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Turkey Tom Strutting.—*Frontispiece.*

TURKEY RAISING

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DEDICATED TO
THE AMERICAN TURKEY
KING OF DOMESTIC FOWLS

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PREFACE

For the past twenty years there has been a general and more or less steady decrease in turkey production. And this in spite of the fact that no other branch of livestock returns as great a profit for the money invested and the equipment required. Recently, however, there has been a considerable awakening of interest in turkey raising and a growing demand for detailed information regarding this industry.

It has been the purpose of the authors to provide in this publication the latest and most thoroughly reliable information on the subject for the use both of the raiser of market turkeys and of the producer of breeding or exhibition stock. In presenting this information it has been the authors' aim to deal with the subject thoroughly and in great detail and at the same time to keep the work so concise, simple and clear that it is of the greatest practical value either to the beginner or to one more experienced in turkey raising.

Recognizing the high value of good illustrations in emphasizing the information given in the text, all phases of this book have been thoroughly illustrated. It is the confident belief of the authors that considered either from the standpoint of the completeness with which all phases of the subject are covered or of the excellence of the illustrations themselves, no equal set of photographs on the subjects treated has ever before been gathered together.

The authors take pleasure in acknowledging their indebtedness to the following persons for the valuable aid which they have given in the preparation of this book—

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For the period of the past ten years the authors have been privileged to work together in the closest relationship for the interests of the poultry industry of the United States. It is to them a matter of deep pride that during this time their first thought has always been to render a service to the poultrymen and women of their country. And it is with this same idea of service that they offer the present book to the poultry public.

HARRY M. LAMON,

ROB R. SLOCUM.

WASHINGTON, D. C., 1922.

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TURKEY RAISING.

CHAPTER I

History, Extent of the Industry and Opportunities

A Native American.—With its size, its majestic appearance, its marvelous beauty of plumage and the most savory character of its flesh, the turkey may justly be termed the king of domesticated fowls. Moreover, on account of its place of origin and because it is the only native fowl of this country which has taken an important place among domesticated poultry, it is a bird in which Americans can feel a special pride and pleasure. The different varieties of domesticated turkeys as they now exist in the United States are undoubtedly a development from the native wild turkey of North America. Formerly the wild turkey occurred in considerable numbers in the wooded portions of a range extending from Maine southward to Florida and from thence Southwest across Texas, New Mexico and Arizona into Mexico. As the country became more and more settled, the number of wild turkeys grew steadily less, until at the present time they are found in the wild state only in the more remote portions of their former range.

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The Wild Turkey

The species of wild turkey which occurred in this range is divided into four varieties. These varieties consist of the common or Eastern wild turkey, the Florida wild turkey, the Rio Grande wild turkey and the Mexican or Merriam's turkey. The common or Eastern wild turkey extended over the eastern part of the United States from Maine to Florida and in the large swamps of the gulf states to Louisiana. The Florida wild turkey is found in southern Florida. The Rio Grande wild turkey has a range extending over southern Texas and northwestern Mexico, while the Mexican or Merriam's turkey is found in the mountains of Arizona, western New Mexico and southern Colorado, south into Mexico.

The common or Eastern wild turkey, the Rio Grande wild turkey and the Florida wild turkey are all quite similar in color in that they have a brilliant bronze plumage and that the tips to the tail coverts and main tail feathers run from a yellowish to a deeper yellowish brown or coffee color. In the Mexican wild turkey or Merriam's turkey, the plumage is of a much darker bronze which is shaded with black, while the tips of the main tail feathers and of the tail coverts are white instead of yellow or brown. In respect to the white tips and to the general darker cast of plumage, the Mexican wild turkey corresponds more closely than does the common wild turkey to our domesticated Bronze variety and gives support to

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the belief that our domesticated varieties have arisen from the Mexican wild turkey rather than from any of the other varieties.

It appears that the Spaniards on conquering Mexico found the Mexican wild turkey in more or less of a state of domestication among the Aztec inhabitants and that they sent specimens of this bird back to Spain. From that country it spread to other parts of Europe and was bred to a considerable extent so that later it was brought back by colonists to the United States and was the foundation from which our present varieties have sprung. It must be remembered, however, that infusions of the common or Eastern wild turkey blood have been made in the domestic varieties with considerable frequency.

The Honduras or Ocellated Turkey.—In addition to the species of wild turkey with its four varieties which has a large part of its range in the United States, there is another species of wild turkey known as the Honduras or Ocellated turkey, the range of which is confined to Central America, extending from Yucatan to Guatemala. This is a very beautiful and much more brilliant bird than the wild turkey of North America but has never been successfully domesticated and has played no part in the making of our domestic varieties. It is a considerably smaller bird. The neck feathers are a bronze black tipped with green, the breast feathers greenish black tipped with bronze, the back feathers bright green tipped with a brilliant copperish bronze, the fluff blue with a black band and

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tipped with a copperish red, the tail coverts bright blue with a black band and tipped with copperish bronze, the tail feathers silver gray with indistinct black penciling and with a blue eye edged with black located toward the extremity of each tail feather, while the tip of the feather is copperish bronze. The feathers of the wing bow are bright green tipped with black. The wing coverts are a bright copperish red and form a beautiful band across the wing while the wing primaries and secondaries are barred with alternate dark and light bars similar to the same sections in our domesticated Bronze turkey.

Origin of the Name Turkey.—In view of the fact that the origin of the turkey traces clearly to North America, some may wonder how this bird obtained its present name which would suggest its origin as being Asiatic. The most logical explanation seems to be that given by E. Richardson. He suggests that the turkeys on being brought to Spain from the New World were handled and sold by the Hebrew merchants of that country. As the turkey was quite generally confused with and called peacock, it was natural therefore that these Hebrew traders should apply to it their name for the peacock or "tukki." More or less common use of this name followed which easily became in the English language our present name turkey. Such an explanation seems to be much more probable than that the name arose as a result of an erroneous impression that the bird originated in or near Turkey.

FIG. 1. Wild turkeys. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 2. Flock of turkeys gleaning the shelled and spilled grain during threshing. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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Extent of the Industry

Turkeys are now raised to a greater or less extent over practically the entire United States. The great bulk of these fowl, however, is found on the general farms throughout the Middle Western and Southern states. Formerly large numbers of turkeys were raised in New England and the northwestern part of the United States, but the turkeys coming from this section are now very greatly reduced in number. For the same reasons that the turkey production in New England has declined markedly so has there been a great reduction in the number of turkeys raised in the United States as a whole. The census of 1900 shows that there were in this country 6,594,695 turkeys while 10 years later, the number had been reduced to 3,688,708. The census of 1920 reports 3,627,028 turkeys or practically the same number as in 1910. But while the number has remained practically stationary, the value due to increased prices, has nearly doubled or from \$6,605,818 in 1910 to \$12,904,989 in 1920.

As shown by the census of 1920 Texas is the leading state in the production of turkeys. Other states followed in this order: Missouri, Oklahoma, California, Kentucky and Virginia. While the country as a whole showed a slight decrease in the number of turkeys from 1910 to 1920, quite a number of individual states showed increases, particularly the mountain states, which nearly

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doubled their numbers, and the Pacific states, which showed a very substantial increase.

Reasons for Decreased Production

The reasons for the decrease in turkey production are several. Probably the principal cause is the fact that as the population in any section of the country increases in numbers, there is a tendency for agriculture to become more intensive and the farms to become smaller. For this reason the amount of range suitable for the raising of turkeys is lessened. Then, too, where farms are close together, the ranging habits of turkeys cause them to work over the grain fields of adjacent farms and this is likely to cause ill will, for damage to the growing crops is attributed to them in a much greater measure than is deserved and no credit is given them for the beneficial effects of the insect destruction which they bring about. Many farmers have therefore given up raising turkeys rather than have this cause of trouble between themselves and their neighbors. Disease has likewise been quite a limiting factor in turkey raising. The mortality among the young turkeys, with the usual care which is given them on farms, runs high. Outbreaks of blackhead and of some other diseases are frequent and serious in certain sections of the country, and the losses resulting from these outbreaks have discouraged the farmers from attempting to raise turkeys. In some sections, also, pred-

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atory animals, such as the coyote and fox, have had a great influence in discouraging turkey raising.

There is another factor, not so generally recognized, but which, nevertheless, has had a decided effect in decreasing turkey production. It is the fact that the care of the sitting hens and of the young poults during the first few weeks of their lives is a very exacting occupation. If the greatest success is to be enjoyed, the raiser must expect to be ready to give the turkeys attention at any time of day that they may require it or in other words must be thoroughly on the job. The turkeys cannot be neglected during this critical period in order to make a trip to town in the automobile. In this day of modern living when it seems to become harder and harder to subordinate pleasure to business, turkey raising by virtue of the fact that it is temporarily exacting and confining, is not increasing in popularity as an occupation. For the person who is willing to devote the necessary time and attention and who will give the welfare of the turkeys precedence over his ease or pleasure, there is an excellent opportunity to make a splendid success in raising turkeys.

Opportunities for Turkey Raising

With turkeys a national institution as a holiday dish, particularly for Thanksgiving and Christmas and with the constantly decreasing number produced, there is an excellent opportunity for those who are favorably situ-

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ated to raise turkeys for profit. In the main, turkeys are produced as a small side-line upon the general farm. Even in those sections of the country where the bulk of turkeys is grown, it is usual to find flocks of not more than 50 or 60 turkeys on any one place. In fact, the average flock is undoubtedly much smaller than this. In Texas, the banner turkey state, flocks numbering as high as 100 to 150 are more or less common. In certain parts of the Southwest and in some sections on the Pacific Coast there are a few persons engaged in turkey raising on a larger scale, as high as 1,000 or more turkeys being produced in a year. Men on horseback are employed to drive these flocks out on range and to herd them. It must be remembered, however, that this is in a section where there is unlimited range and in a climate which is well suited to growing the young poults and where disease does not seem to develop to so great an extent. The semi-arid or irrigated sections of the West and Southwest because of their natural advantages will undoubtedly continue in the future to be the places where turkey raising in its most specialized form will be practiced.

Grain and stock farms are particularly well suited for turkey raising and it is on such farms that most of the turkeys are found at present. For greatest success in this industry plenty of range is essential, and where this can be given, the turkeys will find large quantities of insects such as grasshoppers, quantities of green vegetation, berries, weed seeds, waste grain, nuts and acorns of

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various kinds which they eat readily and which makes the cost of raising them very small and the profits large.

Turkey Raising as a Business for Farm Women

Turkey raising is an agricultural activity especially adapted to the women of the farms. Their natural motherly qualities and the aptitude which they possess to attend to the details of caring for the young turkeys make them especially well fitted to raise the turkeys successfully. Then, too, it is easier for them to give the turkeys the constant oversight and frequent attention which is so necessary during the brooding season, for the hens with their broods can be, and usually are, cooped near the house. For the woman who is successful in raising turkeys, it would be difficult to find any other farm side-line which will yield a greater return. With prices as they have been during the last few years, a sufficiently large flock can be reared from 15 to 20 turkey hens to bring in \$400 or \$500 a year. The cost of raising turkeys is low since they pick up such a large part of their own living. About the only feed they need is that which is given them while they are young and the grain required to fatten them for the market. It is safe to say that no other kind of live stock can be raised so cheaply on the farm as a flock of turkeys nor is there any which brings a better price per pound. Even with high priced grain, turkeys given a good range can be turned off to market at a cost

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not to exceed \$1 a head for feed consumed. The necessary investment for raising turkeys runs low both in the matter of breeding stock and equipment required. It is doubtful if any other kind of live stock requires as small an investment for the return yielded as do turkeys.

A brisk demand will be found by any one having breeding stock of some pure variety for sale and this will greatly augment the possible profit. As an example of what may be accomplished it may be stated that a farm woman, a breeder of Bronze turkeys of fine quality, recently raised 200 turkeys in one season, and sold over \$1,500 worth of stock, being compelled to refuse more than \$500 worth of additional business. Most of her stock was sold for breeding purposes except 17 late hatched toms, which were sold for slaughter on the local market early in February at 35 cents a pound, and for which she received a total of \$109.

A Missouri farmer and wife have sold for the past four years an average of more than \$500 a year of market turkeys. At no time did they have more than 15 breeding hens and sometimes not more than 12.

Turkeys as Insect Destroyers

In spite of the fact that insects, such as grasshoppers, which the turkeys pick up in ranging over the farm, form a considerable part of the diet of turkeys during the summer, the great value of these birds as insect destroyers is often overlooked. Much is said about

FIG. 3. Turkeys clearing cotton field of insects, weed, seeds, etc. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

FIG. 4. Wild turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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the damage they do to growing crops and little or nothing about the good. As a matter of fact turkeys do little damage to crops under ordinary conditions where they can find an ample supply of the feed which they love to glean in their own way. But the loss which they prevent by the destruction of insects is often very considerable. Recently attention was called to the fact that in one farming community the only farmer who was successful in securing a yield of clover seed was one who had allowed a flock of turkeys to range in his clover field. In the same locality another farmer had his oats crop saved from grasshoppers by turning in a flock of turkeys to prey on the grasshoppers. A brood of turkeys when ranging through a field seeking their feed go about their work in a very systematic manner, often advancing in a line at distances apart just about great enough to enable them to cover all of the ground between one another as they advance. Not many grasshoppers get by this advancing line.

Raising Turkeys in Confinement

Most efforts to raise turkeys in confinement have not been very successful and it has generally been considered that to hatch and rear the turkeys artificially and to keep them under rather intensive conditions was impracticable and unprofitable largely for the following reasons: First, that exercise is essential to health and vigor. Second, that brooding the young poults artificially requires too

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much time and personal attention. Third, that with ordinary management it is almost impossible to keep down disease. Fourth, that an experienced feeder is required to feed turkeys in confinement successfully. It will be noted, however, that all but the first of these reasons cannot be urged against the person who has had considerable experience and who knows how to care for turkeys. In fact, enough instances are known of where turkeys are being raised by artificial methods and under restricted conditions to demonstrate that with proper care and attention this is possible, although it is not recommended as a general practice where greater range is available. Further details in regard to artificial methods will be found on page 85.

Prices

It is interesting to note the change that has taken place in the price received by producers of market turkeys for the last six years. It is also of interest to note the range in price according to the section of the country in which the birds are raised and put on the market. In a general way, the farther from the great consuming centers the birds are produced, the smaller is the price received by the grower. The following table illustrates this well.

Prices of Breeding Stock.—As might be expected prices for breeding stock vary widely depending upon the excellence of the birds themselves and upon the reputation

Cents per Pound Paid to Producers of Turkeys *

State	1915		1916		1917		1918		1919		1920	
	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15
Maine	17.7	18.0	18.0	21.0	23.0	25.0	32.0	35.0	31.0	38.0	41.0	43.0
New Hampshire	23.3	21.5	—	—	30.0	35.0	—	—	50.0	48.0	65.0	60.0
Vermont	20.0	17.5	23.0	25.0	28.0	27.5	37.0	38.8	37.0	42.0	42.0	43.0
Massachusetts	—	25.0	32.0	31.5	—	—	45.0	—	—	46.0	42.0	47.0
Rhode Island	22.0	23.0	28.0	30.0	35.0	—	60.0	—	—	48.0	60.0	54.0
Connecticut	22.0	28.0	30.0	30.0	35.0	—	50.0	44.0	41.0	53.0	60.0	68.0
New York	21.0	21.0	24.0	26.0	28.0	30.5	35.3	36.5	38.0	41.0	39.0	46.0
New Jersey	23.0	25.0	26.0	28.0	32.0	32.3	37.0	40.3	40.0	46.0	51.0	46.0
Pennsylvania	18.7	20.9	24.0	24.7	28.0	29.3	33.2	33.9	36.0	41.0	42.0	47.0
Delaware	18.0	20.0	20.0	22.0	26.0	27.5	—	30.0	45.0	—	50.0	42.0
Maryland	19.0	20.2	23.0	22.0	25.5	27.5	31.7	32.7	36.0	40.0	39.0	41.0
Virginia	16.0	16.5	19.6	20.0	23.0	24.3	28.1	29.5	31.0	33.0	35.0	36.0
West Virginia	15.5	16.5	18.8	19.5	23.5	24.5	26.0	28.1	30.0	32.0	33.0	37.0
North Carolina	14.6	15.2	18.5	18.5	22.5	19.0	26.9	29.7	32.0	33.0	31.0	32.0
South Carolina	15.5	15.1	16.9	18.4	23.3	27.6	27.6	32.5	33.0	36.0	30.0	29.0
Georgia	15.4	15.6	17.2	18.5	22.5	25.0	26.4	29.3	31.0	33.0	29.6	28.0
Florida	18.2	19.3	19.0	20.0	25.0	24.6	28.9	32.0	35.0	35.0	38.0	36.0

* Estimate from the Bureau of Crop Estimates, United States Department of Agriculture.

Cents per Pound Paid to Producers of Turkeys.*—*Cont.*

State	1915		1916		1917		1918		1919		1920	
	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15
Ohio	16.9	18.2	21.0	21.0	23.1	25.0	27.7	28.7	31.0	34.0	38.0	39.0
Indiana	15.1	16.2	19.5	20.0	20.5	23.3	26.7	27.1	28.0	31.0	32.0	33.0
Illinois	15.4	16.4	19.7	20.0	21.5	23.7	27.1	27.3	28.0	31.0	31.6	—
Michigan	15.7	16.5	19.4	20.2	22.1	23.0	26.5	27.6	27.0	30.0	29.0	31.0
Wisconsin	14.8	16.1	18.6	19.0	19.7	21.6	25.4	26.9	27.0	29.0	31.0	31.0
Minnesota	13.3	14.0	17.1	18.0	17.2	19.7	22.1	24.3	23.0	29.0	32.0	33.0
Iowa	15.2	15.0	19.0	20.0	18.3	21.7	26.0	25.9	25.0	29.0	31.0	31.0
Missouri	13.7	15.2	18.0	19.7	20.0	23.0	24.5	26.5	28.0	30.0	32.0	33.0
North Dakota	11.9	12.7	14.9	16.0	16.0	18.0	20.0	20.3	20.0	23.0	25.0	25.0
South Dakota	12.9	15.0	16.9	17.1	18.4	18.8	21.7	23.8	23.0	25.0	25.0	27.0
Nebraska	13.6	13.3	15.8	16.9	18.0	19.0	21.4	23.7	26.0	26.0	25.0	26.0
Kansas	12.4	13.2	15.5	17.6	18.3	20.9	24.0	25.6	26.0	29.0	28.0	30.0
Kentucky	14.0	14.5	17.7	19.0	20.5	21.3	23.6	23.6	28.0	30.0	33.0	34.0
Tennessee	12.9	13.2	15.6	18.8	18.2	20.4	24.9	24.2	26.0	28.0	29.0	29.0
Alabama	13.9	13.0	15.8	15.7	20.5	23.1	26.1	26.6	29.0	29.0	28.0	28.0
Mississippi	13.2	13.4	16.5	17.5	21.4	22.9	23.0	25.6	27.0	32.0	30.0	28.0
Louisiana	15.0	15.4	15.5	16.4	20.5	25.5	23.3	26.7	26.0	30.0	26.0	34.0

* Estimate from the Bureau of Crop Estimates, United States Department of Agriculture.

Cents per Pound Paid to Producers of Turkeys.*—Cont.

State	1915		1916		1917		1918		1919		1920	
	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15	Nov. 15	Dec. 15
Texas	11.3	12.1	18.0	18.7	17.1	19.3	21.6	23.0	23.0	26.0	25.0	28.0
Oklahoma	11.9	12.2	16.5	18.0	18.4	20.1	22.4	23.7	25.0	27.0	26.0	27.0
Arkansas	13.1	13.0	15.2	16.0	20.3	21.4	22.3	23.7	24.5	28.0	29.0	27.0
Montana	19.7	17.9	20.6	21.0	20.0	23.7	24.6	—	26.0	26.0	30.0	32.0
Wyoming	13.9	17.1	16.7	17.8	21.7	23.0	29.0	31.9	30.0	29.0	34.0	30.0
Colorado	15.5	14.5	17.0	18.0	21.0	22.0	23.5	23.6	27.0	28.0	27.0	26.0
New Mexico	13.3	14.8	17.2	18.4	20.0	22.0	22.0	24.0	32.0	27.0	33.0	31.0
Arizona	18.8	19.7	25.0	24.0	25.0	28.0	30.8	33.8	37.0	38.0	36.0	37.0
Utah	16.1	16.9	16.0	18.0	21.3	21.6	22.7	26.4	24.5	28.0	28.0	34.0
Nevada	22.0	23.0	24.0	25.0	27.7	28.3	30.0	32.0	39.0	40.0	35.0	38.0
Idaho	15.0	16.8	18.9	19.0	21.0	20.0	24.3	24.2	28.0	28.0	30.0	30.0
Washington	18.0	17.0	20.6	20.0	24.1	23.5	27.8	29.0	33.0	35.0	38.0	36.0
Oregon	15.7	14.8	19.0	19.6	21.5	21.8	26.6	28.2	33.0	33.0	35.0	40.0
California	19.8	20.3	22.0	24.0	27.5	27.1	32.0	32.4	36.0	40.0	44.0	40.0
Average for the United States	14.8	15.5	18.6	19.6	21.0	23.0	25.7	27.0	28.3	31.1	31.8	33.0

* Estimate from the Bureau of Crop Estimates, United States Department of Agriculture.

