

# Some "Game" Birds

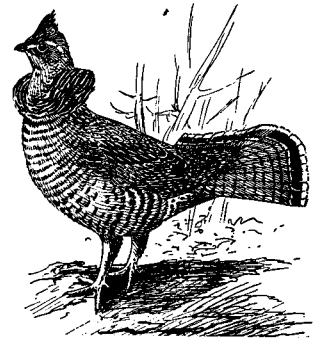
By E. LAURENCE PALMER

*Illustrated by Edwin Sawyer, Hope Sawyer, Louis Agassiz Fuertes and the Author.*

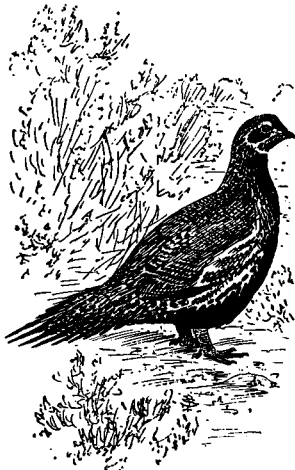
*This is the seventy-first in NATURE MAGAZINE's series of educational inserts.*



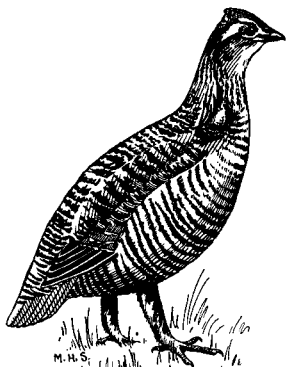
SPRUCE GROUSE



RUFFED GROUSE



SAGE HEN



PINNATED GROUSE



WHITE-TAILED PTARMIGAN



THE NINTH feature in this series dealt with some water birds and some birds described as "upland game." There was not adequate space in that unit to introduce some of the many important species in that group. Therefore, we take pleasure here in adding an even dozen to those that were presented earlier. In our selections here we have listened to the taxonomist, and chosen only birds that are rather closely related. All the birds included here are properly considered as gallinaceous birds.

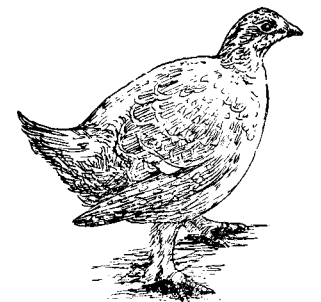
Should we be studying ornithology these days, according to the most recent classifications, we would find that all of these gallinaceous birds are divided into three families. When I first studied them, there were four families, but now the partridges and quails, which I learned to consider as members of the *Perdidae*, are lumped with the pheasants in the Family *Phasianidae*. This makes one less family name that the serious ornithologist has to learn. The members of the group here considered all belong to the Order *Galliformes*, from which we get the common designation of gallinaceous birds. The three families into which these birds are divided are the *Tetraonidae*, which includes the grouse, ptarmigans, prairie chickens and sage hens; the *Phasianidae*, which includes the quail and pheasants; the *Meleagrididae*, which includes the turkeys. If you wish to find more about this classification, I would refer you to the Check-list of North American Birds, issued by the American Ornithologists' Union.

One reason why we decided to consider these birds at this time is that the National Wildlife Federation, which sponsors National Wildlife Week, has elected this year to devote special consideration to the plight of the prairie chicken. It would seem that the most intelligent cooperation in any campaign of this sort would come from an enlightened public that has been provided with some information about the problem at hand, rather than to ask support of a project on a wholly emotional basis. Last year the Federation called attention to the plight of the key deer. This year it is the prairie chicken. We hope we can cooperate with the Federation, and with other agencies next year, in informing the public as to threats toward some other form of wildlife.

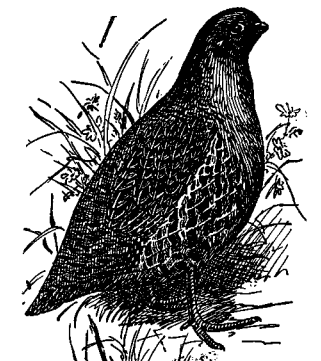
One must not assume that because the birds here presented are considered as game birds by those who hunt them, that they have no other merits. The voters of Iowa and of Ohio have, in the past at least, recognized



SOOTY GROUSE



SHARP-TAILED GROUSE



HUNGARIAN PARTRIDGE

the bobwhite as a song bird, and gave it complete legal protection. Anyone who has lived a part of his life in a region where bobwhites call from nearby fenceposts, and another part of his life where the bird and its voice are absent, will recognize that the bird has something to offer society besides a target and a half-dozen ounces of flesh and feathers. The worst we could wish those who might differ from us on this is that they be doomed to live the rest of their lives without hearing a bobwhite on a bright spring morning, seeing a covey of little bobwhites run across the path on a summer afternoon, flush a covey of the birds at the edge of a grain field when autumn colors are at their best, or in winter spot a dozen of the birds forming a circle, back to back in the snow, under some overhanging cover. Not one of these experiences is academic to me but is based on observations when I moved from central New York to Iowa forty years ago. Through all that time, I have resented the memory of a faculty colleague who, when shown a covey nestled closely together in a snow bank, backed off and with one shot wiped out the whole family. I never went into the field with him again. And others who witnessed the event ostracized him from then on.

There is little doubt but that, with birds of this group given adequate cover and food, and protection when needed, there may well be a harvestable surplus. A Hungarian partridge that lays eighteen eggs, a pheasant that lays a dozen, and a bobwhite that lays to twenty-eight eggs, has a tremendous recuperative capacity. And the fact that bobwhite populations are frequently highest where the population of foxes is also high shows us that under natural conditions these birds can maintain themselves. But there must be land practices that recognize the needs and values of wildlife.

The situation of the prairie chicken has undoubtedly been complicated by the high price of farm products. Land owners have aimed all their efforts at the production of cash crops. Lands that in a less favorable economic period were left neglected have been plowed up and made to produce crops. The result has been that adequate natural territory for this species to carry on its usual life cycle has been cut, and cut, and cut. It is a part of the function of conservation education to show the land owner how, by certain practices,

these cuts may be made less severe.

