bull hunting" in California. (See fig. 39.)

Several bills were passed making the California laws protecting wild-fowl correspond with the new Federal Migratory Bird Law. Hence the open seasons on wild-fowl are now the same as those provided for in the Federal Migratory Bird Law, and all shore birds, with the exception of the Wilson snipe, black-breasted plover, golden plover, and yellowlegs, are protected the year round.

The open season on valley and desert quail (October 15 to December 31) has been made to more nearly correspond with the open season on ducks in order that there will be no excuse for a man to carry a gun during the close season on most game birds. With the increased number of hunters, uniformity in game laws becomes more and more necessary.

The open season on cottontail and bush rabbits is the same as that for valley and desert quail. This act provides that rabbits may be killed at any time by the owner or tenant of premises and by those

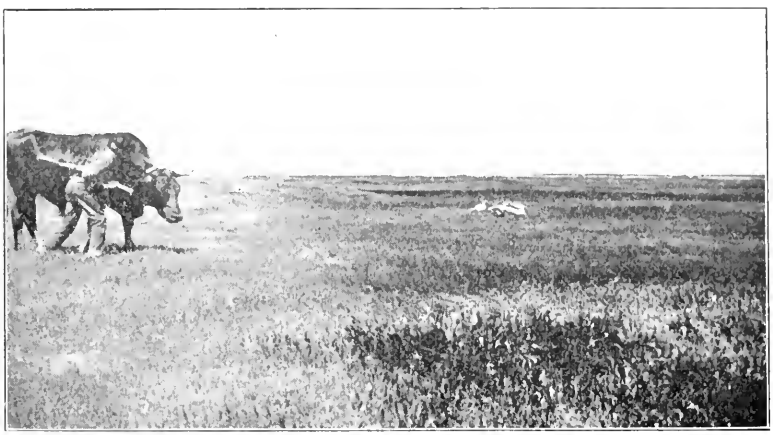

Fig. 39. "Bull hunter" working up a shot. A law will go into effect on August 1 which will prohibit all hunting of this kind. In former years it has been possible for a market hunter with the aid of a steer as a blind to slaughter over two hundred ducks or geese with just two shots from a large bore gun.

authorized in writing by the owner or tenant. This, therefore, will give protection to the man who is suffering from the depredations of rabbits.

A tendency toward uniformity in seasons is also to be noted in the new law on doves which provides for the same season (September 1 to November 30, inclusive) throughout the State. The summer open season has allowed the killing of doves during the breeding season, for they breed throughout the summer. The new law will, therefore, prevent the destruction of many nestlings heretofore left to starve because of the death of their parents who were killed "according to law."

Much improvement on the laws relating to deer is to be seen. The killing of spiked bucks is now prohibited. "Any male deer with straight unbranched horns, or antlers, shall be considered a 'spiked buck.'" The following provision is also made in the same law: "Every person taking or killing any deer must retain in his possession, during the open season, and for ten days after the close of the open season, the skin and portion of the head bearing the horns, and must produce this upon the demand of any officer authorized to enforce the fish and game laws." The open seasons on deer have been placed later in the year,

thus guarding against the possibility of destroying deer while their horns are still in the velvet. Under the law now in force the season opens much too early.

Bag limits on most species have been considerably reduced. Senate Bill No. 971 provides bag limits as follows:

Ducks, geese (except honkers and black sea brant), 25 per day, 50 per week; honkers and black sea brant, 12 per day, 24 per week; quail, shore birds, 15 per day, 30 per week; doves, 15 per day; mountain quail, 10 per day, 20 per week; grouse, sage hen, 4 per day, 8 per week; cottontail, bush rabbits, 15 per day, 30 per week.

In the districting bill, provision for a number of new game refuges is made. Certain areas are designated to constitute fish and game districts, and the killing of wild birds or mammals in these districts is prohibited. The only exception to the total prohibition of hunting in these refuges is to be found in district 28 (see fig. 38), where the killing of water-fowl is allowed. This exception was made because the Bear Valley Lake region constitutes the only duck grounds in southern California that are still open to the general public. Provision is made for the killing of predatory species in all of the refuges by securing written permission from the Fish and Game Commission.

Attempts to make longer seasons and larger bag limits on many of the game species, and the attempt to place meadowlarks, blackbirds and robins in the list of game birds met with failure.

BOOKS AND PAMPHLETS RELATING TO CALIFORNIA BIRDS.

The following list of books and pamphlets treating of California birds has been prepared as a help to teachers and others attempting to become better acquainted with the birds of this State. If you have no immediate need for the list, recommend it to your friends, and above all preserve it for future reference.—H. C. Bryant.

Books.

The following books can be obtained at book stores:

Bailey, F. M.
1914. Handbook of birds of the western United States (4th ed. revised, Houghton, Mifflin Co., Boston and N. Y.), li, 1–570, 36 pls., 2 diagrams, 601 figs. in text. Price $3.50. (The best handbook on western birds; contains good keys to the species).

Finley, W. L.
1907. American birds (Chas. Scribner's Sons, N. Y.), xvi, 1–256, 127 figs. in text. Price $1.50. (General account of habits of many western birds; suitable for general reading).

Myers, H. W.
1913. The birds' convention (Out West Magazine, Los Angeles, Cal.), pp. 1–81, 36 figs. in text. Price 75 cents. (Excellent for use as a supplementary reader by the grammar school teacher.)

Keeler, C.
1907. Bird notes afield (2d ed., Paul Elder and Co., S. F.), ix, 1–226, 16 pls. Price $2.50. ("An introduction to familiar birds in their native haunts"; keys and descriptions of birds in appendix).

Payne, H. T.
1913. Game birds and game fishes of the Pacific Coast (News Pub. Co., Los Angeles), pp. 1–186, many unnumbered plates. Price $1.50. (Written from standpoint of a practical sportsman and angler; treats of game birds only; not scientifically accurate.)

TORREY, B. B.
1913. Field days in California (Houghton, Mifflin Co., N. Y.), 12, 235, 9 pls. Price $1.50. (Personal reminiscences; many references to the habits of California birds. Thoroughly accurate, and reliable; good style).

WHEELOCK, I. G.
1904. Birds of California (A. C. McClurg & Co., Chicago), xxviii, 1–378, 87 figs. in text. Price $2.50. (An account of California birds interesting to the amateur but not scientifically dependable.)

Pamphlets.

The following bulletins and circulars giving details as to food habits of birds, can be obtained free by applying to your congressman at Washington, D. C., or at a slight cost from the Superintendent of Documents, Washington, D. C.

BEAL, F. E. L.
1904. Some common birds in their relation to agriculture. United States Department of Agriculture, Farmers Bulletin **54**, pp. 1–48, 22 figs. in text. (Food habits of many California birds.) 5 cents.

1904. The relation of birds to fruit growing in California. U. S. Dept. of Agric., Annual Report, **1910**, pp. 241–254. 5 cents.

1907. Birds of California in relation to the fruit industry. Part I, U. S. Dept. Agric., Biological Survey Bulletin **30**, pp. 1–100, 5 pls. 20 cents.

1910. Birds of California in relation to the fruit industry. Part II, U. S. Dept. Agric., Bur. Biol. Surv. Bull. **34**, pp. 1–96, 6 colored plates. 40 cents.

BEAL, F. E. L. AND MCATEE, W. L.
1912. Food of some well-known birds of forest, farm, and garden. U. S. Dept. Agric., Farmers Bulletin **506**, pp. 1–35, 16 figs. in text. (Many references to food of California birds.) 5 cents.

BUREAU OF BIOLOGICAL SURVEY.
1913. Fifty common birds of farm and orchard. U. S. Dept. Agric., Farmers Bulletin **513**, pp. 1–31, 50 colored figs. in text. (Beautifully illustrated in color; partly applicable to western birds.) 15 cents.

EDUCATIONAL LEAFLETS.
Published at intervals in Bird Lore by the National Association of Audubon Societies. (Popular accounts of many birds.) Separates obtainable from Secretary Audubon Society, New York City, at 5 cents each.

Miscellaneous.

LIBBY, G.
1912. Bird study in the public schools. California Fish and Game Commission. Bulletin **2**, 1–48, 2 figs. in text. (Helpful to teachers; obtainable from Fish and Game Commission, San Francisco. Supply nearly exhausted.)

BRYANT, H. C.
1912. Birds in relation to a grasshopper outbreak in California. University of California Publications, Zoology **11**, pp. 1–20. (Shows value of birds as insect destroyers. Obtainable from the University of California Press, Berkeley, California.) Price 20 cents.

1914. A determination of the economic status of the western meadowlark. Univ. of Calif. Publ. Zool, **11**, pp. 377–510, pls. 21–24, 5 figs. in text. (Detailed account of food of western meadowlark. Obtainable from University of California Press, Berkeley, California.) Price $1.25.

Local Lists of Birds.

The following faunal and local check-lists of California birds, published by the Cooper Ornithological Club, may be obtained from W. Lee Chambers, Eagle Rock, California.

MCGREGOR, R. C.
1901. A list of the land birds of Santa Cruz County, California, Pacific Coast Avifauna, **2**, pp. 1–23. Price 25 cents.

GRINNELL, J.
1912. A systematic list of the birds of California. Pacific Coast Avifauna, **8**, pp. 1–23. (A check-list only.)

WILLETT, G.
1912. Birds of the Pacific slope of southern California. Pacific Coast Avifauna, **7**, pp. 1–122. Price $1.50. (An annotated check-list.)

TYLER, J. G.
1913. Some birds of the Fresno district, California. Pacific Coast Avifauna, 9, pp. 1–114. Price $1.50. (Applicable to greater part of the San Joaquin-Sacramento Valley. Annotated check-list.)

The following may be secured from the University of California Press, Berkeley, California:

GRINNELL, J.
1908. The biota of the San Bernardino Mountains. Univ. of Calif. Publ. Zool., 5, pp. 1–170, pls. 1–24. (An account of the flora and vertebrate fauna to be found in the San Bernardino Mountains of southern California. Birds are treated at length.) Price $2.00.

1914*a*. An account of the mammals and birds of the lower Colorado Valley, with especial reference to the distributional problems presented. Univ. of Calif. Publ. Zool., 12, pp. 51–294, pls. 3–13, 9 figs. in text. Price $2.40.

1914*b*. A second list of the birds of the Berkeley Campus. Condor, 16, pp. 28–40. (Gives local distribution, status and dates of occurrence; obtainable from Museum of Vertebrate Zoology, Berkeley, California.)

GRINNELL, J., AND SWARTH, H. S.
1913. An account of the birds and mammals of the San Jacinto area of southern California, with remarks upon the behavior of geographic races on the margins of their habitats. Univ. of Calif. Pub. Zool., 10, pp. 197-406, pls. 6–10. Price $2.00.

Ornithological Periodicals.

THE CONDOR.
Bimonthly. Official organ of the Cooper Ornithological Club. W. Lee Chambers, Business Manager, Eagle Rock, California. Price $1.50 a year. (Illustrated magazine of western ornithology; the best bird magazine for those interested in California birds.)

THE AUK.
Quarterly. Official organ of the American Ornithologists' Union. Jonathan Dwight, Jr., Secy., 134 W. Seventy-first street, New York City. Price $3.00 a year. (Rather more technical than popular; treats of North American birds.)

BIRD LORE.
Bimonthly. Official organ of the National Association of Audubon Societies. Bird Lore, Harrisburg, Pennsylvania. Price $1.00 a year. (The best popular bird magazine published in the United States; suitable for school work; has nature-study department.)

N. B. For further bibliographical references to California birds, previous to 1908, see Grinnell's "A Bibliography of California Ornithology." (Pacific Coast Avifauna, 5, pp. 1-166), procurable from W. Lee Chambers, Eagle Rock, California. Price $1.50.

CALIFORNIA FISH AND GAME

A publication devoted to the conservation of wild life and published quarterly by the California State Fish and Game Commission.

Sent free to citizens of the State of California. Offered in exchange for ornithological, mammalogical and similar periodicals.

All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, California.

Juiy 15, 1915.

"It is true that the game belongs to the people; but this rightly means the people who are to be born a hundred years hence just as much as the people who are alive today." — Theodore Roosevelt.

WHAT THE BUREAU OF EDUCATION, PUBLICITY AND RESEARCH HAS BEEN DOING.

EDUCATION.

1. Lectures.—A number of illustrated lectures on the following subjects have been given in different parts of the State:

The non-sale of game.
The economic value of birds.
Common birds of California.
The duck breeding grounds of California.
The scientific basis of bird protection.
Methods of game conservation.
The food of common birds.
The food habits of the roadrunner in California.

In addition a series of lectures was given in a course in Advanced Vertebrate Zoology in the University of California during the past semester, the students in which are prospective teachers, and also a series of lectures on game and game conservation was given to forestry students in a course on forest protection.

2. Nature Study.—An attempt has been made to stimulate the teaching of nature study in the public schools.

3. Bulletins.—*California Fish and Game* a quarterly illustrated magazine with the motto "Conservation through education," has been edited and published.

4. Correspondence.—Many inquiries regarding birds and mammals of the State, game laws, etc., have been answered.

PUBLICITY.

1. A series of articles under the general heading "Game Resources of California," has been published in the *San Francisco Call and Post*. The articles have been regularly reprinted in about twenty other newspapers in the State.

2. Newspaper items giving publicity to the work of the Fish and Game Commission and to game and game conservation have been issued.

3. Certain editorials and articles in *California Fish and Game* have given publicity to the work of the Commission.

RESEARCH.

1. Considerable data has been collected regarding the life histories and status of game birds and mammals.

2. Photographic evidence of the work of the Commission and the status of game has accumulated.

3. Food habits of the roadrunner. Eighty-three stomachs of roadrunners have been microscopically examined and the contents tabulated. A complete report on the food habits of this bird in California is nearing completion.

4. Food of ducks. A large number of stomachs of ducks have been examined and the contents identified. A number of stomachs are still at hand awaiting examination.

5. Data relative to the past and present abundance of fur-bearing mammals in this State has been procured. An investigation of the laws on fur-bearers in force in other states has also been made.

6. The breeding grounds of ducks in Alameda and Merced counties have been investigated and censuses taken. The carrying capacity of a small area of marsh near Los Banos, Merced County, is being worked out by systematically taking censuses of the breeding birds.

7. A comparison of the California Fish and Game Commission with the commissions of other states is under way.

8. Circular letters are being sent to deputies to ascertain the present status of

the ring-necked pheasant. A full report will be prepared.

NEW LEGISLATION.

Your attention is called to articles appearing in this issue which give a short resume of the new legislation regarding fish and game. We are glad to report that practically all of the laws relating to fish and game which were passed by the legislature and signed by the Governor are measures which will do much towards conserving the wild life of the State. The new laws go into effect on August 7. A revised book of "California Fish and Game Laws" and game cards will be available before this time.

WHAT IS THE FUTURE OF GAME IN CALIFORNIA?

The optimist is considered a desirable citizen, but too often the knowledge on which an optimist bases his views is insufficient or one-sided. Were the unbiased or scientific attitude more prevalent, there would be less harm done to worthy causes. A case in point: The optimist maintains that game in California is increasing. He encourages all of his friends to think the same. Hence very few realize the importance of more stringent laws. On the other hand, the man with the scientific attitude attempts to collect all possible information regarding the past and present status of game in the State and finds the following facts:

1. That in spite of more game laws, shorter seasons and smaller bag limits, practically every species has decreased in numbers in the last twenty years.

2. The concentration of game into small areas makes the present numbers appear far greater than they should.

The scientist does not, therefore, depend upon hearsay evidence. He bases his conclusions upon a comparison of censuses taken by dependable observers and attempts to base his evidence on *facts*.

There is not a person interested in conservation in California who would not subscribe to the scientific viewpoint which emphasizes the necessity of obtaining *facts* and basing conclusions on absolute evidence. It is extremely necessary that this particular point of view should be applied to all problems connected with the conservation of game. It is to be hoped that future generations will be so trained that they will continually assume this attitude rather than that of many present-day hunters who are attempting to hoodwink people into the belief that game is increasing in order to attain their own selfish ends. The optimist as a member of society is extremely valuable, but may not his conclusions be at times misleading?

NEED FOR ACCURATE INFORMATION

Few of our readers probably appreciate the great need of accurate information regarding those species of birds in which we are particularly interested. It is the lack of just such information which makes estimates as to the past and present abundance of certain species impossible at the present time. Since increased cultivation is going to make statistical information of still greater importance in the future, every opportunity should be taken to accumulate data regarding our game birds and mammals. Professor Spencer F. Baird, one of the early governmental biologists, made this statement a number of years ago: "Accurate statistical information is the one essential foundation upon which protective legislation must rest." If this sentence was a true statement of fact a number of years ago when it was written, it is certainly a still more important statement of fact at the present.

It is unfortunate that many of the men in the best position to furnish accurate information, are men who fail to realize the true value of such information and who seldom take the trouble to write down what they see.

A scientific record of occurrence or of the nesting of some bird is made up of four parts as follows:

1. Name of species or accurate description of bird.
2. Date of observation.
3. Exact locality of observation.
4. Name of observer.

If you wish to take an active part in game conservation, there is hardly a better method than to systematically collect accurate information as to abundance, habits, and breeding of our game birds and mammals. Will you not record in a notebook the observations which you believe will be of interest and report them

to the Bureau of Education, Publicity, and Research of the California Fish and Game Commission? Here the data will be carefully filed and its accumulation will become increasingly valuable.

The Bureau of Biological Survey is attempting to obtain a census of the birds of the United States for the purpose of ascertaining approximately the number and relative abundance of the different species. This exact information is to be used as a basis for determining the adequacy of the present laws for bird protection and whether the several species are increasing or diminishing. The census will need to be repeated for several years before safe generalizations can be made therefrom. Instructions and report blanks are furnished to all those who will volunteer their services in this work. Bird observers in the west and south are particularly requested to cooperate as these facts have not been sufficiently covered in past observations. A census of the game birds breeding in your particular vicinity will be of exceedingly great value to the Bureau of the Fish and Game Commission having this work in charge and also to the United States Department of Agriculture.

LECTURES ON GAME CONSERVATION GIVEN FORESTRY STUDENTS

The Bureau of Education, Publicity and Research has been successful in establishing a course of lectures on game conservation to be given to forestry students in the University of California. The course this past semester was given in connection with the regular course in Fire Protection in charge of Assistant Professor Woodbridge Metcalf. Six lectures were given in the course from April 5 to 16, 1915, as follows:

1. California Birds and Mammals, by Dr. H. C. Bryant, Game Expert, California Fish and Game Commission.

2. The Economic Value of Birds, by Dr. H. C. Bryant.

3. Mammals in Their Economic Relations, by Dr. H. C. Bryant.

4. The Food and Game Fishes of California and Their Conservation, by N. B. Scofield, in charge Department of Commercial Fisheries, California Fish and Game Commission.

5. Past, Present and Future of Game in California, by Dr. H. C. Bryant.

6. Why and How to Conserve California's Wild Life, by Dr. W. P. Taylor, Curator of Mammals in the University of California Museum of Vertebrate Zoology.

As all forestry men in California, by virtue of their position, become deputy game wardens, these lectures will be of service in developing interest and in affording training to those who will later necessarily become guardians of California's wild life. It is very important that all forestry students be taught to recognize at sight the different species of game fish and animals, the economic value of each and the means by which they can be conserved. In addition there is an intimate relation between the two great natural resources—forests and wild life. Each is dependent more or less on the other. Every forest conservationist should have complete knowledge as to the value of birds as protectors of forests due to their destruction of insect pests. And every game conservationist should realize that with the increase of the number of forests there is an increase in game. Co-operative work such as this planned between the State Forestry School and the Fish and Game Commission will help to properly develop the men to whom the administration of our forests and game will ultimately be intrusted.

Plans are now under way to make this co-operative work permanent. Next year a similar course of lectures will be given in one of the regular courses in forestry. At the present time there are not more than one or two universities in the United States which attempt to give a course of training to those who desire to take up the work of a game warden. A short course of lectures such as that given this past year can not be expected to furnish a man with the information necessary to make him an effective game warden. It is to be hoped that interest along this line will so increase that before many years a regular course of training for game wardens will be obtainable at our State University. Should the University of California be far-sighted enough to take up this work it would be a pioneer in the field and doubtless would draw a large number of students from other states. The days are past when political pull was alone needed for obtaining a position as

deputy. The demand is now for trained men. This demand is growing, and to meet it some university will have to establish the proper courses of training.

NATURE STUDY IN THE PUBLIC SCHOOLS.

Although nature study is a compulsory subject in our public schools there are few places where any pretense of adequately teaching this subject is made. In fact, there is little wonder that this should be the case, for there are very few universities and colleges in the United States which give the proper training to the teacher who desires to specialize in nature study work. Cornell University has made an enviable reputation for itself by emphasizing nature study and many of our best teachers of this subject are graduates of this institution. Interest is growing, however, and it will not be long before there will be a demand for teachers equipped for this sort of work.

A few of the larger cities in this State have nature study supervisors, and consequently the work is organized. In many other places no attempt whatever has been made to meet even the law requirement. When teachers are asked to take up nature study work they either complain that they have not had the training which would enable them to properly conduct the work, or that no material is available. That there is a basis for this last complaint, let it be known that about the only attempt to furnish teachers of this State with proper material has been the publication of a "Bird and Arbor Day" bulletin by the Superintendent of Public Instruction and the publication of a bulletin entitled "Bird Study in the Public Schools" and a series of leaflets for teachers by the California Fish and Game Commission.

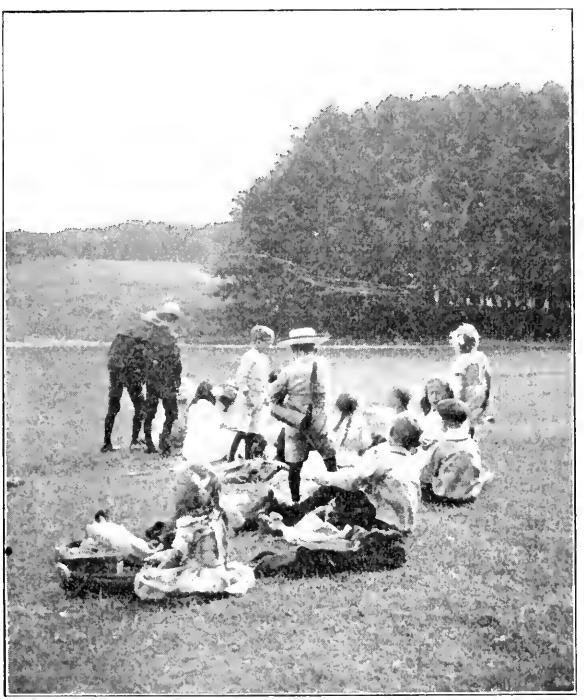

Fig. 40. A group of yellow-haired, blue-eyed Danish children learning the beauties of their native wild life. The field excursion is a fixed institution of many European countries. (Photograph by C. M. Goethe.)

The most needed method in the teaching of nature study is the institution of the field trip. Children should be taught to "read a roadside in the same way in

which they read a book." More can usually be learned from the school of out-of-doors than from the usual methods in vogue in our public school system. In Europe they have long emphasized the field trip, and it is not an unusual sight to see teachers with their classes visiting the outskirts of the city to study wild life first hand. (See fig. 40.)