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of the breeder. Breeding hens can ordinarily be purchased for from \$7 or \$8 to \$25 each, occasional birds bringing more than this. Breeding toms can be purchased for from \$10 to \$50 with some birds sold as high as \$100. Turkey eggs for hatching when they can be bought at all sell for 50 cents to \$1.50 each. Many turkey raisers, however, prefer not to sell eggs for hatching, feeling that they can make a greater profit by hatching and rearing the young.

CHAPTER II

Varieties, Mating and Showing

Where turkeys are raised in the United States, the birds kept may be one of the standard varieties, various crosses between the standard varieties, or, somewhat rarely, the common or Eastern wild turkey. Standard varieties are those which are listed and described in the American Standard of Perfection.* The standard varieties consist of the following: The Bronze, the Narragansett, the White Holland, the Black, the Slate and the Bourbon Red. In referring to individuals of any of the standard varieties there are three separate classes of males recognized and two classes of hens. The males are adult cocks, that is, birds two years old or over; yearling cocks, birds one year old and less than two; and cockerels, birds less than one year old. The female classes consist of hens, birds one year old or over; and pullets, birds less than one year old. Males of all classes are frequently referred to as toms or gobblers rather than as cocks or cockerels. The young turkeys of both sexes are generally called poults.

*The American Standard of Perfection is a book published by the American Poultry Association describing all the breeds and varieties of chickens, ducks, geese and turkeys recognized by that association. This book is the guide by which all poultry shows in the United States are judged.

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Size

In size, the common wild turkey runs smaller than any of the standard varieties of domesticated turkeys. Wild hens usually range from 8 or 9 to 12 pounds in weight while the males may run as heavy as 20 pounds, although this is considered very good weight for a wild tom. It may be said in this connection that while the pure domesticated varieties are larger than the wild fowls, turkeys as commonly kept and bred on farms where many of them receive indifferent attention and where the variety may not be pure, often do not run much heavier in weight than the wild turkey. The following table gives the standard weights in pounds of the various ages and sexes of the domesticated standard varieties:

Variety	Adult	Yearling		Hen	Pullet
	Cock	Cock	Cockerel		
Bronze	36	33	25	20	16
Narragansett .	30	25	20	18	12
White Holland.	28	24	20	18	14
Black	27	22	18	18	12
Slate	27	22	18	18	12
Bourbon Red..	30	25	20	18	12

As a rule the demand for breeding stock is for heavy birds, those heavier than standard seeming to be in active demand. The fact that the larger specimens seem to find favor over the smaller birds in the shows probably ac-

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counts for this. For this reason breeders are inclined to use their larger birds in their matings in order to be able to supply the demand. As a matter of fact the use of birds of extreme size cannot be generally recommended as it is much more likely to be associated with infertility, poor hatches and soft-shelled eggs than when more moderate sized breeders are used. In general it may be said that breeders but little if any larger than standard are the best size to use.

Popularity of Varieties

On account of its larger size and also the fact that this variety has, perhaps, been more carefully, more systematically and more extensively bred than any of the others, the Bronze turkey is the most commonly kept. Turkeys are sold by weight and for this reason the larger birds bring the greater returns. A good size bird is in demand where a considerable number of people are to be served as in hotels, boarding houses, etc. While there is a more widespread demand for a medium sized turkey for family use, the larger birds find a ready sale and in general it may be said that the production of heavier birds proves to be more profitable.

It is quite a commonly held opinion that the Bronze variety is more hardy than the other domesticated varieties, due perhaps to the occasional introduction of wild blood in an effort to keep up the Bronze color. It is difficult, however, to trace any real sustained difference be-

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tween the vigor and hardiness of the different varieties as these qualities and others differ to a marked degree in different individuals and strains of the same variety. Proper management and proper breeding have much to do with the hardiness and stamina of the stock. It is claimed by some raisers that the White Holland lay more eggs than the other varieties and also that the White Holland and the Bourbon Red are inclined to be somewhat more domestic in their habits.

Considerations in Mating

It must be borne in mind that turkeys are kept for meat production, not primarily for egg production. In selecting the breeders, therefore, it is essential that they possess a type or shape of body which is consistent with meat carrying capacity. Select those birds which have a deep long wide body, a broad back, especially across the shoulders, and a round, deep, full breast which comes well forward. A strong well-knit frame is shown by birds which are of good bone, that is, which have thick sturdy shanks and with the legs perfectly straight and set square under the bird and well apart. Avoid any birds which are too long-legged, which are too narrow-bodied or in which the legs tend to be knock-kneed or to crook at the hock.

It must also be kept in mind that birds which are inclined to be short in leg, while they will often reach a greater weight the first season, are not the birds which will eventually develop into the largest specimens. It is

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well, therefore, to avoid breeders which are especially short in legs and to select those which are moderately long in legs but not too long. Avoid also as breeders any birds which are lop-sided or which have crooked breasts or crooked backs. The head should be of good size and length and of a clean healthy appearance. Avoid heads which tend to be too short.

Certain differences in the head over those of the ordinary domestic fowl need comment. In the first place the turkey has no comb such as is found on the chicken, but does have a fleshy elastic protuberance extending out from the head above the base of the upper bill, and which when expanded to its full length hangs down beside and below the bill. This is referred to variously as the dew-bill or snout. The turkey does not have two wattles as in the chicken but has a single throat wattle extending from the underside of the lower bill part way down the throat. The head is devoid of feathers and both the head and upper part of the neck are covered with rough or carunculated skin. There is some tendency for the caruncles of the males to be too smooth, that is not heavy or distinct enough so as to give a good masculine appearance. The color of the head and neck is red, which at times changes to a lighter or bluish color.

Occasionally, turkeys occur which have more or less of a crest or tuft of feathers on the head. These are rare, however, and there is no breed or variety which possesses this characteristic.

The back line of the turkey beginning at the base of the

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neck shows quite an even convex curve which is carried out also in the line of the tail which, unlike that of the ordinary domestic fowl, extends downward rather than upward. The tail itself should not be too closely folded but should show a fairly good spread both when closed and when extended or spread.

Turkeys of both sexes show a tuft of coarse hair growing from the breast called the beard. This is longer and more prominent in the male than in the female. The feet should be of good size with strong well formed toes. It is necessary in this connection to avoid a duck-toed condition, that is to say, where the rear toe turns around to the side or toward the front. It is desirable to select birds with good bright eyes, because these birds are as a rule the strongest individuals in the flock. In some specimens there is a tendency for the back to be straight rather than curved, and it is necessary to avoid these straight-backed birds in breeding. Turkeys should have good strong wings of moderately good size in proportion to the size of the bird. Any tendency toward wings which are too long so that when folded the ends are carried up on the back and tend to lap should be avoided.

In addition to the selection of birds on the basis of their general body type or shape it is of primary importance to make sure that the birds used for breeders are well matured, which means early hatched, and that they are strong and vigorous individuals. It is also necessary in all of the standard varieties to select the breeders which approach as closely as possible to the standard or ideal in their color

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and markings. Too great care cannot be exercised in selecting the breeders, for poor results as exemplified in eggs which will not hatch or in weak poults or in small scrubby turkeys are often the result of carelessness in the selection of the birds for breeders. In general it may be said that turkeys breed quite true and that there will be less culls from the turkey matings than there are from most matings of chickens. This is probably due to the fact that turkeys are not so far removed from their wild ancestors nor have the different varieties been made as the result of such radical crosses.

Making the Mating

The Wild Turkey.—The Wild Turkey is not a standard variety, nor is it kept in domestication to any great extent. However, there are some breeders of the wild variety and the wild blood is in more or less frequent demand for the purpose of crossing with the Bronze variety. The object of crossing is to improve the vigor and vitality of the domesticated stock and also to improve the color or sheen of the Bronze variety. Wild turkeys should have a general plumage brilliance which is as great or preferably greater than that of the best Bronze turkeys. The wild variety, in addition to being more brilliant than the Bronze, differs from it principally in the matter of the color of the edging on the tail feathers and the tail coverts. In the wild variety, this edging varies all the way from a deep red, cherry, chocolate or coffee

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color to a lighter shade which may be yellow or creamy, while in the Bronze variety, this edging should be a pure white. The introduction of wild blood in the Bronze variety can usually be detected by the fact that this edging is not pure white.

When crossed with the Bronze, the wild turkey is more prepotent. In fact, it is difficult, if not impossible, to tell by the color a three-fourths wild bird from a pure wild. However, the crossing increases the size over the wild. Half wild gobblers are often used in introducing wild blood into the domestic turkeys. It was hoped at one time that crossing with the wild variety would result in greater immunity from blackhead, but this has not proven to be the case, and the pure wild variety seems to be about as subject to blackhead, at least under domestication, as any of the domesticated varieties.

To most people the meat of the wild turkey is superior to that of the domesticated on account of its more gamey flavor. In a general way it may be said that the wild bird is a tighter, harder feathered bird than the domestic turkey, and that it has a more racy appearance of body and is of a more restless, nervous temperament. These birds are very quick motioned and can run very rapidly and also fly very well. The egg of the wild turkey is smaller and more pointed than that of the domesticated varieties.

There is quite a difference in the shade of coloring of wild turkeys from different sections of the country. The wild turkey from the extreme South seems to be somewhat more brilliant in color than the birds farther

FIG. 5. Bronze turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 6. Bronze turkey, female. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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North. In mating, therefore, it is necessary to be sure that the birds from the same general section of the country are mated together rather than to use in the mating birds from different sections in which the coloration varies. Where birds from the same general section are used, the wild turkey breeds very true in color. However, birds must be avoided as breeders which tend to run light or mossy on the wings.

The Bronze Turkey.—As stated under the wild turkey, wild blood has been introduced to a greater or less extent into the Bronze variety. This has had the effect of spoiling the plumage color to some extent, especially in causing the white band at the end of the feathers to be creamy or yellowish brown instead of silver white. However, the occasional introduction of some wild blood has been necessary in order to keep up the rich bronze color especially on the back. In a general way the Bronze variety may be said to be of a rich, brilliant, copperish bronze against a background of black and brown and contrasted by the clear white tips of the tail coverts and main tail feathers. The brilliancy of the plumage is usually greatest when the birds are two or three years old, improving in this respect over the younger birds. The brilliancy of the plumage is also greatest at the beginning of the breeding season. As the breeding season progresses some of the brilliancy is lost from the male plumage, and this is likewise true of the hens soon after they begin to lay.

In selecting the breeders for the production of exhibition stock, breed from birds with good open bronze bar-

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ring and with a good white edging of fluff. The fluff is likely to be the weakest section, but if the bird is good in fluff it is likely to be good elsewhere. The birds selected as breeders should be an even bronze color extending over the whole length of the back to the tail. Sometimes the back runs too dark or too near on the black, lacking the bronze. This must be avoided. The bronze bar on the feathers should be straight and extend across the entire width of the feathers. It should not show any tendency to be notched at the center nor should it fail at each side of the feather so that the bronze shows only in the center. A width of the bronze bar of a half to 1 inch depending on the section is good, but some breeders consider that the wider this bar the better. The bronze bar should be edged by a good black bar, and this in turn edged with a good distinct white end or edging in those sections in which a white end to the feather is called for. In the wings, the flight feathers should be distinctly barred across with alternate bars of black and white which should be equal in width and which should run as straight as possible across the feather.

The white bars should be as free as possible from any black peppering. There should likewise be as distinct and clear cut a line between the dark and white bars as can be obtained so that the edging of the bars will not be irregular and so that the color of the dark bar will not be brown on the edge where the two colors join. There is also somewhat of a tendency for the white wing barring to be too narrow, which will cause too dark an appearance

FIG. 7. Wing of Bronze Turkey Tom. On account of the high light the bronze wing bar photographed light in color. Notice the rounded ends to the last two primary feathers and the greater width and evenness of the wing bar as compared with those in Figs. 10 and 17. These characteristics show this bird to be a yearling or older. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 8. Feathers from a Bronze turkey hen. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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of the wing. A tendency for the barring to run together in some cases and in other cases to be zigzag in shape, that is, not straight across the wing must be avoided.

It is desirable to have the barring of one flight feather match or correspond with the barring of the next flight feather so that there will be a continuous or uniform series of bars across the flight feathers as a whole. Sometimes the barring does not carry well across the narrow lower edge of the flight feathers and these sections tend to be largely white or brown. This defect is very objectionable. In some cases the tips of the flight feathers are apt to lack the white barring entirely. This is a defect which should be avoided. Sometimes, also, especially in males, one or more solid black flight feathers will occur. Avoid breeding from such birds as this is a disqualification and as they will sometimes produce a nearly black sport. The tail feathers likewise should show a good bronze bar followed by a black band and with a good wide silvery white edging. A good spread of tail is also desired. There is more or less of a tendency for the bronze bar to be wanting, faulty, or scanty as the center of the tail is approached. In other words, the bronze barring may often be better on the outer tail feathers than on the center tail feathers.

What is desired is bronze barring which runs even and uniform entirely across the tail. Below the bronze barring the tail feathers should be barred across with brown and this brown should be arranged in as regular bars as possible so that the feathers appear to be penciled. Not infrequently the brown occurs as a more or less uniform

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stippling over these feathers and distinct bars are not formed. Sometimes also the main tail feathers are nearly black in color, being almost completely lacking in brown. Birds with such tail feathers should not be selected as breeders. Sometimes there occur near the base of the two center main tail feathers, and more rarely this is true of the four center feathers, white bars or penciling. These are a serious defect and birds possessing them should be avoided as breeders.

In a general way it may be said that the plumage color of the male is always more brilliant than that of the female. Otherwise, the plumage color of the female is the same as that of the male except that she shows a white edging on practically all of her feathers. The more closely the brilliance of the female's plumage approaches that of the male the better. Young Bronze turkeys have legs which are quite dark in color, being nearly black but having some red in them. As the birds grow older this color tends to get brighter and to show more red.

The Narragansett Turkey.—In general it may be said that the Narragansett has much the same general color scheme as the Bronze turkey. Because the feathers end in a band or bar of white or gray this variety has a general color which is lighter than that of the Bronze. In this connection, however, it may be said that it is necessary to guard against birds which are washed out or too light in color. It is likewise necessary to guard against birds, especially males, which run too dark in color. Such males are likely to have solid black backs. In the wing, the pen-

FIG. 9. Narragansett turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 10. Wing of Narragansett Cockerel. The pointed end to the last primary feather and the narrow wing bar with its uneven outline indicate that this is a young bird. Compare with Fig. 7. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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ciling or barring of the Narragansett should be just the same as in the Bronze. The wing bar, however, should be white where the bar on the Bronze turkey is bronze. This variety runs very good with respect to the white edging of the feathers. While young birds will occasionally show creaminess in this edging, this almost invariably comes good and white in the second year.

As in the Bronze variety, it is necessary to guard against solid black primary feathers which may sometimes occur. The Narragansett turkey should show metallic in its black but should have no indication of bronze barring. Sometimes Bronze birds are produced from a Narragansett mating, but these should never be used for breeding. When Bronze and Narragansett turkeys are crossed regardless of the direction of the cross, part of the offspring will be bronze in color and part Narragansett and there does not seem to be any particular blending of the two color schemes.

The White Holland Turkey.—The White Holland should be a pure white throughout in both sexes. In this variety, however, both buff and black sometimes occur and it is necessary to guard against foreign color of any kind. Bronze and white splashed feathers sometimes occur in the fluff and back, and buff or black may occur on the body and occasionally in the primaries. Probably the greatest difficulty in plumage color is black flecking. This consists of very narrow black streaks or flecks ranging from very small in size to a quarter of an inch or even half an inch long, occurring especially in the feathers of

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the thigh, back, tail coverts and breast. This black flecking corresponds to what is known as ticking in white fowls. White turkeys sometimes occur as a sport from the Bronze, and white turkeys also occur occasionally in a natural state as a sport from the wild turkey. It is undoubtedly from this sporting that the White Holland variety has arisen. As turkeys of this variety age there is a tendency for the pink leg color to fade and this color also fades in the female with laying.

The Black Turkey.—In this variety a plumage color is desired in both sexes which is a lustrous greenish black throughout. In other words, this should show a good clean black with a prominent green sheen. The tail coverts often shade to a brownish cast especially in the female, and this, of course, is undesirable. It is likewise necessary to guard against any bronze cast over the back. It is also necessary to guard against barred feathers or an edging to the feathers either of bronze or white. This white edging which occasionally occurs is especially likely to appear in the breast, neck and tail coverts. Not infrequently young Black turkeys will show white tips to the small finishing feathers under the wings until they moult in as yearlings when this disappears. Young turkeys are also quite likely to show white tips to some of the wing feathers but this disappears as the mature plumage is obtained. There is likewise a tendency in young birds for white feathers or bronze stripes to appear over the back, but such birds usually come out as good black birds when they get their mature plumage. When the

FIG. 11. White Holland turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 12. Black turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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poults hatch they are almost half white, the breast being entirely white. When the first feathers appear they will also show more or less white, but they should moult into mature plumage entirely black.

The Slate Turkey.—This variety has also been called the Blue or Lavender turkey. In this variety the birds of both sexes should be of a slaty or ashy blue color throughout. However, there is a decided tendency for the plumage color to be flecked, ticked or dotted with black, but the freer the plumage is from this black ticking the better the birds are for breeding. There is also a tendency for a buff edging or lacing to occur in all parts of the body plumage which may cause a rusty appearance, and this must be guarded against. It is likewise necessary to guard against solid black feathers in the primaries or tail, or black in these feathers. Frequent lacing of buff or red, over the back and tail coverts especially, must likewise be selected against. There is also a tendency toward a general washed-out appearance and birds showing this are not desirable as breeders. There is very little tendency for the plumage to show any blue lacing.

When two Slate turkeys are bred together the resulting offspring may show quite a wide variation in color, some of them coming blue, some black, some very much on the Bronze and occasional birds which are nearly pure white. Very occasionally also birds occur in which the plumage is a bluish red or faded or dirty red over the back and tail coverts. There are very few breeders of Slate turkeys at the present time and no one seems to have tried breed-

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ing the black and nearly white offspring from Slate matings together to see if they would produce all blue offspring as is the case in the Blue Andalusian chicken. While there do not seem to be many breeders of Slate turkeys, more or less Slates will be found in practically any flock gathered together for market. It is probable, however, that some of these Slates occur as the result of the general crossing and mixing of varieties which is so often practiced by market turkey growers.

The Bourbon Red Turkey.—In color this variety should be a good deep red with white flights and secondaries and with white main tail feathers. It is rather difficult, however, to get good depth of red color without more or less black throughout the plumage. This black occurs most commonly as an edging or lacing at the end of the feathers. In the fluff and in the undercolor of various other sections there may also occur a dim transverse penciling of black or dark. More or less black flecking or ticking is likely to occur throughout the plumage. As there is a tendency for the plumage color to run too light in shade it is necessary to guard against a body color which is on the buff rather than on the red. There is quite a likelihood of more or less red occurring in the sections of the wing and tail which should be white.

More than one-fourth red in any of these sections constitutes a disqualification but it is seldom that birds are disqualified for red in any of these sections. It is comparatively easy to keep the primaries white, a little more difficult to keep the secondaries white, and still more diffi-

FIG. 13. Black turkey, female. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 14. Slate turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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cult to keep the tail white. If the bird has a good deep red body color there is a greater likelihood of more or less red or buff occurring in the white sections of the wings and tail. Red is more likely to occur in the main tail feathers at the outer sides of the tail while the center tail feathers are most likely to be clear white.

Preparing Turkeys for the Show

There is not much that needs to be done in preparing turkeys for exhibition. Since birds of good size and weight are usually favored and because turkeys often shrink as much as 2 or 3 pounds during their shipment to the show it is necessary that they be in a good condition of flesh. This does not mean that they need to be especially fat, although turkeys are sometimes fattened to quite an extent in order to have their weight as high as possible when shown. Corn is as good a material as any to feed in preparing turkeys for the show so as to get them in good condition of flesh. If the birds are used to eating any good mash feed this can be used and will put them in condition quicker than corn. However, if they are not used to eating mash they will not take to it readily and will not eat it freely for some time, with the result that they will not condition as quickly. The birds should not be penned up in order to fatten them or get them in good condition of flesh. This is a mistake, as they will not eat well or do well when confined for any length of time. In preparing turkeys

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for the show it must be remembered that they are very loose-feathered birds and that it is very easy to pull out feathers. For this reason they should be handled as little as possible when getting them in condition.