If you have the opportunity, read that superb book, *The Prairie Chicken in Missouri*, by Charles W. Schwartz, published by the Conservation Commission of the State of Missouri in 1944. You will then appreciate that, for this species to survive, it is probably essential that extensive areas be left in which the birds may nest, rear their young, and escape their enemies in winter, and be adequate in numbers to stand gunning pressure. This means a rather permanent cover at least six inches high and of sufficient extent to support the number of birds that make up a normal flock.

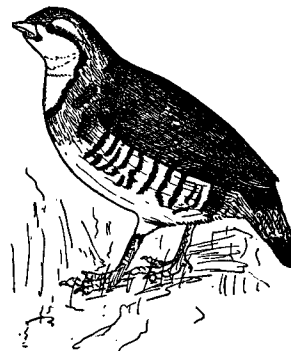
Many of the birds we are here considering may give a false impression of their abundance. Species that flock at any time of the year easily may do this, but the size of these flocks gives us some idea of the status of the population of a species. Where, not many years ago, California quail used to appear in flocks of a thousand or more, now they appear more commonly in flocks of a hundred or less. Possibly one of the reasons may be that about the time the Gold Rush reached its climax market hunters used to average 10,000 quail per hunter per year. That may be the factor accounting for the decline, or the real reason may be the piping of water for irrigation and domestic use so that it is unavailable in the breeding area, or the intensive cultivation of the ground in such a manner that the birds cannot find suitable food or cover throughout the year. The combination of these three factors, plus continued shooting, make it difficult for any organism to survive.

It is to the credit of true sportsmen and wise farmers that efforts are being made to restore suitable cover for many kinds of "game" birds. If these groups can live up to their highest ideals, we can have some faith in the future. Unfortunately, all sportsmen and all farmers do not have the intelligence of the more far-sighted.

The first time I was in the Mount Rainier region I remember a tourist trying desperately to get the park naturalist to agree that Paradise Valley could be improved by the introduction of the native flora of the Alps. I was glad to come to the naturalist's assistance and defend the exclusion of exotic plants from the area. This is a perennial problem with anyone charged with the protection of natural areas, whether it be my little woodlot



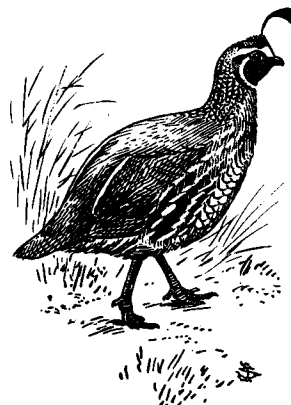
DUSKY GROUSE



CHUKAR



BOBWHITE QUAIL



VALLEY QUAIL

across the street from my home or a project of the Nature Conservancy, the Wilderness Society, or the National Park Service. The same problem arises with respect to our "game" birds. We have introduced into our outdoors the ringneck pheasant, Hungarian partridge, Chukar partridge, and, to a lesser degree, some other species. The ringnecks have established themselves successfully in territory not fully occupied by the native species. With cultivation of the ground, prairie chickens moved out and the pheasants moved in. In the Northwest and the grain fields of southwestern Canada, the Hungarian partridge seems to have done well. In a few western states like California, Washington and Minnesota the beautiful Chukar partridge seems to show signs of maintaining itself, but in eastern states like New York, Ohio, Virginia, Pennsylvania and Rhode Island it seems to have failed completely. Perhaps some justification for introduction of Chukar lies in the fact that it seems to be able to survive in dry, almost desert conditions that do not adequately support native species. The United States Fish and Wildlife Service seems to be trying to find a sensible solution to the question of the introduction of exotic game birds into America. Possibly the best results have been in getting data to prove that it would be unwise even to try to do some of the things proposed by some of our citizens.

Much effort and money has been spent in trying to maintain the game bird population by rearing the birds in captivity and freeing them for harvest. This often has been little more than wild animal husbandry, and, as time has gone on, it has been found that it usually is much more efficient so to manage the environment that the birds will take care of their own maintenance.

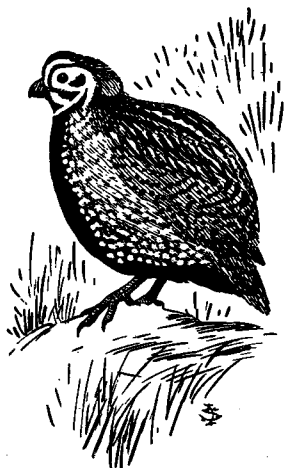
A quick glance at the tabular material in this insert reveals that the birds we are considering vary considerably in the type of country they occupy. In the woodlands, we find the turkeys and the grouse holding sway; in the open fields, it is the realm of the quail, ptarmigan, prairie chicken and sage hens. Even these major areas are easily subdivided. The turkeys, for the most part, have been driven into the heavily forested areas. The ruffed grouse takes over in the woodlands of mixed hardwoods and conifers. The spruce grouse, dusky grouse and sooty grouse are at their best in the evergreen country, and even these birds have their preferences as to dry and wet woodlands, and to lowlands and high mountainous country. We have sug-



SCALED QUAIL



MOUNTAIN QUAIL



MEARNS QUAIL

gested that pheasants favor the vicinity of country raising corn and cereals. Look for yourself in the fields, if possible, or in the tabular text to find which of our birds favor desert lands, grasslands, and so on.

All of these birds are closely related to our domestic poultry. Some of them may, as chicks, be incubated in incubators and brooded by commercial brooders or by domestic poultry. The pheasants probably seem to have yielded most readily to this type of semi-domestication without losing their wildness when they are freed. Attempts to rear many of these birds have failed because of the fact that they are subject to the same diseases that injure domestic birds and do not share their resistance to these troubles. The whole industry of domestic turkey raising was revolutionized when we took to rearing turkeys on wire off the ground, thus preventing the birds from contracting troubles that had their source in ground polluted by our domestic birds. Adapting this technique to the rearing of ruffed grouse yielded results, and while it is now known how to rear these birds in captivity through a number of generations, it does not seem sound economics to solve the problem in this way.