In order to stimulate work along this line (which gives one of the best chances for education in wild life conservation), of Mr. C. M. Goethe, there is every hope that the field trip will become a permanent institution in Sacramento. It is to be hoped that many of the other larger cities in the State will become convinced of the value of this type of education and will institute similar work.

The lack of the proper training which is acknowledged by so many teachers in this State, should be corrected. Each one of the normal schools should offer courses designed to prepare teachers for

Fig. 41. Fifth-graders of Sacramento being taught the fundamentals of game conservation at Southside Park, where many waterfowl are to be found on the lake.

the Director of the Bureau of Education, Research and Publicity of the California Fish and Game Commission has been conducting several field trips in Sacramento. (See figs. 41 and 42.) Classes of fifth-graders have been taken to the city parks and to the outskirts of the city and have been taught the names and habits of the different forms of life encountered. As a result of this work, which was inaugurated through the efforts teaching nature study and in addition the universities should provide a similar training.

This Bureau is planning to furnish teachers throughout the State with the proper sort of material for teaching game conservation along with nature study in the public schools; for no better foundation for permanent game conservation can be laid than that to be found in the proper teaching of the youth of the State.

THE NATIONAL FORESTS AND WILD LIFE

There recently appeared in *Recreation* (May, 1915), an article under the title "The National Forests and Wild Life," by Henry S. Graves, Chief Forester, United States Forest Service. We believe this to be one of the best contributions to conservation literature which has appeared in recent years. Mr. Graves shows his breadth of vision by championing wild life conservation as well as forest conservation. He also shows that his interest goes beyond his immediate duties, for he seeks ways and means of widening the scope of forest conservation.

The following extracts from this excellent article will give a better idea of the worth of the contribution than any words which we can say:

"Forests are more than trees: they are rather land areas on which are associated various forms of plant and animal life. The forester must deal with all. Wild life is as essentially and legitimately an object of his care as are water, wood and forage.

"Conservation means simply intelligent forethought in the collective interest. The wild life question can be settled aright only by adopting as the guiding principle that there shall be realized the largest net total of public benefits.

"I look to the time when the wild life of the National Forest may be handled on sound principles of constructive development and use, such as now characterizes the management of the timber, forage, water and land resources. Such an administration would take account of the general needs of the public, the carrying capacity of the land that can be devoted to game, the needs of individual species and individual forests, the coordinating of game administration in different localities and states, the use of the increment, and the intelligent adjustment of wild-life control to the economic use of other sources.

"The first step required in the creation of game refuges is 'a survey of the situation through a game census combined with a determination of the areas most suitable for use as game breeding and

Fig. 42. A class of Sacramento school children on a field excursion. They are being taught "to read the roadside as they are taught to read a book."

feeding grounds.' The next step is a 'knowledge of the habits and requirements of the various kinds of game, the relative adaptability of different areas for the various species, and the carrying capacity of each area when fully stocked.'

"There must be some means of taking care of the natural increase of game after a certain point is reached. Hence any policy of wild-life protection as applied to game animals must sooner or later be accompanied by hunting as a practical necessity.

"The wild life resource is not being properly developed. Present conditions make its handling haphazard, unintelligent, ineffective and inadequate."

We can not help but add this word of appreciation of the work of the forest service in the State of California. The California Fish and Game Commission has always found the administrative officers to be ready and willing to co-operate in every way with the work of the Commission. They have been willing that forest rangers should become deputies of the Fish and Game Commission. They have allowed rangers to make detailed reports as to the status of wild life on their ranges. They have requested that rangers enforce the game laws wherever possible. The rangers themselves have been instrumental not only in enforcing game laws by prosecuting violators, but in attempting to educate people to the need for game conservation.

Recently they have shown their interest in the Commission's work by strongly advocating the setting aside of large portions of some of the national forests in this State as game refuges.

Hence, the attitude taken by Mr. Graves seems to permeate the whole forest service. Such a body of trained men as compose the forest service united in a strong organization is and will be an important factor in bringing about the proper administration of game.—H. C. B.

CRUDE OIL—A TRAP FOR BIRDS.

Near one of the pumping stations of the Associated Oil Company located at Brito, Merced County, California, there is a large reservoir filled with crude oil. This has proved a trap to many hundreds of birds. The pond is about 50x150 feet and the shining surface of the oil probably appears to the birds flying at night as a pond of water. The moment a bird's feet touch the sticky oil the bird is entrapped, for each successive effort to free itself with its wings only fastens it deeper into the oil. A trip to the pond on May 11, 1915, showed the mummied bodies of at least three hundred birds. In addition along the shores of the pond there was an incrustation several inches deep made up of feathers and bones of birds.

Almost every species of water bird in that vicinity seems to have been entrapped in this oil pond. Examination showed specimens of the following birds identifiable: canvasback, spoonbill, mallard, baldpate?, goose (species?), green-winged teal, cinnamon teal, mudhen, avocet, black-necked stilt, killdeer, least sandpiper, great blue heron, black-crowned night heron, egret, bittern, belted kingfisher, western meadowlark.

In a small puddle of oil about four feet in length were found six killdeer. The killdeer decoys easily, and doubtless the first bird entrapped decoyed the others to their death.

This circumstance furnishes additional evidence looking towards the solution of the problem confronting paleontologists as to the method by which the bones of prehistoric mammals have been deposited in such numbers in the asphalt of Rancho La Brea near Los Angeles. The incrustation of bones and feathers along the border of this oil pond would doubtless, in time, make similar piles of bones to those found in the asphalt. Hence the theory that many of the birds were entrapped in the oil and that many others met the same fate by being decoyed by those entrapped has much present day evidence to support it.

It is to be hoped that measures will be taken in the near future to prevent further catastrophes of this kind. Such a toll of bird life, and especially of such game birds as the ducks found in the pond, is reprehensible since it could easily be averted with small expense. The matter will be taken up with the Associated Oil Company in the hope that further destruction of wild life may be averted.

MORE GAME REFUGES FOR CALIFORNIA.

At the present time there is much interest shown in game refuges. Many reports come from the east telling of the establishment of chains of refuges throughout certain states. It should be understood by all Californians that our State is not behind in this particular regard.

The 1909 Legislature set aside the Pinnacles National Forest Reserve, situated in the counties of San Benito and Monterey, as a state game refuge. The legislature of 1913 made a large part of the Cleveland National Forest a game refuge. These two refuges taken together comprise many square miles of fine game country. During the past legislative session a successful attempt was made to

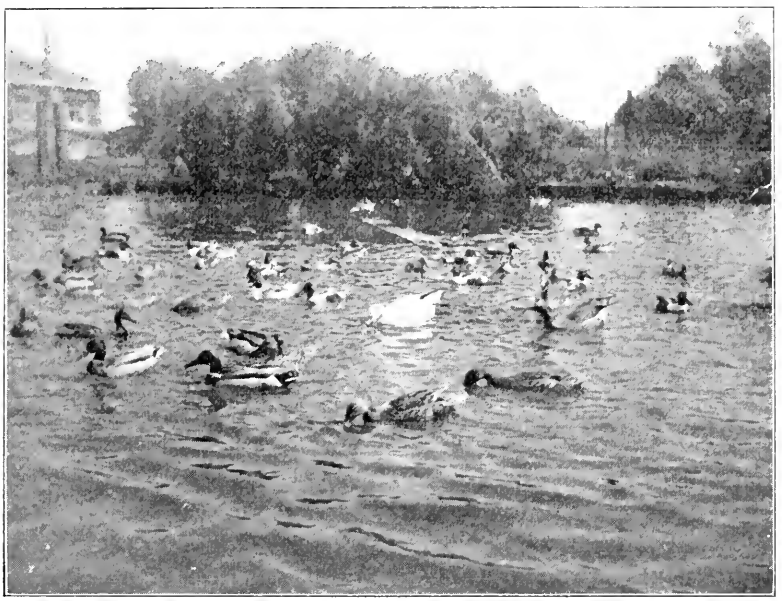

Fig. 43. Ducks and geese on a pond at the State game farm. Many of these ducks have nested on the grass-grown banks this past spring.

make the Trinity National Forest a state game refuge and also a large part of the Angeles National Forest. These combined refuges occupy an area practically equal to that of the state of Rhode Island.

There are now 716,240 acres of national forest on which hunting, except for predatory animals, is prohibited.

A list of game refuges located on national forests in California follows:

Cleveland National Forest Refuge, 72,160 acres.

Pinnacles National Forest Refuge, 2,080 acres.

Trinity National Forest Refuge, 38,000 acres.

Angeles National Forest Refuge, 600,000 acres.

In addition there are several other state and federal refuges, the areas of which are not obtainable as most of them are unsurveyed. They are as follows:

Lake Merritt, city of Oakland, Alameda County.

Klamath Lake Bird Reservation, Siskiyou County.

Clear Lake Bird Reservation, Modoc County.

East Park Bird Reservation, Colusa County.

Farralon Bird Reservation, Farralon Islands off Golden Gate.

Big Basin Game Refuge, Santa Cruz County.

Nor should the national parks of this State, which are Federal game refuges, be forgotten for the Yosemite and Sequoia National parks cover thousands of acres.

Within the next few months over a hundred thousand acres will doubtless be set aside as game refuges under the law enacted in 1913, which provides that "any person, firm or corporation owning and in possession of patented lands in the State of California, embracing an area of not less than one hundred and sixty acres, may transfer by an instrument in writing, duly acknowledged before an officer authorized under the laws of this State to take acknowledgments, to the State

of California, the right to preserve and protect all wild game on the land decribed therein for a period of not less than ten years." The California Fish and Game Commission has been slow to create such refuges for fear that individuals had a selfish motive in creating a reservation. Since the amendment of the law in 1913 changing the term of years to ten, the danger of promoting this sort of game reservation has been largely done away and the Commission has now under consideration several such propositions.

EARLY NESTING DATES OF DUCKS.
(Attention Deputies!)

It is remarkable how few definite records of the early and late nesting of ducks there are available. Just at the present time if more definite information were at hand California might be instrumental in influencing legislation opposing spring shooting. There is much controversy in the middle west as to the time of breeding and the time of nesting of ducks. Missouri has just passed a law allowing two open seasons on water-fowl—one in the fall from September 15 to December 31, and one in the spring from January 1 to April 30. Such a law in this State would allow the killing of many birds on their nests, as can be seen from a note on the nesting of ducks in the Alvarado marshes of Alameda County to be found in the Life History Notes on page 191. We trust that deputies and every one so situated that they are able to report the finding of the nests of game birds will do so, so that data may be on file in this office which will give dependable evidence as to the extent of the breeding seasons of our game birds.

FUR MARKET IMPROVES.

In spite of the fact that the European war has practically dropped the bottom out of the market for furs, yet some American furriers are advertising widely to obtain certain pelts. The greatest demand appears to be for coyote skins and the very best ones can now be sold for from $2.50 to $3.50. Low prices are quoted for practically all other common fur-bearing mammals. We are glad to see this improvement in the market and we trust that within a few years it will again be restored to normal.

FISH EXPERT TO EDIT "HATCHERY AND FISHERY NOTES."

With this number, the Hatchery and Fishery Notes in *California Fish and Game* will be edited by Mr. N. B. Scofield, in charge Department of Commercial Fisheries. Mr. Scofield's training and wide experience especially fit him for these new duties. A marked improvement in the general character of the material in this department is therefore to be expected.

THE PRACTICAL JOKESTER AGAIN.

The newspaper of a back-country town recently printed the following letter which, it was stated, had been received by a State Game Warden. We can not vouch for the authenticity of the letter, but we are sure that deputy game wardens have received letters just as provoking of smiles. This is the letter:

"Dear ser: I don't wan this sorter licents. I thot i was gettin' a Marridge licents, sumbudy sent me to mr. _____ and sed he would gimme a licents, mandy was so mad when i got back with this here hunten licents she would not have Me. she sed i didn't have sents anuff to git marridge licents so she ups and runs off with bill johnson and i Am in a hel of fixt. i want my muney back unless this hear licents will let me shoot bill jehnson.

"yours most truly,

"SAM JACKSON."

CORRESPONDENCE RELATIVE TO "CALIFORNIA FISH AND GAME."

Owing to the fact that the California Fish and Game Commission has a number of district offices with one located at Sacramento, the capital of the State, there is often considerable misunderstanding as to where correspondence should be addressed. Attention is called to the note at the head of the editorial page, where the statement is made that all material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, California. It should also be understood that all communications relative to the quarterly magazine *California Fish and Game*, including requests for the periodical, should be sent to the same address or to the head office, 734 Mills Building, San Francisco.

HATCHERY AND FISHERY NOTES.

OUTPUT OF THE FISH HATCHERIES IN 1915.

The hatcheries of the State Fish and Game Commission are having one of the most successful years in their history. The take of trout eggs is approximately twenty-five per cent greater than any year in the history of the Commission. The hatcheries are running at the fullest capacity at which they can operate and still turn out the fish in the best of condition. Many more eggs could have been taken. Steelhead trout eggs were taken at the egg collecting stations on Scott Creek, Santa Cruz County, and at the Snow Mountain station on Eel River in Mendocino County. The eggs taken at Scott Creek are taken to the Brookdale Hatchery on San Lorenzo River where they are held in the hatchery until they have reached the "eyed" stage, so called from the fact that the eyes of the embryo fish at that time as seen through the walls of the egg, are the most conspicuous part of the fish. At this stage of their development they are known as "eyed" eggs and they will stand shipping for long distances, if properly packed. From Brookdale most of the eggs are shipped to the hatchery at Sisson, partly on account of the limited capacity of the Brookdale Hatchery and partly because they can be more economically hatched at Sisson where the pure cold water of the mountains makes a stronger and better fish. The steelhead eggs taken at Snow Mountain station are "eyed" and shipped to the hatcheries at Ukiah, Sisson, and Price Creek. Three hundred thousand eggs are being held at Snow Mountain and 750,000 at the Ukiah Hatchery. There will be steelhead fry to distribute in the State as follows: From the Sisson Hatchery, 6,490,000; from Brookdale Hatchery, 1,000,000; from the Ukiah Hatchery, 1,000,000, and from Price Creek Hatchery, 862,000.

On Lake Tahoe at Taylor Creek 3,500,000 eggs of the black spotted trout were taken and double this number could have been taken had there been room at the hatcheries. These eggs are being handled at the State hatcheries at Tahoe and Tallac. Three million of the eggs will be retained at these hatcheries, 350,000 shipped to Sisson and 150,000 to the hatchery at Bear Valley Lake, San Bernardino County.

Rainbow trout eggs have been taken on Bogus Creek and Camp Creek, tributaries of Klamath River and are being hatched at the Sisson hatchery, 3,295,000 of them.

From the Sisson Hatchery ponds 1,630,000 Lock Leven trout eggs and 1,075,000 eastern brook trout eggs have been taken.

For the first time in over twenty-five years the State is taking rainbow eggs from the Pit River country. One of the first State hatcheries was built on Hat Creek for the taking of salmon eggs but was soon discontinued. The old building still stands but it is in the direct line of the "mud" flowing from the Mount Lassen volcano. The State is taking its rainbow eggs this year on Burney Creek, a tributary of Pit River ten miles from Hat Creek. The run of rainbows on this creek is quite late and is just now beginning late in May. It is the intention to get a supply of these trout for the Sisson Hatchery ponds and to also find out the extent of the run on the creek.

The State is this year operating a hatchery on Bear Valley Lake, San Bernardino County. This lake is stocked with Klamath rainbow trout and the fish have the same appearance and are about the same size as the Klamath trout. Four hundred and fifty thousand eggs were taken and the hatchery will in addition receive 150,000 of the black spotted trout eggs from Lake Tahoe, all of which are to be distributed in the southern part of the State.

All of the trout enumerated above are to be distributed in the streams of the State and they will doubtless be instrumental in making excellent fishing in a couple of years.

The greatest activity of the hatcheries in California is the propagation of Chinook or Quinnat salmon. The California Fish and Game Commission and the United States Bureau of Fisheries carry on the work together, the United States Bureau operating the spawn-taking and "eyeing" stations and the State doing most of the hatching. Altogether approximately

40,000,000 salmon eggs were taken during the past winter by the bureau's stations on Mill Creek and Battle Creek in Tehama County, at Baird on the McCloud River and at Klamathon on the Klamath River. Part of the eggs were shipped to the Price Creek Hatchery to be hatched and the fry liberated in Eel River and Mad River. The greater part of the eggs, 30,000,000 of them, were hatched at Sisson for liberation in the Sacramento and Klamath Rivers. The balance were hatched at the Baird Hatchery and at the two stations on Mill and Battle creeks, and nearly all of these have been liberated in the Sacramento. At Sisson 5,000,000 of the fry were put in Klink's and Sisson lakes where they will be held until next fall and then allowed to enter and descend the Sacramento River. Last year 4,000,000 were held in these lakes until fall and in addition to the natural food which was there in abundance they were fed each day. They reached an average length of four inches and were a strong healthy lot.

It has been pretty well established that the majority of the adult salmon coming back to their parent stream are salmon that remained in the stream as fry during their first summer, notwithstanding the fact that the greater majority of the fry descend the river before their first summer. So it is becoming the policy to hold as many of the fry as possible through their first summer.

THE SPINY LOBSTER IN MONTEREY BAY.

Deputy Fish and Game Commissioner P. H. Oyer of Pacific Grove reports the finding of a spiny lobster in Monterey Bay near the town of Seaside. The lobster or crawfish as it is commonly called by the fishermen was taken in a trammel net in sixteen fathoms of water and was 13½ inches long and weighed 2¾ pounds.

About two years ago one hundred spiny lobsters were put in Monterey Bay where it was hoped they would live and propagate and increase in numbers, and by the aid of additional "plants" to eventually become of commercial importance. The spiny lobster is of considerable commercial importance in southern California but it has never established itself north of Point Conception. It has been believed by many that the spiny lobster would thrive in our northern waters if it could once be "planted" here; that the reason it is not here now is that there is some natural barrier past which it has not been able to come. The probable reason that it is not found north of Point Conception is that the temperature north of that point is too cold for the young or larval stage of the lobster at the hatching time. It may be found that there are a few places where the temperature is favorable enough to allow of its propagating, hence this experiment in Monterey Bay is of great interest and the question yet to be settled is whether they will be able to propagate. One of the Chinese fishermen at New Monterey thinks he found a lot of the young lobsters in a lead pipe which he recovered from the old wreck off Chinatown Point, but none of these young "lobsters" were saved. The point as to whether the spiny lobsters have actually spawned in Monterey Bay needs to be verified. The sheltered south side of the bay has been selected as the place in which they will be most likely to establish themselves. The large lobster found had about doubled its weight in the two years. —N. B. Scofield.

STORM WRECKS FISHING BOATS.

The recent wind storm created havoc in the Monterey fishing fleet. The fishing boats were either sunk at their moorings or driven ashore where they were crushed and pounded to pieces by the surf. The buildings of the Sacramento River Packers Association were destroyed and the wreckage piled on the beach with the boats. The buildings are being rebuilt by the American Fish and Oyster Company, at a cost of $65,000. They will be in readiness for the salmon run which usually commences in the fore part of June. The American Fish and Oyster Company and the Western Fish Company will receive salmon at this plant and will prepare them for shipment fresh and will also tierce the larger fish.

The Sacramento River Packers Association will receive their salmon at the wharf and buildings of the Monterey Packing Company. They will ship salmon fresh and also tierce as in the past. The Monterey Packing Company are erecting

a new building for the storage of tierced salmon and to hold part of the sardine pack. The building will contain a modern, well equipped ice plant.

Salmon are taken in Monterey Bay entirely by trolling. Gasoline power boats are principally used, but there are a few sail boats. Each boat trolls with two lines attached to bamboo outriggers. The fish are landed at the packing house wharf and dumped on the floor where they are sorted, and the smaller fish gutted, washed, and iced in boxes. From here they are shipped to different parts of the State, but principally to San Francisco, from which point many are reshipped. The larger fish are mild cured in tierces the process of which is roughly as follows:

The head is removed and the fish gutted and then split into two halves with the back bone removed. After being thoroughly washed and trimmed they are salted with as much salt as will cling to the wetted sides and packed down dry in large casks or tierces. When the tierce is full it is headed up and filled with water through the bung. This process is called mild curing because the brine is not strong enough to keep the salmon unless kept in a cold place. They remain in cold storage until they are to be used. When opened for use the sides are hung up and smoked. They are then ready to eat as they are, or to be cooked. Connoisseurs prefer smoked salmon to the fresh article and it commands a higher price. The great bulk of the mild cured salmon goes to Germany and it goes without saying that the present great war has put a damper on the salmon fishing industry. Most of the salmon taken in California are mild cured.

MONTEREY FISHERMEN'S ASSOCIATION.

The fishermen of Monterey have formed an association with a membership of 330, to be known as the Monterey Fishermen's Association. The object is to get a better price for their salmon. They have usually gotten four cents per pound for their fish, but this year, on account of the war and the resulting slump in the mild cured salmon market, the dealers in fish thought three cents was enough to pay for the salmon. We understand the fishermen through the association have been able to contract their fish as usual at four cents per pound.

CONSERVATION IN OTHER STATES.

A SCHOOL OF FISHERIES.

At the initial meeting of the Pacific Fisheries Society at Seattle there was discussed the proposition of establishing a school or department of fisheries in connection with the University of Washington. The object of this school would be to bear the relation to the fish industry that is borne in their way by the schools of forestry and mining to the basic activities which they represent, and by the agricultural experiment station to industries based upon the products of the soil.

Dr. Smith of the United States Bureau of Fisheries said at that time: "This is a wide field; I do not know of any more promising field in the government service than in the culture of fish. The possibilities of making new discoveries, especially in the line of intensive breeding and selective breeding, are almost inexhaustible. I would expect that a tremendous boom to the fish industry of the entire country would be given by a fisheries school such as this if established here."

The fishing industries on the Pacific Coast are largely centralized in the northwest; hence the University of Washington occupies a strategic position. The location of the school here would permit of close co-operation with the various industrial activities related to fisheries. It is to be hoped that this school will actually be established and that it may help to fill the present need for trained men to conduct research experiments on better methods of breeding fish and administering this resource.

A NEW BIRD SANCTUARY IN CONNECTICUT.

Forest and Stream (February, 1915, p. 82) records the creation of a new bird sanctuary at Fairfield, Connecticut. Ten acres of hilly country have been donated and a cat-proof fence has been erected.

Mrs. Mabel Osgood Wright has been placed in charge of "Bird Craft Sanctuary" and an attractive bungalow has been erected for the caretaker. Berry-bearing shrubs will be planted and artificial feeding carried on. "Although part of the mission of the Bird Craft Sanctuary is to interest and to instruct the people of the surrounding country in regard to its bird life, its primary object is the preservation of native birds, both for the sake of their beauty and song and because of their economic value." No visitors will be allowed during the spring and early summer, lest the nesting birds be disturbed.

MINNESOTA COMMISSION TAKES UP EDUCATIONAL WORK.