It is very desirable to coop the birds to some extent before they are sent to the show. This may be accomplished by cooping them for several hours each day in coops of the same size as will be found in the show for a week or two before the show. It is best not to put them in the coops and keep them there continuously for any great length of time as they are almost sure to go off feed and go down in condition with such treatment. The coop in which they are confined for training should have a solid top or should have some covering laid over its top. If the top is of wire the birds will constantly jump up in an effort to get out and will worry and work until they injure their feathers. Where the top is covered or solid they will not make this effort and will more quickly become used to being cooped. About the only other treatment which the birds require is to see that their legs, feet and head are in a good clean condition. To accomplish this it is best to have one person hold the bird while another washes these parts. In the case of dark-legged birds such as Bronze turkeys, the leg color can be helped by rubbing with sweet oil or some similar substance. Vaseline can be used in place of the oil, but in this case it is particularly important that it be well rubbed in with a cloth so that it does not leave the legs sticky and in condition to gather the dirt. Scaly leg rarely occurs in turkeys, in fact prac-

FIG. 15. Bourbon Red turkey, male. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 16. Defective feathers from a Bourbon Red turkey showing black edging at the tips and also dark markings or pencilings across the feathers. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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tically never, unless they are hatched and raised with chicken hens or are allowed to roost with other poultry.

Catching and Handling Turkeys

With wild turkeys or with wild specimens of the domesticated varieties, perhaps the most satisfactory way to catch them is to use a net constructed of stout cord and of suitable diameter, so that it can be cast over the birds. Stand so that the bird to be caught has to pass between you and the side of the building or a fence. As the bird runs by place the net in its path so that it will run into the net. Let the net give before the advance of the bird rather than try to pull the net over the bird, as the latter practice is more likely to injure its feathers. When the turkey is in the net it cannot struggle to any extent.

The left hand can then be inserted in the net, worked along the turkey's back until both wings can be grasped at their base or the point where they are attached to the body. The right hand can then be worked under the bird until it grasps both legs below the hocks. The left arm can then be thrown over the bird's wings and around its body in such a way as to support the bird and at the same time hold down its wings. In this position the bird can be carried under the left arm, the head facing back under the arm, the right hand grasping both shanks. In carrying the bird keep its legs straightened out as this will render it less likely to struggle. If it does try to struggle tilt its

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head down. In grasping the turkey about the base of the wings it is necessary to be very careful, as a rough grasp here is likely to strip off the feathers. If the birds are more or less tame they can often be worked into a corner of the house or yard and caught with the hands grasping them by the wings close to the body, then working the left arm around the body as described before.

It may also be necessary to catch turkeys from the roost at night or some other time. In doing this approach them if possible from behind and grasp a leg with each hand, being sure that the hand is below the hock. If they are grasped above the hock the feathers at this point are very apt to be stripped off. As soon as the legs are grasped swing the turkey clear of the roost so that when it flaps its wings, they will not be bruised or broken. As soon as it has stopped flapping its wings, throw the left arm around the body and over the wings and carry as described before. Where turkeys are intended for market they are sometimes rendered incapable of struggling either by locking the wings over the back or by tying the legs together. Neither of these practices is advised as it is somewhat cruel. It is better to place market turkeys as soon as they are caught in the coops in which they are to be shipped.

Shipping Show Birds and Breeding Stock

Ship birds which are intended for the show in single coops. If two birds are shipped in the same coop and

FIG. 17. Wing of Bourbon Red Cockerel. The pointed ends of the last two primary feathers and the narrow wing bar with its uneven outline indicate that this is a young bird. Compare with Fig. 7. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 18. Proper method of holding and carrying a turkey. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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without partitions they will not arrive in as good condition as if shipped single. The bird should have plenty of room so that it can stand erect and be comfortable but should not be given room enough so that it can turn around in the coop. For a good sized gobbler a coop 30 inches high will be necessary. Not over 16 inches of width should be allowed as this will keep the bird from turning around. If the coop is 2 feet wide the bird will be constantly turning and will injure its plumage in doing so. The sides of the shipping coop should be solid. If the sides are slatted the turkey is apt to be frightened by anything which passes by. The top of the coop should be slatted in order to provide good ventilation, but additional ventilation in the sides near the top is desirable in order to allow for the possibility of something being piled on top of the coop, thus shutting off the ventilation from that source. Coops for smaller gobblers or for hen turkeys can be built proportionately smaller according to the size of the bird.

In shipping breeding stock a distance of not over 200 miles, a coop 2 feet high and 12 to 14 inches wide will be large enough for a mature gobbler. If they are to be shipped further than this as much room should be allowed as would be given where the birds are shipped to the show. For short shipments no feed or water should be provided. If the birds are to be over two days on the road, however, a dish for water must be fastened to the inside of the coop and a supply of feed shipped with the coop so that the express agent can feed the birds.

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Packing and Shipping Hatching Eggs

Eggs for hatching may be shipped long distances successfully. In many cases, however, the shipment seems to affect the hatch, probably due to the continual jarring. It is advisable to set the eggs aside and allow them to rest for about 12 hours after their receipt and before they are placed under a hen or in the incubator in order to allow the germ to regain its normal position.

Shipment may be made either by express or by parcel post. In order to prevent breakage as much as possible and also to lessen the effects of the jars to which the eggs are subjected they must be carefully packed. A common and one of the best methods of packing is to use an ordinary market basket. Line the basket well on the bottom and sides with excelsior. Next wrap each egg in paper and then wrap in excelsior or place a good thickness of excelsior between the eggs when they are packed so that they cannot come in contact with one another. Pack the eggs in the basket, standing them on the small end and being sure that they are tightly packed so that they cannot move or shift around. Place a thick covering of excelsior on top of the eggs, using enough so that it comes above the sides of the basket, and sew a piece of strong cotton cloth over the top. Instead of sewing, the cloth can be pushed up under the outside rim of the basket with a case knife, this being quicker and equally as effective as sewing. Where a larger number of eggs is to be shipped,

FIG. 19. Method of packing turkey eggs for hatching in a market basket for shipment. More excelsior should be used around each egg and between the eggs and the basket than is shown. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

FIG. 20. Breeding flock of Bronze turkeys on free range. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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bushel baskets may be used, the method of packing and covering being the same as when a market basket is used.

Judging Turkeys

The turkeys should be cooped separately in the show. If two turkeys are cooped together it is almost impossible to get them to stand naturally and to show off to as good advantage as they will if cooped by themselves. The coops should be large enough to allow the turkey to stand erect and to move about easily. Smaller coops render it impossible to judge properly as to the bird's type or shape. In judging the birds for type, the whole class should be gone over thoroughly before any of the birds are taken out. Once they have been caught, taken out of the coop and handled, it is very difficult if not impossible to get them to stand naturally again when they are put back as they are frightened by the treatment which they have received. In catching the cooped birds, if the door of the coop is large enough to allow a man to insert his body, the best way to catch them is to throw the left arm over the body so as to hold the wings down and prevent the bird from struggling while the right hand is used to grasp both legs below the hock. In this position the bird can be readily drawn out of the coop without injury to its plumage.

If the door of the coop is smaller it may be necessary to grasp the bird by the wings close to their point of attachment to the body, drawing it out of the door in this man-

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ner, or in some cases where the birds are especially hard to handle it may be necessary to grasp them by the shanks and pull them out in this way. This last practice should not be employed if it is possible to avoid it since the bird is sure to struggle, flap its wings and more or less injury is done to the plumage and to the wings in dragging the bird through the door.

If the judge understands thoroughly how to catch and handle birds it will be better for him to insist on doing all of this work himself rather than to let some assistant do it who does not know how so well and who might do the birds damage. After the birds are taken out of the coop they should be carried to a good light where the different sections can be examined for perfection of color and markings. It is well for the judge to have an assistant or two so that he can have them hold one bird while he holds another for the purpose of comparison. Not infrequently broken flights will be found in turkeys. Other things being equal these broken flights count against a bird considerably but they are not such a serious defect as to prevent a superior bird from winning over an inferior one. A missing flight feather or a missing main tail feather is a much more serious defect than is a broken flight.

CHAPTER III

Management of the Breeding Stock

Making a Start.—What is the best way to make a start in turkey raising, by the purchase of breeding stock or of eggs for hatching? As a rule, it will be found best to purchase breeding stock. Such a purchase will involve a greater outlay of capital but will allow one to begin operations in earnest as soon as the laying season begins. The purchase of breeding stock will also make it possible to gain a better idea of the quality of the stock and what may be expected of the young stock raised. If one does not wish to put as much money into the turkeys at the start, they can purchase eggs for hatching and hatch and rear them under an ordinary chicken hen. Where this is done, however, it will be a year before one can begin breeding turkeys. For the person who has had little or no experience in turkey raising, one tom and from three to five hens will be enough to begin with and many persons will prefer to start with a trio, that is a tom and two hens. With good success from 7 to 10 turkeys should be raised from each hen. In buying breeding stock for a start it is better to purchase a tom which is unrelated to the hens.

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Selection of Breeding Stock

The main considerations in selecting stock for breeding purposes are vigor, size, shape of body, strength of bone, early maturity and in the case of stock for exhibition, color of plumage. It is always desirable for the farmer or other turkey raiser to select pure bred stock rather than to keep ordinary or mongrel turkeys. Not only will the pure bred stock possess greater uniformity and therefore better market quality, but because they have been systematically bred for the purpose of producing suitable carcasses, they will be found to possess better fattening qualities as well. It is also true that the pure bred flocks when given good care so that they have a chance to reach their full size will develop into much larger birds than will the average flock of mongrels. Another consideration which should carry weight with the turkey raiser is the fact that there is always a brisk demand for breeding stock from pure bred flocks both in the way of turkey hens for breeding, good vigorous toms for the same purpose, and eggs for hatching. Such a sale adds very materially to the income which the turkey raiser can secure from his flock of turkeys.

If the farmer or turkey raiser already has a flock of hens which may be crossbred or mongrel and if he does not feel that he can go to the expense of replacing these hens with pure bred individuals, he can secure a rapid improvement in his flock, in fact can grade them up to the point where for all practical purposes they are pure bred,

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by the use in successive generations of a pure bred male, being careful to use each year a male of the same variety.

In too many cases turkey raisers, in securing new blood, buy a turkey tom for breeding purposes wherever they can secure him and quite regardless of his variety or even whether he is pure bred. The result of this practice can only lead to a crossing and mixing up of the blood to such an extent that in a short time the flock becomes one of mongrels. Most turkey raisers recognize the fact that it is really poor policy to mongrelize their flock in this way, but the turkey flock is a small side-line on most farms and many owners do not take the trouble or pains to keep their flocks pure.

Should Turkeys be Inbred?

In a general way it may be said that it is unwise to inbreed turkeys, particularly to continue to inbreed them over any period of time. It is possible to use the same male for two successive years without inbreeding to a dangerous extent, but it is most desirable to secure from time to time absolutely unrelated blood if possible. Where the breeding stock is yarded and more than two matings are made it is possible to use a tom for two years or more without inbreeding by mating him with the same hens with which he was originally mated excluding his daughters from the pen. In the majority of cases continued inbreeding will lead to a loss of vigor and to a consequent deterioration in the flock. Instances

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are by no means rare, however, where inbreeding has been carried on with success over quite a period of time. It is probable that the same condition holds true here as with chickens or with other classes of live stock, namely, that while most strains or families seem to show evil results from continued inbreeding, occasional strains will be found which seem to be able to stand up well under inbreeding and do not show any apparent deterioration.

Where the turkey grower has stock of exceptional quality and is interested in maintaining this quality he will hesitate to purchase a tom of unrelated blood for fear that the two bloods will not nick well and the quality may be destroyed. In this case it is usual to line breed, or in other words, to use breeders of the same family or strain but not closely related. The turkey grower who is line breeding usually purchases new breeding toms from the same source where he secured his foundation stock. Nothing is to be gained by crossing. The increased vigor which may result from such a practice can be obtained just as well by using a male of unrelated blood of the same variety.

Age of Breeding Stock

In selecting the breeders, attention must be given to the age of the stock. While early hatched, well matured pullets can safely be bred, it is true that yearling hens produce eggs which are on the average larger and more uniform in size and it seems to be the general opinion

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that the poults hatched from such eggs are somewhat superior to those hatched from eggs laid by pullets. Early hatched pullets will as a rule start laying earlier in the spring and will lay more eggs than yearling or older hens. Late hatched pullets should never be saved for breeders. Not only do they fail to attain as good size as the earlier hatched birds but the stock produced from them is not as satisfactory. As in the case of early hatched pullets, so early hatched well matured cockerels or young toms can be used for breeding if they show that they are good vigorous individuals.

Late hatched toms, that is July or August hatched, while they should not be used for breeding the first year will often make good breeders the second year and can be retained if desired for that purpose. These late hatched toms seldom if ever attain as good a size as early hatched males. While some breeders claim that they get no bad results from breeding together well matured cockerels and well matured pullets, most breeders prefer to mate pullets with yearling or two-year-old toms and to mate cockerels with yearling or older hens. In no case should slow growing birds of either sex be saved for breeders. A plan which is often followed by turkey breeders and which works out to good advantage is to use about half yearling hens and half early hatched pullets. Old hens are not apt to be as satisfactory breeders as well matured pullets or yearling hens. As a rule these older birds are inclined to be too fat and for this reason to lay fewer eggs, eggs which are less fertile and a consider-

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able number of soft-shelled eggs. The large hens when used for sitting purposes are also likely to break more eggs. While it is a general practice and good practice not to retain many hens beyond their second year for breeders, if the turkey grower possesses an especially valuable hen from a breeding point of view or one which makes an exceptionally good mother, she should be retained as a breeder just so long as she is in good breeding condition.

Older turkeys, both males and females, tend to be less fertile than younger birds, probably due to the fact that they are fatter and heavier and less active. Hens are not ordinarily profitable after they are four years old. Yearling toms are as a rule more clumsy than cockerels, owing to their greater weight and this of course is still more true of two-year-old or older toms. For this reason they are not quite as satisfactory breeders as well matured cockerels. It is usually possible to distinguish between young turkeys and those which are yearlings or older by means of the wing feathering. In all varieties the two outer primary feathers are carried as chick feathers until the birds moult as yearlings. These chick feathers are pointed at the end and are easily distinguished from the mature feathers which are rounded.

The second way to tell the age is by the wing bar which does not mature until the second year. In the mature female the wing bar is about as wide as three fingers and the feathers which form it grow out to an even length, causing its lower edge to be regular in outline. In the

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pullet the wing bar is not more than two fingers wide and the feathers do not grow out to an even length so as to form a regular outline to its lower edge. In the mature gobblers the wing bar shows a width of about four fingers and has an even outline while in the young gobbler the wing bar is not over three fingers wide and has an uneven outline. See Figs. 7, 10 and 17.

Prevent Injury to Hens in Breeding

Where yearling or older toms are used they are very likely to injure the hens in mating because of their weight and their sharp spurs and toe nails. When they are used, therefore, it is necessary to cut off the spurs and clip or file down the toe nails short and blunt. Some breeders protect their hens from injury during the breeding season by fastening a cloth covering or sort of apron over their backs. Injury to the hens during the breeding is more likely to occur where the hens are very fat as the skin of their backs rips more easily in this condition or when the tom is very much heavier than the hens. Care should be used to see that there is a definite relation between the size of the hens and the tom used. For instance, if it becomes necessary or desirable to use a tom weighing 35 to 45 pounds, no hen should be mated with him which weighs less than 25 pounds. The use of light weight small females with heavy toms is very likely to result in breaking them down. With the wild turkeys it is best to use toms which do not run more than 2 or 3 pounds heavier than the hens used. One

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8 or 10 pounds heavier is sure to injure the hens in some cases so severely that they will die. When the skin of a hen's back is severely torn it may sometimes be desirable to sew up the tears, rubbing carbolated vaseline on the wound after the sewing is completed.

Selecting and Purchasing Breeders

The best time to select the breeders is during the fall, before the turkeys are sent to the Thanksgiving and Christmas markets. At this time the turkey grower can pick out from his young stock the best grown, most vigorous females to save as breeders. There is entirely too great a tendency for turkey raisers to be tempted by the holiday prices to send their best grown, largest birds to market, with the result that after the Christmas marketing, they have left only the slow growing, small, scrubby females to retain as breeders. Such a practice must of course result in a deterioration in the stock. In case turkey hens or breeding males are to be purchased, the fall is the best time to do this as there will be a larger number of birds to select from at that time. It is also well to have the breeders selected early and placed under the conditions where they will be bred so that they will become thoroughly used to their environment before the breeding season commences.

When breeding birds are purchased they should be isolated, when received, for a few days, in order to make sure that they are thoroughly healthy before they are allowed

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to run with the flock. At this time it is also well to examine the purchased turkeys carefully to see that they are free from lice, and if any indication of lice is found they should be thoroughly treated as described on page 125. In buying turkeys for new blood it is better to purchase a gobbler rather than to buy hens. The purchase of a male makes it possible to inject the new blood more widely in the flock by means of a single individual. Moreover, there will not be much difficulty experienced from a strange gobbler straying away as he will stay with the hens. If strange hens are purchased they are much more likely to wander away than are the turkey raiser's own hens. Very frequently turkeys are bought at a certain guaranteed weight. In this connection it must be remembered either in buying or selling that the shipment is hard on turkeys and they will often lose as much as 2 or 3 pounds while en route. A common practice in selling turkeys for breeding purposes is to send sample feathers from the bird so that the prospective purchaser can form a good estimate as to the general excellence of the bird in question.

Number of Hens to a Male.

In the wild variety it is not desirable to mate more than eight hens with one male. In the domesticated varieties a good vigorous young tom can be safely mated to as high as 15 hens. If a flock of 25 or 30 hens is to be kept, two toms should be used. The best practice is to allow one tom to run with the hens one day

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and the other the following day. If the two toms are allowed to run with the flock at the same time they will fight frequently and seriously and may injure each other so that they will not be in the most vigorous breeding condition or may even be killed. In addition to that, the stronger tom intimidates the weaker to such an extent that the stronger does practically all of the mating. The presence of the weaker tom then serves only as a detriment to the mating for he is not allowed to mate with any of the hens and he attempts to interfere with the stronger tom when mating.

A tom which struts about and spreads his tail frequently is usually in good health while one which mopes around with his tail down is not. A glossy clean condition of the plumage is also an indication of good health. Where a flock of 40 or 50 hens is kept, three toms can be used, alternating them each day or perhaps what is better practice, each half day. Whatever may be the number of gobblers necessary in order to insure fertility from the flock of hens kept, it is well to select and hold over an extra gobbler. This will insure against loss of time in case anything happens to one of the breeding males as it may be difficult to secure the kind of male desired on short notice during the breeding season.

Breeding Yards

As turkeys are usually kept with only a few hens in a flock, it is common practice to allow the breeders free

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range. This is a very desirable practice if the danger of loss of the eggs is not too great and if the number of hens involved is not so many as to make the work of looking after them in the nests which they steal too burdensome. Where a larger number of hens is kept it is best to provide a roomy enclosed pen or breeding yard, and many raisers prefer to do this even with a smaller number of hens on account of the time saved in looking after the turkeys, the ease of locating the nests and the fact that all eggs laid are thus secured.

Sometimes the breeding pens are comparatively small in area, but it is best to allow an acre or two of ground for this purpose even if no more than 20 or 30 hens are kept. When a small breeding pen or yard is utilized the practice should be to keep them shut up during the morning and about half of the afternoon. By that time practically all of the eggs will have been laid and the turkeys can then be turned out of the pen and allowed to roam at will during the rest of the day and to roost out where they wish at night. Even when large breeding yards are used this is good practice. Early in the morning they should be driven back into the pen, which will be found to be easy of accomplishment if the birds are fed in the enclosure regularly each morning. An orchard makes a very desirable breeding enclosure for the turkey hens. Such a place enclosed with a hog-tight wire fence 3 feet high will usually serve to hold the turkeys especially if no board or rail is used at the top of the fence. Where such a rail or a wooden fence is used the turkeys see a place to

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alight and this leads them to fly upon the fence and then over. With the wire fence they see no such handy alighting place and will not as a rule attempt to fly over. For the same reason steel posts in the fence offer less of an alighting place than wooden posts, and if the latter are used, the tops should be sharpened to a point.

If any difficulty is experienced in the hens flying out of the enclosure provided for them, this can usually be checked by clipping the flight feathers of one wing. It is not as a rule necessary to clip the wing of a tom except in the case of wild birds for he will not leave the hens. It must be remembered that clipping the wings of hens renders them somewhat helpless against the attacks of dogs or foxes and will also make it necessary to provide easy means for them to get up on the roosts high enough to be out of reach of foxes or coyotes. Clipping the wings of hens also injures their usefulness to some extent for brooding as they cannot hover as many poults to as good advantage. Occasionally, also, clipping the flight feathers may render a bird unfit for showing since the wing may not grow out in time for the show. Turkeys can be prevented from flying by tying a piece of light board across the back over the wings. Such boards are called paddles, or shingles. The paddle should be about 4 inches wide and may be from 8 to 15 inches long. Two holes bored over the base of each wing allow a strip of soft cloth or a soft string to be passed through there and around the wing at the base, thus securing the paddle in place. This must not be tied so tightly as to cut off the circulation. When

FIG. 21. Showing how the shingle or paddle is attached to a turkey to prevent it from flying. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 22. A barrel laid on its side is a favorite nesting place for turkey hens. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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the paddle is thus tied in place across the shoulders the bird is prevented from raising and spreading its wings and cannot fly.