Probably there is no group of birds that provides us with more interest than do these birds during their courtship period. The general pattern seems to be for the birds to be polygamous. In the case of the prairie chicken a few cocks may win all the honors, but this requires a congregation of a large number of birds of both sexes in a relatively limited area. As is usually the case where polygamy prevails, the male takes little responsibility for the family after the mating period. With the bobwhites, however, a pair of birds may remain together for nearly a year, with both adults assuming some responsibility for the family.

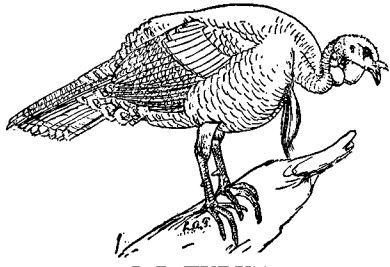
With some of these birds, there is a distinct tendency toward segregation of the sexes as maturity approaches. The courtship behavior, of course, varies, with the bobwhites possibly offering the simplest technique and the prairie chickens the most complicated. Even though the bobwhites may approach monogamy, the males have to rewin their mates with the approach of the breeding time. This is probably as it should be for domestic harmony. Associated with the breeding period, of course, are the sounds produced by these birds. These vary from the rooster-like crowing of the pheasants, and the gobbling of the turkey, (Continued on page 256)

NAME SCIENTIFIC NAME	DUSKY GROUSE <i>Dendragapus obscurus</i>	SOOTY GROUSE <i>Dendragapus fuliginosus</i>	SPRUCE GROUSE <i>Canachites canadensis</i>	RUFFED GROUSE <i>Bonasa umbellus</i>
<b>DESCRIPTION</b>	Length, cock bird, to 21 inches; hen, to 18 inches. General appearance, dark gray to blackish grouse with light border on tip of tail. Cock, dusky, with yellow or orange patches over eyes.	Length, 16 to 19 inches. Conspicuous as a dark gray fir-forest grouse of the Northwest. Shows a light band at the tip of the tail. Sometimes appears in flight to be an almost black grouse. Hen is browner than the cock and might be confused with a Ruffed Grouse except that it has a gray cast rather than a rusty one.	Length, to 17 inches, slightly smaller than Ruffed Grouse. Legs, feathered to toes, while lower tarsus of Ruffed Grouse is bare. Above is barred black, gray and brown. Underparts have black feathers tipped with white. Skin above eyes is red. Hen paler than cock and underparts barred. Tail, composed of 16 feathers, which have a wide orange brown band at end.	Cock, to 19 inches long with wingspread to 25 inches and tail to 7 inches. Weight, to 29 ounces. Buff to mahogany, spotted with gray above. Underparts, lighter buff being lightly barred on breast and heavily barred with dark on the flanks. A conspicuous ruff on the neck of the cock and a well defined crest on the head. In winter toes may be heavily "feathered."
<b>RANGE AND RELATIONSHIP</b>	Order Galliformes. Family Tetraonidae. Six subspecies include Dusky, of Utah, Idaho, Colorado, New Mexico and Nevada and Arizona; Richardson's, of British Columbia, Alberta, Oregon, Idaho and Wyoming; Sierra, of Washington, Oregon and California and Mt. Pinos, of California as well as the Canadian Sitka and Fleming's Grouse.	Order Galliformes. Family Tetraonidae. There were 4 subspecies; the Sooty, the Sierra, the Sitka and the Mount Pinos Grouse, but field differences are negligible. All from evergreen forested areas of Pacific Northwest, ranging from Washington to southern California (the Mt. Pinos subspecies), but are not found in eastern Cascades of Washington and Oregon.	Order Galliformes. Family Tetraonidae. Four subspecies recognized, including Hudsonian from eastern Rocky Mountains in Alberta to Labrador Peninsula; the Canada from southern Manitoba to New Brunswick and south through Wisconsin, Michigan, New York, New England and Nova Scotia; the Alaska and the Valdez, both of Alaska.	Order Galliformes. Family Tetraonidae. Five subspecies recognized, including the Eastern of Minnesota to southern Ontario and New York and south to Kansas and Georgia formerly; the Canada from northern Quebec and Maine through northern New England, New York to Minnesota; the Gray from S.D. to Colo. and Utah to B.C.; the Yukon and the Oregon.
<b>HABITS</b>	Cocks may weigh to 3½ pounds, making them largest of woodland grouse. Cocks may fight over hen, displaying inflated neck sacs and booming a challenge. Nest not well hidden on ground, with 7 to 10 creamy buff eggs speckled with reddish-brown spots. Incubation about 3 weeks by hen alone. Young able to move about actively soon after hatching.	In courtship or challenge the male gives a series of 6 or 7 low, muffled booms sounding about an octave below the hoot of a horned owl and being highly ventriloquial. Nest is on ground slightly lined with vegetation. Males may battle over a hen. Eggs number under a dozen and are incubated by hen about 3 weeks. Young are able to run about soon after being hatched.	Cocks strut and flutter before female in courtship antics. One cock may win number of hens. Breeds chiefly in swampy, evergreen forested lands. Nest, on ground in depression usually under cover. Eggs, 8 to 16 variably buffy with brown and purple spots, 1-2/3 by 1-1/5 inches. Incubation by hen for 17 days. Chicks able to run soon after hatching.	Cock, courts by strutting before hen drumming on log. One cock may mate with several hens. Nests well hidden in depression on ground. Eggs, 8 to 14, pale brown, 1½ by 1¼ inches. Incubated 21 to 23 days by hen. Young able to run when hatched or immediately after. Hen provides protection through summer. One annual brood.
<b>FOOD</b>	Food is largely buds of evergreens, berries and other vegetable foods available in environment. In winter, may keep to tops of tall evergreens getting food there from the tree buds. The name Fool Hen is applied to the Dusky Grouse, but it is not always appropriate, since bird may become wily if molested too much.	In courtship male displays inflated air sac on each side of neck with surrounding feathers being extended outward. Head is held downward at beginning of booming sound. Sooty Grouse and Dusky Grouse are not so clever as Ruffed Grouse in concealing nest, and both come rather rightly by common name Fool Hen.	Food in summer largely small fruits and insects including crickets and grasshoppers; in winter dried fruits, buds and needles of spruce, larch and fir and other evergreens. Belongs with the Fool Hen group because where not annoyed may become insensible to danger and may be approached with ease by its many enemies.	Food acorns, nuts, tree buds, green leaves, fruits and seeds. Young guided but not fed by hen. Subject to many diseases of poultry, and when reared in captivity are kept off ground except that courtship is stimulated by being temporarily on the ground. Brood together through first winter ranging over 40 acres of land. Flight speed to 55 feet per second.
<b>ECONOMIC IMPORTANCE</b>	A suitable "game" bird of its territory, and in some situations a valuable food for lost persons, who on occasion may kill them with a stick. It is interesting to the nature enthusiast. Called Blue Grouse, Gray G., Mountain G., Pine G., Pine Hen.	A bird of relatively limited distribution in the United States, likely to survive so long as suitable cover is available and adequate protection is afforded, but likely to disappear if these fail. Its high mountain haunt may delay extinction.	In winter flesh is unpalatable largely because of the food eaten by the bird. Larches and fir can hardly produce superior flesh. Bird may be of value as emergency food for lost travelers and surely is deserving of more protection than it gets. Among its common names are Black Grouse, Wood Grouse, Cedar Grouse, Spotted Grouse and Swamp Partridge.	One of finest woodland birds, which has survived heavy inroads on natural habitat. Where over-hunted becomes shy. Peak populations every 10½ years. Habitat management probably best practice. Pennsylvania's state bird.