A number of state fish and game commissions are becoming convinced of the fact that the development of a public sentiment favoring game conservation is a very necessary item to law enforcement and that education as to the value of and the need for game conservation is more important in the long run than arrests and convictions. The last commission to undertake such work is the Minnesota Game and Fish Commission, which has just undertaken the publication of a new quarterly bulletin called *Fins, Feathers and Fur.*

MISSOURI'S NEW GAME LAW.

Missouri has just passed a new game law. It seems that a number of concessions had to be made by conservationists because of the fact that the whole state commission and all of the laws regarding game were threatened. Consequently Mr. E. T. Grether, editor of the "Rod and Gun" department of the *St. Louis Daily Globe-Democrat*, who has done much to obtain the present laws, believes the new measures to be good ones. Two things are of particular interest; first, absolutely no attention is paid to the Federal Migratory Bird Law, which apparently is considered to be detrimental to the interests of the Middle West; and second, spring shooting is to be allowed, for there is an open season on wild-fowl in fall and another one extending from January 1 to April 30 in the spring.

Mr. Grether writes that careful investigations are being carried on to obtain definite information as to whether any of the ducks are breeding during these spring months. Photographs showing the condition of the birds, taken by Professor Frank Schwarz of the St. Louis Naturalists' Club and Mr. Grether are to furnish the evidence. The statement is made that all of the ducks so far examined do not contain developing eggs and that the "presence of pin feathers showed them to be in the moulting season and not in the breeding season." Also that ducks no longer breed in Missouri. Could it not be that the spring shooting which Missouri has so long permitted is directly responsible for this lack of breeding birds?

STRINGENT HUNTING LAWS PROPOSED IN MASSACHUSETTS.

An effort is being made in Massachusetts to require licensed hunters to make a sworn statement of game killed each year as a condition to receiving a license the following year, that licenses be not issued to hunters under eighteen years of age, and that hunting on private property, whether posted or not, may be only permissible when the hunter has secured the written consent of the owner, upon penalty of revocation of license.—*Fins, Feathers and Fur*, March, 1915.

A SPORTSMEN'S LEAGUE FOR OREGON.

All of the different sportsmen's organizations in Oregon have united to form the Oregon Sportsmen's League. Each club is entitled to representation according to membership. The working body consists of an executive committee composed of seven members, one from each of the seven game districts of the State. The effectiveness of the various organizations will doubtless be greatly improved through this new consolidation plan. Oregon has initiated several unique methods of administering her game resources; hence this new move will be watched with interest.

LIFE HISTORY NOTES.

A RECORD OF THE NESTING OF THE WOOD DUCK IN CALIFORNIA.

On May 3, 1914, I discovered a nest of a wood duck (*Aix sponsa*) in a sycamore tree on the bank of the Sacramento River about ten miles north of Sacramento. The nest was about two feet in diameter and overhung the water. The hole or entrance to the nesting place was about twelve feet from the ground. The cavity itself was about thirty inches deep and about twelve inches in diameter at the entrance. The nest was composed entirely of down and contained thirteen eggs. The female bird was frightened from the nest.

By keeping the eggs at the proper temperature with hot cloths and engine waste from the engine of my launch they were safely brought to Sacramento. Here they were placed beneath a mallard duck which was making her nest in Southside Park. The eggs were transferred to the nest after dark, and within a few minutes the mallard had returned to her nest. Every one of the thirteen eggs hatched out. Later, however, a number of the birds died. On the Fourth of July last, a fireworks display was held at this park. This frightened a number of the young birds to death. At the present time there are only four live birds, two males and two females. These birds are not pinioned, and they often fly to an adjoining field where there is some wild land and tule. They always return, however, at the regular feeding time.

For a number of years I have known the locality where this nest was found and have noted several trees in which wood ducks nest. It appears to be customary for the same duck to nest in the same tree each year. I have occasionally seen as many as three females endeavoring to take possession of the same hole in a sycamore tree.—GEORGE NEALE.

DO SOME OF OUR MIGRANT DUCKS COME FROM THE GREAT BASIN?

I recently obtained an aluminum band that was taken from a male pintail duck (*Dafila acuta*) killed near Herndon, Fresno County, on January 24 of this year. The band had this inscription on one side: "No. 574" and on the other side: "Notify U. S. Agt., Washington, D. C."

After obtaining possession of the tag, I wrote as requested and received word from the assistant biologist, Alex Wetmore, that the metallic band was placed on the duck September 16, 1914, at the mouth of Bear River, Utah. He also stated that the duck was one that had recovered 'from the sickness similar to that which affects ducks around Tulare Lake. Does this not show that at least some of our water fowl migrate into California via the Great Basin?—S. L. N. ELLIS.

CINNAMON TEAL AND SPOONBILL NESTING ON APRIL 15.

A trip to some overflow land about two miles north of Alvarado, Alameda County, disclosed the fact that a number of ducks were already nesting on April 15, 1915. The following nests were found:

Species	Number of eggs	Location of nest
Cinnamon teal (*Querquedula cyanoptera*)	11	Sedge
Cinnamon teal (*Querquedula cyanoptera*)	5	Sedge
Spoonbill (*Spatula clypeata*)	10	Pickle weed (poorly concealed)
Spoonbill (*Spatula clypeata*)	10	Sedge (eggs covered with down)

Many mudhens' nests were also found containing sets of from eight to thirteen eggs. The eggs from the above nests were collected and taken to the game farm to be hatched out in order to carry on certain experiments and that more exhibition birds may be available another year. —H. C. BRYANT.

MALLARDS' NEST AT GAME FARM.

On April 15, six mallard ducks (*Anas platyrhynchos*) were nesting on the State Game Farm at Hayward. On the 23d four more had taken up the duties of incubation. Most of the nests were hid

away in the tall grass surrounding the small pond in which the ducks are kept. Complements of twelve eggs were most common. One female refused to leave her nest on any one's approach and attempted to defend her nest by attacking the intruder viciously with her bill. Last year a number of broods were successfully reared, and doubtless greater success will attend the efforts of the superintendent this coming year. The experiments in rearing ducks have been carried on on a very small scale, but nevertheless they demonstrate the fact that mallards can easily be reared in captivity. In artificial propagation we have a solution of the problem as to a means of supplying our markets with game.—H. C. BRYANT.

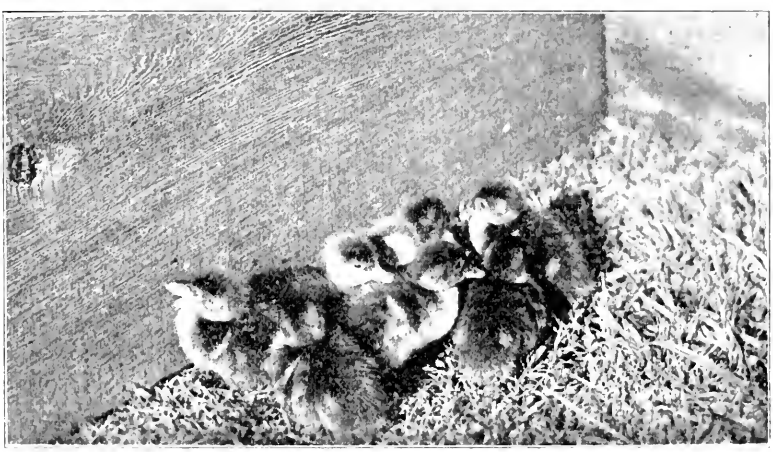

Fig. 44. Some downy redheads. These little ducks were hatched in an incubator at the State game farm from eggs procured in the marshes near Alvarado, Alameda County.

CALIFORNIA CLAPPER RAIL BREEDS IN ALAMEDA SALT MARSHES.

On April 3, 1915, I discovered a nest of the California clapper rail (*Rallus obsoletus*) on Bay Farm Island, Alameda County. The nest was hidden beneath a small clump of the common composite, *Grindelia cuneifolia*. No attempt has been made to use building material and the nine eggs were simply laid in salt grass, the crushed-down stems forming the only bedding for the eggs. A bird was flushed from the nest; whether a male or a female, I could not determine.

Another nest found the same day by Dr. Grinnell had originally contained nine eggs, but five of them had been broken by some predacious mammal, probably a rat. This nest was concealed in pickle weed (*Salicornia*) and several dry stems of this same weed composed the nest proper.

No more definite information regarding the benefit to be derived from the Federal Migratory Bird Law is at hand than the remarkable increase of the California clapper rail. This bird, with a limited distribution—the salt marshes around the southern arm of San Francisco Bay—was so reduced in numbers four or five years ago, that the species would doubtless have become absolutely extinct within a very few years. The five-year close season afforded by the Federal Migratory Bird Law evidently came in good time, for the birds are now increasing remarkably fast. The species is apparently prolific, for the average set of eggs is nine. A comparison of the numbers to be seen in the salt marshes of Alameda County at the present time with those of four or five years ago shows that the species is fast returning to normal numbers. We trust that this dependable evidence will form a basis for future legislation and will convincingly show the value of a five-year close season.—H. C. BRYANT.

AT THE END OF THE MIGRATION SEASON.

Investigations in the vicinity of Los Banos, Merced County, May 10-14, 1915,

gave evidence that the nesting season for ducks was just beginning. But one duck's nest, that of a cinnamon teal (*Querquedula cyanoptera*), containing the incomplete set of seven eggs, was found. Practically all the ducks seen were in pairs. A few nests of the avocet (*Recurvirostra americana*) and the black-necked stilt (*Himantopus mexicanus*) were found but most of these birds had not begun nesting. Evidence of a very early nesting of the latter species was obtained through the finding of a family of four downy young, two or three days old, on May 12. Fulvous tree-ducks (*Dendrocygna bicolor*) and white-faced glossy ibis (*Plegadis guarana*) were still flying about in flocks.

The following notes as to the occurrence of certain northern migrants which had evidently lingered behind the main flight are of interest.

Whistling swan (*Olor columbianus*). One seen feeding in shallow ponds on several successive days, May 11-13. It appeared to have full powers of flight.

Northern phalarope (*Lobipes lobatus*). Two or three flocks of about a dozen birds each seen. Two birds which had had a wing completely severed from the body by striking telegraph wires, were found.

Wilson snipe (*Gallinago delicata*). One lone one seen on two different occasions in the marsh near Gadwall, Merced County (last seen on May 11), and a pair seen on a muddy pond ten miles west of Madera, Madera County, on May 14. The call heard in both instances helped in identification.

Fig. 45. Nest and eggs of a sora rail, Alvarado, Alameda County, California, April 23, 1915. The nest contained fourteen eggs.

Long-billed dowitcher (*Macrorhamphus griseus scolopaceus*). A flock of eleven seen May 13.

Western sandpiper (*Ereunetes mauri*). A flock of at least two hundred were seen feeding at the edge of a large pond on May 13.

Hudsonian curlew (*Numenius hudsonicus*). One startled from a pond on May 13. It circled around overhead calling loudly.

Semipalmated plover (*Ægialitis semipalmata*). A single bird flushed from a muddy pond ten miles west of Madera, Madera County, on May 14.—H. C. BRYANT.

NESTING OF THE SORA AND VIRGINIA RAIL IN ALAMEDA COUNTY.

While investigating some marshes about two miles north of Alvarado, Alameda County, on April 23, 1915, I came upon the nest of a sora rail (*Porzana carolina*). The nest, composed of the stems of grass and reeds, was placed about eight inches above the ground in tall pickle-weed (*Salicornia*). Fourteen eggs in various stages of incubation were in the nest. One of the eggs formed a second layer. No rails were seen in the vicinity.

On the same day I found one egg of a Virginia rail (*Rallus virginianus*) which had evidently been carried away from a nest by some predaceous animal. At any rate the egg had been broken into and the contents sucked out. A comparison of this egg with those of the sora rail left no doubt in my mind but that this egg furnished evidence that the Virginia rail was nesting in the same marshes.—H. C. BRYANT.

FISH-CATCHING MUSSELS.

The speed with which a mussel can close its valves, when irritated, is vividly illustrated by the accompanying photograph. (See fig. 46.)

These specimens were taken from the bottom of the sailing vessel *Erskine M. Phelps*, a sister ship of the *William P. Frye*, which was recently sunk by the Germans. After lying at anchor in San Francisco Bay for the past winter (1914-1915), the *Phelps* was taken across the bay and put in dry-dock, being raised from the water on the day following the trip across the bay. The bottom was densely covered with mussels (*Mytilus edulis*), and other organisms. The ship is 312 feet in length and 45 feet in width, and on the bottom area about 50 or 60 fish were found trapped by the mussels. The fish were all in the same condition and comparatively fresh, part of the viscera still being present and the flesh firm.

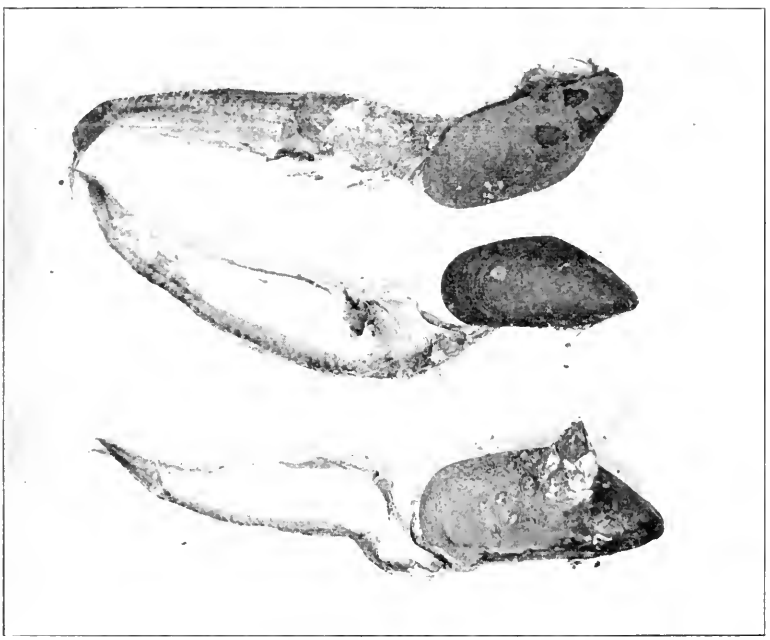

Fig. 46. Mussels which have captured fish. These mussels were taken from the bottom of a ship on San Francisco Bay. The fish are anchovies. (Photograph by E. E. Johnson.)

It is probable that, on the trip across the bay, the ship ran through a school of anchovies (*Engraulis mordax* Girard). Attracted by the edges, or foot, of the mantle of the mussels, many of the anchovies tried to secure a bite, with fatal results. The valves of the mussels were snapped shut with sufficient speed and strength to enclose and hold the more or less pointed head of the fish.—EDWARD E. JOHNSTON.

OPOSSUMS NEAR SAN JOSE CONTINUE TO INCREASE.

Since the appearance of Dr. Grinnell's article on the opossum in the last number of CALIFORNIA FISH AND GAME, this species has been captured in a number of places near San Jose. One of the most interesting of the occurrences is that near Boulder, Santa Cruz County, where about a dozen of these animals have been trapped. The high water in the vicinity of San Jose drove a number of opossums into localities where they were easily caught.

Apparently still another party is partly responsible for the presence of the opossum in Santa Clara County. W. D. Watkins of Campbell, California, brought back in 1900 from Pineville, MacDonald County, Missouri, five opossums. These animals succeeded in gaining their liberty from Mr. Watkins' home, at that time about three miles southeast of San Jose. —I. L. KOPPEL.

WILD LIFE IN RELATION TO AGRICULTURE.

ROBINS AND BLUEBIRDS PROVED FRIENDS OF THE FARMER.

One of the latest bulletins of the Department of Agriculture is that by F. E. L. Beal, assistant biologist, on "Food of the Robins and Bluebirds of the United States."

The conclusion in regard to the robin is that the bird is "omnivorous and feeds upon pretty much every eatable accessible." After an examination of 1,236 stomachs from thirty-two states, the District of Columbia and three Canadian provinces, the conclusion is that the food consists of 42.40 per cent animal matter and 57.60 per cent vegetable matter. As regards the destruction of olives by robins in California, the following statement is made: "Robins rarely attack olives because usually their native food abounds, but where this fails the hungry birds shift about until they find a substitute."

The writer has taken 192 cutworms from the stomach of one western robin collected in Inyo County, California. Furthermore the stomachs of birds collected in strawberry fields near Tres Pinos, San Benito County, where robins were accused of destroying the berries, contained wireworms, beetles, ants, earthworms and a few weed seeds. No evidence that these birds had been feeding on strawberries was found.

"From what is known of the insect food of the varied thrush, it does not appear that the bird is likely to do much mischief by eating useful insects . . . . and the bird does not at present spend the breeding season in a well-settled and cultivated country, and so does not overmuch trespass upon farm products.

"The western bluebird is less migratory than the eastern and does not entirely desert the United States in winter; so its good work is continuous. As insects are active in California in every month, the bird renders a great economic service in the reduction of these pests at this season, for insects that live through the winter are the stock by which the species is perpetuated, and the destruction of a few at this time is equivalent to the death in summer of hundreds or even thousands. That the western bluebird is an eminently useful species is so patent that it hardly needs to be pointed out. Whatever harm fruit growers have suffered from birds, none can be laid at the door of the western bluebird."—H. C. BRYANT.

THE ROADRUNNER OMNIVOROUS.

Three years ago when the California Fish and Game Commission was attempting to determine the economic status of the western meadowlark, the stomachs of a number of other birds about which complaint had been received were collected. The examination of eighty-three stomachs of the roadrunner (*Geococcyx californianus*) has just been completed. Practically all of these stomachs are from birds collected in San Diego County. The

investigation has not furnished evidence that the roadrunner preys upon the eggs and young of the valley quail as has often been stated. On the contrary, this bird apparently feeds almost entirely on insects, lizards and mice. As an illustration of the omnivorous food habits of this bird the stomach contents of a roadrunner taken at Lemon Cove, San Diego County, on January 21, 1913, follows:

Vegetable.

2 seeds (*Rhus integrifolia*).
1 filaree seed with stem (*Erodium* sp.).
2 grass blades.

Animal.

6 beetles (*Amara insiguis*).
1 beetle (*Elcodes aculicauda*).
5 beetles (*Microschatia inaequalis*).
5 beetles (*Centrocleonus pilosus*).
8 wireworms (Elateridæ).
12 grasshoppers (*Melanoplus* sp.).
1 Jerusalem cricket (*Stenopelmatus* sp.).
2 spiders (Agalenidæ).
1 scorpion (*Anuroctonus phaiodactylus*).
1 spider egg case.
1 lizard (*Uta stansburiana*).

About ninety per cent of the food for the entire year is made of animal matter and but ten per cent of vegetable matter, largely the seeds of a species of sumac. A full report, giving the results of this investigation, will be published later.—H. C. BRYANT.

COTTONTAIL RABBIT REPORTED AS A PEST IN SAN DIEGO COUNTY.

The ranchers of San Diego County have so consistently complained about the depredations of cottontail rabbits that it was found necessary to place a provision in the new law allowing the killing of rabbits when found destroying crops. Mr. G. D. Stead of San Diego writes as follows: "My loss from rabbits was upwards of $350 last season. On the brush side of all fields the grain was eaten off from three to five rods. One piece of wheat was completely eaten off. None to harvest."

Although there is usually a tendency to overestimate the damage caused by a game species, yet the new provision in the rabbit law is a good one and will evidently come as a boon to many ranchers in San Diego County and other places in the State where the cottontail is numerous.

THE EUROPEAN STARLING IN THE EASTERN UNITED STATES.

Every one is familiar with the English sparrow as an example of a foreign bird which has become well established in the United States and which is considered detrimental to man's interests. It appears that a second European bird is now getting such a start in the eastern states that there are grave fears of its becoming a pest similar to the English sparrow. This is the European starling introduced into the United States about twenty-five years ago. Since that time it has extended its range from New York City into the neighboring States of Connecticut, New Jersey, New York, Pennsylvania and Massachusetts. During its migrations it has been found much farther from the original center and has occurred even so far south as the District of Columbia.

The Bureau of Biological Survey reports on the economic value of this bird as follows: "The starling is markedly insectivorous, especially in summer, and preys upon many noxious varieties. In this respect it is to be classed among our useful birds. So far as is known, it has not proved destructive to grain crops, but it is known to be very fond of small fruits, and as it associates in large flocks it is likely to become a pest to the orchardist. In addition, it prefers tree cavities, boxes, or recesses in buildings for nesting sites and thus is brought into direct competition with certain of the useful native birds, more particularly the bluebird, purple martin, white-bellied swallow, house wren, and flicker."

Many of the states where the starling is found have taken protection from the bird in the hope of checking its increase and spread, and the shipment of these birds from one state to another has been prohibited under heavy penalty by an act of Congress. Hence, it can be seen that an endeavor is being made to prevent its becoming too numerous. Nevertheless, there is great danger that the bird, in spite of these acts, will ultimately spread over a large part of the United States. Particular study is being given the food habits of the starling in an endeavor to find out whether it will necessarily be classed as a beneficial or as a destructive bird.

REPORTS.

VIOLATIONS OF THE FISH AND GAME LAWS.

March 1 to May 26, 1915.

Offense	Number arrests	Fines imposed
Game.		
Hunting without a license	20	$275 00
Deer, close season, killing or possession	15	475 00
Illegal deer hides	2	75 00
Ducks, close season, excess bag limit	4	50 00
Quail, close season	3	75 00
Doves, close season	4	100 00
Rail, close season	1	25 00
Tree squirrels, close season	4	100 00
Cottontails, close season	4	75 00
Non-game birds	7	70 00
Total game violations	64	$1,320 00
Fish.		
Angling without a license	29	$535 00
Fishing for profit without license	18	90 00
Underweight striped bass	3	60 00
Trout, close season	16	280 00
Trout, excess bag limit; taking other than with hook and line	15	290 00
Young of fish	2	----------
Taking shellfish in Monterey Fish Reservation	1	25 00
Illegal nets; traps	22	2,870 00
Catfish, undersize	2	40 00
Crabs, undersize and female	17	90 00
Clams, undersize and excess bag limit	8	100 00
Abalones, close season, undersize	10	205 00
Lobsters, close season	2	40 00
Pollution of state waters	1	----------
Total fish violations	146	$4,625 00
Grand total fish and game violations	210	$5,945 00

SEIZURES—FISH, GAME AND ILLEGALLY USED FISHING APPARATUS.

March 1 to May 26, 1915.

Fish.	
Striped bass	59 pounds
Trout	215 pounds
Miscellaneous fish	56 pounds
Crabs	366
Clams	522
Abalones	76
Lobsters	7
Illegal nets and traps	12
Game.	
Deer meat	709 pounds
Hides	12
Ducks	6
Non-game birds	32
Cottontails	8
Squirrels (tree)	2
Miscellaneous	6

SEARCHES.

Illegal fish and game	226

LION BOUNTIES.

Statement of Lion Bounties Paid by Fish and Game Commission from January 1 to May 30, 1915.