Where hens have stolen a nest and started to lay before they have been shut up in the enclosure they will make every effort for a few days to get out in order to continue laying in the nest which they have selected for themselves. In this case the eggs should be removed from the nest which they have stolen and their wings should be clipped or they should be paddied so as to prevent their flying over the fence. As a rule they will begin laying in a few days in one of the nests provided in the enclosure.

Where wild turkeys are kept it is necessary to clip the flight feathers of one wing in order to keep the birds from flying over the fence. Even with one wing clipped, a higher fence is necessary than is the case with the domesticated varieties and it is best to use a fence 8 or preferably 10 feet high. It is better to clip one wing only rather than to clip both wings, as this tends to unbalance the bird more when it tries to fly or climb. With both wings clipped the birds are able to climb over quite a high fence. In this connection, it should be stated that the wing of the wild turkey tom should never be clipped until after the breeding season is over. To do so makes it difficult for the birds to balance when treading the hens and therefore interferes with the breeding. On this account it may be necessary until after the breeding season is over, to keep the wild turkeys in a run covered over

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the top with wire netting to prevent the tom from escaping. It is unnecessary to clip the wing of domesticated gobblers for they will stay with the hens.

Feeding the Breeding Stock

To be in good breeding condition the birds should come through the winter in good condition of flesh but not fat. If they are fed too much corn throughout the winter there is quite a likelihood of their being too fat when the breeding season opens. Where the birds have free range they are able to get for themselves a varied supply of feed including grass, tender shoots, young leaves, insects and nuts and seeds of various kinds. This is particularly true during the breeding season in the South, and where an abundance of this kind of natural food is available one good feed daily of grain such as oats or wheat will suffice to keep the birds in good breeding condition.

In the North where the winters are more severe turkey raisers generally feed the birds twice a day. A good feed for this purpose is one consisting of equal parts of oats, wheat and corn together with some vegetables such as beets, cabbages, turnips, potatoes, clover or alfalfa for a green feed. Another good feed for breeding turkeys consists of 3 or 4 parts of oats to 1 part of corn. Some turkey raisers also like to leave bran where the turkeys can help themselves at any time. Buckwheat is relished by turkeys when they are used to it, but should not be used exclusively as a grain feed. Some animal feed dur-

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ing the winter is also necessary if the birds are to be kept in the best condition, as this takes the place of the insects which they are able to secure at other seasons. Ordinary commercial beef scrap such as is fed to hens, or beef livers or lungs or skim milk, either sweet or sour, is suitable for this purpose.

Often a good laying mash such as is used for laying hens can be fed to the breeding flock just previous to the breeding season in order to start them laying. Unless turkeys are used to eating a mash, however, it may be some little time before they will eat it readily. Where the breeding stock is confined to a breeding pen it is well to sow some green crop such as grass, oats, rye, wheat, barley, clover or alfalfa. It is not desirable to feed the breeding stock on corn alone for a grain. Wheat and oats are the best grains for the purpose. The laying hens should also have access during the breeding season to grit and charcoal and also to oyster shells for the purpose of furnishing shell-forming material.

It is especially necessary to supply grit when the soil does not contain much gravel. Charcoal is an excellent aid in keeping the birds in good condition as it is a good corrective for digestive troubles. Unless the birds have access to a stream of water, it is necessary to provide fresh water daily in a pan, pail or other receptacle which can be kept clean. Stagnant water is bad for turkeys, and they prefer to drink from a stream. Such a stream is therefore a valuable asset on a farm where turkeys are raised.

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Winter Shelter for the Breeders

Many turkey raisers provide no shelter whatever for their breeding stock even during the winter, allowing the birds to roost in trees or upon roosts especially prepared for them. This is particularly true in the more southern localities. In the North where the winters are severe some form of shelter should be available as a protection to the birds. This may not be used during most of the winter but should be available so that the birds can be driven into it during severe stormy weather especially during sleet or ice storms.

Turkeys can stand a greater degree of cold than hens, but like them they are more susceptible to a damp cold than to a dry cold. During severe sleet storms the turkeys roosting in the open sometimes have such a coat of ice frozen on them and become so stiffened that they may be blown from their roosts and injured in their fall to the ground. Any shed or barn can be utilized as a shelter for turkeys during storms. Where turkey houses or sheds are provided they usually take the form of a shed with most or all of the south front open. Such sheds may be used to shelter the breeding stock during all of the winter season, but as soon as the weather moderates in the spring the birds should be turned out of the house and made to roost outside. This they will readily do and will keep in better health as a result.

Where turkey houses are used it is necessary to keep the interior of the house very clean, removing the drop-

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pings regularly, and to provide plenty of litter if the health of the stock is to be maintained. Where only a few turkeys are kept they are sometimes allowed to roost in the chicken house with the chickens. It is best, however, not to allow turkeys to roost with fowls as they will do better when they are kept separate.

A satisfactory turkey house, built especially for that purpose, is one 30 feet long and 16 feet deep. The front wall is 9 feet high and the rear wall 6 feet, the roof being of the single slope or shed roof type. The foundation is concrete and the floor is board. The walls are a single thickness and may be either of matched boards, of barn boards with the cracks battened or of barn boards covered with paper. The house is tight on all sides except the front, where there is an opening 3 feet wide extending clear across the house. This opening is placed 4 feet from the floor and 2 feet from the roof. It is, of course, covered with wire netting. A wide door is provided in the middle of the front. A dropping board runs along the rear of the house 3 feet from the floor and roosts are placed above this. The floor is covered with a thick layer of straw which is changed weekly. During the cold or stormy weather the turkeys are driven into this house each night and if the weather is particularly bad they can be kept there for a day or two, feeding them inside. Ordinarily, the turkeys are fed outside the house. A house of this size will accommodate 60 turkeys very nicely and more can be kept in it for limited periods.

16
30
48
48
60

57
8-17-18
more for limited periods

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Breeding and Laying Season

The breeding season for turkeys usually begins in the South in the early part of February and in the North nearly a month later. Laying usually begins in a week or ten days after the turkey hen has mated for the first time. A single mating suffices to fertilize all of the eggs in a litter but usually the hen mates several times before she begins to lay. The greater proportion of the matings occurs either early in the day, soon after the birds have come down from the roosts, or later in the day, not long before they go to roost again.

The number of eggs which a turkey hen lays will depend upon several things: First of all upon her age; secondly, upon whether it is a first, second, or third litter, and, thirdly, upon the individuality of the hen herself. The hens do not all begin laying, of course, at the same time and variation in this respect may be as great as six weeks or two months from the time the first hen begins to lay until the last starts. Pullets, as a rule, begin laying slightly earlier than do yearling or older hens. The average number of eggs in the first litter is about 18 but individual hens may lay anywhere from 12 to 30 eggs. The number of eggs laid in the second litter is smaller, being about 12, while in the third litter the average number will not be much over 10.

The following table gives the individual records of laying of a number of females which were kept under close observation. Attention is called to the fact that the num-

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ber of yearling hens, which is two, is too small to attach any great significance to their average. The same may be said of the three November-hatched pullets. It is a matter of interest that these November-hatched pullets began laying May 1, 2 and 5.

<i>Spring Hatched Pullets</i>				
	1st litter	2nd litter	3rd litter	Total
No. 1.....	17	—	—	17
" 2.....	18	14	—	32
" 3.....	14	10	11	35
" 4.....	20	10	9	39
" 5.....	25	—	—	25
" 7.....	19	—	—	19
" 8.....	17	—	—	17
" 9.....	18	12	—	30
" 10.....	17	—	—	17
" 12.....	22	11	—	33
" 14.....	16	9	—	25
" 15.....	16	13	—	29
" 16.....	18	17	—	35
Average.....	18 $\frac{3}{13}$	12	10	—

<i>November-Hatched Pullets</i>				
	1st litter	2nd litter	3rd litter	Total
No. 18.....	17	—	—	17
" 19.....	12	—	—	12
" 20.....	17	—	—	17
Average.....	15 $\frac{1}{3}$	—	—	—

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<i>Yearling Hens</i>				
	1st litter	2nd litter	3rd litter	Total
No. 6.....	31	15	—	46
“ 11.....	21	14	—	35
Average.....	26	14½	—	—

Some turkey hens, especially if they are broken up and not required to sit, can be made to lay as many as four or five litters, but this is not a practice to be recommended for the reason that poults hatched after the first of July do not have time to develop into suitable turkeys for the market at Thanksgiving or Christmas and will not be well enough grown to make suitable breeders the following spring. Occasional hens lay throughout the summer without becoming broody and may lay 100 or more eggs. Most of the eggs are laid in the morning, although occasional eggs will be laid in the afternoon.

When the laying first begins it progresses at the rate of an egg every other day until two or three eggs have been laid when the rate usually quickens to an egg each day, although days may be skipped now and then through the laying, particularly on the day before laying the last egg of the litter. When the hen first begins laying she usually leaves the nest within an hour or two after the egg has been laid. As the laying progresses, however, she stays longer and longer on the nest after laying until she is really sitting by the time the last egg is laid. This is well illustrated by the following table which shows the time at which the eggs of a clutch were laid by a turkey

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hen, and the length of time she remained on the nest after she had laid.

A hen that begins laying in the middle of March generally finishes her first litter early in April, and when broken up will finish her second litter late in April and her third late in May, although, of course, this depends to a large extent on the number of eggs she lays in each litter and upon the promptness with which she is broken up after she becomes broody. Oftentimes when hens are allowed to sit and hatch out and raise their brood of poults after they have laid their first litter of eggs they will begin to lay again in the fall and will hatch poults at that time if allowed to do so. This is not desirable, however, for poults hatched at this time are not very valuable and require entirely too much time and care to raise them during the cold weather.

Fall hatched pullets will often begin laying the following spring but on account of the smaller size and unevenness of their eggs, they do not make desirable breeders. It is not a difficult matter to break a turkey hen of broodiness. If she is confined to a slat bottom coop, she can usually be cured of her broodiness in two to four days. After being broken up and let out she will mate again in a short time and often begin laying in about a week.

Locating Stolen Nests

Where the breeders are given free range the turkey hens generally steal off and select the nesting place where

Time at Which Eggs are Laid

Date	Time leaving nest		Date	Time leaving nest	
	Time of laying	Time leaving nest		Time of laying	Time leaving nest
Mar 27	3:00 p m	4:00 p m	Apr 6	9:00 a m	2:00 p m
Mar 29	11:00 a m	1:00 p m	Apr 7	9:00 a m	3:00 p m
Mar 31	8:30 a m	10:00 a m	Apr 8	10:00 a m	4:00 p m
Apr 1	11:00 a m	1:00 p m	Apr 9	10:30 a m	4:00 p m
Apr 2	4:00 p m	5:00 p m	Apr 10	10:00 a m	6:00 p m
Apr 3	11:00 a m	12:30 p m	Apr 11	10:00 a m	6:00 p m
Apr 4	8:30 a m	9:30 a m	Apr 12	*7:30 a m	—
Apr 5	9:00 a m	3:00 p m	Apr 14	**——	—

* Sitting

** Date of laying last egg.

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they will lay their eggs and hatch the poults. If a good enclosed breeding yard is available where there is little or no danger of loss of the eggs as the result of predatory animals of any kind, it is not a bad practice to allow the hens to steal their nests. This is particularly true of wild turkey hens which are inclined to be badly disturbed by having their nests moved or by being bothered too much while they are sitting. Usually there is considerable danger of loss of the eggs either due to their becoming chilled early in the season or else to their being destroyed by some marauding animal such as skunks, opossums, rats, crows, dogs, minks, coyotes, wolves, foxes, cats and snakes. Some of these marauders may also destroy the sitting hen herself.

It becomes desirable in most cases, therefore, to locate stolen nests for the purpose of removing the eggs as they are laid, although it is always necessary to leave a nest egg or two so that the hen will come back to the nest to do her laying. Stolen nests can be located by following the hen when she separates from the flock for the purpose of going to her nest to lay, but this is rather a tedious process as she often proceeds to the nest in a very leisurely and round about manner, feeding as she goes. It is also necessary to make sure that the turkey hen is not aware of the fact that she is being watched, as in that case it is very difficult to get her to betray the location of her nest. Sometimes a bell is hung about the necks of turkey hens and this serves as a help in locating stolen

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nests as well as helping to locate the hen with her brood later in the season.

The best way to locate stolen nests is to confine the hens in question in the morning after they come down from the roosts and to keep them there until late in the afternoon. This necessitates their holding back the egg which they would probably have laid in the morning, and as soon as they are let out in the afternoon they will go straight to their nests in order to deposit the egg which they have been holding.

Turkeys love to locate their nests in a secluded place such as thick undergrowth or piles of brush. They also show evidences of their wild ancestry very plainly in the way in which they cover up their eggs with leaves when they leave the nest. Usually the nests are so cleverly concealed in this manner that a person can walk right by without being aware that a nest exists. If attractive nesting places are provided about the house or barn, turkey hens will sometimes lay in them. This is more likely to be the case in the North where there may be snow on the ground when the laying first begins, as during the time the snow stays on the ground, the turkey hens are less inclined to roam very far.

Suitable nests can easily be made from boxes or barrels or by scooping out a little earth from the ground so as to form a nest. A barrel laid on its side with a nest of hay or straw formed in it is one of the favorite nesting places of turkey hens. If barrels or boxes with nesting material in them are placed in secluded but not too far distant

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places the hens will often select them as a nesting place when stealing their nests. This proves to be a great convenience as it will save considerable time in hunting for stolen nests. Not infrequently two or three hens may lay in the same nest. In this case, of course, it will be necessary to gather the eggs as they are laid, leaving only a nest egg or two, as too many eggs will be laid in the nest for one hen to cover properly when hatching.

Care of Eggs for Hatching

Not infrequently the poor results which are obtained in hatching turkey eggs may be due to carelessness in gathering or caring for the eggs. No matter how the eggs are to be hatched, whether under a turkey hen, chicken hen or an incubator, it is usually best to gather the eggs as they are laid, leaving only a nest egg or two except in those cases where the hen has stolen her nest in a safe location and where it is desired to let her hatch out her brood. Gathering the eggs in this way will prevent loss from crows or predatory animals and will also prevent the chilling of eggs during the cold weather early in the season.

If the weather is especially cold the eggs should be gathered as promptly after laying as possible in order to prevent chilling or freezing. As the eggs are gathered they should be dated so that they will not be held too long before they are set. Never hold turkey eggs over two weeks before placing them either under a turkey hen,

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a chicken hen, or in the incubator. Eggs for hatching should be held at a temperature somewhere around 50 or 60 degrees. They should also be turned daily in order that the yolks may not stick to the shell. In handling the eggs be as careful with them as possible so as not to jar them or crack the shell.

CHAPTER IV

Incubation of Turkey Eggs

Period of Incubation.—It requires on the average about 28 days for turkey eggs to hatch. As with any other class of poultry, however, this varies somewhat. The first egg generally pips early on the 27th day and the first poult may be hatched on that day. The hatch should be well completed at the end of the 28th day. In some cases, however, the hatches may be completed slightly before this and in some cases the hatch may not be complete before the end of 30 days. It is common practice to test turkey eggs twice during incubation as in the case of hens' eggs for the purpose of detecting and removing infertile eggs and dead germs. This testing should be done on the 10th and 20th days.

Testing may be done in a dark room, proceeding exactly as with hens' eggs and using a tester similar to that which comes with an incubator. Testing may also be done by means of a tube similar to an ordinary paste-board mailing tube which is cut out at one end so that the egg will fit closely against it. This tube is held up to the eye toward the sun and the egg placed at the other end of the tube. In this position the sunlight shines through and the condition of the egg is easily seen. Such a tube tester

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is more convenient for use when the eggs are set under turkey hens and are scattered about the farm in various places, as it enables one to do the testing at the nest.

Fertile eggs can be recognized the same as with hens' eggs by the fact that the germ appears as a movable spot from which blood vessels radiate out. If the germ is dead it will usually be attached to the shell and the blood will have settled away and formed a ring a quarter or half an inch away from the germ. Infertile eggs will show perfectly clear except for the shadowy outline of the yolk. Any infertile eggs tested out should be saved and used in feeding the young poults when they hatch.

Methods of Hatching

Turkey hens are reliable sitters, and if they are properly managed, will undoubtedly give the best results in hatching the eggs. This may be due to the fact that turkey hens sit more closely on the eggs than do most chicken hens, as this treatment seems to be favorable for a good hatch of turkey eggs. In addition to using turkey hens for the purpose of incubating the eggs it sometimes becomes desirable to make use of chicken hens or, more rarely, incubators. This is often done to save time when a number of turkey eggs have accumulated before any of the turkey hens have finished laying their litter and are ready to sit.

It is also frequently done when it is desired to break the turkey hens up when they become broody in order to

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cause them to lay a second and third litter so that more eggs for hatching will be available and more poults can be raised. Some turkey growers hatch the turkey eggs in incubators entirely, even though they use the turkey hens to brood the poults. The idea in this case is to save the condition of the hens by not confining them and subjecting them to the long period of inactivity while they are hatching. Since it is by all means desirable to give the poults to turkey hens to raise, it is good practice to set a sufficient number of turkey hens about a week before the eggs, which may be under chicken hens or in an incubator, are due to hatch. These hens may be given a few of the eggs from the incubator or the chicken hens or they may be set on a nest egg or two. If they are allowed to hatch a few of the eggs themselves it is an easy matter to slip more newly hatched poults under them from the chicken hens or from the incubator. If the turkey hens are not allowed to hatch any of the eggs themselves but are set on nest eggs a newly hatched poult or two can be slipped under each turkey hen at night and in most cases they will mother these poults and others by morning.

Number of Eggs to Set

There should be a very definite understanding as to what constitutes the proper number of eggs to set. Never give the turkey hen or a chicken hen more eggs than she can cover well. Turkey hens will ordinarily cover from 15 to 18 eggs to good advantage, depending on

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the size of the hen, while chicken hens of the general purpose type such as the Plymouth Rock will cover from 8 to 10 eggs. Unfortunately, in an effort to utilize the turkey or chicken hens to the fullest advantage, there is a great tendency to place more eggs under them than they can properly cover. The result of this is that one or more of the eggs is considerably exposed to the weather and is likely to become chilled. As the hen moves the eggs around in the nest all or most of the eggs may in turn be exposed to this same condition, with the result that the hatch is entirely spoiled or very poor. It is not infrequent for turkey raisers to try to set from 21 to 23 eggs under a medium sized turkey hen or 13 under a chicken hen. Such a practice will not give good results.

Nest for Sitting Hen

In constructing or preparing a nest for sitting turkey or chicken hens it is best to make it on the ground. A little earth can be hollowed out of the ground so as to make a depression deep enough to keep the eggs from rolling out of the nest. Clean straw or hay can then be used as a thin covering over this hollow to form a nest and to prevent the eggs from being directly on the ground. A good-sized roomy coop should be placed over the nest and the hen to keep her from being disturbed.

Where only a few hens are kept and where there is little danger of loss of eggs or of the hen being disturbed by marauding animals, good results will be obtained by

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letting the hens steal their nests. As a rule, however, it will be found much more convenient and much more satisfactory to set the hen in a nest which has been prepared for her and which will, therefore, be more convenient and more protected. This is especially true when a number of hens are to be set, as this will allow a row of nests to be made on the ground next to one another but separated with solid board partitions, and will greatly facilitate taking care of the sitters. Where a number of hens are set close together it is necessary to be careful when they are let off that they go back on their own nests and that two hens do not try to crowd on the same nest, leaving the eggs in one nest to become chilled.

Where only a few hens are set they can be placed some distance apart, which will prevent the occurrence of this difficulty. Often nests are prepared for sitting hens in boxes or barrels laid on their side and so arranged that the opening can be shut to protect them from marauding animals. Where nests are made in a barrel it is well to bore holes in the bottom so that if the rain beats in and the barrel is tight, the water will drain out and the eggs will not lie in water. Where nests are made in boxes or on wooden floors it is well to use if possible sod or soil in the bottom of the nest, as this holds some moisture and seems to give more favorable conditions for a good hatch. Nests prepared for laying hens or for sitting hens should be roomy enough so that the hens can go on the nest to lay, turn around, and come off without breaking the eggs.

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Setting the Hen

A turkey hen shows that she is ready to sit when she becomes broody and stays on the nest for two or three nights in succession. She may then be trusted with the sitting of eggs. If, as is usually advisable, it is desired to move the hen from the nest which she has selected to another which has been prepared for her, she should be moved to the new nest after dark, given a few nest eggs and shut on the nest so that she cannot go back to the old one. If she seems to be contented on the new nest and sits quietly she can be allowed to come off on the evening of the following day and the sitting of eggs placed in the nest. In most cases on being let off the nest she will return to the old nest. If she does so, it is, of course, necessary to carry her back to the new nest and confine her there. In most cases she will immediately settle down on the eggs and seem to be contented. It may happen, however, for two or three days longer, that when she is let off in the evening she will return to the old nest. Each time she does so it is necessary to carry her back to the new nest but after three or four days at most she will become used to the new nest and will remain there.