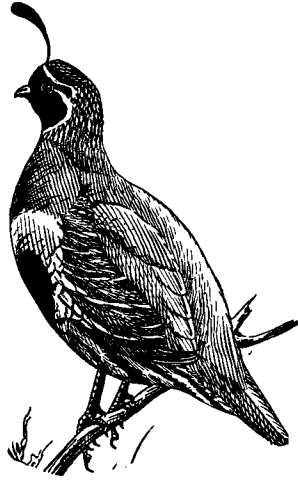
<p>WHITE-TAILED PTARMIGAN <i>Lagopus leucurus</i></p>	<p>PINNATED GROUSE (PRAIRIE CHICKEN) <i>Tympanuchus cupido</i></p>	<p>SHARP-TAILED GROUSE <i>Pedioetes phasianellus</i></p>	<p>SAGE HEN <i>Centrocercus urophasianus</i></p>	<p>HUNGARIAN PARTRIDGE <i>Perdix perdix</i></p>
<p>Length, to 13 inches being smallest ptarmigan. In summer, adults have neck, back, head and breast marked with gray, brown and white, with tail and most of wings and lower breast pure white or dark flecked, with much variation in individuals. In winter adults are pure white with bill alone appearing black. Young all white except for grayish tail.</p>	<p>Length, to 18 inches, or about the length of the Ruffed Grouse. Tail, to 4½ inches. Weight, to 2 pounds. Sexes, about equal in size, barred brown in general. Cock, with inflatable air sac on neck, bordered by long tufts of feathers, which, in courtship, are erected exposing the orange yellow sacs. Cock also has erectile spots over eyes. Temperature, about 109°F.</p>	<p>Length, to 20 inches. Differs from Pinnated G. by having longer spiked middle tail feathers. Both are considered as Prairie Chickens. Head and neck, buff with white streak behind eye. Upper parts brown marked and barred heavily with black. Breast, marked with black Vs and throat light brown. Sexes similar but cocks have orange, inflatable air sacs on side of neck.</p>	<p>Length, cock bird to 30 inches, weight to 8 pounds. Hen, to 23 inches. Cock, conspicuous because of spike-like tail feathers and contrasting black belly. Shoulders, with black wiry plumes and downy white feathers. Distensible yellow air sacs on side of neck. Legs, feathered. Chest band, blackish with wiry feathers. Hen, smaller without ruffs. Belly, brown.</p>	<p>Length, to 14 inches. Weight, to 15 ounces. Cock, slightly heavier than hen. Appears about 1½ times as large as Bobwhite. Upper parts including head, neck, shoulders, back, tail and breast are shades of gray, but back is brownish-gray. Wings, brown with whitish lines. Flanks, pale gray with chocolate splotches. Dusky horse-shoe patch on breast. Red phase rare.</p>
<p>Order Galliformes. Family Tetraonidae. Five subspecies recognized, the Vancouver, the Kenai and Rainier of limited range, the Northern ranging from northern British Columbia and central Alberta to Vancouver Island and the more widely distributed Southern White-tailed, which ranges through the Rocky Mountains, Mont. to north N.M.</p>	<p>Order Galliformes. Family Tetraonidae. Three subspecies, including the extinct Heath Hen, the Greater Prairie Chicken of west-central Alberta, southeastern Saskatchewan and southern Manitoba to Colorado, Arkansas, Missouri and Illinois and even into Ohio, Kentucky and once possibly into Pennsylvania, and the Attwater Prairie Chicken of Texas and Louisiana.</p>	<p>Order Galliformes. Family Tetraonidae. Three subspecies include the Northern of central Alaska to Ungava and south to Lake Superior and Quebec; the Columbian from British Columbia to northeastern California, Utah, Colorado and New Mexico and the Prairie from southern Alberta and Manitoba to Wyoming, Neb., S.D., Minn., Kan. to Ill.</p>	<p>Order Galliformes. Family Tetraonidae. A single species with no subspecies ranging formerly from British Columbia southern Saskatchewan and northwestern North Dakota south to northwestern Nebraska, northwest New Mexico and middle-eastern California. It is a bird of the sagebrush plains of the Transition Zone, shunning forested lands.</p>	<p>Order Galliformes. Family Phasianidae. Originated in central Europe and native of Sweden, Germany, British Isles, France, Switzerland and the Pyrenees. Introduced into America about 1899. Reasonably established in wheatbelt of southwestern Canada in provinces of British Columbia, Saskatchewan and Alberta, also in Wash., Wis., Ore., Ida., Mont., Ill., Minn.</p>