	1914	January 1 to May 30, 1915	Total
Alameda			1
Amador			8
Butte	1		30
Calaveras	1		8
Colusa	2		13
Del Norte	1	1	76
El Dorado	1		36
Fresno	1	1	11
Glenn	1		36
Humboldt	46	19	459
Inyo	1	2	1
Kern	5	1	60
Lake	5	5	76
Lassen			6
Los Angeles	5	1	20
Madera	9		20
Mariposa	9	1	32
Mendocino	15	6	156
Merced			1
Modoc			3
Monterey	3	5	53
Mono	2		2
Napa			3
Nevada			3
Orange			4
Placer	3	1	26
Plumas			8
Riverside			13
San Benito	2	1	23
San Bernardino	1		13
San Diego	2		27
San Luis Obispo	7	2	47
San Mateo			1
Santa Barbara	4	1	62
Santa Clara	1		7
Santa Cruz			1
Shasta	9	5	182
Sierra			6
Siskiyou	31	9	224
Sonoma	2		14
Stanislaus			3
Sutter			1
Tehama	5	3	145
Trinity	13	4	229
Tulare	10	2	49
Tuolumne	2	3	33
Ventura	1	3	23
Yuba			3
Totals	204	76	2,261

Lion Bounty Claims.

A bounty of twenty dollars ($20.00) on the scalps of mountain lions is paid by the California Fish and Game Commission on meeting certain requirements. Claim blanks will be sent on application.

FINANCIAL REPORT.

Statement of Expenditures for the Months of February, March and April, 1915.

	February		March		April	
GENERAL ADMINISTRATION.						
Commissioners' traveling and other expenses	$13 00		$77 85		$163 27	
Salaries of administrative assistants	1,045 00		1,045 00		1,045 00	
Traveling expenses of administrative assistants	53 65		79 85		132 40	
Rentals, office and other supplies	295 02		309 75		354 79	
		$1,406 67		$1,512 45		$1,695 46
GENERAL FISH AND GAME PATROL.						
San Francisco Division.						
Salaries of deputies and employees	$2,866 50		$2,936 50		$2,923 00	
Traveling expenses of deputies and employees	953 42		1,175 64		1,226 88	
Rentals, office and other supplies	217 68		177 05		170 91	
		4,037 60		4,289 19		4,320 82
Sacramento Division.						
Salaries of deputies and employees	$2,641 17		$2,510 00		$2,377 60	
Traveling expenses of deputies and employees	1,113 87		1,115 39		1,004 75	
Rentals, office and other supplies	75 27		48 72		306 36	
		3,830 31		3,674 11		3,688 11
Los Angeles Division.						
Salaries of deputies and employees	$875 00		$934 00		$912 00	
Traveling expenses of deputies and employees	177 65		318 82		236 79	
Rentals, office and other supplies	170 20		142 39		135 76	
		1,222 85		1,395 21		1,284 55
Fresno Division.						
Salaries of deputies and employees	$1,047 60		$938 00		$961 67	
Traveling expenses of deputies and employees	555 02		466 06		375 40	
Rentals, office and other supplies	129 32		86 80		89 65	
		1,731 34		1,490 86		1,426 72
Miscellaneous Expenditures.						
Prosecutions and allowances		379 61		339 06		117 00
General printing		311 95		----------		297 12
Total, general administration and patrol		$12,923 33		$12,700 88		$13,129 78

FINANCIAL REPORT—Continued.

Statement of Expenditures for the Months of February, March and April, 1915—Continued.

	February		March		April	
Probable cost general administration and game patrol (60%)		$7,753 998		$7,620 528		$7,877 87
Probable cost general administration and fish patrol (40%)		5,169 332		5,080 352		5,251 91
		$12,923 33		$12,700 88		$13,129 78
FISHERY EXPENDITURES.						
Administration.						
Salaries of superintendent of hatcheries and assistants	$350 00		$350 00		$262 56	
Traveling expenses, superintendent of hatcheries and assistants	146 16		105 05		98 85	
Office and laboratory supplies, etc.	35 95		59 30		42 26	
		$532 11		$551 35		$103 67
Fishery Research and Publicity.						
Salaries	$215 00		$364 20		$567 00	
Traveling expenses	27 25		172 65		158 30	
Supplies, etc.	2 15		205 85		723 13	
		271 40		742 70		1,448 13
Screen and Fishway Surveys.						
Salaries	$100 00		$100 00		$100 00	
Traveling expenses	7 35		103 25		80 15	
Supplies, etc.						
		107 35		203 25		180 15
Fish Transplanting (pack-train, messengers, etc.).						
Salaries						
Traveling expenses					$13 50	
Repairs and supplies					16 01	
						29 51
Fish Distribution (car and messengers).						
Salaries	$100 00					
Messenger allowance and traveling expenses	13 50				$1 95	
Repairs			$249 95		4 17	
Supplies, general expense, etc.	1 90				39 65	
		115 40		249 95		46 07

Fish Patrol (launches, etc.).						
Salaries	$242 50		$230 00		$244 00	
Messenger allowance and traveling expenses	79 75		43 45		80 55	
Repairs	4 42		294 20		21 15	
Supplies (oil, etc.)	75 35		63 16		157 55	
		402 02		630 81		503 25
Sisson Hatchery.						
Salaries	$1,435 50		$1,686 19		$1,603 34	
Traveling expenses			2 75		6 30	
Construction and repairs	3 55				8 25	
Fish food and ice for meat	163 14		242 30		333 25	
General supplies and expenses	23 37		95 99		63 09	
		1,625 56		2,027 23		2,014 23
Tahoe and Tallac Hatcheries.						
Salaries	$10 00		$10 00		$386 66	
Traveling expenses					56 45	
Construction and repairs					5 80	
General supplies and expenses					51 00	
		10 00		10 00		499 91
Price Creek Hatchery.						
Salaries	$261 67		$275 00		$212 50	
Traveling expenses	55 70		4 50		41 50	
Construction and repairs	31 30				4 00	
General supplies and expenses	92 31		113 48		168 69	
		440 98		392 98		456 69
Ukiah and Snow Mountain Hatcheries.						
Salaries	$282 00		$294 12		$342 50	
Traveling expenses	29 90		21 58		30 85	
Construction and repairs			21 36		6 95	
General supplies and expenses	8 70		66 51		97 95	
		320 60		403 57		478 25
Wawona Hatchery.						
Salaries						
Traveling expenses						
Construction and repairs						
General supplies and expenses						

FINANCIAL REPORT—Continued.

Statement of Expenditures for the Months of February, March and April, 1915—Continued.

	February		March		April	
Sisson Hatchery Auxiliary Stations.						
Salaries	$282 00		$660 00		$482 50	
Traveling expenses	28 10		77 10		42 00	
Construction and repairs	268 83		156 85			
General supplies and expenses	21 23		30 95		68 95	
		600 16		921 90		593 45
Scott Creek and Brookdale Hatcheries.						
Salaries	$185 50		$284 00		$280 00	
Traveling expenses	4 00		2 30		60	
Construction and repairs	70		4 60		9 58	
General supplies and expenses	19 64		74 59		71 76	
		209 84		365 19		361 94
Bear Valley Hatchery.						
Salaries					$165 16	
Traveling expenses					21 50	
Construction and repairs						
General supplies and expenses					10 15	
						196 81
Miscellaneous Expenditures.						
Printing and lithographing fishing licenses, notices, application blanks, etc.						35 76
Angler's license commissions and refunds		269 10		263 40		433 90
Market fishing license commissions				43 25		199 50
Crawfish inspection		35 00		129 03		100 00
Total fishery expenditures		$1,942 52		$6,900 91		$7,981 49

GAME EXPENDITURES.

Hayward Game Farm.						
Salaries	$200 00		$230 00		$200 00	
Traveling expenses	1 20		6 50		1 80	
Rent	37 50		37 50		37 50	
Construction and repairs	46 35		16 00		86 75	
Feed for birds	76 55		54 20		71 60	
General supplies and expenses	34 53		105 28		57 22	
		$396 13		$449 48		$454 87
Game Research and Publicity.						
Salaries	$233 50		$358 80		$629 40	
Traveling expenses	35 05		100 68		9 85	
Supplies, etc.	50 23		317 54		1,074 40	
		318 78		777 02		1,713 65
Miscellaneous Expenditures.						
Printing and lithographing of hunting licenses, notices, application blanks, etc.		662 00		277 40		1,291 70
Hunting license commissions and refunds		380 00		420 00		220 00
Total game expenditures		$1,756 91		$1,923 90		$3,680 22
Grand total of all expenditures		$19,622 76		$21,525 69		$24,791 49
Total of fish expenditures		$10,111 852		$11,981 262		$13,233 40
Total of game expenditures		9,510 908		9,544 428		11,558 09
Grand total		$19,622 76		$21,525 69		$24,791 49

Summary of Expenditures for the Months of February, March and April, 1915.

	February	March	April
General administration, salaries, traveling expenses rentals, supplies, etc.	$1,406 67	$1,512 45	$1,695 46
San Francisco District, salaries, traveling expenses, rentals, supplies, etc.	4,037 60	4,289 19	4,320 82
Sacramento District, salaries, traveling expenses, rentals, supplies, etc.	3,830 31	3,674 11	3,688 11
Los Angeles District, salaries, traveling expenses, rentals, supplies etc.	1,222 85	1,395 21	1,281 55
Fresno District, salaries, traveling expenses, rentals, supplies, etc.	1,731 34	1,490 86	1,426 72
Hatchery administration, salaries, traveling expenses, rentals, supplies, etc.	532 11	554 35	103 61
Fishery research and publicity, salaries, traveling expenses, supplies, etc.	274 40	712 70	1,148 13
Screen and ladder survey, salaries, traveling expenses, supplies, etc.	107 35	203 25	180 15
Fish transplanting, salaries, traveling expenses, supplies, etc.			29 51
Fish distribution car, salaries, traveling expenses, supplies, etc.	115 40	219 95	16 67
Fish patrol launches, salaries, traveling expenses, supplies, etc.	402 62	620 81	503 25
Sisson Hatchery, salaries, traveling expenses, supplies, etc.	1,625 56	2,027 23	2,011 23
Tahoe and Tallac Hatcheries, salaries, traveling expenses, supplies etc.	10 00	10 00	499 91
Price Creek Hatchery, salaries, traveling expenses, supplies, etc.	110 98	392 98	456 69
Ukiah and Snow Mountain Hatchery, salaries, traveling expenses, supplies, etc.	320 60	403 57	478 25
Wawona Hatchery, salaries, traveling expenses, supplies, etc.			
Sisson Hatchery Auxiliary Station, salaries, traveling expenses, supplies, etc.	600 16	924 90	593 15
Scott Creek and Brookdale Hatcheries, salaries, traveling expenses, supplies, etc.	209 81	365 49	361 94
Bear Valley Hatchery, salaries, traveling expenses, supplies, etc.			196 81
Game Farm, salaries, traveling expenses, rentals, supplies, etc.	396 13	149 48	154 87
Game research and publicity, salaries, traveling expenses, supplies, etc.	318 78	777 02	1,713 65
Prosecutions and allowances	379 61	339 06	417 00
Hunting license commissions and refunds	662 00	277 40	1,291 70
Angler's license commissions and refunds	269 10	263 40	433 90
Market fishing license commissions		43 25	199 50
Crawfish inspection	35 00	129 03	100 00
Mountain lion bounties	380 00	120 00	220 00
Printing and lithographing	311 95		332 88
Totals	$19,622 76	$21,525 69	$21,791 19

Balances February, March and April, 1915.

	February 1		March 1		April 1	
Balance in State Treasury.						
Fish and Game Preservation Fund	$90,392 35		$80,627 11		$76,649 66	
Support and Maintenance Hatcheries Fund	16,376 09		13,871 12		13,018 14	
		$106,768 41		$94,198 23		$89,667 80
In Bank.						
Fish and Game Preservation Fund	$370 00		$1,638 97		$2,651 60	
Support and Maintenance Hatcheries Fund	1,060 00		2,330 00		7,640 00	
		1,430 00		3,968 97		
					$10,291 60	
Less amount for market fishing licenses, 1915 1916					7,300 00	
						2,991 60
Total belonging to fiscal year 1914 1915		$108,198 41		$98,167 20		$92,659 40
Less monthly bills		19,622 76		21,525 69		24,791 49
Balance		$88,575 68		$76,941 51		$67,867 91

CONTENTS.

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

THE ADMINISTRATION OF FISH AND GAME LAWS.*

By ERNEST SCHAEFFLE,
Executive Officer, California Fish and Game Commission.

The speaker deeply appreciates the honor of having this subject assigned to him for presentation—a subject which has engaged his attention for a considerable number of years and one that he considers of much importance. The fish and game of the country have a value that is now unquestioned and, quite naturally, the various means used in the preservation of the supply are of increasing interest. It is indeed significant and encouraging that this distinguished association should give its time for a discussion of the proposition.

At the outset the speaker desires to suggest that the administration of law, while of admitted importance, may in time prove to be of less value to a commonwealth than the voluntary observance of wise regulations on the part of the public, a consummation that would render unnecessary large police forces and complicated and expensive programs. That it is not impossible to bring about such a condition seems to have been demonstrated already in this State, where twenty years ago even the leading citizens, and sometimes the public officials, violated the fish and game laws openly and without fear of punishment. Today the game law violator is usually the irrepressible mountaineer or the unschooled immigrant, while to the offense is attached the same obloquy that attends the commission of larcenies and other unpopular misdemeanors.

For reasons easily appreciated the so-called "game laws" have not always been held in the same esteem as those laws which are designed primarily for the protection of the person and private property. Game laws in the past—and even today in other countries—have had as their real purpose not so much the protection of wild life as they have had the protection of the more or less imaginary rights of the landholder against trespass. Human selfishness, aided by the almost universal respect for property for itself, has quite naturally dictated the enactment of drastic statutes and their rigorous enforcement, with the result that the propertyless majority in all lands have come to have a hatred and disregard for even those laws whose purpose is good.

Handicapped by this antagonistic sentiment the administrator of fish and game laws has had, in the past, a task almost impossible of accomplishment. In this country the task has been peculiarly difficult, for added to the unfavorable public sentiment has been the weakness of a democratic form of government in compelling law observance. This weakness has been demonstrated nowhere so fully as in the field of wild life protection and has resulted in what the speaker has long considered an unnecessary and extravagant political arrangement.

*A paper read before the American Association for the Advancement of Science at its annual meeting held at the University of California, Berkeley, California, August 2, 1915.

In practically every state this proven incapacity of the regular peace officers has forced the citizens to organize special forces of "game wardens" whose duties in the past have consisted largely of the detection and prosecution of those offenders against the statutes with whom the sheriffs, constables, and other statutory officials either could not or would not interfere. This scheme of providing an extra piece of machinery for performing the functions of a regular branch of government seems peculiarly American and should be a source of condemnation rather than of satisfaction. Not only is the scheme expensive, but also demoralizing in its certain tendency toward a shirking of responsibility and the inevitable public acquiescence in a bad condition.

But given the game warden—what then? As we have seen, there has existed—in the past at least—a widespread suspicion and dislike of the game statutes, which in itself has created a difficult and discouraging task for the officer. Added to this state of the public mind there has been an inexcusable condition of statute which has irritated and disgusted the practical-minded American and doubly handicapped the warden. The trouble has not been that laws were lacking, but rather that there has been a multiplication of faulty and ambiguous statutes, the work of officials and legislators lacking in knowledge of the conditions calling for remedy.

As is well known, the average fish and game official of the past was a gatherer of political scraps. If he knew anything at all it was something absolutely foreign to fish and game conservation—a subject that interested him solely because of its possibilities in the way of paying off political debts and of building up a private machine. Small wonder it is that the fish and game supply of the country has diminished to the danger level; if nature were not so wonderfully prolific there would be nothing left. It must ever be borne in mind that while fish and game are held to be public property in the United States, yet there is no private preserve system and no such thing as the private breeding and protection of game on an extensive scale. Game is plentiful in older countries—yes; but in those countries the general public lacks the opportunity for practically unrestricted shooting, and game is bred in immense quantity. For game shooting, which does not include the shooting of rabbits, hares and at least some kinds of wild fowl, Great Britain issues about 68,000 licenses yearly. For the same period, California, with an area practically the same as Great Britain, but with less than one-fifteenth the population, issues 160,000 licenses. It can be seen that there is no warrant for the claim often made that California could have on sale the same quantity of game as Great Britain and that the British system is better for both game and man.

It will be freely granted that the restriction of the shooting privilege to the aristocratic minority makes for a positive limitation in the kill of game, and consequently *is* of advantage in that one direction. But is the saving of the fishes, birds, and mammals from ultimate extinction all that even the conservationist is concerned with? How about the "rights" of the common people to outdoor life, recreation, fishing—and even killing, if they desire to kill? In this country we feel that it is not only right, but wise, that man's instinct for sport be kept alive. Would not certain European nations be better off in this crisis if their common people—boys and men—had been permitted to hunt, fish,

learn to camp out—and to handle arms? We think so; and further, we think that a state or country where the average man knows how to shoot is safer in times of peace and war than those countries which are obliged to depend upon conscript armies of men whose experience with firearms is limited practically to the dismounting, assembling and polishing of their weapons.

But to get back to our theme, the inadequacy of legislation. With experience from past blunders to guide them, progressive fish and game officials have been working for sane legislation—legislation based upon actual, demonstrable facts in connection with the life histories of their charges; until now the fish and game laws of most states begin to meet the purposes for which they are intended. With the enactment of proper laws—laws that even the layman, who is no fool, sees to be reasonable and likely to bring about beneficial results—has come a gratifying reversal of public opinion. Where once game laws were made only to be broken we now find them being religiously observed by the average person. What this new condition augurs for the future of conservation can not be estimated; but the outlook would seem to be bright.

Added to the bungling laws of earlier days so aptly described by a leading jurist of the State as "legislative blacksmithing," and the usual incapacity of administrative chiefs, went a corresponding incapacity in subordinates. These men were almost without exception given their reward for political services, served unwillingly their allotted time, and were displaced at the election time by a batch of the same, or worse material. But in the last twenty years has come a decided change for the better, not only in fish and game administration, but in government generally. With a realization of the fact that earlier and existing wasteful practices meant the extinction of all wild life forms within a generation, came a demand for positive conservation through the adoption of proper legislation, for the selection of earnest and fit officials, for the strict enforcement of statutes, and for the development of an informed and healthy public sentiment.

How this has been done and is now being done can not be set forth in a paper limited as this of necessity must be. The speaker feels justified in declaring, however, that conditions as a whole are very satisfactory in most of the states. In this State, for instance, we have a fish and game department under the strictest civil service control. Deputies are chosen in rigid, but practical, examinations, and are protected from political whim and spite by the regulations of an able and impartial civil service board. Having the assurance of continuous employment during good behavior and the faithful performance of duty, the individual warden now has pride in his position and strives to train himself for better service and promotion. What was once a seasonal "pick-up" has become a well-paid, respectable profession, offering inducements to educated, solid men whose connection with the public service is a real asset to the State.

Men of this character not only can wield clubs when occasion demands, but they can go about among the people, instructing them as to the vital necessity of conservation at this day and winning them over as converts and allies for positive, constructive activities. Already we are getting results from the work of such men, and because people as a rule desire to do the right thing, when they know what the right

thing is, we feel justified in expecting such "team work" in time that the fish and game supply will be safe. And this to the mind of the writer is the greatest work an educator or police official can do—to do his own work so well that finally there is no need for him at all.

SOME HINTS ON MAKING PHOTOGRAPHS FOR ILLUSTRATION.

By TRACY I. STORER.
Assistant Curator of Birds, California Museum of Vertebrate Zoology.

Photographs intended to illustrate articles relating to fish and game and similar subjects should be "snappy," that is with good contrast between the lightest and darkest parts, and sharply focused so as to show all details distinctly. Such pictures differ in several respects from these prepared for artistic purposes. No special kind of camera or lens is necessary for the production of good illustrative material but of course some kinds are more convenient and capable of being used for a wider range of subjects than others. More really depends upon the worker's familiarity with the instrument used than its style or equipment. Pictures possessing the qualifications mentioned are obtained by paying attention to certain details of manipulation. The possibilities in animal photography are enormous. Whole books have been written about the subject, and it is by no means yet exhausted. This article is intended merely to indicate some of the principal points to be observed in securing such pictures and to stimulate interest in the work.

There are many different styles and makes of cameras, but all can be grouped into a few simple classes. First there are the box or fixed focus cameras such as the "Bullseye" and "Brownie," to secure sharp pictures with which the distance from camera to subject must be considerable, usually twenty feet or more. Roll-film and filmpack cameras such as the Folding Pocket Kodaks and Filmpack Premos, in which the front bearing the lens can be drawn out and set for varying distances, can be used for a wide range of subjects. For objects less than fifty feet from the lens the distance should be carefully measured and the front bearing the lens set at the corresponding distance-mark on the scale. When provided with an extra "portrait" lens (which slips on over the front of the regular lens) these cameras will produce sharp photographs of objects within three feet of the lens; otherwise the minimum distance is about six feet. Cameras using plates (or film packs in adapters) and provided at the back with a ground glass form the third class. With these it is possible to see the image on the ground glass exactly as it will appear in the finished picture (except for color), and to arrange and focus it by altering the distance of the lens until a position is reached in which the image is quite sharp. Reflecting cameras such as the "Graflex" and "Reflex" form a fourth class. In these the subject may be viewed, arranged and focused on a ground glass up to the instant of exposure. Because of their high cost and special manipulation they will not be considered here.

If time exposures are to be made, some kind of a camera support is necessary. In emergencies the camera may be set on a box, chair, ladder, or other similar support, but when much work of this kind is to be done a tripod is essential. It should be a substantial affair. Folding wooden tripods are capable of being used under a wider variety of conditions and are more dependable than the slightly more compact telescoping metal ones. When photographing such things as footprints (and some nests) a tilting tripod top is a great convenience; one of the broad, hinged-board type is most satisfactory.

Probably the most difficult problem with which the amateur photographer has to contend is that of determining the proper exposure (the time which the shutter must be open for light passing through the lens to act sufficiently on the plate or film). Exposure depends upon light strength, nature of subject, lens "stop" and speed of plate used. As most amateurs use but one brand of plates or film almost exclusively, the last item need not be considered.

Light is photographically strongest during the middle of the day, during June and July, on sunny days, and at high altitudes. It is weakest in early morning and late evening, in December and January, on dull cloudy days, and near sea-level. Under conditions between the extremes mentioned the light is of intermediate strength.

Instruments known as actinometers ("light measurers") can be obtained from dealers in photographic supplies. These devices enable the light intensity to be accurately measured and by simple calculations the necessary exposure can be determined. Altogether they furnish the best solution to this vexing problem. The Wynne and Watkins actinometers are well known and widely used. Then there are numerous tables, charts, and calculators, but these all involve human judgment in estimating the light intensity. Finally one may learn to judge light intensity fairly well through experience, but this is a tedious and expensive process and often results in failing through incorrect exposure to secure what otherwise would have been valuable pictures. One of the best ways of becoming familiar with different light conditions is to make a set of experimental exposures of the same subject under different light conditions (as at different times of the day and under different conditions of the weather) and of different subjects under similar light conditions (at about the same time on a single day). Then study the results obtained and use them as guides in future work.

Dark subjects or ones with deep (faintly lighted) shadows, or subjects close to the camera require relatively longer exposures while views including sea, clouds or sky need less, as indicated in the table here given.