Management of Sitting Hen

When left to themselves turkey hens frequently stay on the nest for two or three days at a time without com-

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ing off for feed or water. It is best, however, when they are confined to a coop, to give them an opportunity to come off of the nest each day. This will give them an opportunity to stretch their wings and to walk around and fly a little, and this exercise rests them and helps to keep them in the best of condition. Sometimes turkey hens sit so closely that they will not come off at all of their own accord and will starve unless they are made to come off for feed and water. Whole corn is one of the best feeds for sitting hens and as much of this as they desire should be given them once a day when they are let off the nests. Fresh water should also be provided at this time as well as a supply of grit.

Should any of the eggs in the nest become broken and soil the others, or if they should become badly soiled in any other way it is best to clean them by washing with a cloth dipped in luke-warm water. The nesting material must also be kept clean. Just before the poults are due to hatch it is good practice to remove the old nesting material and replace it with new clean straw or hay. If the weather is dry it will usually be found best to sprinkle the eggs which are set under turkey or chicken hens two or three times during the last week of incubation with water heated to blood temperature. It is often good policy to remove the first poults which are hatched, taking them into the house and wrapping them in flannel or leaving them in a flannel lined basket near the stove. If the first poults hatched are left with the hen she sometimes becomes restless before the hatch is complete. The poults

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which are taken away from her can be returned readily after the hatch is complete, putting them under her at night.

Dusting the Sitting Hen for Lice.—In order to keep the hen faithfully on the job it is necessary to see that she is as free as possible from annoyance by lice. To accomplish this and also to prevent the lice from being troublesome to the young poults when they are hatched, the hen should be thoroughly dusted with a good lice powder before she is placed on the nest. Similar treatment should be given to the hen and the nest once a week during the first three weeks of the incubation period. Do not dust her just before hatching commences as the insect powder may prove harmful or fatal to the newly hatched poults. An effective homemade lice powder for use on turkey hens can be made of 1 part crude carbolic acid and 3 parts gasoline, stirring in enough plaster-of-paris to take up all the moisture and to form a dry powder. In mixing this lice powder do not put the hands into the mixture while moist as the carbolic acid may burn them slightly. Sodium fluoride is very effective to use in dusting the sitting hen. Directions for using this are given on page 126.

Hatching with Chicken Hens

In hatching with chicken hens a sitting of eggs should not be entrusted to them until they show by the fact that they have become broody and stayed on the nest for a

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couple of nights in succession that they are ready to sit. When they have shown that they are in proper condition they can then be removed to a nest previously prepared for them and a couple of nest eggs placed under each hen. This should be done in the evening, and if by morning they are still sitting closely and seem to be contented in their new quarters the sittings of eggs can be placed under them. Chicken hens are best set in a house or shed and should be confined to the nest. They should be let off once a day, preferably toward evening, to get a supply of feed and to drink. Whole corn is a good feed for sitting hens. As soon as they have eaten and drunk and have exercised a few minutes they should be put back on the nest if they do not return of their own accord.

Hatching with an Incubator

Turkey eggs can be hatched in an incubator almost if not quite as successfully as hens' eggs. In fact, in many cases turkey eggs will be found to hatch better than the average run of hens' eggs, as turkey eggs when fertile and from good vigorous stock usually hatch very well. One turkey grower has reported as the result of a considerable experience in hatching with incubators that he secures about 60% vigorous poults from the fertile eggs set. Another grower reports much better success than this, as is shown by an instance where 109 poults were secured out of 112 fertile eggs. Any of the different styles of incubators giving success with hens' eggs can be used for turkey

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eggs as well. The thermometer should be so placed that the bulb is about on a level with the top of the eggs. If the thermometer is left in the same position as when it is used in hatching hens' eggs the temperature should be $\frac{1}{2}$ to 1 degree lower than that used for hatching hens' eggs.

A temperature ranging about 102 degrees for the first week, slightly more than this for the second week and 103 degrees the third and fourth weeks seems to give good satisfaction. If the temperature runs up to 104 or even to 105 at hatching time, it will do no harm. If the hatching is completed earlier than with natural incubation, it is an indication that a temperature slightly too high is being used. Beginning with the third day and continuing until the first egg pips, the eggs should be turned twice a day, that is, in the morning and in the evening. During the first week, the eggs do not need to be cooled longer than the time required to turn them leisurely. After the first week and until the machine is shut up for hatching, they should be cooled until they feel cool when held against the face.

In hatching turkey eggs in an incubator it is best to use considerable moisture. A good practice in this respect is to sprinkle the eggs with water warmed to about blood temperature each day during the last week right up to the time the eggs pip, and if the weather is warm and dry a dish of warm water should also be placed on the bottom of the machine under the egg trays. Poults hatched in an incubator seem to be quite as healthy as those hatched under turkey or chicken hens. An incubator will accom-

FIG. 23. Comparison of the size and shape of turkey, guinea and hen eggs. Two turkey eggs on the right, guinea egg on the left, and hen egg in center. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 24. Enclosed run for turkey poults made by using a wagon box. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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moderate approximately three-fourths as many turkey eggs as it will hens' eggs.

A good idea of the size of turkey eggs can be secured from the following weights of eggs laid by Bronze females in a well-bred flock. The medium-sized eggs weighed $2\frac{3}{4}$ lbs. per dozen, while the smaller eggs weighed $2\frac{1}{4}$ lbs. per dozen. Eggs from a good-sized pullet weighed $2\frac{1}{2}$ lbs. per dozen and eggs from a 25-pound hen, one of the largest in the flock, weighed 3 lbs. per dozen. As compared with this, average sized hens' eggs weigh $1\frac{1}{2}$ lbs. per dozen.

CHAPTER V

Brooding and Rearing the Young Stock

Causes of Loss among Poults.—The proper brooding and care of the newly hatched poults is perhaps the most important factor in raising turkeys successfully. The greatest part of the loss of young turkeys occurs when the poults are less than a week old. Comparatively few are lost after they have attained an age of one month except, of course, where there is a disease epidemic. Under ordinary conditions with fairly good care about 50% of the poults hatched out will be reared. This means about seven poults for every turkey hen that hatched out a brood. Experienced and very careful turkey raisers who give their young stock special care and who understand the nature and the needs of the turkeys are able to raise a higher percentage than this. The following may be given as the principal causes of heavy losses among young turkeys:

- (1) Exposure to dampness and cold.
- (2) Improper or over feeding.
- (3) Too close confinement.
- (4) Lice.
- (5) Predatory animals.

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(6) Inherent weakness due to carelessness in the selection of the parent stock or to careless breeding.

(7) Disease.

Protection for the Poult

When the hatch is completed and the young turkeys begin to run about outside the nest it is time to move the turkey hen and her brood to a suitable place which should have been prepared for them previously. Such a coop must provide the brood with shelter from the rain, should have sufficient room to allow the turkey hen to stand up and to walk about, should be so constructed that it can be closed at night so that animals cannot get at the turkeys, and at the same time must provide plentiful ventilation.

Any type of coop which embodies these requisites will be found satisfactory. One coop should be provided for each hen and her brood, and there should never be any attempt made to place two hens together in the same coop. A coop 3 by 6 feet or one 4 feet square will be found a suitable size for a hen and brood. One successful turkey grower recommends the use of a coop which is 36 by 40 inches and only 12 inches high. This particular coop has a galvanized iron top with slats all the way around the outside. The idea of using a low coop is that it compels the hen to squat or sit so that as long as she is confined to the coop the young poults can crawl under her if they become chilled and will not find her standing up, when

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she might refuse to hover them. If it is desired to confine the poults to this coop for a day or two this can be readily done by placing 6 or 8-inch boards against the outside of the coop.

Sometimes a pen made of 12- or 14-inch boards laid on edge or a wire pen is used in connection with the coop where the hen is confined. Such a yard is used to confine the poults until they are old enough to fly over, at which time both the poults and the hen are given their liberty. The coops should not be placed too close together but should preferably be scattered about over the well-drained portions of the farm where there is an abundance of tender green feed and other natural feed such as weeds and insects, especially grasshoppers. It is likewise desirable to locate the coops where the grass is short. This accomplishes the double purpose of insuring tender green feed and also of causing less difficulty from the poults getting chilled going through the long wet grass. Where the grass is short it is possible to let the poults out earlier in the morning.

It is often desirable to locate the coops where they can be readily seen from the house and where it is easy to attend to them. This is particularly true when the work of caring for the turkeys falls to the lot of the housewife, as it makes her work convenient. The coop should be so constructed that it can be easily moved, and it should be an unvarying practice to move the coop each day to a fresh location so that the ground upon which it is placed will be kept clean and sweet and there will always be an

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opportunity for the hen and her young to secure a supply of fresh green feed inside the coop. For this reason the coops should be without floors.

The necessity for plentiful exercise for the poults cannot be over emphasized. For this reason they should be allowed to run whenever possible. Of course, it is folly to let the young run out in rainstorms if this can be avoided, but whenever the weather is suitable they should be allowed to run even when it is necessary to confine the hen. If there is a long continued period of bad rainy weather, it will be found as a rule better policy to confine the hen but to allow the poults to run out whenever it is not actually raining, even if they do have to range through damp grass. Since the hen is confined the poults will not range far and can always return to her and she will be ready to hover them and warm them up if they become chilled.

A well-drained location, such as a sandy or light soil, is very desirable in order to keep the interior of the coop perfectly dry. A location where there is some protection from heavy winds is also desirable. If it becomes necessary on account of the weather to confine the hen for a week or more, this can be done provided she is given proper care by being fed and watered and that the coop is moved to fresh ground each day. When the weather is warm and dry, as is more likely to be the case with the poults hatched later in the season, it is not necessary to provide shelter for the hen and poults. In fact, they will be likely to do better in the open. It is, however, advisa-

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ble to keep them for the first three or four days within a fenced enclosure such as a garden until the poults gain sufficient strength so that they can keep up with the hen without any difficulty. Sometimes the turkey hen instead of being shut in a coop is tethered out to a tree or post for the first few days by means of a cord fastened to one leg. For convenience in moving the hen and her brood to fresh ground each day, the cord by which she is tied may be fastened to a weight too heavy for her to move.

Under favorable conditions the hen and brood can be allowed to run at liberty after the third or fourth day. It is most desirable, however, to keep the youngsters out of the heavy dews of the morning and to protect them from rain during the first two or three weeks. After they have reached this age, especially after their backs are covered with feathers, dews or light showers followed by warm sunshine are not serious as the poults will warm up quickly. If a period of cold damp weather sets in even after this age it will be necessary to provide the poults with dry quarters and perhaps to keep them from running at liberty part of the time. Nothing is more serious and fatal to young poults than becoming thoroughly wet and chilled. Occasionally young turkeys will get caught in severe rainstorms and not be properly hovered by their mothers so that they may become thoroughly wet and chilled or even drowned. It is occasionally possible to revive young turkeys that are apparently dead by wrapping them in heated cloths and putting them in the house behind the stove.

FIG. 25. Turkey hen confined to a coop while the poults are allowed to run at liberty. A slat has been removed from the upper part of the coop front in order to show the hen more distinctly. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

FIG. 26. Well ventilated turkey shed used to shelter the hens and their broods during rainstorms. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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While chicken hens are sometimes used as mothers for the young turkeys, and while a few persons have used artificial methods of brooding with some success, the turkey hen is undoubtedly the best mother that can be provided for the young poults. She not only seems to be able to make them understand what she wants them to do but she is very careful in guarding them from any danger and, moreover, while she is ranging she keeps her brood together, not allowing them to become widely separated so that any of them are not likely to become lost. She is especially apt also in teaching them to hunt the kind of food such as grasshoppers and other insects which are especially well suited for their growth and development. Chicken hens are often valuable mothers of the earliest turkeys as they can be confined with their broods to better advantage during the cold, bad, wet weather so likely to be encountered at that time.

It is often desirable in setting turkey eggs to give a sitting to a turkey hen and to a chicken hen at the same time so that they will hatch out together and all of the poults can be given to the turkey hen since she makes a better mother. It is best, however, not to give the turkey hen more than 20 poults as she will raise a considerably larger proportion of this number than if given 30 or 35.

The principal objections to the chicken hen as a mother for turkeys are that she stays too close about the farm buildings, that she weans the young turkeys too early and that she is more likely to give them lice. Turkeys do best when they do not stay too closely about the farmyard and

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also when they are kept separate from other fowls and chicks. It is quite as necessary to keep turkeys and chickens separate as it is to separate hogs and sheep. Sometimes a turkey hen and her brood and a chicken hen and her brood of poults of the same age are put out in coops near one another. This seems to work to pretty good advantage as the turkey hen tends to take the chicken hen and her brood farther away from the buildings while the chicken hen tends to keep the turkey hen and her brood from straying too far. Moreover, when the chicken hen weans her little turkeys at an age which is too early for their best development, the turkey hen will usually mother and care for both broods.

Bowel trouble or diarrhea is a frequent source of difficulty with the little turkeys. The causes of bowel trouble are several and the effects of it on the little turkeys are bad. Bowel trouble may result from overfeeding or from faulty feeding such as improper feeds or sloppy feeds, and may likewise be the result of severe chill. The feeding of boiled rice is claimed by many turkey growers to be a good corrective for diarrhea. It is seldom necessary to keep the hen and poults confined for more than a few days at a time. The sooner they can be given free range the better it will be all around. The question of whether they should be put in the coop at night after they have ranged during the day up to the time they are ready to roost depends both on the weather and the danger that exists of their being killed by marauding animals. Occasional gobblers may prove troublesome in killing young

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turkeys or young chickens, but this is not very common. Where a gobbler shows such a disposition, he must, of course, be kept away from the poults until they get older or else must be disposed of. On the other hand gobblers will occasionally help to brood the young.

Rearing Poults by Artificial Means

When the effort is made to brood turkey poults artificially some people experience difficulty in getting the youngsters to eat, as they seem to go about with their heads up in the air and not to see the food on the ground or floor. To teach these youngsters to eat, a baby chick or two is sometimes put with them and serves by its example to teach the turkeys where to find the feed. It is probable, however, that in most cases where artificial methods are employed there is too great an eagerness on the part of the turkey raiser to get the poults to eat, as they should have nothing until they are two days old. The yolk of the egg which has been absorbed just before the poults hatched furnishes all the feed they need during this period. There is a grave tendency to over-feed poults whether raised by natural or artificial methods but, of course, this is particularly true under artificial conditions where all of the feed for the first two or three weeks at any rate is supplied by the person looking after the youngsters.

Where the effort is made to rear turkey poults by artificial means the usual course followed is to make use of heated brooders such as are used for little chicks. In

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general, the management of the poults in the brooders is just the same as that given to chicks. It is best not to place more than 25 or 30 poults under a hover large enough for 50 chicks. In some cases it appears that the hovers provided for baby chicks are not quite high enough for turkey poults, with the result that they are inclined to develop a leg weakness due to their backs being too close to the source of heat. The common stove brooder with hovers which can be raised can undoubtedly be adapted to raising turkey poults artificially to very good advantage. At first the temperature under the hover should be about 90 to 100 degrees and is gradually reduced as the turkeys grow older until it is down to 70 degrees in about three weeks' time. After the poults are six to eight weeks old they no longer need heat as a rule.

A successful example of rearing turkeys artificially is that of the College of Agriculture of the University of California at its farm at Davis, Cal., where turkeys are run at the rate of about 300 or 400 per acre in yards. Here they are hatched and reared artificially with good success. The newly hatched poults are started upon a moist mixture of equal parts of chick grain and chick mash in which there has been mixed a considerable quantity of very finely chopped tender greens such as onions, etc. A power driven meat chopper or sausage cutter is used for grinding the green stuff and the juice which is extracted in this grinding is used to mix a crumbly mash.

At first the turkeys are fed four times a day, but after a few weeks the feedings are reduced to three a day and

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at about five weeks of age, grain is fed morning and night with a feeding of moist mash and finely cut green stuff at noon. This method of feeding is continued until the turkeys are practically full grown. During the non-breeding season the adult stock is fed almost entirely upon two feedings of grain a day and all of the buttermilk they can drink. During the breeding season the birds are given a crumbly mash at noon in addition to the grain feeds. Plenty of green stuff, grit and shell are always provided. No houses have been used, open air roosts 6 or 7 feet high being erected in each yard. It is planned, however, to erect shed roof houses to furnish shelter from the rain-storms. In view of the fact that the turkeys are kept and reared under confined conditions new blood has been introduced into this flock each year.

Feeding the Poults

Improper feeding, especially when combined with too close confinement, has accounted for many failures in turkey raising. When given free range the poults are exercising all day long in their search for food and are therefore not so likely to be overfed. If the range available is abundantly stocked with natural feed and if the weather is favorable so that the poults can be allowed to range all of the time perhaps the best plan is to allow the hen and her brood to feed themselves. Even under these conditions, however, it is best to have the turkeys come home at night and this can be more

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readily accomplished if they are driven up to a certain place and fed lightly each night. By following this practice they soon learn to come to this point daily of their own accord.

Judgment must be exercised in determining whether or not the range supplies feed enough early in the season, and it is often necessary to continue to supply some feed until grasshoppers become plentiful. Where on account of unfavorable weather or an unfavorable condition of the range or any other cause it seems to be best to keep the poults cooped more or less, great care must be exercised in their proper feeding, remembering that for the first two days after hatching they require no feed. During this time clean fresh water and a little coarse sand with perhaps a little green feed to pick at is all that they will need, but beginning with the third day it is necessary to supply them with feed, the amount required varying according to the amount of natural feed which they are able to secure for themselves outside of the coop. The most careful judgment of the turkey raiser must be exercised in this particular.

The poults must be kept hungry all the time. They should never be fed so much that their desire for ranging in search of feed is destroyed as this will lead to a lack of exercise with consequent digestive and other troubles. If the amount of natural feed which they can secure is very scarce or if it is necessary to keep the poults from ranging outside to any extent, they should be fed lightly about five times a day. If they are allowed to run outside the

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coop and can secure more or less natural feed through their own efforts two or three feeds a day are usually enough. Sloppy feed should never be given to poults.

There is a great variety of feeds used for young poults, all of which may be successfully employed, the particular success attending the different kinds depending to quite an extent upon the person who is feeding. The following common feeds used may be mentioned: (1) Hard-boiled egg chopped fine together with corn bread crumbs for the first few days. After this, whole wheat and hulled oats. (2) Stale bread soaked in milk and squeezed dry. This is used for the first few days and is then replaced with common chick feed. (3) Clabbered milk seasoned with salt and pepper together with corn bread crumbs. (4) Equal parts pinhead oats, whole wheat and cracked corn. (5) Cracked wheat. (6) Corn meal and wheat bran mixed in the proportion of three to one and baked into a bread which should be baked fairly hard and fed in a crumbly condition. (7) Bran or middlings one-half, cracked Egyptian corn one-fourth, wheat and hulled oats one-fourth.

Milk is also a most valuable feed for the poults. Usually skim milk is used for this purpose but whole milk if available can be utilized. The milk is best fed sour as the acid in the sour milk seems to have more or less disease preventive properties. Sour milk can be left before the poults during the morning for a drink, without any water being available, and water given to them during the afternoon. Water or milk should be given to the poults in a

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drinking fountain or in some other manner so that they can have ready access to it, but so that they cannot get into it and get wet. Rolled oats and corn bread crumbs fed in conjunction with sweet milk as a drink where the poults can help themselves to it all the morning has been a very successful feed, the rolled oats being fed at noon and the corn bread crumbs at night. Corn bread seems to be a feed of which the poults are fonder than most any other. Clabbered milk or cottage cheese and bread soaked in milk and then squeezed dry are also feeds which the poults like immensely. Hard-boiled eggs rubbed up with rolled oats makes a very good feed for young poults until they are two or three weeks old. In conjunction with this may be fed clabbered milk.

Another successful feed used by turkey growers consists of ordinary white wheat bread cut up in slices so as to let it dry and then rolled into crumbs. This is moistened with a little sweet or sour milk and fed mixed with hard-boiled eggs. The bread is just moistened and is not sticky or sloppy. Any infertile eggs tested out of the sittings should be saved for this purpose. It is also possible when living near a hatchery to purchase infertile eggs which have been tested out of the incubators and which can be used for this purpose. The wheat bread and boiled egg can be fed for about three weeks, mixing with it occasionally a little rolled oats. After three weeks, rolled oats and chick feed can be gradually substituted and after four or five weeks old they are fed grain sparingly and only at night when they come home. In this connec-

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tion it might be well to state that where it is possible to do so, it is well to feel of the crops of some of the turkeys when they come in at night from the range. If the crops are full very little feed should be given, while if the crops are partly empty, more feed can be used to advantage. Feeling the crop in this way is a guide to the amount of grain which should be given.