<p>Nest is found on ground in a depression, either bare and exposed or with some grass lining and construction, sometimes with a few feathers added. Eggs 8 to 15, dull cream-colored to pale red, generally somewhat heavily marked with brown. Nesting period is early summer, and there is one annual brood. Incubation is by the hen for 26 days but cock stays by.</p>	<p>Many males hold courtship powwow, stamping, bowing, inflating air sacs and giving loud booming sounds and fighting other cocks so that eventually a few cocks win many hens. Nest is in small depression sheltered by grass. Eggs, 10 to 14, sometimes speckled, 1-3/5 to 1¼ inches. Incubation by hen for 23 days. Cock ignores family. Young mature first winter.</p>	<p>Males court females, which congregates in flocks of 100 or more. Great bowing, scraping, stamping and fluffing of feathers with repeated rumbling "cac, cac". Nest on ground in a depression with little or no lining. Eggs, 11 to 14, cream-brown to pale olive with spots of reddish brown sometimes, 1-3/5 by 1-1/5 inches. Hen well protected by coloration.</p>	<p>Mating period ends in May. As many as a hundred males may congregate and engage in a dance involving foot stamping, drumming, croaking. A few cocks win many hens. Courtship antics usually at dawn or dusk. Males may reach height of ardor in February. Nest on ground, with 7 to 9 dull eggs attended only by hen, incubated 3 weeks.</p>	<p>Males fight viciously in breeding season but do not assist in incubation or in rearing of young. Pair in January. Nest in April or May. Eggs, 6-18, olive-green or blue, somewhat pointed, weigh 26 g., plain. Incubation, 21-26 days, with cock acting as guard but not a participant. Young run soon after hatching, begin feeding on insects. Young molts to adult plumage in early fall.</p>
<p>Food largely plant material, including buds of trees, wild fruits such as blueberry and vetch and many tree fruits. Also included in season are insects and other small invertebrates that happen to be available. Excessive grazing by sheep nave and will reduce the range in which young will be raised and reduce the species.</p>	<p>Food largely (86%) vegetable matter such as grain, acorns, fruit and berries and most of the remainder of insects particularly in the summer and when young. In winter flocks of one or another sex may form and there may be some migration. Almost wholly dependent on cover at least 6 inches high for food and shelter. Needs much better protection from hunting.</p>	<p>Food grains such as wheat and oats, also sunflower seeds, buckwheat and buds of tamarack and flower clusters of birch with some green vegetation. Gravel must be available for use in crop. Supports a number of intestinal parasites and serves as food for a number of predatory animals. Needs suitable cover and better protection from hunters to survive.</p>	<p>Family of hen and chicks remain together until fall, when sexes separate. Food largely sage brush. Water requirements of a minimum nature. While there is large congregation of numbers in the fall there is little major migration in the seasons. Young may feed largely on insects and grains. Gizzard is lacking so gravel is not important in digestion.</p>	<p>Food consists of grain and of insects, the latter including grasshoppers, locusts and potato bugs. Chicks feed abundantly on ants. Plant food includes leaves of clover, millet, wheat, cabbage, grain and many kinds of berries. Estimated 40.5% insects, including 23% of total harmful species; 50% plant material, with only 3.5% grain. Speed 53 m.p.h.</p>
<p>A useful, interesting bird but doomed to extinction if upland grazing is not managed with some intelligence. The birds may have food value to man in survival situations. Related ptarmigan include the Rock Ptarmigan and the Willow Ptarmigan, the former being western and the latter being essentially eastern.</p>	<p>National Wildlife Federation, in 1953, is emphasizing a program to give protection to this valuable bird by calling attention to great reduction in numbers and threat that goes with intensive cultivation of former range lands. Has periodic abundance and scarcity somewhat like that of Ruffed Grouse. May live in woodlands but does not prosper there.</p>	<p>A useful bird doomed to extermination unless abandonment of farming lands restores sufficient territory of a suitable nature before the populations reach the critical stage. Has shown some increase in parts of its range. There is a cycle of abundance and scarcity and some migration. Called Spike Tail, Black Foot, White Grouse, Willow G., White bellied G.</p>	<p>Interesting game birds but almost hopeless as a source of food, particularly as adults, having fed almost exclusively on sage, are unpalatable and tough. Young birds having fed on grain, berries and fruits may be considered as reasonably good eating. Called Sage Cock, Cock of the Plains.</p>	<p>In Europe is shot by thousands by men who drive them over hurdles making them fly to be shot by hunters sitting comfortably handy. White Leghorns have been suggested as a more conspicuous substitute. May replace the vanishing Prairie Chicken, or relieve pressure on them. Popularly called Hun.</p>