Sea and sky	1/10	Times normal exposure.
Snow scenes	¼	
Subjects with light foreground	½	
Objects less than 20 feet from camera	1½	
Dark objects	2 to 8	

Camera lenses vary considerably in their construction, but are all made on the same general principle and serve the purpose of bringing light rays from the subject to a sharp focus on the sensitive plate or film. All modern cameras are provided with some means of reducing the diameter of the aperture in the lens. This has the important

effect of increasing the distance within which objects included in the field of view are in sharp focus. Box cameras usually have these "stops" on a metal strip, by moving which one or another of the different sized apertures (usually 3) may be placed in front of the lens. Other cameras have an "iris diaphragm" (so-called from its resemblance to the structure of the same name in the human eye) with which the size of the aperture may be varied at will. Certain designated apertures, called "stops," are marked on the lens barrel or on the shutter case. Two systems, the "F" and the "U. S." (uniform system), are in vogue. The stops marked on most cameras together with the proportionate exposures necessary are as follows:

Stop in F system	8	11	16	22	32	45	64
Equivalent stop in U. S. system	4	8	16	32	64	128	256
Proportionate exposure	1	2	4	8	16	32	64

Objects close to the camera require the use of a smaller stop (that is, one of a higher numerical value) and a correspondingly longer exposure. As a general rule for subjects within twenty feet of the camera use stop f/16 (= U. S./16), and for objects under six feet use stop f/22 (= U. S./32) or even a smaller one.

In the case of living subjects where a short exposure is necessary to prevent movement in the picture a large stop will usually have to be employed, with the result that only a part of the picture will be in sharp focus. Under such conditions it is better to be content with taking the picture at a greater distance and securing a smaller but sharper image, which can later be enlarged.

Subjects involving a considerable range of color, such as landscapes including snow, clouds or sky, are more satisfactorily rendered by being photographed through a ray filter or color screen. Use of a ray filter increases the necessary exposure from three to eight times, the exact amount being indicated on the filter or instructions accompanying it.

Development is best carried out by the tank method, as this gives better average negatives, especially if the exposure has not been exactly right. Prints for illustration should be made on glossy paper and should be "glazed," that is, squeegeed on a polished ferrotype plate so as to have a very glossy surface. They should not be mounted. The data pertaining to them is preferably written on a separate piece of paper which is pasted along the lower edge; if written on the reverse side of the print care should be taken to bear lightly so as not to injure the highly finished surface. The data should include descriptive title, date and photographer's name.

Prints smaller than 2½ x 3½ inches are rarely of much value for illustration. It is well to have them the same size or twice the size that they are to appear when published.

It is by no means impossible to secure good photographs of living animals with an ordinary camera; in fact, some of our best pictures of wild birds and mammals have been secured with very inexpensive apparatus. One scheme that has been used with success is to focus the camera on a point marked by some inconspicuous object, and then wait

for or induce the animal or animals to occupy or pass the spot, whereupon the shutter is snapped. In photographing a bird on the nest the camera can be placed in the proper position on its support and left some time—for several hours or even days—until the bird is no longer afraid of it. A thread, or a strong rubber bulb and long tube, fastened to the shutter release will permit the operator to conceal himself at some distance and make the exposure at a favorable instant. For concealment and protection the camera may be covered with a piece of light-tight, waterproof material.

Many kinds of big game have been successfully photographed (some even by flashlight) by arranging a thread across a path or runway frequented by the animals. One end of the thread is attached to a firm support such as a tree, and the other end to the shutter release, the camera being placed at one side of the runway, focused on the latter, and securely anchored against movement. When an animal in walking along the path presses against and breaks the thread, the shutter is snapped and the picture obtained.

Birds and even some mammals may often be attracted by regularly placing food or water or both in a well lighted spot. Some excellent pictures have been obtained by attracting the animals to a favorable location in this manner.

Many good pictures have been secured by the use of "blinds" in which the photographer can remain concealed until the animals being studied approach near enough to be photographed. A blind can be easily constructed of a large umbrella with an elongated staff by which it is supported from the ground, and with a piece of cloth hung from the side to form a rounded enclosure for the camera man. The whole tent should be of an inconspicuous green or brown color. Loop holes in the side cloth permit the lens being protruded to secure pictures. Such a blind is easily transported. In many situations it may be covered with grasses or brush for further concealment. Sometimes a blind of natural materials such as brush and grasses can be constructed on the spot. Finally there are many little tricks to be learned in photographing animals in the open. A flock of feeding birds may often be directly approached if the photographer is careful to move slowly. Often by creeping along the ground with his camera in front of him, ready to snap at any instant, he may be successful.

THE MEANING OF NATURE STUDY.

By CARROLL DEW. SCOTT,
Supervisor Nature Study and Agriculture, San Diego Public Schools.

Man can not get away from his past and be normal. The forces of heredity chain him in many ways to the experience and thought of his ancestors. How strong those forces are is shown in the persistence among men of the most primitive beliefs and superstitions—the belief for instance that the moon has an effect on germinating seeds or that it is unlucky to have anything to do with the number thirteen. If man's ideas are colored by the far-off past, how much more his physical body, habits, senses. The young child is still a little savage, born with only a greater aptitude for culture perhaps than his savage ancestors. Man still lives for the greater part of his time in touch with the primitive things of the world. His health is continually menaced by changes in temperature of the air, by the attacks of insects and bacteria; his individual energy, his racial achievements are more or less according to the climate and the abundance or scarcity of natural resources. If man is successful in conquering nature it is just as true that he is in danger of being conquered by his own civilization, which is not only based upon nature but violates her laws to man's vital injury. We are still children of nature. We can not do without a knowledge of her laws and we remain in ignorance of her at our peril. It is still necessary for the sake of man's body, mind and soul to take cognizance of his natural surroundings.

Because man's life has its roots so deeply imbedded in the recent past the child instinctively turns to the natural phenomena about him. From the time children are a few years old they are attracted by flowers, insects, trees. Their first passion is perhaps the love for a dog or cat. They like to play in the water and they have a fondness for dirt and sand both inside and out. It is a striking proof of the stupidity of men that they have not from the beginning used the materials at hand in the child's world to educate him. In spite of the common fact that in every generation thousands of self-educated persons have become trained to efficiency in life by the natural method of doing well whatever their hands found to do, educators have taken children away from the things of most interest to them and tried to train them by a so-called logical method of instruction based upon the needs of the adult mind. And they are still doing it everywhere. The first step in the education of a child is to secure his attention. To do that you must put something before him that takes hold of his interest. Mental faculties develop by use. It makes no difference whether the mind is impelled to exert itself by force or curiosity so long as there is native attraction. Children are naturally interested in plants, growing things, living things that compose the outdoor world. There is no better way to train their minds than to direct their attention to these things.

How much shall we include in the nature study course? That will always be a question of judgment for the teacher, largely decided by the locality. Usually the difficulty is to choose the best material from a bewildering mass. The teacher can not go far astray if she keep in mind the viewpoint in nature study—a concrete study of the child's

natural environment. Nature study is not geography, or biology, or physics, or anthropology; but it may take facts freely from these or other sciences. As much geography or history, for example, might be taken as the child can gain a first-hand knowledge of. In San Diego the beach and ocean make ideal nature study; in Nebraska the study of the ocean would be physical geography. Gardening easily belongs in nature study because it is closely related with everything else out of doors—more so for instance than carpentry or watch-making. Any further discussion of this topic must come under methods.

In the primary grades the attainment of knowledge is only a minor end (in education). The child does not remember what he learns, and it is too general to serve him if he did remember it. He is learning to handle tools of knowledge, and the greatest of these is the mastery of his language. Nature study makes the best contribution towards this end of any branch of study. Because the subject-matter of nature study is of interest to the child, because it is all about him, and because it is real, concrete, visible, it is the best means of developing power of oral and written expression. To talk and write about the plants in his garden, the birds in his trees, the pets in his backyard, the butterflies, rocks, animals he has seen in the parks or in the country is one of the delights of childhood. The life story of most men of power shows that the idea that stale and uninteresting things must be done to train the child's mind is a foolish delusion.

If there is any principle of modern education that will stand the test of time it surely is that one which declares that children learn most easily and many learn almost entirely, by self-activity. Because adults from their wide experience are able to learn from books or lectures does not prove this to be the best method with children or even with adults. Even with adults the lasting impressions are those made by our own senses. Even good literature is rarely written outside a writer's own limited experience. Bret Harte's stories of California, a country in which he spent his early manhood, are masterpieces; but those of other places in which his experience was meager or second-hand are pale and unconvincing. If concreteness is essential to clear-cut ideas for adults, how much more necessary for children, whose minds are not stored with varied images which supplement their eyes and ears.

In his mental and physical development the child follows the large course of his ancestry. It was only a short time ago both historically and geologically that our forefathers were educating their brains by using implements of stone and wood and iron, by using their senses to apprehend danger, to discriminate between plants and animals that were useful or harmful to them. And scientists tell us that civilization has been won from the jungle by this training of the hand and eye and ear and emotions, because it has increased the size of the brain and laid the foundation for the acquisition of all our present knowledge. Just so the child's brain responds to the stimulus of impressions from the senses and especially to the physical effort made in walking, playing, working, collecting and gardening. The study of nature will cultivate habits of observation and discrimination which will sharpen the wits in any line of work the child may take up. And the effort to see things

accurately will give him a love for truth—one of the highest benefits education can bestow.

Nature study is the indispensable preparation for agriculture and science either in the higher grammar grades or the high school. When the essentials of plant and animal life and gardening operations are learned at the proper time the work of advanced courses can proceed properly. As it is now, students enter these courses usually without the information which they should have learned in their early teens. And what is more lamentable, those who quit the grammar grades before graduation grow up ignorant of how to plant, cultivate or irrigate a garden, ignorant of the plants best adapted to their home town, and of the value of protecting wild birds and animals. Many children interested in nature study will become florists, landscape gardeners, teachers of science, and farmers. Indeed the main reason for introducing agriculture into the schools is that the prosperity of the state depends largely upon the number of its well-trained farmers. But if the average child should learn enough to become an intelligent citizen, to make an attractive home with flowers, trees and vegetables around it, the purpose of nature study in the grades would be fulfilled.

There is no better service that nature study can render the child than to make him love the outdoors. All children when they are young want to be outdoors where they belong, but, as they begin to go to school, they get the indoors habit. All their lessons and many of their games are indoors. There is too little play outdoors and most of that is artificial and often involves the wideawake child only. Nature study alone can furnish an interesting reason for going outdoors, away from the nerve-racking noises and sights of cities; and this habit once cultivated will remain always an antidote to the too close application to business or social pursuits. Grown people will not go into the country without some stimulus or purpose, and to most of them nowadays the country is stupid and repelling. That is because they know nothing interesting about it. To the naturalist every landscape is full of interest and wonder.

It is mostly idle to talk to children or grown-ups about cultivating a love for the beautiful in nature, because on the part of the child it is an evolution of spirit, and if it is not present in the adult you can not talk it into him. All nature is beautiful to a nature-lover, because it is all the result of the working of law and order and a part of the wonderful universe. The child goes to nature from instinct, curiosity, wonder, and for bodily exhilaration. He is attracted first by living, moving things—often even by the desire to kill them like his savage ancestors did. (Most grown people today can not pass a snake or a lizard without trying to kill it.) Gradually he comes to love all these things, to see their relations and exquisite adaptation to the world, and to appreciate the beauty of inanimate things such as clouds, landscapes, sunsets. Stevenson said the average person would not spend three minutes looking at a landscape. But the nature-lover and the artist spend hours and days and never tire. The love of nature is a growth of spirit. It elevates life and gives a sense of companionship with the world which keeps us from being extremists. It makes for sanity. But it must be consciously cultivated because pavements and houses and trolley cars tend to kill it.

It is gratifying to see that more and more people each year go into the primitive places which have now become more accessible by the extension of railroads and the invention of automobiles. Yet only a small percentage of people can afford to travel very far and most of them go for the excitement of moving from place to place rather than for any interest in the treasures of the landscape. Future generations will think more of the country and less of the means of transportation, for they will go to the wild places for weeks at a time instead of for a day or a few hours.

The average man of the city is the one who most needs the country to keep him out of the grooves of work and worry. He needs parks and playgrounds in the city and in the suburbs, and it is for his sake largely that we want thousands of acres not only of improved but of primitive landscape. We want to teach nature to children so that, as future citizens, they will appreciate the necessity of maintaining recreation centers, of preserving wild places, of protecting birds and harmless animals so that future generations may study and enjoy the plants and animals which nature has evolved through millions of years but which man may ruthlessly exterminate in a decade. We must realize that "there is nothing so practical as the preservation of wild beauty." The present generation is the guardian of this wild beauty for those to come. The time and place to emphasize this truth is in the public schools, so that conservation of resources will become a national habit and duty.

Such, then, are some of the sidelights that illumine the meaning of nature study in the grammar grades. The educational value of concrete, living, moving things and processes as materials of study, is becoming recognized. Also it must become evident to teachers that it is just as important (perhaps more so) to help a child to be happy as to be effective. Nature study should add to individual happiness by putting one on more intimate terms with the living things about him which are all wonderfully made and patterned and colored like the skies of sunset. We must live and be happy and healthy where we are, and association with nature is one of the strongest influences towards making us what we ought to be. We must go back to nature for vigor, vision, and peace.

SOME PRECAUTIONS IN THE PLANTING OF TROUT.

By John P. Fisher.

At this time of the year the State hatcheries send out many millions of trout fry to stock the streams of the State. Comparatively few people are familiar with the necessary precautions which are vital to the successful stocking of our streams, and many fish are lost because of the inexperience of those engaged in planting. Hence, a word of advice to prospective fish planters may be in season.

Fig. 47. Planting trout on the American River. Photo by McCurry Company.

Two things must be carefully watched—the temperature and the aeration of the water. A lowering of the temperature or lack of air quickly affects trout fry.

The necessary equipment must include a thermometer and a dipper. The ordinary thermometer to be purchased at any notion store is as good for this purpose as a higher priced one, and an ordinary handled tin dipper having a cover of wire screen soldered over the top of the bowl is all that is required.

When the fish are received the temperature of the water should be taken. This will be found to be about 40° Fahrenheit. It should be borne in mind that the temperature should at no time be allowed to rise higher than 45° Fahrenheit. If the fish must be transported any great distance during warm weather, it will be best to provide ice as a means of keeping down the temperature of the water in the fish cans.

The ice should be well wrapped in an old blanket or other non-conductor. Care should be taken when placing the ice in the cans that the fish are not injured.

During the journey from the hatchery to the stream there is great danger that the fish will be smothered because of insufficient aeration. This should be carefully guarded against. If the fish are transported by wagon, the jolting of the wagon over rough roads will under ordinary circumstances provide aeration enough to the water; but if transportation is by auto or by wagon over smooth roads, the water in the cans should be aerated every fifteen or twenty minutes. This can be done by taking a dipperful of water from the can, raising the dipper about twenty-four inches above the can, and then pouring the water back into the can. This operation should be repeated six or eight times.

By keeping careful watch of the temperature and looking to the aeration of the water no trouble will be had. Only in exceptional cases is it necessary to change the water. If it is found necessary to keep the fish over night before they can be planted, one of two methods may be adopted to keep the fry in condition. If there is a flume carrying cold water handy, the cover may be removed from each can of fish, a piece of mosquito bar or bobbinet may be tied securely over the opening, and a small stream of water dropped into each can from the flume. If there is a running stream available, the cans should be uncovered, adjusted as above, and then laid on their sides in the water. The tops should be up stream at a slight angle to the current so as to secure circulation. In either case it is best to equalize the temperature by first taking a few dipperfuls from the can and replacing by water from the flume or stream, continuing to do this until both are of the same temperature.

Upon arriving at the stream or lake where the fish are to be planted, the first precaution taken must be to equalize the temperature in the manner above noted. A point should then be selected on the stream or lake where the water is shallow and where the bottom is sandy or gravelly. Here some of the fish may be slowly liberated. The same process may then be repeated at other suitable points.

THE SNOWY PLOVER.

By Carroll DeW. Scott.

Little snowy plover pacing on the strand,
Blending like a sea-shell with the gray-white sand,
On your back the sand-bar, on your breast the foam,
Over land or water you are quite at home.

Do you wish to lure me far and far away
Till the siren breakers charm my soul astray?
Ah, I know your fluttering wing and anxious pace
Only lead me farther from your nesting place.

Somewhere on the sand-dunes (I would never tell)
In a hollow lined with bits of kelp and shell
Three gray eggs would answer for your pretty game
Or three downy nestlings colored just the same.

Charming home you've chosen on the shining dunes;
On one side the wavelets lap their peaceful tunes,
On the other sound the thunders of the surf—
'Twixt the bay and ocean, neither sea nor earth.

CALIFORNIA FISH AND GAME

A publication devoted to the conservation of wild life and published quarterly by the California State Fish and Game Commission.

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All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, Cal.

October 15, 1915.

"Unquestionably, nothing can be of more value to the cause of game protection at this time than a systematic campaign of education conducted officially by the game departments in every state in the Union, and an extension in the work on that line now being performed by the federal bureau."—Henry Chase.

BEAVERS TO BE TRANSPLANTED TO YOSEMITE VALLEY.

Permission has been obtained from the Superintendent of the Yosemite National Park to introduce into the lower part of Yosemite Valley a number of golden beavers (*Castor subauratus*). The Fish and Game Commission will attempt to transplant several of these animals from the Cache Slough district of Solano County to the Yosemite. In the National Park they will doubtless receive careful protection, and as conditions are ideal the animals should increase rapidly and thus rehabilitate a place long since depopulated by the trapper. Should this experiment prove successful, other transplantations will doubtless be made. Oregon has already obtained marked success in starting new colonies in different parts of that state. Reduced to very small numbers here in California five years ago, the beaver is now on the increase, and if the proper protection is given, the animal will doubtless re-establish itself in all favorable localities in the State.

OVER 12,000 DEER KILLED IN CALIFORNIA LAST YEAR.

For several years past the California Fish and Game Commission has attempted to obtain a census of the number of deer killed in the different counties of the State during the open season. The Commission is indebted to forest rangers and deputies for the detailed information which has been cheerfully furnished the last four years. Those reporting have been unable, of course, to record every deer killed, and often reports for the different counties need to be multiplied two or three times to show the actual number killed. However, these reports furnish a basis on which a reliable estimate of the total annual kill of deer can be made.

On page 245 will be found a table showing the number of deer killed in each county as computed from the data received from deputies and forest rangers. The tabulation shows an increase for each year. This does not necessarily mean that there has been an actual increase in the number of deer killed, for those reporting have been able to make more complete reports each succeeding year. Nevertheless, the increased number of hunting licenses issued and the ease with which the hunter reaches the hunting districts would seem to insure a greater kill each year.

It is interesting to compare the numbers killed in the different counties. A glance will show where deer are abundant and where they have been reduced to small numbers. Trinity County leads the list with a total of 735, nearly 100 more than were killed in any other county. Monterey is second with a total of 632, and Siskiyou third with 575. In southern California, where in many places deer have been nearly extirpated, a correspondingly low kill was reported. The returns show a total of only 143 for Los Angeles County, 102 for Riverside, 97 for San Bernardino, and but 45 for San Diego.

The total number reported for the open season of 1914 is 8,699, a number exceeding the kill for 1913 by 430. Only 6,489 were reported for the year 1911. When the fact is considered that only a portion of the deer killed in each county is reported, it seems safe to say that the actual kill for 1914 must exceed 12,000.

Could deer be sold on the market, each would bring an average price of $25. Hence the yearly crop of deer in California is worth approximately $300,000. This represents a capital of at least $4,000,000. From an economic standpoint, therefore, the deer of this State are certainly worth conserving. They form a natural resource representing in money value millions of dollars and producing an annual crop valued at $300,000.

A much more accurate count could be made if all hunters were required to report their kills, as is required in many eastern states. The need for information as to the yearly kill of deer is obvious. Legislation should be based on absolute evidence as to the crop that can be safely harvested without imperiling the breeding stock necessary for the persistence of the species. Accurate reports would also furnish evidence valuable in preventing concentration of hunting in certain localities. The number of deer killed in each county should be in proportion to the deer population.

Twelve thousand deer a year is obviously too great a toll considering the size of our breeding stock. It is fortunate that at the last legislature a successful attempt was made to shorten the season and to protect spiked bucks. Should a greater or equal number of deer be reported for the open season of 1915, definite steps will necessarily have to be taken to prevent further endangering of the breeding stock. It will be far better to control the yearly kill so as not to imperil the breeding stock than to be forced to close the season to allow recuperation.

SAME FISHING LAWS APPLY IN NATIONAL PARKS.

There has been some misunderstanding regarding the laws relating to fishing in the national parks. A communication from Assistant Secretary Sweeney of the Department of the Interior states that the laws of the State of California obtain and are enforceable in the Yosemite, Sequoia and General Grant National parks. Hence persons desiring to fish in the waters in these parks much first secure a fishing license and be governed by the State laws as well as by those obtaining within the national parks.

THE ARMY OF HUNTERS.

The present European war has stirred up a great deal of sentiment favoring preparedness. In the discussions as to means of providing a trained army are to be found many references to the potential power available in the army of hunters. We here quote a few paragraphs from an article by Mr. Charles Askins on "Federal Game Protection," which appeared in the August number of *Recreation*. We recommend these statements to the thoughtful consideration of our readers:

"Modern wars are not going to brew long enough before the pot boils over to permit us to train men with no knowledge of firearms into soldiers in time to be of any use. We must have men who are already potential soldiers, who have every attribute of the soldier except military tactics and military discipline. We can trust the intelligence of Americans to quickly learn military commands, but it takes far more time to teach men the accurate use of a gun, and to inure them to outdoor life. A man's ability to hike long distances without breaking down, and his ability to live comfortably and maintain his health in camp are of no less importance than his skill in the use of a gun * * *.

"Congress made an appropriation of fifty thousand dollars for the three million sportsmen and game shooters of America, her backbone of outdoorsmen. That is a cent and a half apiece, and is perhaps the true measure of what Congress considers sport worth from a sentimental standpoint. Now if we can convince our lawmakers that shooting men are worth more than that from a utilitarian point of view, possibly the next game law will have some brains put into it and some authority placed back of it. If we can't convince Congress that the sportsmen of America are worth more than a cent and a half apiece, as an

asset of national defense, then the deal is off for good * * *.

"If the game of the United States is ever to be protected and conserved by the Government for the purposes of sport and not for its own sake, as our sentimentalists desire, it will only be because an alternative is presented—that of a civilian army of half a dozen million outdoorsmen, or a standing army of a million men."

conform the regulations to the wishes of the majority of sportsmen so far as it can be done and at the same time give wild fowl the necessary protection."

Fortunately the game laws of California have been made to conform to the federal laws, so there can be no misunderstanding in this State. If one follows closely the state laws he need not fear that the federal laws are being broken.