Green feed and grit can usually be found by the poults if they range outside of their coop. If they are not available, however, they must be supplied. Chopped onion tops, lettuce leaves, dandelion leaves, kale, cabbage and alfalfa make good green feed. Coarse sand furnishes a satisfactory form of grit. Charcoal should be available to the poults as this is an excellent preventative for digestive troubles. While the hen is confined to the coop she must be carefully fed as well as the poults. To do this give her a feed twice a day of all of the grains such as equal parts wheat, corn and oats, which she will eat up. In addition to this she must be supplied with green feed, water and grit where she can help herself. As an aid to keeping her in first-class condition an occasional feed of meat scrap or fresh lean meat of some kind will be very valuable and is greatly relished.

In feeding the hen while she is confined to the coop be sure to feed her inside while the poults are fed outside of the coop. If the poults are given their feed inside the coop the hen may eat a large part of it away from them, but if they are fed outside it is easier to gauge the amount they are eating and to regulate it more intelligently.

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Lice on Poults

One of the greatest causes of mortality in poults is lice. If they are badly infested they become weaker and weaker and finally die. Head lice are perhaps the most serious. These are found burrowing into the skin on the top of the head above and in front of the eyes and under the throat. If they are discovered it is necessary to grease these places carefully, being sure not to use too much grease as this in itself may kill the poults. For greasing the poults ordinary lard can be used to good advantage or lard to which has been added a few drops of kerosene. A drop of olive oil is also suitable for this purpose. It is best to grease the poults on a warm day or during the warmth of the day. If the effort is made to grease them when it is cold the grease does not spread to as good advantage and one is more likely to use too much grease.

Frequently quite large numbers of small white lice are found in the hollows or creases between the quills of the main wing feathers. While these are harmful to the poults and must be gotten rid of, they are not as serious as the head lice. A little grease or oil applied where the lice are found will be effective in getting rid of them. Body lice such as occur on chickens are quite common to turkeys, but they are not usually found on the young poults, occurring as a rule after they are half grown. For this reason they are not as serious a thing as the head lice. In this matter of lice on poults, as in most of the

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other factors which are responsible for high mortality among young turkeys, there is no reason why it cannot be largely if not entirely prevented, by proper attention at the proper time. If the hen is dusted with some good insect powder during the time she is sitting, as has been explained before, page 74, there should be little if any trouble with lice on the poults when hatched. Examination of the newly hatched poults at frequent intervals for lice, and treatment if found, must not be overlooked. See page 126.

Marking and Pedigreeing Turkeys

It is often desirable to mark little turkeys in some distinguishing manner. The need for this may be that the turkey raiser has two or more separate matings or blood lines and he desires to know from which matings his young stock came in order to guide him in making future matings. For this purpose the young turkeys can be marked by toe punching the web between the toes in the same manner as in chickens. The web in turkeys is not so large as in chickens, but by using care room enough can be found. To make sure that the punch in the web is a permanent mark go over the poults about a week after the punching is done. If any punch marks show signs of growing shut, punch them out again, after which no difficulty will be experienced.

Poults can also be marked, if desired, by means of numbered open pigeon bands, such as are used in pedigreeing chickens, which are put around the leg of the

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poults when hatched and in four or five weeks transferred to the wings. Colored bands can also be used for this purpose, but will require changing several times to a larger size to accommodate the growth of the legs. Permanent marks may also be given turkeys by clipping off the first joint of the toe, the joint carrying the toe nail. By clipping different toes for different matings, a record of the breeding can be kept.

Where the flock of turkeys ranges far and may mix with neighbors' turkeys it is desirable to mark them in such a way that they can be told from the other turkeys. This will prevent disputes as to ownership. The best plan, of course, is to keep the turkeys at home by training them to come home each night to roost. See page 98. Toe marks as explained above, or colored or numbered bands, will serve to identify turkeys, while some varieties, especially whites, can be easily marked by using a dab of colored paint or dye on the back or shoulders. It is quite a common practice for neighbors to make a point of keeping different varieties of turkeys so that the ownership of the birds can be easily established.

Feathering of Poults

When first hatched, the poults like baby chicks are covered with a soft down. In the Bronze variety the poults show a brown color over the back with two parallel, dark brown stripes running from the head over the shoulders and back, the breast being of a yellowish white

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color. This marking is similar to that of chicks from partridge matings. Newly hatched black turkey poults are only partially black, the entire breast being white. Soon after hatching, the wing feathers begin to develop and at two weeks old these are long enough to extend back of the rump when folded and they cover the back, sides and rump. At about 10 days old feathers begin to appear at the point where the wings join the body, and this feathering gradually extends back to the main wing feathers in about a week. In about three weeks the tail feathers begin to appear and should be about an inch long at the end of the first month. At this time the poult is feathered only on the wings and tail, but on account of the wing feathering covering the back, the poult appears to be feathered from the shoulders to the tail. Occasional poults show feathers starting down the middle of the back between the shoulders and down each side of the breast from the neck, at one month of age. Frequently, especially where poults are not making good growth, the wing feathers seem to be unusually long as in the case of chicks under similar circumstances, so that they may touch or nearly touch the ground. This is probably not due to an undue growth of wing feathers but to a poor growth of body. At any rate such a condition gives the poults a weak, sickly, discouraged appearance.

Some turkey raisers feel that it is a benefit to clip off these wing feathers and that by so doing less of the strength of the poult goes into the growth of the feathers. It is a question whether there is any advantage in such a

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practice although the poults with clipped wings seem to get around better and to keep cleaner.

Shooting or Throwing the Red

At four weeks of age no trace of red will be found on the heads or necks of the poults. At five weeks the caruncles begin to form and at six weeks of age a trace of red can often be seen in the caruncles under the feathery down of the neck, and the down begins to be shed at this time from that section of the neck. At about seven weeks of age the red on the under part of the neck can be seen at some distance, particularly in the males, but does not become easily visible on the females until a week later. Too much dependence, however, should not be placed upon being able to differentiate between the two sexes of young turkeys at this time, for it is only by a very careful comparison that their sex can be determined under three months of age.

The appearance of the red on the head and neck is oftentimes termed "shooting the red" or "throwing the red," and this in the opinion of many turkey growers is a delicate period. At this time the young turkeys are inclined to be somewhat less active and some poults may be lost at this stage.

Distinguishing the Sexes

At the age of about three months there appears on the breast of the males a small fleshy protuberance. It

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is from this protuberance that the hair starts to grow about two weeks later which eventually forms the tuft of hair on the breast known as the beard or tassel. While the beard starts growing on the breast of the males at about three and a half months, the females do not begin to grow a beard until they are about one year old. At this age the beard of the male should be from 3 to 5 inches long and grows longer with additional age. Moreover, the beard of the tom is much coarser than that of the hen and at any particular age is much longer. The feathers on the neck of the male stop far down while on the female there is usually a light growth of feathers extending along the back of the neck to the top of the head in a rather narrow strip.

The fleshy protuberance which grows just above the beak and which is sometimes termed the dewbill or snout is larger and more elastic in the male than in the female. In toms under one year of age there is only a short blunt knob on the inside of the shank. As the bird grows older this develops into a stout spur. In the case of the hen, however, there is only a rudimentary spur or small button found. In the tom the breast bone tends to be more or less in a straight line, while in the hen it is as a rule curved to a greater extent, thus forming a rounder breast. Of course in the case of the Bronze and Bourbon Red, the breast and body feathers of the female are tipped with white, while the feathers of the male show no white tipping in these sections.

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Management of Growing Turkeys

As soon as the young turkeys are six weeks old they are old enough to go to roost. Most turkey raisers allow the birds to roost out in the open in trees or on fences. Some turkey raisers, however, build roosts especially for them. If high winds are prevalent it is well to build the turkey roosts next to the barn or some shed which will afford protection from the wind. It is natural for turkeys to roost high and it is well therefore to construct the roosts for them set up on posts at least 5 or 6 feet from the ground. Often they are built higher than this, sometimes as high as 8 or 10 feet. In the latter case, however, it is necessary to provide roosts of intermediate height or cleated runways by means of which the younger turkeys can get up to the higher roosts. High roosts are desirable since they protect the birds from loss due to foxes or coyotes. In sections where difficulty is experienced owing to thefts of turkeys, it is well to construct the roosts near the residence so that any disturbance can be heard. Sometimes a guinea chick or two is raised with the turkeys and will remain and roost with them. If there is any disturbance during the night the guinea will make a great uproar and serve as an alarm.

It is possible to teach the young turkeys to roost wherever desired. This is done by driving them up to the place where they are to roost and feeding them there just before dark. If they are held in this place until dusk falls they will then go to roost on the places provided for

FIG. 27. Turkey roost constructed in the trees. Note the cleated incline leading up to the roosts to enable the young birds to reach them. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 28. Flock of turkeys gone to roost. Notice the inclined ladders to provide easy access to the roosts. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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them. By repeating this a few times the turkeys will learn to come to this particular spot to be fed and will roost on the roosts provided for them of their own accord.

During the summer and the early part of the fall there is a great abundance of feed suitable for turkeys which they can get through their own efforts if they are allowed to range. It is this fact which makes the raising of turkeys, after they have passed the danger point, such a simple and such a cheap process. The feed which they are able to secure consists of the various weed and grass seeds, the grain which has been shelled in the field, green vegetation and all kinds of insects, especially grasshoppers where they are abundant. In parts of Texas, wild grapes are plentiful and the turkeys eat these readily. Moreover, during the fall the turkeys will eat quantities of nuts such as pecans, beech nuts and acorns if these are available, and with a plentiful supply of this feed they will fatten to good advantage of their own accord. Where this natural feed is abundant, therefore, it is unnecessary to provide the birds with any other feed except such as may be given them each night in order to teach them to come home to roost.

In order to prevent, insofar as possible, the trouble which may occur due to the turkey flock ranging over the neighbors' farms, it may in some cases be desirable to feed more heavily than would otherwise be done in order to reduce their desire for ranging. Even with this precaution, however, there is a decided tendency for them to

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range a long way. This can be prevented to some extent and probably most effectively by driving the turkeys into a fenced enclosure such as might be used for a breeding pen in the spring and keeping them there until about noon. During the warm weather the turkeys do most of their ranging in the morning. During the heat of the day they are inclined to stay in the shade and not range very far. By confining them during the morning, therefore, they will not start ranging until late in the afternoon and are not likely to go very far. If the practice is made of feeding the turkeys each morning in the pen where they are to be confined, they will go there of their own accord when they come down from the roosts and no great trouble will ensue in shutting them up. Clipping the flight feathers of one wing will prevent them from flying out of the pen.

It may sometimes pay, if a considerable flock of turkeys is reared, to hire a boy or two to herd the birds. This will make it possible to protect the flocks from the attacks of any animals and will also prevent any difficulty from the birds going on neighbors' farms without permission. It also makes it possible to drive the birds and keep them in any particular field where the insects may be bad and where they can do the most good. With someone to look after the flock of turkeys and keep them within bounds, there will often be calls from the neighbors for the flock to be turned into fields where they are having trouble with grasshoppers or other insects, and

FIG. 29. Pens used to confine the turkeys during the mornings in order to keep them from ranging so far from home. By feeding them regularly they soon learn to go into the pens each morning of their own accord. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 30. Turkey hens with their broods on free range. Note the bell on the hen at the left.
(Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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this provides additional room and sources of food supply for the flock.

It is desirable to arrange the hatching in such a way that two or three turkey hens with broods of about the same age can be turned out to free range at the same time. If they are turned out together in this manner they usually remain in one flock, which makes it easier to hunt them up and care for them than would be the case if each brood was by itself. It is not, however, desirable to turn more than two or three broods into one flock as there is a tendency for the poults all to try to crowd under one or two hens to be hovered, with the result that this is not properly accomplished. Occasionally one or more hens has a bell hung around its neck. This serves a useful purpose in making it easier to locate the flock of turkeys at night when they are to be driven home or at any other time when it is desired to find them. The young turkeys usually remain with their mother until October or November, when they are weaned. At this time the males usually separate from the females and range by themselves.

CHAPTER VI

Marketing

Time of Marketing.—The two principal times of year when turkeys are in great demand are the Thanksgiving and Christmas holiday seasons. It is at this time that the great majority of turkeys is shipped to market as the demand for this class of poultry is especially heavy. Turkeys in lesser quantities are shipped to market at other seasons, but compared with the Thanksgiving and Christmas trade this casual shipment is of very minor volume and goes principally to supply hotel and restaurant trade. Usually there is more or less of a surplus of turkeys for the Thanksgiving and Christmas markets accumulating between these two dates, which is put into cold storage and is later withdrawn as the demand occasions, largely to supply hotel and restaurant trade.

Size of Young Turkeys.—Where some standard variety is kept and where the stock is strong and vigorous and the youngsters have been given an opportunity to make good growth, there should be no difficulty in getting cockerels to weigh 15 to 20 pounds and pullets 12 to 14 pounds for the Thanksgiving market, or in other words at an age of five to six months. Many of the ordinary mongrel flocks will of course fail to reach these weights,

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while occasional individuals of any of the standard varieties will also prove to be small or slow growers.

Principal Markets and Market Demands

The principal markets are, of course, the large cities. The highest priced markets are those of the large cities of the East such as New York, Boston and Philadelphia. There are no special demands for particular classes of turkeys other than the fact that a medium-sized bird is in general in greater demand than the larger birds. As these latter are suitable only for exceptionally large families or for hotel or restaurant trade after the Thanksgiving and Christmas holidays the demand for larger birds is not nearly so good and for this reason any exceptionally large fowls should be shipped for one or other of these occasions. Occasionally there is a demand for turkey broilers, that is, young turkeys weighing two or three pounds, but this demand is very limited and the supply of turkeys which will be sold at this age is also very small. It will ordinarily pay the turkey grower better to raise his turkeys to a larger size than to turn them off as broilers. Sometimes late hatched birds can be disposed of in this manner to good advantage.

Most of the markets prefer dry picked turkeys and while most consumers prefer a yellow carcass, still the color of the skin and legs has little or no effect on the market demand. In this connection it might be stated that the Black turkey, contrary to the expectation of many

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people, dresses out into a nice plump yellow carcass. Most of the markets at the present time demand dressed turkeys to be picked clean, although there is a considerable demand for birds in which the largest feathers after the flights are pulled, that is, the flight coverts, have been left on the last joint of the wings. This demand has grown up from the custom of cutting off the last joint of the wing and using it for a brush about the kitchen.

There is also a very limited demand for turkeys to be marketed with the feathers on. This is true especially with large toms. These birds are utilized for hanging out in front of restaurants or retail shops. If the turkey grower makes any effort to dress turkeys for the market he should get in touch with the dealer through whom he expects to market in order to learn what the preferences are with respect to the manner of dressing.

Fattening Turkeys

The usual custom in fattening turkeys for the market is to begin to feed them heavily about November 1. The results of this are not the best. Beginning to feed heavily at this date without accustoming the birds gradually to the heavy feeding is likely to cause scours or bowel trouble with the result that the birds get out of condition and do not fatten as well as expected. Another difficulty caused by the heavy feeding at this time is the prevalent custom of using new corn. If the birds are gradually accustomed to new corn they can be fed

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on it quite heavily without bad results, but to feed it in considerable quantities at the start is very likely to cause scours.

A better practice in fattening is to begin feeding for this purpose at night and morning about October 1. At first the feeds should be light so that the birds will go away feeling a little hungry. As they become used to being fed the amount can be gradually increased until during the week previous to sending them to the market they can be given all they will eat up three times a day. Corn is the grain which is most commonly used for this purpose and is excellent especially during the latter part of the feeding when the weather is cooler. Some turkey raisers feed wheat and oats during the first part of the fattening period and gradually change to corn with the cooler weather. It will be found that not all turkeys are fattened with equal facility and the usual practice is to pick out the birds which have fattened and are in pretty good shape for sending to the Thanksgiving market and to continue to feed the others in order to get them in better shape for the Christmas market. Sometimes also it is good policy for the turkey raisers if they have lots of feed on hand and if their turkeys are a little late or not in prime condition, to hold them over past the Thanksgiving market so as to have a longer fattening period to put them in better condition. As a rule more attention is paid to fattening and finishing the turkeys by the raisers in the North. As a result of this the southern turkeys are inclined to run poorer in quality and it is for this

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reason that the northern raised turkey is in better repute on the market.

While the turkeys in the best condition for marketing should be selected to send to the Thanksgiving and Christmas markets, it is necessary here for the turkey raiser to use judgment in not selecting all of the best birds of the flock for this purpose. In other words, he should pick out the strongest, most vigorous, best grown, early maturing birds to reserve as breeders. Failure to do this and to send all such birds to the market simply because they are in condition will result in his having a lot of small, less thrifty, late maturing birds left for breeders, and this will of course lead to deterioration in his flock.

Sometimes the effort is made to fatten the turkeys by penning them in a relatively small enclosure and feeding them there with the idea that by preventing their ranging they will not use up so much of their energy in this way and more of the feed will go to flesh. While turkeys penned in this manner usually eat well for a day or two, after a few days they are likely to go off their feed, lose their appetites and lose flesh rather than gain it. For this reason it is not well as a rule to attempt to pen the turkeys when fattening them, but they should rather be allowed to continue on free range where they will keep in better condition and will be eager for their feed and, therefore, more inclined to fatten to good advantage.

Where turkeys have free range under conditions where there are large quantities of nuts such as beech nuts, chestnuts, pecans and acorns, little attention need be given to

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fattening the turkeys. With an abundance of material of this sort the turkeys will fatten themselves and can be marketed in fairly good condition.

Caponizing

As a class the young males are harder to fatten than the females. They are especially hard to get in good market condition by Thanksgiving time. This is due in part to the fact that they have larger frames and that it requires a longer feeding period to flesh them in good shape. It is likewise due to the fact that the young males are inclined to separate from the flock and to range by themselves over a much wider area, and this increased activity on their part makes them more difficult to fatten. While caponizing has never been practiced to any great extent on turkeys it is no more difficult an operation than is the case with common fowls and is performed in the same manner and with the same instruments. The result of the operation is to render the males quieter in disposition. They do not gobble or strut. It is probable that on account of the quieting effect it has on them that they would not be inclined to separate from the flock, as do the uncaponized males, and that they would not, therefore, range so far. For this reason it would probably be somewhat easier to fatten the turkey capons, especially in time for the Thanksgiving market. Uncaponized young toms are as a rule in much better condition in January than they are in November.

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Selling Turkeys Alive

The majority of turkey raisers sell their birds alive. This is true in practically all cases except for local trade, and in some sections of the country where the areas of production are situated fairly close to the large markets such, for example, as New England and New York State. The usual manner of selling is for the producer to ship his turkeys by express if he is fairly close to a good market and the number of birds he has to handle relatively few, to sell them to a poultry produce concern or poultry buyer in the nearby village, or to sell them to turkey buyers who may visit his farm. The size of coop used for shipping turkeys alive varies greatly. In some states the law requires that the coops be not less than 2 feet high in order to make them more comfortable for the turkeys. Many shippers, however, use coops which are 16 to 20 inches high, and if anything, the turkeys will go through in coops of this height with less loss than in the higher coops, due to the fact that it is impossible for the birds to get on top of one another. A cheap, simply constructed coop often used is one 2 feet 4 inches wide, 3 feet 10 inches long, and 19 inches high, constructed with a solid wooden bottom and with a wooden frame covered with wire. This coop is divided into two sections by means of a partition in the center. If desired, the coop can, of course, be made higher than this.

In the sections of the country such as the Middle West

FIG. 31. Turkey capon at six months of age. Notice the feminine appearance and the big frame. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 32. Turkey drive on the way. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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and Texas where the bulk of the turkeys are grown, there are poultry packing houses which are prepared to handle and which do handle large quantities of turkeys at the proper season, busying themselves with chickens and eggs during the remainder of the year. These are concentrating points for the live turkeys and here they are either dressed, which is the usual procedure, or else shipped to market alive in car lots. In sections like Texas, where turkeys are plentiful, it is quite a prevalent custom for hucksters to go out through the country buying turkeys from the farmers, adding them to their flock and driving the flock along the roads until they reach the killing station or concentration point. In this way flocks of turkeys are often gathered together running to more than 1,000 in number.

In the season of 1912 there were gathered in this way 8,000 turkeys which were concentrated at Myersville, Tex., and driven from this point to Cuero, Tex., a distance of 13 miles. This drive from Myersville to Cuero was accomplished in two days with the aid of 30 men. Smaller flocks can of course be driven more rapidly. A flock of 700 turkeys was driven over this same distance in 8½ hours, five men being employed in the drive. It is usual to make use of a team and wagon in connection with these drives, the wagon going on in front and the driver throwing out a little corn from time to time in order to get the birds to follow. Such a wagon is also useful for picking up and hauling the rest of the way any birds which become lame or tired or which cannot

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keep up on account of being very fat. Where the flocks are driven over a period of several days it is necessary when night comes on to pick a spot in a grove or some similar place where there are plenty of trees for the birds to roost. When darkness comes the turkeys will start going to roost wherever they may be and it is necessary to select a place where they can be kept together and easily guarded. When the drive arrives at the killing station the birds are weighed up and driven into pens from which they are drawn for killing or to fill cars for shipment alive.