NAME SCIENTIFIC NAME	CHUKAR PARTRIDGE <i>Cacabis chukar</i>	BOB-WHITE <i>Colinus virginianus</i>	SCALED QUAIL <i>Callipepla squamata</i>	VALLEY QUAIL <i>Lophortyx californica</i>
<b>DESCRIPTION</b>	Length, about 15 inches. Upper parts of male, slaty or pale blue, irregularly streaked with buff. Wing-feathers light brown tipped or bordered. Underparts, almost white, but sides with broad black bands. A black band extends through eye down side of neck and joins at lower throat. Face below this line and throat white. Bill, feet and legs vermillion.	Length, to 11 inches, with 16-inch wingspread. Weight, to 9 ounces but average from 5 to 6 ounces. Tail, short. Lower breast, with blackish bars or U-shaped marks. Conspicuous white throat and with whitish band across side of head and through eye. In the hen this band is buff. The black on the head of the cock is replaced with brown in the hen.	Length, 1 foot. Tail, to 4½ inches. Adults closely resemble each other. Pale bluish-gray and dull brown. Neck, shoulders, breast and belly appear scaled because of dark-tipped whitish feathers. Sides, white-streaked. Short white-tipped crest and dark bordered yellowish cheek patch. Crest of young, brownish.	Length, 9 to 10 inches. In California, quail cock is deep ashy-brown above with rusty brown stripes on sides of back and with olive-brown sides white streaked. Slate-gray below with scale-like markings and a brown patch. Head, conspicuously black and white lined with curved crest. Hen lacks conspicuous head markings, being mottled olive-gray and white.
<b>RANGE AND RELATIONSHIP</b>	Order Galliformes. Family Phasianidae. The form introduced into America was native of the foothills of the Himalayas but other forms are being experimented with to get birds that will survive in areas not now occupied by native species. Close relatives include the Greek, the Barbary, the Arabian and the Smyrna partridges. Most successful introduction is in Cal.	Order Galliformes. Family Phasianidae. Five subspecies include the Eastern that ranges through eastern North America from South Dakota to southern Ontario and southwest Maine and south to northern Florida and Texas; the Florida from much of Florida, the Key West now extinct; the Texas, from Washington to Texas and northern Cal. and the Masked.	Order Galliformes. Family Phasianidae. Two subspecies, the Arizona and the Chestnut-bellied Scale Quails, the former ranging from western Texas, western Oklahoma and Southern Colorado through central Arizona and New Mexico and into northern Sonora and northern Chihuahua; the latter more restricted to southern Texas and northern Mexico.	Order Galliformes. Family Phasianidae. Five subspecies recognized: California, ranging from Vancouver Island to Monterey, California; Valley, ranging from Upper Klamath Lake to Nevada and throughout California; Catalina, found on Catalina Island; San Quentin between lat. 30° and 32° from Pacific Coast east to Sierra San Pedro Martir, and San Lucas Quail.
<b>HABITS</b>	Seems to be able to survive on drier areas than some related species. Some success in introductions in Minnesota, Nevada, Nebraska, North Dakota and Washington. Failures seem to have been in eastern and southern states where introductions have been tried. Do not have data on reproductive habits of this species.	May keep mates over 1 year, though cocks fight at beginning of breeding season. Cock builds nest on ground, though several pairs may use common nest. Eggs, 7 to 28, white, about 1 by 1-1/5 inch, weighing 18 grams. Incubation by hen and cock for 23-24 days with an average hatch of 86%. Young leave nest immediately after hatching and are cared for by both parents.	Nest on ground, often under bush or in grain field, with coarse grass lining. Eggs, 12 to 16, cream colored with regularly distributed buff markings, lusterless, thick-shelled. Incubation period, 21 days. One annual brood but a relatively long season required for rearing that family, in which mortality is high. Both adults assist in rearing young.	Nests on ground, in depression with vegetation border. Eggs, 12 to 17, creamy white with brown and lavender spots. Incubation, for 21 to 23 days with both parents participating. Breeding season begins in March, with breakup of last year's covey when males begin calling "ku kwak up" repeatedly. Nests rarely to 10 feet above ground. Young run soon after hatching.
<b>FOOD</b>	Chukars seem to have adapted themselves to a wide range of habitats. Possible that successful introductions may depend more on habitat management than on other factors. May be that given similar amount of time to become acclimated that Chukar may equal Ring-necked Pheasant and Hungarian Partridge as successfully introduced bird to relieve natives.	Food to 86% vegetable matter, or, in season, injurious insects such as grasshoppers, June beetles, chinch bugs, potato beetles, squash bugs. In winter, food may be largely weed seeds and waste grain. Winter coveys of less than 10 birds are unlikely to survive severe conditions. Coveys crowd together tail to tail. Individual range about 1 sq. mile. Speed 50 m.p.h.	About ¾ of the food is vegetable matter of which ½ is seeds including pigweed, buffalo burr, oats, wheat, kafir corn, cactus, sage and mesquite, also leaves and sprouts of plants and fruits (about 4%) of mistletoe, juniper, tomatilla and cactus. Insects (about 25%) include grasshoppers, beetles, scale insects. Can survive on dew and plant water.	Flight to 80 feet per second. May get water from dew or fly to drinking place daily. Food may be to 98% vegetable matter, with emphasis on fruit, though most important food probably is bur clover and alfalfa. May eat waste grain and quantities of weed seeds. Enemies include foxes, cats, skunks, weasels, horned owls, Cooper's hawks, coyotes, bobcats.
<b>ECONOMIC IMPORTANCE</b>	There is every reason to expect that this will be sometimes considered an outstanding game bird, although its beauty may win it defenders among those who respect beauty. However the efforts aimed at the introduction are being supported almost wholly by those who seek its establishment as a game species.	In some States such as Iowa and Ohio Bobwhite has been considered by legislation to be a song bird. Its abundance is based usually on cover conditions and may be most abundant in areas boasting high populations of foxes. Is State bird of Oklahoma and Rhode Island. Call <i>Bob</i> 1,6545 c.p.s., <i>white</i> , 2,742 c.p.s.	Food more largely insects than in bobwhite. May become attached to a particular area and become tame as pets. Because of this habit it is popular. Some winter migration.	In 1860, average market hunter shipped about 10,000 of these quail a year to market. Thousands of quail used to congregate but now 100 is a large flock. May destroy some fruit by pecking it. Has yielded to management practice; hen under management may lay to 70 eggs a season. Tremendous recuperative capacity. Considered as a "game" bird as once were robins.