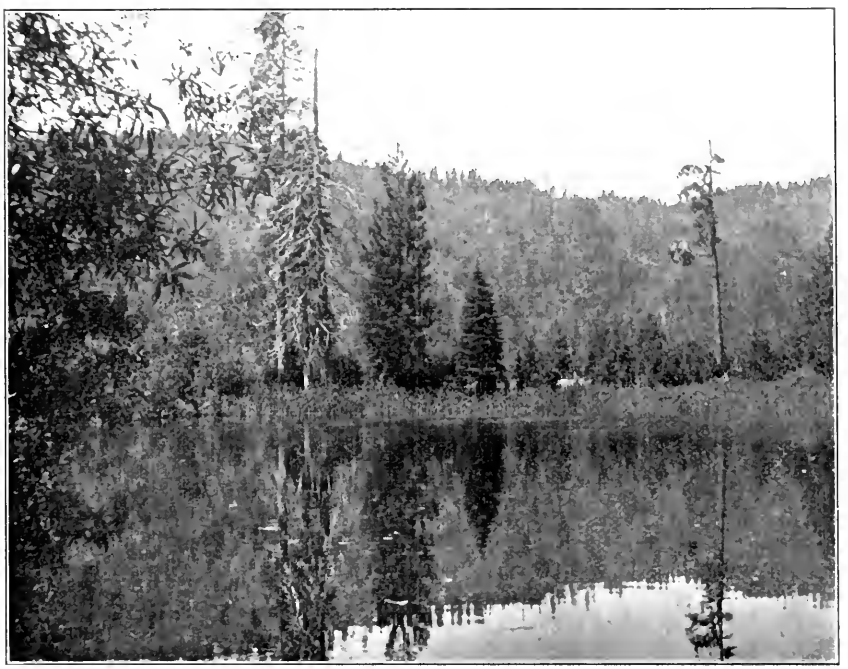

Fig. 48. Klink's Lake, Sisson, California, now used as a rearing pond for salmon. Five million salmon are being held at Sisson for distribution late this fall.

MIGRATORY BIRD LAW.

The United States Biological Survey, which is in charge of the enforcement of the Federal Migratory Bird Law, has issued a warning that the federal regulations for the protection of wild life must be observed in spite of the agitation regarding the constitutionality of the law. The federal regulations as amended October 1, 1914, will be strictly enforced.

"The department will consider any recommendations submitted in good faith for amendment of the regulations, but will hold no public hearings thereon, nor will it amend the regulations prior to October 15, 1915. It is the purpose to

GOOD PHOTOGRAPHS.

The Fish and Game Commission is building up a collection of photographs depicting the work of the Commission and the present status of fish and game. The attention of deputies is therefore called to the instructions for making good photographs contained in Mr. Storer's article on page 212. It is very desirable that the photographs procured for the Commission's collection be of such a quality as will render them available for scientific illustration. Experience is the best teacher of photography, but much may be learned by a careful perusal of the directions given in the article mentioned.

MORTALITY AMONG WATERFOWL AROUND GREAT SALT LAKE, UTAH.

A disease which attacks waterfowl similar to that which appears at Tulare Lake has been reported for a number of years from Great Salt Lake, Utah. Thousands of wild ducks, snipe, sandpipers, and other birds have perished from some unknown cause. The United States Biological Survey has investigated conditions there, and Mr. Alex Wetmore, Assistant Biologist, has recently published a preliminary report (U. S. Dept. Agric. Bull. No. 21, May 26, 1915) as to the results of the investigations.

No evidence was obtained that sulphur or smelter and factory waste were responsible for the disease. On the other hand, all evidence seems to show that mortality results from an alkaline poison the exact nature of which is still to be determined.

"Fresh water is the only remedial agency yet discovered for dealing with this mortality among waterfowl * * * A measure which might be adopted in all three localities [Great Salt Lake, Tulare Lake, Owens Lake] and one strongly recommended is to station men on the marshes to gather up the helpless birds and pen them on fresh water. Considering the great number of birds that might be saved in this way the expense will be slight, and in dry seasons this may prove the only feasible means of relief." Mr. Wetmore states that California sportsmen will be interested to know that at present this appears to be the only measure that will prove successful on Tulare Lake.

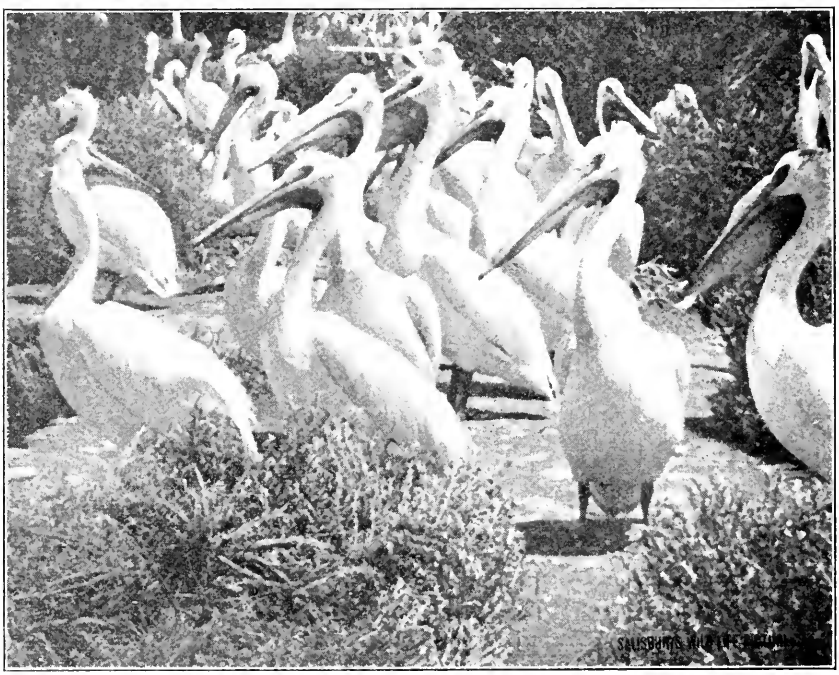

Fig. 49. White pelicans on island in Clear Lake, California. A view from Salisbury's Wild Life Films which show these birds on their breeding grounds.

THE PROPAGATION OF GAME BIRDS.

Following the institution of a new department called the Department of Applied Ornithology by the National Association of Audubon Societies has come the publication of a series of bulletins written by Herbert K. Job giving definite information as to ways and means of propagating game birds. There are now available three bulletins as follows:

No. 1. Attracting birds about the home. Illustrated, 32 pp. Price 15 cents.

No. 2. Propagation of upland game-birds. Illustrated, 36 pp. Price 35 cents.

No. 3. Propagation of wild waterfowl. Illustrated, 32 pp. Price 25 cents.

The sales are virtually at cost and exclusively for the benefit of the Association.

Mr. Herbert K. Job, formerly State Ornithologist of Connecticut, has had long experience in the propagation of game birds. He has also traveled widely and obtained information as to methods used at all of the best game farms in the United States. Hence his bulletins are authoritative and will be of great help to all those interested in the propagation of game.

Fig. 50. Young bald eagle in nest. A view from Salisbury's Wild Life Pictures.

SALISBURY'S WILD LIFE PICTURES.

All who have seen the Salisbury Wild Life Pictures will be interested to know that there are now thirty-five sets of these films being shown in the United States. After selling the state rights to the pictures in California, Mr. Salisbury took them East and showed them in all of the best theaters. In Chicago they were run for several weeks at the famous Studebaker Theater. State rights to the films have now been sold in most of the eastern states. Fish and game associations and sportsmen unite in proclaiming these pictures as among the finest wild life pictures ever taken. Not only do these films portray animal life in its native habitat and so create active interest but they teach wild life conservation (see Figs. 49 and 50).

THE MACOMBER PHEASANTRY.

By far the most extensive attempt by private enterprise to rear the ring-necked pheasant in captivity is that by Mr. King Macomber of Paicines, San Benito County. Mr. Macomber owns about fifteen thousand acres in San Benito County, much of which is especially well adapted for the ring-necked pheasant. He is greatly interested in firmly establishing this valuable game bird on his ranch. His object is not so much to have these birds furnish sport as to have them furnish interest and life to his home surroundings. Thirteen hundred ring-necked pheasant chicks were out of the shell, seventeen hundred eggs were in incubators, and seven hundred

eggs under hens on June 14, 1915. Two men are in charge of the work and it is their intention to be able to furnish several thousand birds for liberation this fall.

Last year about nine hundred birds were liberated and they are to be seen commonly about the ranch house and in the lowlands nearby. A number evidently bred in the wild, as females with their young have been seen during the summer. About one hundred and fifty breeding hens are kept to furnish the eggs for hatching. Six hens are given each cock.

In addition fifty pair of Hungarian partridges were recently obtained from Hungary. These have been placed in an enclosure covering an acre of ground affording natural cover and water. These partridges are apparently doing well, and certainly this experiment will demonstrate conclusively whether it is possible to breed these birds in California. Every precaution has been taken to furnish the birds natural surroundings and the pens are made proof against snakes and predacious mammals by the use of half-inch wire netting.

There is probably no area in California where pheasants are doing so well as on the Macomber ranch. With the addition of several thousand pheasants this fall the ranch will be alive with these beautiful birds.

Mr. Macomber has also increased the quail near his home place by protection and by feeding. Each morning hundreds of quail gather in front of his home to feed. Several mothers with their young have been seen recently.

The sanctuary idea is also to be furthered by the construction of a deer park comprised of four or five hundred acres. This park will be surrounded by a strong wire fence and will contain excellent cover and running streams. The park will be stocked with deer and possibly with elk.

A PROTEST AGAINST THE INTRODUCTION OF WYOMING ELK IN SAN LUIS OBISPO COUNTY.

Have you ever tried to make a high mountain tree grow in our hot valleys? If so, it is almost certain your attempt has proved a failure. It has become a matter of such common knowledge that the plant life peculiar to a hot tropical climate will not thrive in a cold country that no one tries to raise dates in Alameda County or pineapples in Trinity County. Each plant becomes so accustomed to certain conditions of temperature and moisture that it seldom thrives in unlike conditions. The same laws hold with animal life. Every effort to introduce the Gambel or desert quail into northern California has met with failure.

With this evidence at hand it appears that the present move to introduce elk from Wyoming into San Luis Obispo County is ill advised.

The Wyoming elk (*Cervis canadensis canadensis*) is an animal accustomed to a cold climate. For several months during the winter, deep snow covers the ground so that even the valleys to which the elk migrate furnish but little forage. Transport these elk into San Luis Obispo County and you place them in an entirely different environment—in fact, one so different that it is very doubtful whether they would survive. In addition you endanger the farmers' crops, for an altitudinal migration is certain to take place between summer and winter.

We have in our own State a fine herd of native elk. These animals are the remnant of the vast herds that roamed over the great valleys in the early days. They do well in a warm climate and would without doubt soon stock a range if transported to other parts of the State. Already an attempt to start herds in other parts of California has been made by the California Academy of Science. Last fall fifty head were captured near Buttonwillow, Kern County, and shipped to various parts of the State. Why should not the people of San Luis Obispo County and all others interested in the introduction of elk into California make the proper arrangements with the California Academy of Science and procure some native valley elk? Such a move would help in preserving our native game and would assure success, whereas the attempt to introduce the Wyoming elk would doubtless prove but a costly and unsuccessful experiment.

TO GAME BREEDERS IN CALIFORNIA.

Believing that it is to the interest of game conservation to foster the breeding of game birds and mammals in captivity, CALIFORNIA FISH AND GAME stands ready to publish short notes regarding the success of breeders in this State. Should the amount of material warrant it, a special department will be formed wherein those interested can obtain an avenue of publication. If you desire information as to methods of rearing game birds in captivity or wish to give publicity to success which you have obtained, write the editor of CALIFORNIA FISH AND GAME.

snow goose, white-fronted goose, fulvous tree-duck, and mud-hen.

Two methods were used this past spring and summer to stock the pond. Eggs were collected in the Alvarado marshes and hatched at the Game Farm, and downy young and floppers were captured in the same locality and near Mendota in Fresno County.

Another year experiments will be carried on to determine the feasibility of breeding wild ducks and geese in captivity. This past year a number of mallards were reared and a setting of eggs was obtained from a cinnamon teal which had been kept in captivity for more than a year.

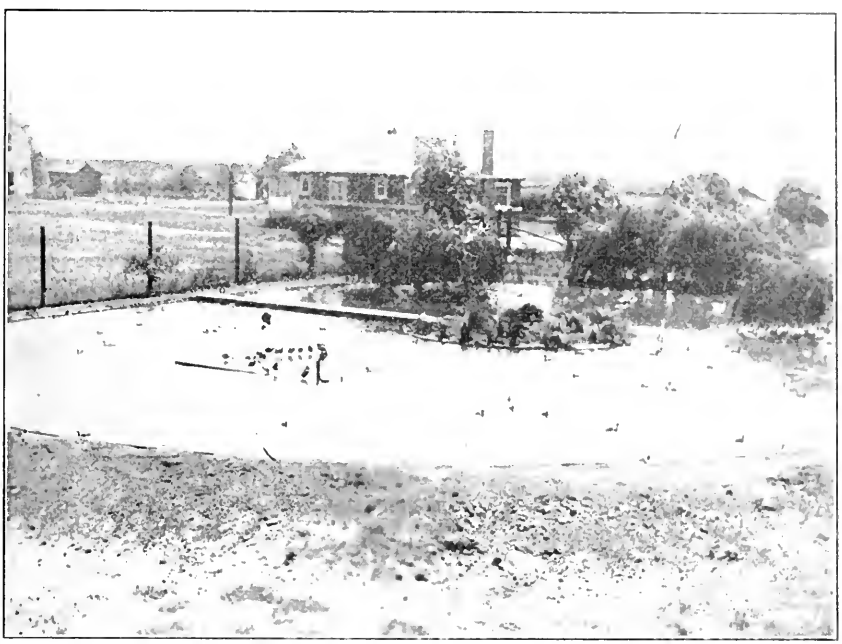

Fig. 51. The new duck pond at the State Game Farm. Sixteen different species of wild-fowl are to be found on the pond at the present time.

NOTES FROM THE GAME FARM.

A fine new pond has been constructed for wild fowl at the State Game Farm at Hayward, and this now affords a home for more than two hundred and fifty ducks and geese. The following species are represented: mallard, gadwall, baldpate, green-winged teal, cinnamon teal, Bikal teal, shoveller, pin-tail, mandarin, red-head, lesser scaup, ruddy, lesser

Only a few hundred ring-necked pheasants were reared this year. These are being planted in large lots in localities where pheasants have already made a start. This should aid the birds to increase in those localities where it has been demonstrated that favorable conditions exist.

Success has attended the efforts to rear California valley quail. Over three

hundred birds hatched in incubators and reared in brooders are now nearing maturity. A few small plants will be made. The experiments have clearly demonstrated that the valley quail is not a difficult bird to rear in captivity.

NATIVE BIRDS FURNISHED FOOD.

The Oakland park department has decided to take up one of the methods so widely advocated for increasing the numbers of native birds. All new shrubbery designed for the parks of Oakland has been selected with the idea in mind of providing a supply of food for birds. A number of the best fruit-bearing plants have been purchased, and the nurseries will soon be ready to furnish the correct type of food plants. By this method the Oakland parks will be made attractive to native birds.

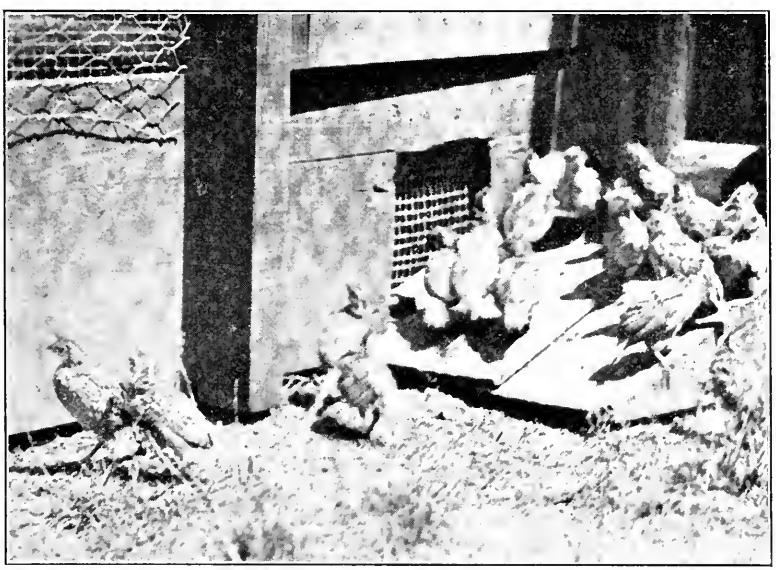

Fig. 52. Young valley quail raised at State Game Farm. Over three hundred quail were hatched from incubators this year.

HOW TO SKIN A BIRD FOR MOUNTING.

It is often necessary to know how to skin a bird in order that it be saved for mounting or for accurate identification. By closely adhering to the following directions a useful scientific specimen may be made.

Lay the bird on its back on a flat surface (a board or table) and by gently blowing, part the feathers midway between the legs. Insert a knife blade under the skin and cut a slit from the vent to the breast bone. Gently push the skin back from the legs and tail, disjointing legs at knee and tail vertebrae at first joint. The flesh should be removed from the bone still attached to the foot. The skinning of a large bird is facilitated by tying a stout cord to the bare legs and hanging the bird up. In this position it becomes easy to work the skin over the body, thereby turning it inside out. The wings are disjointed at the first joint and the skin pulled over the neck and skull. The head of a duck or woodpecker is so large that the skin at the back of the head has to be slit in order to successfully pull the skin over the head. Cut carefully around the ear and eye sockets and continue pulling the skin down to the beak; then cut out a piece as follows: one cut upward between the jaws, well forward, severing the tongue, two cuts parallel with the jaw bones on each side of the neck and one cut across the back of the skull over the neck; these cuts can be made with a thin bladed knife or a small scissors. A gentle pull will then remove the brain, tongue and meaty parts of the head.

The eyes should be removed and the skull and skin rubbed with common salt or commercial arsenic.

By pushing the skull back through the neck the skin may be turned right side out, dried, and packed. In making a "study skin" cotton is used for stuffing.—JOHN P. FISHER.

CALIFORNIA DEPUTY TAKES NEW POSITION.

Mr. J. S. Hunter, for many years past a deputy of the California Fish and Game Commission and in more recent years Assistant Secretary, has accepted a position with the United States Biological Survey. Mr. Hunter will collect evidence on alleged violations of the Lacey Act and of the Federal Migratory Bird Law. Since leaving the employ of the Commission, Mr. Hunter has traveled extensively through the Pacific Coast states, and is now located in Washington, D. C., where he will spend the winter working up briefs for important cases of violations of federal game laws.

HATCHERY AND FISHERY NOTES.

FISH AND THE MOSQUITO PROBLEM.

In the war which in the near future will be waged against the mosquito in all parts of this State, fish will play an important part. It may be one of the activities of the State Fish and Game Commission to supply fish for mosquito extermination just as they now supply fish for food and sport. Most small fish and the young of the larger fish eat the mosquito larvæ or "wigglers," but the small, viviparous top minnows of the southern states have the reputation of being the best for the purpose. Top minnows have been taken to Honolulu where they have become established and have greatly reduced the number of mosquitoes. These fish bring forth their young alive and have several broods a year. They mature very quickly, those at Honolulu bringing forth a brood at the age of three months. Thus there may be several generations a year.

We have here in California a fish which, in the San Francisco Bay region at least, is just as good as the top minnows would likely be, and possibly a great deal better. It has been known that our little stickleback eats mosquito larvæ, but it has not been known until recently that in the bay region this fish is a perfect control of the salt marsh and fresh water mosquito in waters that are inhabited by it.

I first learned of the sticklebacks' good work from Mr. W. L. Chandler, who in his mosquito extermination work at Black Point near San Rafael and on the Suisun Bay marsh at Bay Point has thoroughly demonstrated that sticklebacks keep the water inhabited by them free from mosquito larvæ. I recently spent a day on the marshes at Bay Point and went with Mr. Chandler over the district on which he is working. He has found by experience and observation that it is not necessary to spray oil on water that can be reached by these fish, and all such places have not been oiled this year. Ten days before our visit all places not inhabited by sticklebacks had been oiled, but since that time mosquitoes had come in from surrounding districts and deposited their egg rafts on the water. Most of these had hatched and the wigglers were in evidence in places where the fish could not reach them, as in cow tracks and in isolated pools; but in no instance did we find even a few of the wigglers where there were sticklebacks. Sticklebacks were there in large numbers and, on the tide which was then high, they had penetrated to the remotest reaches of the water in the marsh. The only barrier to them was dry ground or a perfect mat of fine grass and algae. By knowing that the stickleback can be relied upon, no time and money is now being wasted in oiling anything but the pools that cannot be reached by the fish. That the extermination of the mosquito wigglers was due to the sticklebacks is certain, for sticklebacks were there in large numbers and there were no other fish to be found. Water insects and larvæ of insects may eat the wigglers; but these insects were found in the isolated pools where the wigglers were present as well as in the places where there were fish and no wigglers.

During the extreme high tides, the sticklebacks gain access to tide pools

that are ordinarily isolated. The receding tides leave them prisoners in these pools, where during the summer months they are lost when the water evaporates or becomes too stagnant. The loss of sticklebacks in this manner is enormous and must keep their number greatly reduced. In the work in mosquito control on the salt marshes, small ditches could be dug to connect the isolated pools with the main body of water, so that the fish could get at pools that are ordinarily inaccessible and could get away again when the tide recedes. Thus the number of fish would be increased and they would kill off the mosquitoes in many places that now have to be oiled every two weeks.

The most remarkable thing about the mosquito control work at Bay Point is its complete success and its ridiculously small cost. The work was taken up two years ago because the mosquitoes had become unbearable. The large lumber mill in the district had been obliged to close down occasionally on account of this pest, and when it was running the efficiency of the men was much reduced on account of the necessity of continually fighting mosquitoes. Herds of cattle which took refuge in the water to escape the mosquitoes' stings were drowned by the rising tide. Now the town and mill are practically free of mosquitoes and everyone testifies to the great success of the war that has been waged against this pest. The cost of the work for the first year was $500, but for this second year the cost will be but little more than $200. The cost was necessarily much greater for the first year because the territory had to be learned and workers did some unnecessary spraying, having not then learned to rely more fully on the stickleback.

This district at Bay Point, while it covers quite a large tract of marsh ground, is but a small part of the marsh district. This extends to Antioch on one side and nearly to Martinez on the other. The work could be better and more economically done if the whole south side of Suisun Bay would unite in the work of control. But the success obtained at Bay Point shows what can be done by a small enterprising community even though surrounded by an apparently hopeless expanse of mosquito-breeding marsh.

At the last session of the legislature a law was passed under which districts can be formed in any part of the State by petition of a certain per cent of the citizens. This was designed to facilitate the extermination of mosquitoes, flies, and other insects. The law also provides for the government and operation of the districts and for levy and collection of taxes for the purpose. Under this law, no doubt, many mosquito-control districts will be formed in the State, and great good should result, especially in stamping out malaria, which is caused by the *Anopheles* mosquito. It is estimated that mosquitoes cost the State annually not less than $2,000,000, and that this sum can be saved by a yearly outlay of $300,000.