Killing and Dressing

Turkeys should be killed and dressed as soon after they arrive at the killing station as possible. On account of their free roaming nature turkeys do not stand confinement well and when shut in coops under conditions to which they are not used, they shrink in weight rapidly. It is to avoid this shrinkage that the killing should be done promptly.

Practically all turkeys are dry picked. This is done partly because the market demands dry picked birds and partly because the feathers are valuable and are saved to sell. Scalding injures the feathers. Turkeys are loose-feathered birds and are easier to dry pick than any other class of fowl unless it be pheasants. In this connection it is interesting to note that experienced pickers always seem to choose the dark-colored turkeys in preference to the white ones as being easier to pick, claiming that the

FIG. 33. Woman dry picking a turkey. Notice the blood can and also the convenient means of hanging the turkey in position by slipping its legs into the slots cut in the scantling. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 34. Interior of turkey killing establishment. Note the shackle in the foreground in which to slip the turkeys' legs. Notice the bins for feathers and that the shackle is on a roller track so that the turkeys can be readily wheeled over different feather bins to receive the tail and wing feathers and the body feathers. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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feathers of the white variety do not mature or ripen so early.

The usual procedure in a turkey killing plant is to put 15 or 20 turkeys in a cage for a picker to draw his birds from. The picker selects a bird, takes it out of the cage, hangs it up by the feet by means of a cord, then proceeds to bleed and stick. Often two cords are used for hanging up the bird, a cord being placed about each foot. Instead of cords wire shackles are also made, having a place in which each foot can be easily slipped. The use of such a shackle saves time and also holds the legs in such a position as to make picking easier. The bleeding is accomplished by cutting the veins in the throat just at the rear edge of the skull. A cut properly made at this point will result in free bleeding. The picker then sticks the bird, that is, plunges the knife through the roof of the mouth to a point between and a little back of the eyes, or this same point may be reached by a stick from the outside starting the point of the knife just under the eye. A very good knife for this purpose is one made from a single flat piece of steel about $1/16$ inch thick, with a handle 5 inches long and $3/4$ inch wide. The blade should be $2\frac{1}{2}$ inches long and $1/4$ inch wide, ground to a point and sharpened to a straight cutting edge on the inner side. For best results this knife must be kept very sharp. When the knife reaches the brain which is the object of the stick, the picker usually turns it somewhat, which causes a convulsion of the muscles. If the stick is good in this respect the feathers will then come out easily. As soon as

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the stick is made a blood can, weighted with lead or some other heavy material, is fastened by means of a wire hook into the lower jaw of the bird to keep the bird's head down and to receive the drip of blood.

Turkeys are frequently killed by bleeding only, that is to say, without following the bleeding by sticking. This manner of killing usually results in a better bled bird but does not make picking as easy. In some states the law requires that if a bird is killed by bleeding only it must first be stunned by hitting it on the back of the head with a club. Good bleeding is necessary in order to secure a carcass which looks well and which keeps well.

The picker first removes the main tail feathers with one motion and next the main wing feathers. These large feathers are put in a separate bin from the body feathers. The next operation is to pick off the body feathers which is accomplished very rapidly by expert pickers. In the special turkey-dressing establishments it is common practice to have the shackle, by means of which the bird is hung, mounted on a track. After the bird is stuck the shackle is wheeled over a barrel or bin in which the main tail and wing feathers are allowed to fall. It is then moved over another bin into which the body feathers are allowed to fall. This makes the separation of the two classes of feathers easy. As soon as the body feathers are removed the picker then goes over the bird carefully to remove the pin feathers. Pickers become very expert and can entirely finish a bird in a few minutes. In Texas a good many negroes and Mexicans are employed for this

FIG. 35. Dressed turkeys ready to be removed to the cooling room—Cuero, Texas. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 36. Dressed turkeys packed in barrels. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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purpose. In other places the best pickers are white men. Women are also employed to a large extent in picking, especially for pinning or finishing up the birds. The price paid for picking runs about 4 cents apiece for hen turkeys and 5 cents for toms. After the bird is thoroughly picked, the blood is washed from the head, and the feet are also washed if very dirty, and it is laid on a rack with other dressed birds.

When the rack is filled it is wheeled into a cold storage room where the temperature is a little above freezing. The turkeys are left in this room until the body heat is thoroughly out of the birds. This may take from 12 to 24 hours. When the birds are thoroughly cooled they are graded according to size and condition and are packed in suitable containers for shipping to market.

Packing

Turkeys are put up in two ways: either in boxes or barrels. Probably there are more barrel turkeys than box turkeys, although boxes are used very largely on the Pacific Coast markets and to a considerable extent in other markets. Both barrels and boxes are lined with clean wrapping paper or parchment paper and the heads of the turkeys are likewise wrapped with clean paper. White lumber such as cottonwood is the kind favored for making the barrels and boxes. It is said that pine will impart a flavor and odor to poultry when packed in it. Where turkeys are packed in barrels there are as a rule

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six layers of hen turkeys with five hens to the layer and four or five layers of toms with four to the layer, this of course depending on the size of the birds. On the average a barrel will hold about 250 pounds of turkey.

There are two principal sizes of boxes used for packing turkeys, one used for hens and the other for toms. The standard dimensions for these boxes are as follows: Turkey tom boxes, ends $24 \times 12 \times \frac{3}{4}$ inches; sides $28 \times 12 \times \frac{3}{8}$; tops and bottoms $28 \times 24\frac{3}{4} \times \frac{3}{8}$; turkey hen boxes, ends $20 \times 11 \times \frac{3}{4}$ inches; sides $30 \times 11 \times \frac{3}{8}$ inches; tops and bottoms, $30 \times 20\frac{3}{4} \times \frac{3}{8}$ inches.

The turkeys are packed in these boxes in two layers, the tom boxes holding layers of six each or 12 to the box, while the hen boxes hold layers of eight each or 16 to the box. The boxes make a much neater package than do the barrels and it is also possible to pack the turkeys in them in better shape as they do not have to be doubled up as is done when packed in barrels. It is claimed, however, that the cost of packing in boxes is about a half cent per pound more than packing in barrels. After the turkeys are packed, the box or barrel should be plainly marked with the number and kind of turkeys which it contains and with the gross, tare and net weight.

After the turkeys are packed either in barrels or boxes they are put into what is called the sharp freezer, that is to say, a cold-storage room where the temperature is considerably below freezing. Here they are frozen solid and held until they are to be shipped. They are shipped in re-

FIG. 37. Dressed turkeys packed in boxes. Notice the feathers left on the last joint of the wings. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

FIG. 38. Farmer selling his turkeys to the highest bidder. Turkey day, Lisbon, N. Y. The farmers dress and bring in their turkeys on this day and buyers bid for them as they are offered along the street curb. (*Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.*)

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frigerator cars each of which will hold from 20,000 to 25,000 pounds of dressed poultry.

Turkey Feathers

In plucking the turkeys the wing and tail feathers are kept separate in one bin and the soft body feathers in another bin. The wing and tail feathers are referred to in the trade as quills. Various other trade names are applied to different grades of these feathers. At times, depending upon the demand, white body feathers and white quills are worth considerably more money than the dark or mixed feathers and, for this reason, the white feathers are kept separate in many establishments.

Scalded feathers are not worth as much as dry picked feathers. Likewise, feathers which are freshly packed and therefore damp, not having been given a chance to dry out, are likely to arrive at their destination matted and musty or heated. Such feathers are not worth as much and are discounted according to their condition.

Turkey feathers have a variety of uses, the demand for the different classes of feathers and for the various uses depending to quite an extent upon prevailing fashions. At certain times the white quills are in active demand for millinery purposes while at other times, white quills are almost a drug on the market and must be mixed with dark quills in order to sell them to concerns which manufacture feather dusters. Practically all dark quills are used in the manufacture of feather dusters, these being split and

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milled by machinery. At times, especially when feather boas are in fashion, the white turkey body feathers are in considerable demand for this purpose and the price runs much higher than at other times. Dark body feathers and also white body feathers when not in special demand for other purposes are used mainly in making feather beds and pillows.

The prices paid for feathers not only vary quite widely according to their kind, color and condition, but also at different times of the year and in different sections of the country due to the changes in fashion in women's dress. The quotations given herewith represent the range of prices paid at three different points during March, 1920:

Dark turkey body feathers, full

fleece20 to 55 cents a pound

White turkey body feathers, full

fleece45 to 80 cents a pound

Dark turkey quills.....10 to 13 cents a pound

White turkey quills.....10 to 25 cents a pound

In the case of any mixture of feathers either of class, grade or color, the feathers as a whole will bring only the price of the cheapest feathers in the mixture.

All turkey feathers will heat if sacked for shipment before being thoroughly aired and dried. Even though they are apparently dry, they will become warm and damp again in a short time when sacked, unless the animal heat has been thoroughly removed. To dry them spread them

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out on a clean floor, such as a loft above the killing and picking room, in a layer not over 4 to 6 inches deep and turn them each day until they are dry, giving them plenty of air. Turkey quills, particularly tails, should also be thoroughly aired before packing as only dry quills bring the top price for this class of feathers. The body feathers should be packed in sacks for shipment. Packed in this way, the freight rate is one and a half times first class. If shipped in boxes or barrels, they take double first-class rate. Quills should be laid straight in boxes or bags for shipment. If they are stuffed carelessly in bags they are broken to some extent. If good sacks are used and care is taken to lay the quills in them as straight as possible, they can be shipped in this way fairly satisfactorily, although they will not go through in as good shape as when packed in boxes. Like the body feathers, when shipped in barrels or boxes they take a double first-class rate, while in bags they take one and a half times first class.

Dressing on the Farm

For local trade, or in certain sections within easy shipping distance of some of the larger markets and where considerable numbers of turkeys are raised in a small area, it is common practice to dress the turkeys on the farm. This is done in sections of the New England and Middle Atlantic states where the birds are either sold direct to the consumer, to city dealers, or to buyers who come into the locality. In Heuvelton and Lisbon, N. Y.,

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for example, there is held each year shortly before Thanksgiving, a turkey day. On the day before this event the farmers kill and dress their turkeys, using the same methods as are employed in the packing plants except that the birds are allowed to cool by hanging them out over night, provided the weather is cool enough to reduce their temperature to about 35 degrees. If the weather is not cool enough for this purpose they are put into ice water and cooled in this manner.

Care must be taken in cooling turkeys by hanging them outdoors to see that the temperature is not so severe that the turkeys will freeze on the outside before the body heat has left the interior of the birds, as this will cause them to spoil rather quickly. The turkeys to be killed should not be fed on that day or the previous night, except the little that may be necessary to entice them into the barn or some other building to catch them. Feeding before slaughter causes the crop to be distended with feed and makes an unsightly carcass. On the next day the farmers bring their dressed turkeys into the town by wagon. A number of turkey buyers representing different concerns are present and they bid for and buy the turkeys at the street curb.

In a general way it may be said that it is hazardous for the farmer to attempt to dress and ship his turkeys to market, since with small lots he does not have refrigerator facilities and since he usually makes no effort to ice his turkeys. If the weather happens to turn warm or if the shipment is delayed, there is a grave chance of the birds

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arriving at market in bad condition. If the turkey grower desires to dress and ship turkeys it is best to pack them in a barrel, alternating each layer of turkeys with a layer of ice. In this condition the turkeys have a much better chance to come through in good shape.

It is sometimes advisable for the turkey grower when taking advantage of an opportunity to retail his birds, not only to kill and pluck them, but to draw them as well. Whether or not this should be done will depend entirely upon the trade which he has and the demands which are made on him for this work. Usually the drawing which is done by the grower consists simply in cutting around the anus and in drawing the intestine out through the hole thus made until the gizzard is reached when it is broken off. It is seldom desirable to remove the other organs or to attempt to remove the crop unless the crop is filled with feed and as a result is likely to turn dark in color and spoil the appearance of the bird.

Shipping Turkeys Alive

Turkeys are shipped alive either in small lots by express, where the distance from the farm to the market is not great, or in large lots by freight where they can be concentrated in carloads. Because of the fact that turkeys shrink a good deal when shipped any great distance alive, the turkeys are for the most part killed and dressed before shipping. However, quite a good many carloads of live turkeys are sent through. An-

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nually just before Thanksgiving and also before Christmas a train known as the Turkey Special is made up at Morristown, Tenn., and rushed direct from there to Jersey City as quickly as possible. This train usually consists of a number of cars of live poultry, most of which are turkeys, together with some cars of dressed poultry. In shipping the turkeys, both the especially constructed live poultry transportation company cars and ordinary stock cars are utilized.

The live poultry transportation cars are manufactured for the purpose of shipping live fowls. These cars consist of a series of cages built up on each side of the car with an aisle between and with a feed room in the center. Each car contains 128 cages. Since they are built for chickens they are about 12 inches high and do not allow the turkeys to stand erect unless the flooring between two cages is taken out and this is not a usual practice. Each cage will hold from 7 to 12 turkeys according to their size and as a rule about 1,200 live turkeys can be loaded in a car. The minimum weight for which the shipper must pay in using one of these cars is 18,000 pounds and it is difficult to load this weight of turkeys in a car. When stock cars are used, ordinary wooden shipping cages or coops are employed and are piled one on top of another. These wooden coops are usually deeper than the coops in the live poultry transportation cars with the result that not as many coops can be put in nor as many turkeys shipped in one of these cars. However, the birds

FIG. 39. Live Poultry Transportation Car loaded with turkeys. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

FIG. 40. Weighing up live turkeys as they are unloaded from the car. (Photograph from the Bureau of Animal Industry, U. S. Department of Agriculture.)

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which are so shipped are not as crowded and for that reason go through in a little better shape.

In the live poultry transportation cars an attendant accompanies each car. It is the duty of this man to feed and water the birds, to see that the car goes through as promptly as possible, and that the birds are weighed correctly when they are unloaded. The cars are provided with troughs for each coop and in this is fed a sloppy mixture of crushed corn and water. When the weather is cool, as it usually is at this time of the year, no other water is given to the turkeys. About 12 hours before the train is due to arrive at Jersey City the turkeys are given all the whole corn that they will eat with the object of cutting down the shrinkage as much as possible. However, during the journey the turkeys are much disturbed and do not eat very well so that their shrinkage is high.

Shrinkage on a car of live turkeys will run as a rule from 12 to 15% as compared with the shrinkage on a car of chickens under the same conditions which runs from 9 to 10%. A few of the turkeys die during the trip or are accidentally killed. However, the loss from this source is not large, probably not amounting to more than 1%. The cost of shipping live turkeys from Tennessee to New York City will run better than 5 cents a pound. In addition to this cost of shipment 5% commission must be deducted for handling the turkeys on the market.

When the cars of live turkeys arrive at the railroad terminal in Jersey City the turkeys are unloaded and weighed as soon as possible. The commission firm to

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which the turkeys are sent has a man on hand who sees to removing the birds, cooping them, and weighing them up, the attendant who came with the car checking the weights for the shipper. After weighing, the coops are ferried across the Hudson River to New York and distributed by the commission firm among retailers throughout the city, who dress and sell them to the consumers. Some wholesale dealers, however, buy the turkeys themselves, dress them and then sell to the retailer.

Market Prices

The following are wholesale quotations for the different grades of turkeys on the New York market as reported by the *New York Produce Review* under date of November 24 and December 22, 1920:

November 24, 1920.

Spring, dry packed, boxes: Western, dry picked, hens and toms, selected, per lb., 54@55¢; southern, 53@54¢; western and southern, fair to good, 50@52¢; old hens and toms, 50¢.

Spring, dry packed, barrels: Maryland, dry picked, hens and toms, selected, 60@62¢; poor to good, 45@58¢; culls, 35@40¢; old hens, 50@54¢; old toms, 48@52¢; Virginia, selected, dry picked, 53@56¢; scalded, 51@54¢; poor to good, 45@50¢; culls, 35@40¢; Western, selected, 52@54¢; poor to good, 45@50¢; culls, 35@40¢; Kentucky and Tennessee, selected, 51@52¢; Texas, selected, 51@53¢; poor to good, 45@50¢; culls, 35@40¢; western and southern old toms and old hens, 47@49¢.

Spring, iced: Western, dry picked hens and toms, selected, 50@52¢; poor to good, 42@48¢; western, old toms and old hens, 46@48¢; southern, hens and toms, selected, 48¢; poor to good, 41@47¢; culls, 35@40¢; Ohio and Michigan, scalded, selected, 51@53¢; other western, scalded, selected, 48@51¢; Virginia, Tennessee and Kentucky, scalded, selected, 46@48¢; poor to good, 42@45¢; culls, 35@40¢.

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December 22, 1920.

Spring, dry packed, boxes: Western, dry picked, hens and toms, selected, per lb., 56@58¢; southern, 55@57¢; western and southern, fair to good, 50@54¢; old hens, 49@50¢; old toms, 46@48¢.

Spring, dry packed, barrels: Maryland, hens and small to medium toms, selected, 61@63¢; large toms, 60@61¢; fair to good, 55@60¢; Maryland, old hens, 50@52¢; old toms, 48@50¢; Virginia and West Virginia, selected, 56@58¢; fair to good, 50@53¢; Western, selected, 55@57¢; fair to good, 50@54¢; poor, 44@48¢; Kentucky and Tennessee, selected, 52@54¢; Texas, selected, 52@54¢; fair to good, 47@51¢; poor, 43@46¢; culls, 30@40¢; Western and southern, old hens, 48@50¢; old toms, 45@48¢.

Spring, iced: Western, dry picked hens and toms, selected, 50@55¢; poor to good, 44@48¢; Southern, hens and toms, selected, 48@53¢; poor to good, 42@46¢; culls, 30@40¢.

CHAPTER VII

Insect Pests, Diseases and Predatory Animals

The principal difficulties experienced by turkey raisers in maturing their stock aside from those occasioned by faulty management are insect pests, diseases and predatory animals. Of course suitable management will also prevent or greatly reduce the losses which would otherwise be occasioned from these sources.

Lice

There are four different species of lice which occur quite commonly on turkeys in the United States. Two of these seem to be native to the turkey itself and it seems probable that they occur on turkeys in the wild state. The first is the head louse which is so extremely injurious to young poults if allowed to get a start. The second is another form of turkey louse which occurs through the feathers in various parts of the body. It is especially likely to be prevalent on the neck and the breast. In addition to this there are two other species of lice which are not native to the turkey but which occur where the turkeys are or have been associated with chickens. The first of these is the common body louse of chickens, which may occur in considerable numbers on the turkeys. Usually,

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however, the body lice are not present in sufficient numbers to cause any particularly injurious effect to the mature fowls but they do cause considerable irritation and are injurious to the young turkeys. The shaft louse of chickens has also been found on turkeys but does not seem to be very prevalent.

Where the young poults become badly infested with lice of any kind they usually grow weaker and weaker until they finally die. Due to lack of attention to keeping down lice this is one of the most important causes of high mortality in young turkeys. Head lice are the most serious and cause most of the trouble. If the young turkeys are examined, head lice if present will be found on the top of the head above and in front of the eyes and under the throat where they burrow into the skin. In addition to the head lice small white lice are frequently found in large numbers along the wing bar in the hollows or creases between the quills of the flight feathers. Sometimes these places will be found to be literally alive with these lice. They are also found occasionally below the vent.

The first principle to be observed in combating lice is to prevent their occurrence insofar as possible. When hen turkeys are set they should be dusted with some good insect powder before being put on the nest and several times during the period of incubation. If this is thoroughly done they will be freed of lice and no difficulty will be encountered with the poults on this account. If one neglects to dust the hens during the time they are sitting

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or if the job is not well done, the poults must be carefully examined soon after they are hatched and every few days thereafter. Examine most carefully the head and throat in the sections where the head lice are apt to occur and if any of these pests are found, the places where they occur must be carefully greased with lard or some similar grease. The lard will kill the lice but care must be taken to see that not too much is used as it might have a fatal effect on the poults themselves. Do not be content with greasing the poults once and expect to get rid of the head lice in that way but examine them several times at intervals of a few days so that if other lice are found they can be greased again. Greasing the wing bar of each poult is also frequently practiced where lice are found to occur at that point. Do not dust young poults freely with ordinary insect powder as it may prove harmful to them, especially in the way of causing sore eyes. Sodium fluoride applied according to the directions given below may be safely used.

For any kind of lice which occur on turkeys, sodium fluoride will be found to be a most effective treatment. Where sodium fluoride is used on chickens it is recommended that it be used either in the form of a powder or else as a dip. For turkeys, however, dipping is not recommended. Sodium fluoride is exceedingly poisonous to all species of lice killing both the young and the adults and the young which emerge from the eggs which were present at the time of treatment. This chemical is not very well known and is not very widely kept in drug stores.