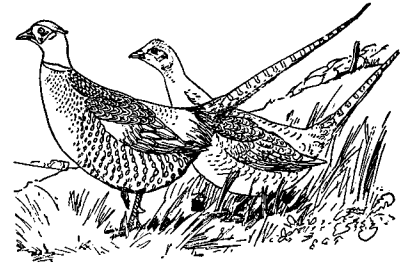
GAMBEL QUAIL <i>Lophortyx gambeli</i>	MOUNTAIN QUAIL <i>Oreortyx picta</i>	MEARNS QUAIL <i>Cyrtonyx montezumae</i>	RINGNECK PHEASANT <i>Phasianus colchicus</i>	WILD TURKEY <i>Meleagris gallopavo</i>
Length, to 10 inches. Tail, to 4½ inches. Adult male, with black 1½-inch recurved plume on top of head, with black patch on buff belly, brown flanks streaked with white, reddish-brown crown and throat and forehead with black and white border. Hen, with 1-inch crest and belly uniformly buff without the black patch of the cock and black and white on head.	Length, to about 1 foot, with sexes closely alike. Upper parts, olive-brown and slatish-gray beneath. Sides with wide black and white bands. Plume on top of head usually of two 2-inch black feathers that may stand erect. Throat and upper breast, orange-brown with narrow black border with further white border. Region back of beak white. Black near eyes.	Length on average 9 inches for both sexes. Feet large with powerful claws. Tail remarkably short and obscure. Cock with pale brown back streaked with white; sides slaty gray with white spots; middle underparts dark brown and black. Legs and feet blue-gray. Head patterned with black, white with fawn colored small crest. Hen less conspicuously marked.	Length, to 3 feet, 1/3 of which in the cock is the tail. Hen, about 20 inches long. Male, with strong spurs, brilliant coloration including a white collar and ear tufts. Cock, burnished reddish-brown to chestnut, forming a finely checkered pattern. Wattles vary in season. Hen, brownish to chestnut and less conspicuous than the cock. Weight, to 4½ pounds.	Length, to 50 inches. Weight, to 40 pounds. The male, a gobbler is a burnished chestnut and black with banded tail, conspicuous wattles and a breast tuft of hair-like structures. Normally gobbler weighs about 20 pounds and hen half as much. Differ from domestic turkey in having chestnut instead of white tips to tail feathers and wing coverts.
Order Galliformes. Family Phasianidae. Two subspecies, the Gambel, ranging from southern California, southern Nevada, southwestern Utah, Arizona, and the El Paso region of Texas into northeastern Lower California and Guaymas, Sonora, Mexico; the Olathe Quail of southwestern Colorado. In the Olathe cock, the upper parts are gray and the lower parts buffy.	Order Galliformes. Family Phasianidae. Three subspecies include the Mountain Quail, ranging from southwestern Washington and Vancouver Island to Monterey County, California; the Plumed Quail from the west side of Cascade range in north-west Oregon to the Mexican line and desert area of extreme western Nevada; the San Pedro Quail of the Sierra Juarez.	Order Galliformes. Family Phasianidae. But one species but with closely allied races to the south. Ranges from central Arizona, central Texas and central New Mexico south into Mexico in mountains of northern Coahuila, Chihuahua and eastern Sonora. Is found for most part in arid lands and in mountainous country. Summer range in New Mexico at 5000 to 8000 ft.	Order Galliformes. Family Phasianidae. Native of eastern China from Canton to the Yangtze. Four races were introduced, these have mingled and crossed to form the bird of our fields and woods. Particularly established in grain-yielding areas of Iowa, Minnesota and the Dakotas. Also is established in England and other countries.	Order Galliformes. Family Meleagrididae. Four subspecies include the Eastern, which ranged from Pennsylvania to Kansas and south to Florida and Texas, formerly through New England and into Ontario; the Florida, found north to Gainesville; the Rio Grande of middle Texas and northern Mexico; the Merriam from southern Colorado through New Mexico and Ariz.
In a long breeding season resulting usually in two annual broods beginning in April and July the nest is on the ground in a grass-lined or bare depression. Eggs, 8 to 12, white or buffy brown with purple and brown spots. Incubation, for 21 to 24 days with the chicks able to run soon after hatching, but needing and getting parental care for about 2 weeks.	In courtship, the cock crows like a bantam rooster, or gives bob-white-like "quit, quit, queah." Nest is on ground surrounded by vegetation, or under bushes. There are from 6 to 12 eggs in a clutch. They measure from 1-1/3 inches, are rather pointed, light buff, usually unmarked or stained brown from leaves. The breeding season in Cal. early April through Aug.	Nest is in a depression, well lined with vegetation, partly hidden by surrounding grasses, or may be a bulky mass of grass resembling a rat's nest with but one entrance, which is small. Eggs, white and usually 8 to 12. Incubation, probably about 3 weeks and but one brood per season. In breeding season, call is low and quavering like that of a screech owl.	Cocks fight for hens, maintaining considerable harem of as many as 7 hens. May fight domestic roosters in breeding season. Gives high pitched crow. Nest in grasses, grain or other vegetation made by hen. Eggs, 6 to 12, olive-buff, 1-2/3 by 1-1/3 inches, incubated only for 23 days. Young cared for by hen until fall when molt takes place and sex differences obvious.	Gobbler maintains a harem of to 15 hens for which he fights rivals. Gobbler does not help hen in nest building, incubation or young-rearing. Nest carefully hidden on ground with 10 to 14 eggs that are pale buff or brown speckled, 2 by 2¾ inches. Incubation 28 days. Young do not eat for 2 days but run soon. Two hens may combine flocks. Others may join later.
Food in winter and spring mostly vegetable matter, mistletoe fruits, mesquite leaves, cactus fruits and many weeds in various stages of development. Insects may include grasshoppers, ants, stink bugs, scale insects and plant lice. As much as 90% of the food may be plant matter, of which the ever-green hackberry provides an important part.	Food, if in agricultural areas, is wheat, corn and barley totalling about 97% and remaining 3% is almost wholly insects. Cannot live on succulent plant material alone. Since it requires drinking water its range may be limited by availability of water. May be found close to rushing mountain streams and with taking of water into conduits may vanish from territory.	Greatest percentage of food is vegetable matter, including grass seeds and wild berries. May be unusually wild, but individuals may be exceptionally tame. When excited may spread its crest instead of raising it, as do most of its relatives. May sit close until almost stepped on. Because of this has been called Fool Quail. Flocks are small and rarely exceed a dozen in number.	Food includes both plant and animal matter, with roughly about twice as much plant matter as animal. Includes grain, fruits, acorns and the like with some green matter. Destroys great numbers of grasshoppers in season. May drive other game birds from territory. Middle West population averages 1 bird per acre.	Food largely seeds and vegetable matter including acorns, nuts, grains and weed seeds, with insects in season. Has learned to be one of the most cautious and shy of game birds, but may be called to hunter's or photographers' stands. Was reported in early days to be pests in New York State but is now gone forever. Increasing in some areas.
Known as Desert Quail by some writers. Its flight is estimated at from 50 to 60 ft. per second or about 50 miles per hour being slower than the California Quail and Bobwhite. Enemies are coyotes, foxes, snakes, man and the usual predators of its habitat. Habit of forming large flocks for a few weeks in fall has its disadvantages to the species. Called Desert Quail.	In northern range, may migrate with the seasons into milder areas if the season is rugged. The region of greatest abundance is probably California where it is hunted at altitudes of between 5000 and 10,000 feet. It is a bird prized alive by nature lovers generally.	Considered a "game" bird of limited possibilities. Cannot be considered as a pest because its habitat usually is unsuitable for agricultural development. Family life may be ideal with both sexes caring for the brood of the year. At these times may be a master of concealment tricks. Is rarely abundant anywhere but may be at its peak of abundance in western Texas.	Most important of our "game" birds. Was raised and freed from game farms but practices change and in the future it is more likely that management will consist primarily in cover management. Abundance may be determined largely by seasonal conditions during breeding and by severity of winter, also food. Called various names.	Possibly America's finest "game" bird and in the South in some areas is reasonably abundant and with wise management may be maintained and even increased. In Texas and some other states the annual take is managed to fit the available population and in some areas land owners may collect for privilege of making the harvest.