The malaria mosquito is not a serious problem in the bay and coast regions for very few are found there, but in the interior valleys and even well into the mountains they are a serious menace to the health of the people. One thing that adds greatly to the difficulty of exterminating the *Anopheles*, or malaria mosquito, is the presence of rice fields in some of our worst malaria sections. These rice fields are kept flooded during the breeding period of the mosquito and oil can not be used for their extermination. Apparently the only alternative is to use fish for the purpose. This will be quite a problem, for the stickleback will probably not thrive in these regions as it does in the marshy country of the bays, also it may not be able to control the *Anopheles*, for they remain almost constantly at the surface of the water, and sticklebacks are not what are called surface feeders. Top minnows would be much better for this purpose, and it is probable they may be introduced into the ditches supplying water to the rice fields. Large numbers of the fish will unavoidably be lost when the fields are drained for harvesting the rice, but breeding ponds can be constructed along the ditches where the supply of fish can be kept up. Not only will these mosquito-control campaigns be helpful to residents of the section where the mosquito is a pest, but they will help to make attractive some of the best fishing grounds in the State. The angler will profit directly from work of this kind.—N. B. Scofield.

FISH DIE IN MANY PARTS OF THE STATE.

During the month of August reports came in to the Fish and Game Commission of fish dying in different parts of the State from Santa Barbara to Shasta counties. The cause of death was traceable in nearly every case to the exhaustion of the free oxygen in the water by the decomposition of organic matter. In other words the fish smothered.

Fish breathe by means of gills which are so constructed that the free oxygen mixed in the water is extracted and passes into the blood of the animal, just as the free oxygen in the air passes into the blood of animals breathing by means of lungs. The water of streams and lakes contains more oxygen in winter than at any other time, but as spring and summer come on, the temperature of the water rises, and the fermentation and decomposition of vegetable and animal matter on the bottom or in solution increases at a rapid rate and exhausts the free oxygen in the water. This exhaustion of oxygen is most marked in lakes, reservoirs, and sluggish streams which are catchment basins where organic matter is carried and deposited on the bottom. In streams of more rapid flow oxygen is supplied from the air by the movement of the water. There have been more than the usual number of cases of fish dying this summer, for the reason that there was an unusually large amount of organic matter washed into the streams during the past winter. Decomposition was held in check during the cool weather of early summer, but beginning late in July and continuing through August the weather was exceptionally warm. This warm weather coming at a time when the streams were low quickly exhausted the oxygen in the more quiet waters. This destruction of fish can in a great measure be prevented by ceasing to make of our streams the dumping places for garbage, factory refuse and city sewage.

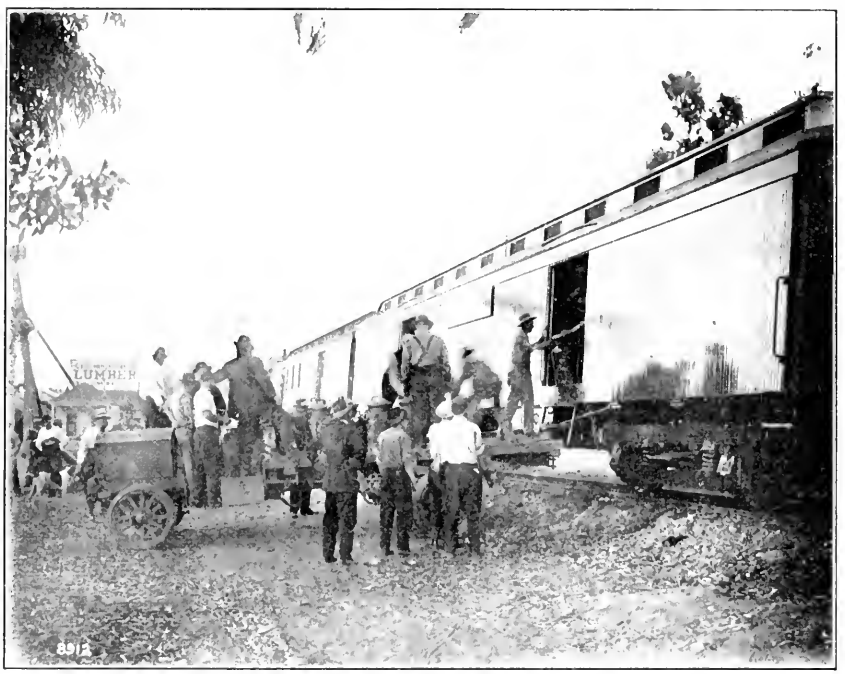

Fig. 53. Receiving trout from the fish car to plant in the American River. Photo by the McCurry Company.

AN EFFORT TO REHABILITATE THE AMERICAN RIVER.

In an effort to bring the American River and tributaries back to their former conditions when these streams furnished some of the best fishing in the State, both

salmon and steelhead, the Fish and Game Commission on July 13th planted sixty cans containing 300,000 steelhead fry.

The California fish distributing car arrived at Folsom at 5 p. m. from Sisson. The distribution was made under the personal supervision of President F. M. Newbert, who is deeply interested in bringing this stream back to its former condition. A dozen large motor trucks and many automobiles kindly loaned by the Natomas Consolidated and business men of Folsom started on the long trip to Salmon Falls. The first stop was made at Mormon Island, where twenty-one cans were placed in the South Fork of the American River above the bridge and where a remarkable picture was taken at 7.45 p.m., or just before dark. The water was found to be of fair temperature and very clear. The procession of trucks then proceeded up the river to Salmon Falls about eighteen miles, arriving there at 10.30. A committee had been sent ahead to build large bonfires. With the assistance of nearly thirty volunteers the balance of thirty-nine cans of young fry were quickly placed in the river, where the conditions were more favorable than lower down stream.

On the return of the party to Folsom many stories were told by the old timers of the historic mining town of the trout fishing in 1849 to 1860. Mr. John Rider, a pioneer resident of Sacramento, who came to California in 1852, informed the writer that when the teams comprising his party crossed the river at the falls of the American at what is now Sixteenth Street in Sacramento, the salmon and trout were so numerous as to frighten the horses to such an extent that two of them ran away. Soon after this period hydraulic mining came, which filled the river with debris and drove all young fish life from the stream. Since hydraulic mining has been stopped by law this stream has resumed some of its old form. After the winter freshets the water becomes quite clear, so that striped bass and many other fish are frequently taken with hook and line quite a distance up stream. Some three years ago five thousand steelhead fry were placed in the stream above Folsom as an experiment. This year a number of these fish have been taken at the mouth of the American River and some miles up stream. Hence the endeavor to rehabilitate it and bring it back to its early condition, which indeed looks promising.—GEO. NEALE.

CONSERVATION IN OTHER STATES.

A NEW DEER LAW FOR LOUISIANA.

After a consultation with the leading sportsmen and conservationists of the state President M. L. Alexander, of the Conservation Commission of Louisiana, has announced the new regulations just passed by that board in respect to the killing of deer.

The open season is set from September 15th to January 5th of each year. Does are protected until October 15th. Still hunting for bucks only, and without the use of dogs, is allowed between the 15th of September and the 15th of October. Bucks and does are allowed to be taken and killed and hunted with dogs from the 15th of October until the 5th of January. The new law provides that no deer shall be killed for sale, offered for sale, or had in possession for sale at any time. It allows one person to take five such wild deer in an open season and to possess but two carcasses or parts thereof at one time.

The new regulations do not affect the previous laws that prohibit the killing of wild deer between the hours of sunset and sunrise; or when in the water; or when driven to high land by overflow or high water; or the use of guns that have any device for deadening the sound of the explosion, commonly known as a "silencer." The snaring or trapping of wild deer is also prohibited and fawns are not allowed to be killed at any time.

"There has been such a difference of opinion as to the season in which deer should be permitted to be killed that the question of adjusting the season so as to protect the deer has been one of the hard problems of the commission," said President Alexander.

"Our experience of last year in permitting the season to open August 15th forcibly demonstrated to the commission that no deer should be permitted to be killed at so early a date. We found in many sections of the state that the

fawns were not weaned or able to take care of themselves until as late as October; that the does were poor, and the weather so hot that to permit them to be hunted with dogs simply brought about a useless destruction of this species we are so anxious to protect.

"The commission believes that no deer should be permitted to be hunted in the state before the first of October, but, in a desire to meet the wishes of certain sportsmen in the state, we decided to permit still hunting from September 15th to October 15th, and general hunting with dogs from October 15th to January 5th. The first five days in January were declared open so as to permit sportsmen to engage in a New Year's Day hunt.

"To succeed in bringing about an increase of the deer of Louisiana in any appreciable way, the Conservation Commission realizes that it will be necessary to put such restriction on their hunting so as to make it hard, rather than easy, to hunt them."

SUMMER COURSES IN BIRD STUDY.

The National Association of Audubon Societies promoted a number of courses in bird study in the different university summer schools the past summer. Special courses under the auspices of the association were given in New York, Vermont, Virginia, Georgia, South Carolina, Florida, Montana, and California. At the University of California Summer School Dr. C. Hart Merriam, formerly Chief of the United States Biological Survey, gave four illustrated lectures on wild birds and animals of North America.

GAME CONSERVATION IN OKLAHOMA.

"What a wonderful change for the worse has occurred since my trip through here—Oklahoma—thirty-eight years ago. Everywhere is total ignorance of animal life. I have not met a single sportsman or farmer who knows a mockingbird from a wren. The hunters here shoot at all seasons and kill everything with feathers or fur. Yesterday I saw a man shooting cardinals and feeding them to his dogs. All the farmers boast of killing all kinds of birds, including quail, at all seasons. In the early days, this country was filled with strong-minded, great-hearted sportsmen of the true cult. Now it seems to have only ignorant butchers. I'll say no more."—H. R. Walmsley. (From *Recreation Magazine* for August, 1915, page 94.)

OREGON FISH AND GAME COMMISSION REORGANIZED.

At the last session of the Oregon Legislature in the spring of this year the law relating to the Fish and Game Commission in Oregon was changed so that the Commission consists of the Governor as chairman, and four others appointed by the Governor. Two of these are appointed from District No. 1, that part of Oregon lying west of the Cascade Mountains, and two from District No. 2, lying east of the Cascade Mountains. The first commissioners are appointed for terms of one, two, three and four years, and thereafter the service is a four-year term.

The personnel of the present commission is Governor James Withycombe, chairman, Salem, Oregon; Mr. I. N. Fleischner and Mr. F. M. Warren, of Portland, Oregon; Mr. Marion Jack, Pendleton, Oregon; and Mr. C. F. Stone, Klamath Falls, Oregon.

Before the present Fish and Game Commission took office the work was divided as follows:

As Master Fish Warden, R. E. Clanton had charge of the issuance of commercial fishing licenses, and the superintending of the various hatcheries of the State which were used both for propagation of commercial fish and game fish.

As State Game Warden, William L. Finley had charge of the entire warden service in the State, and also the propagation and distribution of game birds, as well as attending to scientific and educational work.

In Oregon the Hatchery Fund is composed entirely of funds brought in from the issuance of commercial licenses, as well as any funds appropriated by the Legislature. The law provides that this fund must be kept entirely separate and apart from the Game Protection Fund, which is derived from the issuance of hunter's and angler's licenses.

Under the new organization the fish and game protection work is divided as follows:

Mr. Carl D. Shoemaker has been appointed to the position of State Game Warden. He has entire charge of the warden service.

Mr. H. L. Kelly holds the position of Master Fish Warden and has charge of the collection of commercial fish licenses, as well as matters relating to fish ladders and the enforcement of laws relating to commercial fishing.

Mr. R. E. Clanton as Superintendent of Hatcheries has charge of all the work relating to the propagation of both commercial and game fish.

Mr. William L. Finley as State Biologist has supervision of the work at the State Game Farm and is in charge of educational and scientific work in conjunction with fish and game protection and propagation.

VERMONT PASSES A FISHING LICENSE LAW.

Vermont has fallen in line and has passed a fishing license law. Doubtless many other states during the next year will awake to the fact that it is not fair to ask the man who hunts to pay for the restocking of the streams. Fair play demands that the hunter pay for the preservation of game and the administration of game laws and the fisherman for the preservation of fish and the administration of fish laws.

LOUISIANA TAKES PROTECTION FROM TURKEY BUZZARD.

The constant complaint of farmers that turkey buzzards carry such diseases as hog cholera and anthrax, and the decision of the Conservation Commission that the bird is unprotected by law has led to a campaign to destroy these birds in Louisiana. Similar agitation is to be noted in other states. Some experimentation to determine the extent to which the buzzard aids in disseminating diseases of cattle and hogs has been carried on, but the evidence which should be forthcoming before the bird is branded as a pest is not at hand. The main thing that seems to be proved is that anthrax can not be found in the feces, evidence which distinctly favors the bird's protection rather than its destruction. It is to be hoped that some investigator will fully demonstrate what part the turkey buzzard really takes in carrying disease so that each state may be able to formulate its laws accordingly. Until absolute evidence is at hand the buzzard should be given the benefit of the doubt and accorded protection.

WISCONSIN PROTECTS DOES.

The Wisconsin Legislature acted upon the recommendations of State Game Warden Sholtz and good sportsmen throughout the state, and passed a "buck law." The new law prohibits the killing of any doe deer or any fawn of either sex, and imposes heavy penalties for the shipment or possession of the carcass of any doe or fawn at any time.

It was high time. The game wardens estimated that 65 per cent of the deer killed in Wisconsin last fall during the open season were does. Besides being a much needed conservation measure, the new law will go a long way toward reducing the danger of hunters being shot by mistake for deer, as it now will be necessary to look for the horns.—*Recreation*, August, 1915.

THE AUTOMOBILE AND GAME.

Michigan is one of the first states to restrict the hunting of game by automobile. The game laws as amended by the last legislature prohibit the use of automobiles in hunting partridges. Although doe deer are still allowed to be killed, the limit has been reduced to one deer per person. The season on fox, black and gray squirrels has been closed for a term of years, as has also the season on wood duck.

LIFE HISTORY NOTES.

THRIVING BEAVER COLONIES NEAR MENDOTA, FRESNO COUNTY, CALIFORNIA.

The total protection given the golden beaver (*Castor subauratus*) in 1911 seems to have allowed these animals to increase greatly. Near Mendota, Fresno County, there are now at least a dozen colonies. The largest colony is to be found on Belle Island just above the large dam constructed by the Miller & Lux Company. Here is to be found a beaver house 16 feet long, 10 feet wide, and 6 feet high. This is inhabited by between 30 and 40 individuals according to a man who lived until recently within 25 feet of this house. Several smaller colonies are reported as existing on one of the Miller & Lux canals a short distance below the Mendota dam. There are also three or four colonies on the San Joaquin River some distance above the dam.

According to all reports there were not more than two or three pairs of beavers in this vicinity five years ago when a close season was instituted. At the present time there are certainly over fifty individuals within a radius of five miles, and the mammals seem to be increasing rapidly.

Reports from eastern states show that wherever the beaver has been properly protected increase always follows. Apparently we are demonstrating the same thing here in California, and if the increase continues we can expect that this valuable fur-bearing mammal will again become important commercially.—H. C. Bryant.

Fig. 54. Beaver house on Belle Island, near Mendota, California. A number of other beaver colonies are located in the near vicinity.

SIERRA MOUNTAIN SHEEP ON THE INCREASE.

Last spring, while collecting some specimens for the United States Biological Survey, I was able to make a close study of one of the large herds of Sierra mountain sheep ranging north of Independence, Inyo County. I had previously estimated the number in the vicinity of Mount Baxter to be about eighty, but during a two weeks' trip we saw at least

two hundred individual sheep, and doubtless did not see many others ranging in the near vicinity. Including the Nelson mountain sheep, which inhabits the desert ranges, there must be in the neighborhood of fifteen hundred sheep in Inyo County alone. Apparently the total protection afforded the species is allowing it to increase. Fortunately, I am able to report that there has been little poaching even by the Indians, and there is every hope that mountain sheep, at least in this district, will remain a heritage to pass on to future generations.—E. H. OBER.

HARLEQUIN DUCKS IN THE SIERRAS IN 1915.

On May 2, 1915, Mr. R. S. Kimball and myself noted six strangely marked ducks on the south fork of the Merced River just below the Wawona Fish Hatchery in Mariposa County. On investigation I am convinced that these ducks were harlequins (*Histrionicus histrionicus.*)

Records of the appearance of this species on the rushing mountain streams of the Sierras during spring and summer is of peculiar interest since this duck has very rarely been found nesting in this State. That this duck does nest along mountain streams seems to be proved, for young were taken in Tuolumne County in 1879 or 1880 and again in 1898, but additional evidence is very desirable. The harlequin duck is not uncommon along the coast where it feeds in the surf and along the kelp beds during the winter season, but its existence on fresh water during the summer is of much rarer occurrence.—J. E. NEWSOME.

Fig. 55. Nests of the American egret and the great blue heron in oak tree near Crows Landing, Stanislaus County.

A NESTING COLONY OF AMERICAN EGRETS IN STANISLAUS COUNTY.

Reports during the last few years have established the fact that the American egret (*Herodius egretta*) has been slowly increasing since protection was given it several years ago. No definite record of a nesting colony, however, has been reported. I am glad, therefore, to be able to give some definite information regarding a nesting colony located near Crows Landing, Stanislaus County.

During the last part of July Mr. J. E. Newsome notified me that he had located a nesting colony of egrets and great blue herons. The place was visited on August 3, 1915. During the three hours spent in the vicinity about a dozen egrets were seen. Six were frightened away on our arrival. It was immediately evident that we were too late to take a census of the breeding birds for the young had already flown. Mr. P. F. Crow on whose ranch the birds had nested estimated the number this year at from fifty to seventy-five. A much larger number he said nested in the same vicinity two years ago.

Nests were placed in the tops of large oak trees which grew along a small creek (see Fig. 55). Nests of the great blue heron, two of which still contained young, could be distinguished from those of the egret by their larger size. On the ground beneath the trees three small, downy egrets and one of larger size, which had evidently tumbled out of the nests, were found (see Fig. 56). Although people living in the vicinity had picked up most of the molted aigrettes, yet we were able to find over fifteen. A colony of black-crowned night herons was located in some nearby oak trees, but no nests were located close to those of the egrets.

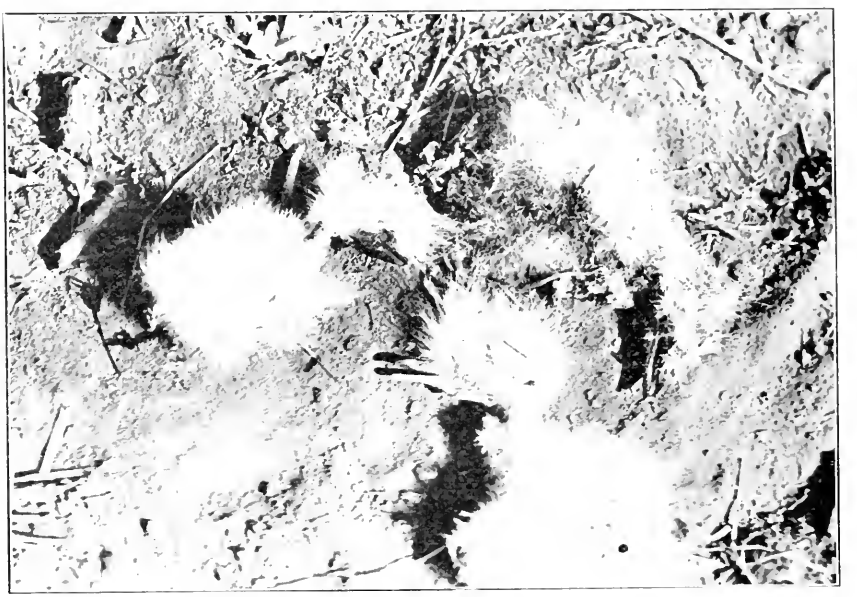

Fig. 56. Downy egrets found on ground beneath nests at Crows Landing, California.

That certain people are still willing to kill white herons in order to secure the plumes was evidenced by two birds which had evidently been shot and their plumes removed.—H. C. BRYANT.

BALD EAGLES KILL FAWNS.

The accompanying photograph shows a fawn which I saw killed by two bald eagles (*Haliæëtus leucocephalus*) near Five Pines, Trinity County, California, a few years ago. The doe made a desperate fight, but the pair of eagles was too much for her. One of the eagles finally succeeded in carrying the fawn away in its talons and killing it. The fawn was photographed after it had been partly devoured by the eagles (see Fig. 57).—Geo. W. Giddings.

burger and myself visited the Oliver ranch near Mount Eden in order to procure some "floppers" for the State Game Farm. About some fresh-water ponds which are, however, situated in a salt marsh, we noted at different times two fulvous tree-ducks. A later visit made to the same place on June 26th also disclosed a bird of this species about a mile away from the place where one was seen on the 22d. Whether the birds were nesting in this marsh or not we were unable to ascertain.—W. N. Dirks.

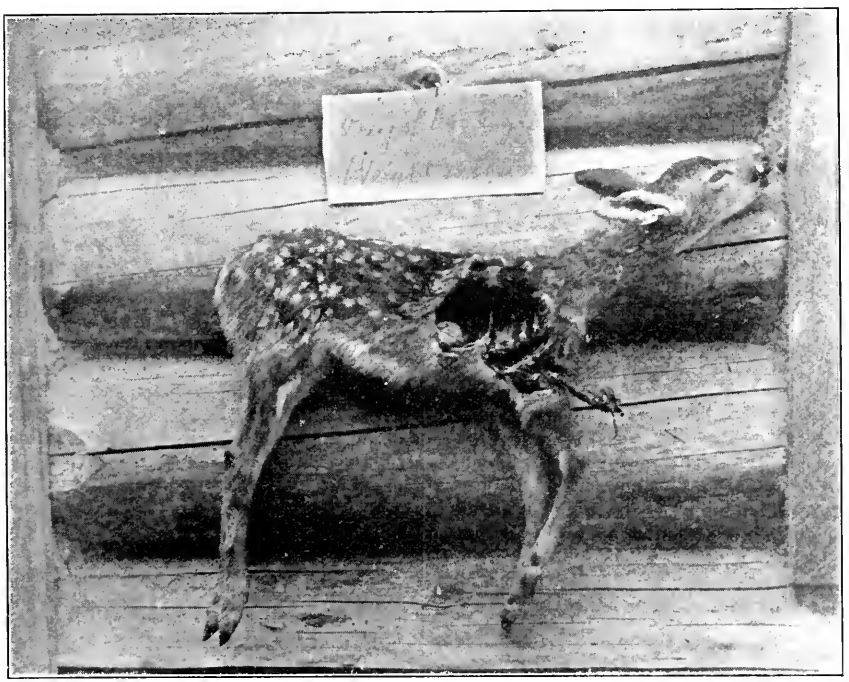

Fig. 57. Deer fawn killed by bald eagles near Five Pines, Trinity County, California. Photograph by Geo. W. Giddings.

THE FULVOUS TREE DUCK IN ALAMEDA COUNTY.

The fulvous tree duck (*Dendrocygna bicolor*), usually called "squealer," is seldom found in California except during the summer season, and even then it is largely restricted to the interior valleys where it nests. Its appearance along the coast is unusual, and hence this note of its occurrence in Alameda County seems worthy of publication.

On June 22, 1915, Mr. R. B. Gans-

HYBRID GEESE.

Some very interesting hybrid geese have been reared by Mr. Chase Littlejohn of Redwood City. These hybrids are a cross between female Canada geese (*Branta canadensis*) hatched from eggs secured at Lake Tahoe and the Chinese horned goose. The horned goose gander is not of the usual type, being almost white. Four out of five of the female Canadas laid, and sixteen young have been reared. A few from the earlier

settings were almost full grown on June 27, 1915. Although having many characteristics of the Canada goose, such as white cheeks and gray bodies, yet the two cheek patches meet on the throat and there is usually a white stripe down the middle of the neck and breast and other white patches on the body. The rearing of these hybrid geese is especially interesting because of the fact that the wild Canada goose has never been successfully bred in California, and because so few characteristics of the horned goose appear in the hybrid birds.—H. C. Bryant.

Fig. 58. Hybrid geese reared by Mr. Chase Littlejohn of Redwood City, California. These geese were produced by crossing a drake Chinese horned goose with a Canada goose.

A RECORD HATCH OF VALLEY QUAIL.

It appears that the hatching of the eggs of the valley quail is not a difficult thing. Mr. Lee Villinger of Lodi, San Joaquin County, put 38 eggs under a buff Cochin bantam on June 12th. From this setting he hatched 33 birds. Thirteen eggs placed under another hen on July 5th furnished 10 healthy chicks. The whole 43 are alive and doing well. Mr. Villinger wishes to know if anyone has been able to beat this record of 33 from one hen.—Richard Squire.

DEER IN TRINITY COUNTY INCREASE.

Residents of Weaverville, Trinity County, estimate that deer have increased fifty per cent in their district. Junction City, Canyon Creek, Helena, Big Bar, Douglas City, and other sections also report an increase.—G. O. Laws.

WILD LIFE IN RELATION TO AGRICULTURE.

A SPRAY FOR PREVENTING DAMAGE BY DEER.

Early last spring I planted nine acres of pears, prunes and peaches on my range near the head of Felix Creek near Hopland, Mendocino County. My ranch containing forty acres is fenced with a hog-tight fence five feet high. The trees were planted in late March and early April, 1915. They sent out healthy shoots of eight to eighteen inches.

On visiting the ranch during the last of May, I found that deer had cropped clean all of the new shoots. On taking my troubles to the office of the Fish and Game Commission in the Mills Building, San Francisco, Mr. John P. Fisher, one of the Commission's game experts, suggested that I spray the trees with a mixture of blood-meal. I immediately procured one hundred pounds of blood-meal. This was mixed in the proportion of one pound to three gallons of water, and was painted and sprayed onto the new shoots. Depredations by deer ceased immediately.

A nearby rancher procured some of the meal and successfully protected garden truck by using it. It was found that the vegetables were not injured in the least except cabbage and lettuce which seemed to absorb some of the spray.

New growth needs to be covered about every two or three weeks in order to make the spray successful. The expense is slight. My trees have been sprayed twice and it has only cost me seventy-seven cents for the blood-meal and seven hours' work at twenty-five cents an hour. Blood-meal can be procured for $3.50 per hundred pounds. If the value of blood-meal as a fertilizer is considered the outlay becomes still smaller. I highly recommend this method to anyone troubled by the depredations of deer or jack-rabbits. The odor of the blood-meal appears to effectively frighten the animals away.—H. C. WAGNER.

A DEER SPRAY.

As a direct result of the successful attempt to protect orchard trees from injury by deer carried on by Mr. H. C. Wagner, the Agricultural Experiment Station at the University of California will carry on some experiments to determine whether or not blood-meal can be added to other sprays used as insecticides on apple and other orchard trees. If it is found that blood-meal can be added to the spray regularly used for codlin moth and other injurious insects, the expense attendent upon spraying to prevent damage by deer will be still further reduced. If anyone wishes to co-operate with the Agricultural Experiment Station and carry on experiments along this line, communicate with the Editor of CALIFORNIA FISH AND GAME.

OHIO TAKES A STEP BACKWARD.

Ohio has placed a bounty of one dollar on hawks. The proposed bounty law was discussed at the January meeting of the Fish and Game Protective Association of Southeastern Ohio, and at that time sufficient evidence against such a move was adduced to cause the Association to take no action in the matter. The State Game Warden, General Speaks, however, succeeded in having the bill introduced into the legislature, and it was signed by the Governor. The law is very poorly worded and will therefore give every chance of promoting the destruction of beneficial hawks. For instance, one of the hawks on which bounties are to be paid is called the "chicken hawk." Such a name has at different times been applied to almost every beneficial hawk. We are sorry to record the fact that neither the legislature nor the Governor, nor the Chief Game Warden of Ohio accepted the expert evidence furnished by the United States Biological Survey, but instead took the word of the "practical people" who had demanded the law and who did not realize wherein their best interests lay.

Perhaps this law is needed to teach the people of Ohio a lesson. We hope that in the end, when beneficial hawks are again protected, as they should be, not only will the people of Ohio be more enlightened on the subject, but a similar occurrence in other states will be impossible.

DO BUZZARDS CARRY DISEASE?

For the past few years there has been considerable agitation regarding the turkey buzzard (*Cathartes aura septentrionalis*) as a carrier of certain diseases of cattle and hogs. Recently a convention held at Ventura, California, advocated the taking of protection from this bird because of its danger to the interests of the rancher through the spread of hog cholera. Whether this bird in reality spreads this disease appears to be extremely doubtful; and certain it is that it cannot spread the disease any more than the English sparrow, blackbird, or other birds feeding in the near vicinity of infected hogs.

The following quotation from an article in *Bird Lore* (May-June, 1915, page 195) by Mr. Robert Ridgway, one of our foremost ornithologists, bears on this point and is particularly interesting. Speaking of the causes of decrease of certain birds in Illinois, he states: "These are, the State law compelling the burial of dead animals and the shooting of large numbers of buzzards on account of the wholly erroneous supposition that they are active agents in the dissemination of hog cholera." Certainly such an ornithologist as Mr. Ridgway, connected as he is with the United States National Museum, would not make such a statement were there not ample foundation for it. Agitation in this regard is doubtless of the evanescent kind and will stop as soon as the facts are known.—H. C. BRYANT.

REPORTS.

VIOLATIONS OF THE FISH AND GAME LAWS.

June 1 to August 31, 1915.

Offense	Number arrests	Fines imposed
Game.		
Hunting without a license	44	$610 00
Deer, close season, killing or possession	13	320 00
Female deer, spotted fawns, spiked bucks, killing or possession	12	350 00
Illegal deer hides	2	30 00
Illegal shipping of game, not properly marked, etc.	1	
Ducks, close season, killing or possession	5	75 00
Night shooting	1	25 00
Quail, close season, killing or possession	5	150 00
Quail, trapping without proper permit	1	25 00
Doves, close season, killing or possession	5	125 00
Sage hens, close season, killing or possession	1	25 00
Rabbits, close season, killing or possession	27	480 00
Tree squirrels, close season, killing or possession	5	25 00
Non-game birds, killing or possession	5	20 00
Total game violations	127	$2,260 00
Fish.		
Angling without a license	24	$515 00
Fishing for profit without license	22	205 00
Dealing in fish without wholesale dealers' license	3	60 00
Not keeping a register of fish purchased	1	25 00
Underweight striped bass, taking or possession	7	60 00
Underweight salmon, offering for sale	1	20 00
Catfish, offering undersized for sale	1	20 00
Trout, excess bag limit; taking other than with hook and line	9	115 00
Salt-water perch, offering for sale	1	
Black bass, taken other than with hook and line	2	40 00
Abalones, undersized, taking or possession	4	40 00
Crabs, undersized, taking or possession	4	95 00
Lobsters, close season	3	50 00
Dried shrimp; Chinese shrimp nets	5	85 00
Clams, undersized, excess bag limit	2	40 00
Illegal nets and traps	5	150 00
Fishing in reservations	3	250 00
Total fish violations	97	$1,770 00
Grand total fish and game violations	224	$4,030 00

SEIZURES—FISH, GAME, AND ILLEGALLY USED FISHING APPARATUS.

June 1 to August 31, 1915.

Fish.

Striped bass	1,333 pounds
Salmon	132 pounds
Trout	208 pounds
Miscellaneous fish	643 pounds
Black bass	38 pounds
Clams	28
Crabs	127
Shrimp	3,100 pounds
Abalones	44
Lobsters	19
Illegal nets and traps	18

Game.

Deer meat	273 pounds
Hides	3
Quail	1
Doves	60
Cottontails	54

Searches.

Illegal fish and game	67

NUMBER OF DEER KILLED IN VARIOUS COUNTIES DURING THE OPEN SEASONS OF 1911-1914.

District No. 1.

County	1911	1912	1913	1914
Del Norte	No record	42	See Dist. 2	See Dist. 2
Siskiyou	275	300	313	575
Modoc	54	129	Est. 129	160
Lassen	39	50	38	89
Shasta	506	281	396	357
Trinity	707	367	522	735
Humboldt	711	256	See Dist. 2	See Dist. 2
Tehama	5	159	165	198
Totals	2,297	1,584	1,563	2,114

District No. 2.

Mendocino	422	546	345	268
Glenn	42	No record	396	90
Colusa	136	144	8	250
Lake	45	494	161	161
Sonoma	664	261	193	436
Napa	29	31	72	373
Yolo	No record	51	No record	38
Solano	23	12	14	14
Marin	355	363	325	320
Del Norte	No record	See Dist. 1	120	No record
Humboldt	See Dist. 1	See Dist. 1	700	200
Totals	1,716	1,902	2,334	2,150

District No. 3.

Plumas	28	10	23	200
Butte	2	9	No record	39
Sierra	6	No record	No record	37
Yuba	7	No record	No record	6
Sutter	No record	No record	No record	No record
Nevada	88	117	38	143
Placer	71	40	46	77
El Dorado	202	240	248	300
Sacramento	35	78	6	30
Amador	3	11	17	36
Alpine	No record	No record	See Dist. 7	39
Calaveras	47	130	204	202
Tuolumne	183	250	226	203
Mariposa	14	No record	Est. 50	53
Mono	9	7	See Dist. 7	See Dist. 7
San Joaquin	No record	See Dist. 4	30	8
Totals	695	892	888	1,373

District No. 4.

San Joaquin	No record	30	See Dist. 3	See Dist. 3
Stanislaus	No record	60	35	close season
Merced	No record	34	Est. 34	close season
Madera	43	69	Est. 69	57
Fresno	182	124	30	151
Kings	No record	No record	No record	14
Tulare	276	266	Est. 266	128
Kern	112	156	350	235
Totals	613	739	784	585

NUMBER OF DEER KILLED IN VARIOUS COUNTIES DURING THE OPEN SEASONS OF 1911-1914—Continued.

District No. 5.

County	1911	1912	1913	1914
Contra Costa	4	20	Est. 20	No report
Alameda	52	270	420	8
San Francisco	No hunting	No hunting	No hunting	No hunting
San Mateo	132	155	202	5
Santa Clara	19	350	513	5
Santa Cruz	69	109	85	155
San Benito	123	67	42	11
Monterey	401	510	552	632
San Luis Obispo	25	132	Est. 132	60
Santa Barbara	See Dist. 6	See Dist. 6	210	475
Totals	828	1,613	2,206	1,351

District No. 6.

Santa Barbara	111	214	See Dist. 5	See Dist. 5
Ventura	10	125	110	No report
Los Angeles	17	186	89	143
Orange	27	38	16	24
San Diego	61	62	62	45
Imperial	No record	No record	No record	No record
Riverside	1	89	76	102
San Bernardino	22	42	40	97
Inyo	88	45	See Dist. 7	See Dist. 7
Totals	310	801	393	411

District No. 7.

Mono	See Dist. 3	See Dist. 3	Est. 7	152
Alpine	No record	No record	14	No record
Inyo	See Dist. 6	See Dist. 6	80	40
Totals			101	192

Additional Reports from National Forests.

Shasta National Forest	87
Lassen National Forest	13
California National Forest	238
Stanislaus National Forest	96
Santa Barbara Nat'l. Forest	89
Totals	523

Total for year 1911	6,489			
Total for year 1912		7,537		
Total for year 1913			8,269	
Total for year 1914				8,699

FINANCIAL REPORT.

Statement of Expenditures for the Months of May, June and July, 1915.

	May	June	July
General administration, salaries, traveling expenses, rentals, supplies, etc.	$1,435 54	$1,557 63	$1,467 98
San Francisco District, salaries, traveling expenses, rentals, supplies, etc.	4,236 47	4,040 92	4,464 42
Sacramento District, salaries, traveling expenses, rentals, supplies, etc.	3,751 72	3,843 34	4,244 14
Los Angeles District, salaries, traveling expenses, rentals, supplies, etc.	1,382 64	1,332 81	1,756 88
Fresno District, salaries, traveling expenses, rentals, supplies, etc.	1,667 10	1,751 25	2,012 33
Hatchery administration, salaries, traveling expenses, rentals, supplies, etc.	476 58	504 87	457 76
Fishery research and publicity, salaries, traveling expenses, supplies, etc.	670 66	632 36	496 49
Screen and ladder survey, salaries traveling expenses, supplies, etc.	180 55	210 95	444 54
Fish transplanting, salaries, traveling expenses, supplies, etc.	75 35	6 00	2 00
Fish distribution car, salaries, traveling expenses, supplies, etc.	97 47	886 09	1,257 12
Fish patrol launches, salaries, traveling expenses, supplies, etc.	370 81	435 68	369 49
Sisson Hatchery, salaries, traveling expenses, supplies, etc.	2,283 88	2,681 34	2,485 09
Tahoe and Tallac hatcheries, salaries, traveling expenses, supplies, etc.	390 69	358 21	444 42
Price Creek Hatchery, salaries, traveling expenses, supplies, etc.	344 10	202 18	1 45
Ukiah and Snow Mountain Hatchery, salaries, traveling expenses, supplies, etc.	395 40	433 64	399 17
Wawona Hatchery, salaries, traveling expenses, supplies, etc.			
Sisson Hatchery, auxiliary station, salaries, traveling expenses, supplies, etc.	411 95	345 50	141 19
Scott Creek and Brookdale Hatchery, salaries, traveling expenses, supplies, etc.	366 18	274 38	301 52
Bear Valley Hatchery, salaries, traveling expenses, supplies, etc.	457 66	177 35	265 32
Game farm, salaries, traveling expenses, rentals, supplies, etc.	382 25	527 97	376 99
Game research and publicity, salaries, traveling expenses, supplies, etc.	817 79	555 66	404 63
Prosecutions and allowances	296 89	227 50	322 18
Hunting license commissions and refunds	439 10	1,962 40	300 40
Anglers' license commissions and refunds	20 70	1,541 60	1,442 30
Market fishing license commissions	217 00	40 00	35 50
Crawfish and abalone inspection	100 00	110 00	200 00
Mountain lion bounties	140 00	80 00	160 00
Printing and lithographing	713 86		511 23
	$22,122 34	$24,719 63	$24,764 54

Balances May, June and July, 1915.

	May 1		June 1		July 1	
Balance in State Treasury.						
Fish and Game Preservation Fund	$63,035 92		$53,758 18		$77,173 15	
Support and Maintenance Hatcheries Fund	11,284 82		17,987 91		22,613 13	
		$74,320 74		$71,746 09		$99,786 28
In Bank.						
Fish and Game Preservation Fund	$975 18		$7,760 00		$6,838 00	
Support and Maintenance Hatcheries Fund	5,070 00		2,589 00		2,700 00	
		6,045 18		10,349 00		9,538 00
Totals		$80,365 92		$82,095 09		$109,324 28
Less monthly bills		22,122 34		24,719 63		24,764 54
Balance		$58,243 58		$57,375 46		$84,559 74

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INDEX TO VOLUME 1.

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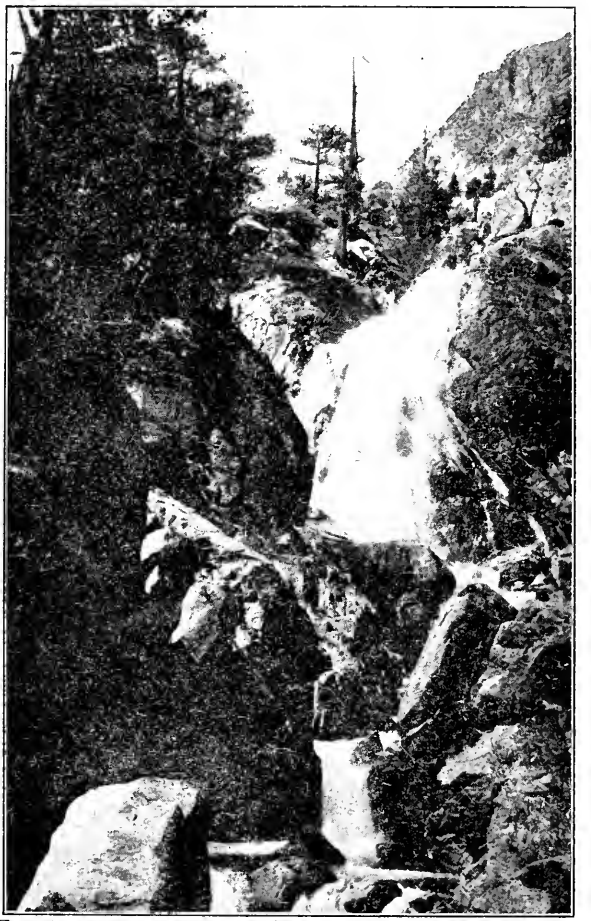
CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 1 SAN FRANCISCO, OCTOBER, 1914 Number 1



Forests, water power, and wild game are three of California's greatest resources. They are ours to use but not to destroy.

The United States Department of Agriculture says:
"The free marketing of wild game leads swiftly to extermination."
—*Yearbook, 1910, page 254.*

Published Quarterly by the California Fish and Game Commission

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DO YOU WANT DUCKS ON THE MARKET, WHEN—

Thirty-one States of the Union prohibit the sale of wild ducks;

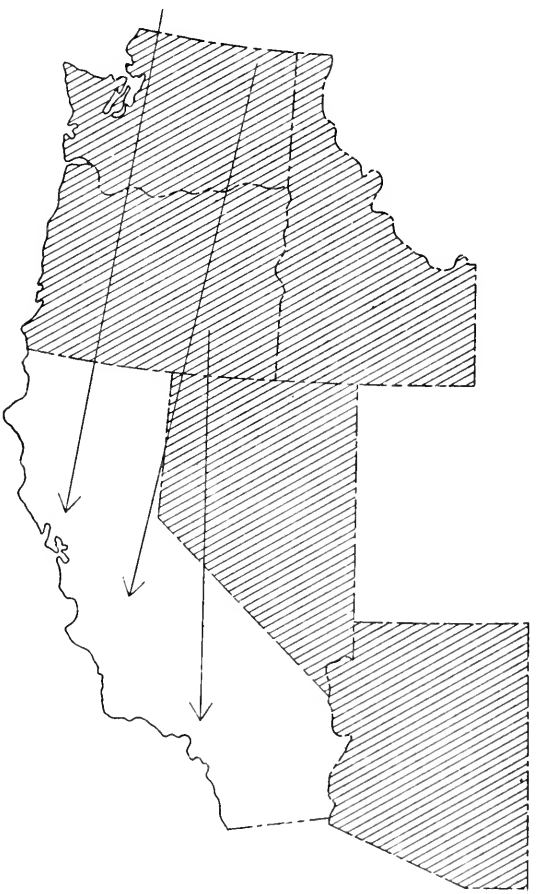
Oregon and Washington, where many of California's ducks are raised, prohibit their sale;

Free marketing of game is more destructive to a species than any other factor;

It is a known fact that market hunting eventually wipes out of existence any game species;

Non-sale makes hunting more democratic, game being left accessible to everyone who will go and take it;

To sell game on the market is directly against the interest of game itself, and all the people of the State?



Many wild ducks raised in Oregon and Washington (non-sale states) migrate into California. Fair play demands that California SUSTAIN the NON-SALE OF GAME.

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 1 San Francisco, January, 1915 Number 2

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CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 1 San Francisco, April, 1915 Number 3

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"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 1 San Francisco, July, 1915 Number 4

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CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 1 San Francisco, October, 1915 Number 5

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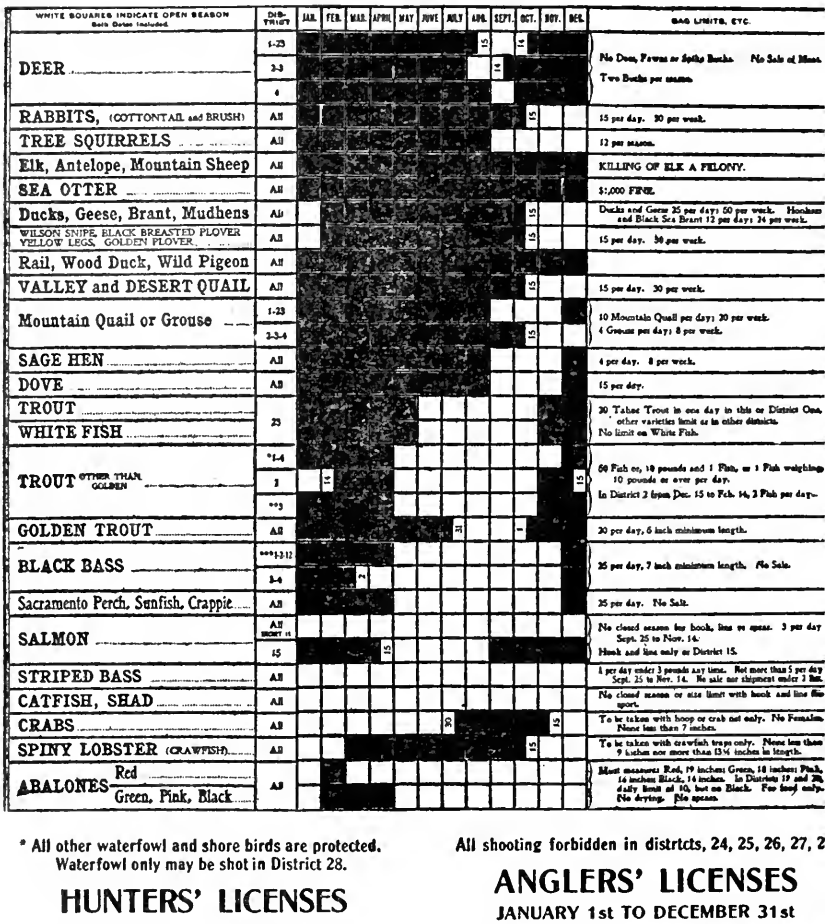
1915 CALIFORNIA FISH AND GAME LAWS 191



* All other waterfowl and shore birds are protected. Waterfowl only may be shot in District 28.

All shooting forbidden in districts, 24, 25, 26, 27, 2

HUNTERS' LICENSES

JULY 1st TO JUNE 30th

Obtain of County Clerks or Fish and Game Commission or Deputies

CITIZENS, resident of California	$1.00 per year
CITIZENS, non-resident of California	10.00 per year
ALIENS,	25.00 per year

ANGLERS' LICENSES

JANUARY 1st TO DECEMBER 31st

Obtain of County Clerks or Fish and Gam Commission or Deputies

CITIZENS, residents of California, over 18 years	$1.00 per
CITIZENS, non-resident of California, over 18 years	3.00 per
ALIENS, over 18 years	3.00 per

For market fishing laws see special market fishing cards or booklets of laws in f