WILD TURKEY



GAMBEL QUAIL



RING-NECKED PHEASANT

(Continued from page 251)  
through the whistled call of the bobwhite, to the booming of the prairie chickens and sage hens, and to the "drumming" by the rapid wing-beats of a courting ruffed grouse.

Much of man's interest in wildlife is associated with food problems. If a creature eats or destroys substances that are of food value to man, this habit leads to prejudiced judgment. Most of these birds do feed on grain when it is available. Quail may also feed on or injure grapes, and where injury affects the market value, this detracts from the popularity of the birds. However, most of these birds feed heavily on weed seeds and waste grain, and, during the season when the young are being reared, insects rank relatively high in the food list. This is the time when the birds need the insects and man needs to have the insect enemies of his crop destroyed, so everything works out well.

Man has a real interest in these birds because of their food value to him, but it is doubtful if the amount of meat harvested from these birds is justified economically when we consider the amount of money hunters spend on guns, ammunition, travel, special clothing, licenses, club dues and so on. It is claimed that the birds contribute to the health of many persons who find in field sports the opportunity for exercise they might not otherwise get. If we consider the value of the flesh of the birds as food to man, we would find in most species much to be desired. A grouse that has fed on evergreen buds, or a sage hen stuffed with sage, cannot compare with a turkey that has fed on beechnuts, or a pheasant that has become fat on good mid-West corn. Few of these can compare with a live bobwhite calling at the top of his lungs from a post near your window when you wake up on a spring morning, or a mother ruffed grouse trying to lead you away from her hiding chicks by appearing to have a broken wing. I have never been able to observe the courtship behavior of the prairie chicken, but from the moving pictures and the descriptions of my friends, I am sure that I would regret its extinction.

Part of the verve of living outdoors comes from experiences with these birds. This is true, whether we refer to the bombshell-like rise of a covey of quail, the stalking of a dumb fool hen, the excited chatter of a disturbed cock pheasant, the confidence in the value of protective coloration exhibited by an incubating ruffed grouse or the dainty behavior of any of our western quails. It seems as though we do know how to save these birds

for all time. It would seem that we should have the sense to save them efficiently through the restoration of their environment, and wise restraint in shooting. Somehow, we must work out a plan where their varied appeal

to a greater number of our public gets recognition. Working together we can still have what we now have in years to come. More than that, we can have things better than they now are. Such a program of improvement is worth fighting for, is worth sacrifices, and brings worthy rewards.

Perhaps, in this vein, we may take heed of *The Bible*, where, in Numbers, XI 31-33 we read:

"And there went forth a great wind from the Lord and brought quails from the sea, and let them fall by the camp. . .

"And the people stood up all that day and all that night and all the next day and they gathered the quails; he that gathered the least gathered ten homers (80 bushels) and they spread them all abroad for themselves round about the camp.

"And while the flesh was yet between their teeth ere it was chewed the wrath of the Lord was kindled against the people and the Lord smote the people with a very great plague."

There is a considerable library of books dealing with these birds, and ample opportunity for further study of them. Included on this list are such books as the following:

*The Ring-Necked Pheasant and Its Management in North America.* Edited by W. L. McAtee and published by the Wildlife Management, Washington, D.C. Distributed through the Stackpole Company, Harrisburg, Pa.

*The Wild Turkey in Virginia.* By Henry S. Mosby and Charles O. Handley. Published by the Commission of Game and Inland Fisheries, Richmond, Virginia.

*Bobwhites on the Rise.* By Verne E. Davison. Published by Charles Scribner's Sons, New York.

*The Ruffed Grouse.* By Frank C. Edminster. Published by The Macmillan Company, New York.

*Grouse Feathers.* By Burton L. Spiller. Illustrated by Lynn Bogue Hunt. The Macmillan Company, New York.

*The Ruffed Grouse.* By Henry Marion Hall. Illustrated by Ralph Ray. Oxford University Press. New York.

*The Prairie Chicken in Missouri.* By Charles W. Schwartz. Conservation Commission of Missouri, Jefferson City, Mo.

*Life Histories of North American Wildfowl.* Two volumes. By A. C. Bent. Smithsonian Institution, Wash., D.C.