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It can, however, be obtained from wholesale druggists in the larger cities and other druggists can secure it on demand. It comes in two forms known as the commercial sodium fluoride and as the chemically pure sodium fluoride. The commercial is recommended for use inasmuch as it is in a more finely powdered form, is cheaper in price and will do the work very well. Commercial sodium fluoride should be procurable from druggists at a retail price between 30 and 60 cents a pound. This material keeps very well if placed in stoppered bottles or in closely covered cans.

Where the turkeys are to be dusted small amounts of the sodium fluoride should be placed around on different parts of the fowls to be treated. In treating the adult turkeys one should have an assistant to hold the bird while the sodium fluoride is applied. It is well to place the bird on a table where the assistant can hold it by the legs and wings. Place a small pinch of the sodium fluoride among the feathers next to the skin in the following sections: one pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one on the tail, one on either thigh and one scattered on the upper side of each wing when spread and one scattered on the under side. The action of the chemical is comparatively slow. If the turkeys are examined two or three days after they have been treated it is possible that some lice will still be found but in a few days more all of them should have disappeared. In using the material no fear need be felt that it will produce any bad effects on the

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turkeys as it does not seem to cause a skin irritation or to injure the feathers. Sometimes after dusting, the fowls may sneeze and breathe hard but this soon wears off. Care should be taken to see that the sodium fluoride is not left around where the fowls could get it in their food or water, as it is poisonous.

Care should also be taken by the person using the sodium fluoride to prevent it from getting and staying on the hands or body for any length of time as it may have an irritating or burning effect on the skin. It is for this reason that it is better to put the fowls to be treated on a table rather than to hold them on the lap. Sodium fluoride may be used on young turkeys as well as on the mature fowls without danger of bad results. In using it on the young fowls, however, it is best that it be used in the morning instead of just before they go to roost. Where the mother turkey has been properly dusted it is unnecessary to use more than a couple of pinches on each poult, one scattered on the neck and top of the head and throat and the other on the back and wings and below the vent.

In addition to sodium fluoride any good commercial insect powder can be used with good results. A home-made powder of this sort which is effective is composed of 3 parts gasoline, 1 part crude carbolic acid, into which plaster of paris is stirred until it blots up all the liquid and forms a dry powder. The powder should be kept in a tight can or bottle in order to preserve its strength.

It is very easy for one who is not used to looking for

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lice on young turkeys to overlook these pests even after what they consider careful examination. For this reason if one's turkeys are droopy and not doing well and still the owner is convinced that there are no lice on them, further examination for this purpose should be made. The following experiment may be tried on little turkeys under those conditions. Submerge the little turkey in warm water which has been heated to about body temperature. Hold the little bird there with just its bill sticking out so that it can breathe, until the entire plumage is thoroughly wet, then wrap it in a white cloth which has been nicely warmed and hold the bird this way for several minutes. Then take the cloth off and notice whether there are any lice on it. Usually this experiment will result in finding a large number of lice on the cloth even when the turkey was supposed to be absolutely free from them.

Stick-Tight Fleas or Chiggers.—In addition to the lice which trouble turkeys there is also more or less difficulty in parts of the South from the stick-tight fleas or chiggers, which affect both chickens and turkeys. These fleas breed and abound in dry sandy soil, particularly in sheltered places out of the rain under buildings. They attach themselves to the fowl especially on the uncovered head parts where they suck the blood and cause intense irritation. The effort should be made to keep the turkeys as free from stick-tight fleas as possible by not allowing them to go under buildings or other sheltered places where the soil is not rained upon but is dry and sandy. Not as much difficulty is likely to be experienced with

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stick-tight fleas on turkeys as on fowls since the turkeys are inclined to range more and to stay away from the farm buildings to a greater extent. Where stick tight fleas are troublesome, however, various ointments sold for this purpose are effective in killing them. These ointments must of course be rubbed on the parts to which the fleas are attached. Ordinary salt fat such as ham fat or salt pork fat rubbed on the fleas is also effective in ridding the turkeys of them.

Diseases

While turkeys do not seem to be subject to a great number of diseases still, on account of their nature and habits, serious difficulty may be experienced with disease unless the fowls are given the right kind of treatment and are allowed to range almost at will. They do not seem to be able to withstand the more restricted conditions of domestication as can the ordinary domestic fowl. When the range is ample, however, the diseases are not so common nor do they prove particularly troublesome provided the stock from which the birds are bred is strong and vigorous and the management and care given them are correct. It may be said that while diseases, particularly blackhead, have been given credit for being the reason for turkey raising declining to such an extent as it has in many portions of the country, as a matter of fact it is not the principal reason for people discontinuing the business of turkey raising. The real reason lies

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rather in the increased population of the countryside with the result that it becomes more difficult to keep the turkeys from ranging over the neighbors' farms. But while the diseases to which turkeys are subject will not prevent their being raised successfully, it is true that the losses from disease have been serious particularly in certain sections. Diseases are most common where turkeys have been raised in considerable numbers for the longest period.

General Disease Preventive Measures.—In raising turkeys as in raising any other kind of domestic poultry the most important consideration insofar as disease is concerned is to use every reasonable precaution to prevent its occurrence. In order to do this it is necessary that the turkey grower be a close observer and that he watch his birds carefully in order to discover the least sign of sickness. Often if diseases are discovered just as they begin they are easily cured and in any case prevention of their spread is a much simpler matter. Whenever new stock is purchased it is well to isolate it for a few days before letting it run with the home flock. This will give an opportunity to observe the birds and see whether or not they are in a good healthy condition. The turkey flock should be kept separate insofar as possible from the chickens. It is easy for turkeys to pick up diseases from the chickens and often diseases which are not so serious with the chickens may prove to be very troublesome with the turkeys. For this reason it is well to keep the fowls ranging away from the farm buildings

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as much as possible, encouraging them during the summer and fall to come home only at night to roost.

If any birds become seriously sick it will not as a rule pay to attempt treatment. Not only is treatment likely to be futile but keeping a very sick bird around is a menace in that it may lead to a spread of the disease through the flock. Even birds which are not seriously sick and which it is desired to treat should be separated from the main flock for this purpose. With seriously sick birds it is, therefore, best to kill them as soon as discovered. The bodies of such birds should be either burned or else buried deeply so that there will be no chance of the spread of the infection from this source.

Where turkeys are housed during the severe winter weather in the North, it is necessary to keep the house in a very clean sanitary condition if the turkeys are to remain in the best of health. The droppings should be kept well cleaned out and it is also desirable to spray the house occasionally with some disinfectant. During the summer also it is desirable to clean up the droppings frequently from under the outdoor roosting places so that a large accumulation of this material will not take place. If there are any small areas of ground near the house used by the turkeys a great deal and if there is any reason to suspect that these places may be sources of infection to the flock it is well to lime this ground and then turn it over.

Precaution should be taken in feeding young turkeys to see that the feed is thrown on clean ground or on

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clean board surfaces or other feeding places. Surplus feed should not be allowed to lie around where it will sour and spoil, as such material is very bad for turkeys. It is likewise desirable both in feeding young and old birds not to continue to feed on the same spot of ground indefinitely but to change occasionally to fresh places. Many turkey breeders feel that the feeding of sour milk as a drink both to the young turkeys and to the mature stock is a most valuable disease preventive. In case there are indications of any disease developing it is a good precautionary measure to place a disinfectant in the drinking water where this is provided for the birds in fountains or other receptacles. Potassium permanganate is a good disinfectant to use, putting enough in the water to give it a deep purple color.

Blackhead.—Undoubtedly, the prevalence of blackhead throughout the New England and Middle Atlantic states has been a great factor in reducing the number of turkeys raised there to an almost negligible quantity, although turkey raising in former years was quite an important industry.

An example may be cited of the condition which occurred in St. Lawrence County, N. Y., a famous turkey producing section, during the late summer and early fall of 1914. At this time an epidemic of blackhead broke out here which was more serious than had ever before been experienced in that section. How serious this was is well shown by a comparison of the number of turkeys hatched and the number raised from the records of sev-

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eral turkey raisers in and about Heuvelton and Lisbon, N. Y.

No. Turkeys Hatched	No. Turkeys Raised
200	25
168	126
155	60
140	40
130	106
115	25
100	30
50	10
50	40
47	19

It will be seen that from all of these flocks there was an average of 41.6% of the turkeys raised out of those hatched. A careful examination of the different flock records, however, shows that in spite of this serious epidemic of blackhead, certain turkey growers were able to raise a very much larger proportion of turkeys hatched than the average. This goes to show that with proper management turkeys can be successfully raised even though disease may be a serious bar to those who do not understand the needs and nature of the fowls. In connection with the epidemic cited it might be stated that most of the turkeys died when from two to three months old and showed the characteristic blackhead lesions when opened up and examined. The farmers in the section did

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not know what disease caused the turkeys to die and called it various names such as cholera, white cholera, yellow cholera, scours, white diarrhea and yellow diarrhea.

Of all the diseases to which turkeys are subject, blackhead is undoubtedly the most serious and has had the most detrimental effect on the turkey raising industry. It is an infectious disease which occurs most commonly and with most disastrous results through New England, the Middle Atlantic States and parts of the Middle West. It also occurs occasionally in parts of the South and on the Pacific Coast. Where turkeys are permitted by virtue of the climate and an abundance of range to have their liberty and to forage for most of their feed from the time they are hatched, this disease is far less frequent in occurrence and disastrous in effect. In the main it affects young turkeys at any time between the ages of six weeks and four months. It occasionally affects mature turkeys as well but not often. Blackhead is an unfortunate name for the disease since it leads the turkey raiser to expect the head to turn black or dark. While this often happens it does not always do so and even where it does, the dark color of the head may be a symptom of some other ailment instead of blackhead. The symptoms in a general way are indicated by a steady weakening of the bird, a refusal to eat and a considerable thirst. Death ordinarily occurs anywhere from a few days up to two or three weeks after the disease is first noticed. Quite often, however, the progress of the disease is slower than this.

Diarrhea accompanies the disease and the color of the

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droppings is often a bright yellow but may vary from white to brown. It is on opening up the body of a dead turkey that one is able to find the conditions which are characteristic of the disease. This is evidenced by one or both of the caeca or "blind guts" being enlarged and plugged full of a cheesy material. In addition, the liver is likely to be more or less enlarged and to show yellowish or yellowish green spots on its surface.

There is a considerable difference of opinion as to what may be the cause of blackhead. In the opinion of some turkey raisers and others who have studied this matter it is simply the fact that the turkey is not easily adapted to domestication and that unless the greatest care is taken in selecting strong healthy breeding stock and giving the birds proper management and allowing them free range, they are likely to develop this diseased condition. Another theory lays the cause of the disease to a parasitic protozoan called an amoeba which exists in the digestive tract of the bird and is discharged from the body with the excrement, in this way infecting other birds by being taken into the body with the food or drink. A third theory holds that the disease is caused by another kind of protozoan organism known as flagellates. These occur in the intestines of practically all turkeys but give rise to the trouble which is evidenced as blackhead only when the circumstances under which the turkeys live are unfavorable and lead to digestive conditions in the intestines such that the flagellates find conditions suitable for their multiplication. Many of them then penetrate the

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lining of the caeca and from there are carried to the liver, establishing a diseased condition in both places. Regardless of what may be the specific cause of the disease there seems to be quite a close agreement of opinion that practically all turkeys in the sections where the disease is prevalent are subject to the infection and that the question of whether or not the disease develops at all or whether it reaches serious proportions is largely a matter of management.

There really is no treatment for blackhead which will give definite and satisfactory results. It will scarcely ever pay to attempt to treat sick birds since they are always a menace to the rest of the flock, as they are likely to cause further spread of the disease, and if they are seriously sick it is best to take no chances but to kill them and bury them deeply or burn them. Precautions can also be taken in keeping the droppings cleaned out from the roosting place and also in spreading lime on the soil in such places as the turkeys frequent to a great extent. It is also well to use some form of disinfectant in the drinking water such as potassium permanganate to the extent of about as much as can be placed on a dime to each gallon of water.

Overfeeding seems to predispose the birds to the disease and if the beginnings of any trouble are noted it will be well to cut down the feed. Many turkey raisers feel that the feeding of sour milk or buttermilk is advantageous in keeping the turkeys in good condition and in reducing the likelihood of blackhead. Another remedy

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which is often used consists of sulphur 5 grains, sulphate of iron 1 grain; or benzonaphthol 1 grain, salicylate of bismuth 1 grain; or sulphate of iron 1 grain, salicylate of soda 1 grain. Where either of these remedies are used they are preceded by a dose of epsom salts from 10 to 35 grains for a bird; or a dose of castor oil of from one-half to 3 teaspoonfuls, depending on the size of the bird. One-third teaspoonful of catechu to the gallon of drinking water is also said to have a beneficial effect. Another blackhead remedy advocated by a turkey grower consists of epsom salts in the drinking water in the proportion of one pint of saturated solution of the salts to five gallons of water. This is given for one day and is followed on the next day with four teaspoonfuls of muriatic acid to each gallon of drinking water.

There has recently been announced, by Dr. H. M. Wegeforth, San Diego, Calif., an ipecac treatment for blackhead which is claimed to be both a preventive and curative. For sick birds, fluid extract of ipecac is administered in the amount of 10 drops three times a day for 3 days for each bird. For the next three days, the dose is 10 drops twice a day and for the next 3 days 10 drops once a day. This treatment it is claimed cured birds with well developed cases of blackhead.

As a preventive treatment, the ipecac was administered in powdered form mixed with a mash feed giving one teaspoonful twice a week for each 20 turkeys, making no difference in the dosage for size or age of the birds. This

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treatment it is claimed will keep the turkeys from developing the disease.

At the present time the ipecac treatment of turkeys for blackhead has not been sufficiently used and under sufficient conditions and sections to determine its real effectiveness. When blackhead is troublesome its use in an experimental way is advised.

Chicken-pox or Sore Head.—Ordinary chicken-pox or sore head, particularly in the South, not infrequently troubles turkeys just as it does fowls. It is evidenced by the same nodules or scabby eruptions about the head. Where this disease appears in the flock it is likely to spread rapidly from bird to bird. For this reason if a bird is found to be infected it should be removed from the flock and kept separate. The scabs which form may be soaked off by bathing them with warm water when the surfaces below should be washed with an antiseptic such as a 2% solution of carbolic acid or a solution of potassium permanganate, or the sore, after the scab is removed, may be touched with a tincture of iodine. A saturated solution of borax is also said to give good results in the treatment of this disease.

Roup.—Next to blackhead roup is probably more troublesome than any other disease of turkeys. It is particularly likely to occur when the birds are exposed to draft or to dampness. It begins like an ordinary cold but as it develops into roup there will be a swelling which occurs about the eyes, usually below, and because of which the disease is often termed "swell head." Roup seems to be

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highly contagious and for this reason affected birds should be isolated from the flock. If the disease is very bad the bird should be killed rather than run the risk of spreading the disease, but if the bird is lightly affected the nostrils and mouth can be washed out with some disinfectant such as a solution of potassium permanganate. Where a serious swelling is formed this should be lanced and the puss or material which it contains squeezed out, after which the sore should be washed out with an antiseptic.

Limberneck.—As in chickens so in turkeys limberneck sometimes occurs. It is characterized by loss of the use of the muscles of the neck, causing the head to hang down. It is commonly supposed that limberneck is a paralysis caused by intestinal poison. This may be due to eating decayed meat or unsound food of some kind or in some cases to digestive disturbances or intestinal worms. The usual treatment for this difficulty consists of giving the affected birds a tablespoonful of castor oil. It is also well to add 10 to 15 drops of turpentine to the oil.

Crop-bound.—In turkeys a crop-bound condition or impaction of the crop sometimes occurs. This is usually caused by the fowls eating feathers or some other indigestible material such as straw or stiff grasses which prevents the food from passing out of the crop and causes the crop to become full and hard. As a treatment give the bird a teaspoonful of sweet oil. After this has reached the crop, the contents can be worked about with the fingers until the oil is well mixed through and when

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loosened up in this way the material in the crop can usually be forced out through the mouth by holding the bird with its head down. In case it is not possible to clear up the difficulty in this way, the crop can be opened by cutting through the skin and through the wall of the crop itself. In making the incision pull the outside skin to one side so that when it is allowed to slip back to its normal position after the cut is made, the incision in the crop will be covered by the outside skin. The material can then be taken out with the handle of a spoon or some similar instrument, being sure that the obstructing substance is removed. The crop is then sewed up again, precaution being taken to sew up the walls of the crop and the skin separately.

Worms.—Turkeys are quite subject to intestinal or round worms. They occur both in young poults and in the adult fowls. These are slender, white, threadlike worms which may be present at times in considerable quantities. In order to prevent trouble from this cause it is well to worm the breeding stock in the spring before the ovaries begin to function and laying starts. It should be done at this time in order not to interfere with the laying. Give each turkey a dose of sweet oil to which a few drops of chenopodium or American wormseed oil has been added. Nearly a half cup of this mixture can be given as a dose for a large bird, and in this quantity there should not be over three or four drops of wormseed oil. The young turkeys as well as the adults are apt to be greatly troubled by worms. In many cases it may prove

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to be a valuable precaution to treat them for worms from the start. For this purpose use a mixture composed of two tablespoonfuls of turpentine to a pint of sweet oil. This can be administered to the young poults with a medicine dropper giving them three or four drops to start with and gradually increasing the dose until a whole medicine dropper is used as the poults grow larger.

Gapes.—Gapes are not as troublesome to turkeys as they are to chickens. This is probably largely due to the fact that the turkeys range away from the buildings to a greater degree and are not so likely to pick up the infection. Occasionally, however, gapes do cause trouble and may even be so serious as to make it difficult to raise turkeys. The disease, gapes, is so called from the characteristic gaping action of the affected chick or turkey. The disease is due to small forked worms which attach themselves to the lining of the windpipe, causing irritation, and if present in sufficient numbers may even make breathing difficult and result in the weakening and eventual death of the young bird. Gapes are most apparent and most seriously affect young fowls between the ages of 10 days and four weeks. As a rule the larger, stronger, more vigorous youngsters are not seriously affected. The young worms or the eggs from which they come are picked up from the infested soil, and this infection will last from one year to another. The logical and self-evident action to take in case gapes are troublesome is to place the turkey hens with their broods far enough away from the house so that they will be on land which has not

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been previously ranged over to any extent by chickens. If this action is taken at the start there will be little if any trouble from gapes.

In the case of birds which are affected it is often possible to save them by treating the individuals. This is best done by looping a horsehair, dipping it in turpentine, and running it down the windpipe of the little turkey. Be sure that the horsehair is introduced into the windpipe and not down the throat itself. After the hair has been run down the windpipe turn it about several times and then pull it out. This action should be repeated several times and will result in loosening the hold of many of the worms which are attached to the walls of the windpipe. Some of them may be drawn out by the looped hair, but if not those which are loosened will be coughed up by the turkey.

Bumblefoot.—Occasionally turkeys are troubled with bumblefoot, which is a swollen or corn-like condition on the bottom of the feet. It is due to an injury to the feet usually caused by the birds jumping down from their roosts or other elevations to a hard floor. It may become so bad as to cause considerable pain and lameness. The best treatment is to lance the swelling with a sharp knife, squeezing out the puss and the core which will be found. The wound should then be washed thoroughly with a disinfectant and greased liberally with carbolated vaseline.

Diarrhea or Bowel Trouble.—Diarrhea is a common ailment of turkeys, both young and mature. It may be the symptom of some disease, or it may be due to over-

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feeding or to faulty feeding. In young turkeys it is frequently due to their being chilled. When diarrhea appears immediate effort should be made to ascertain its cause and of course to correct the conditions which are responsible. In the case of young turkeys, make sure that they are not being chilled and that they are not overfed or that they do not have access to sour or spoiled feed. In mature birds, likewise, make sure that they are not getting spoiled feed or feed which disagrees with them such as too much new corn. Boiled rice fed to young turkeys is claimed by many turkey growers to have a corrective effect in case of diarrhea. Castor oil may be given to older fowls in a dose of from one to three teaspoonfuls, depending on the size of the bird.

Predatory Animals

Marauding or predatory animals frequently cause serious losses of turkey eggs from the nest where the hen is sitting, of young turkeys and even of mature stock. Skunks, opossums, rats, crows and dogs are the greatest destroyers of turkey eggs. Mink, raccoons, coyotes, wolves, foxes, cats and certain large snakes are also egg eaters. The best way to prevent loss from this source is to locate all turkey nests and remove the eggs as they are laid, leaving only a nest egg or two to encourage the hen to keep on laying them. When the hen is set she should be given protection from animals by being placed under a coop so constructed as to protect her

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properly. A little strychnine dropped in an egg and left in a turkey nest over night will often serve to kill the animals which come to rob the nest. Where a turkey hen is disturbed by any of these pests she often changes her nest to some other locality.

In addition to the losses from eggs being destroyed, young poults are sometimes caught and killed by hawks and by most of the animals mentioned above. Night losses can be prevented by driving the brood into a coop where they can be closed up for the night so that animals cannot get at them. This must be continued until the turkeys are old enough to roost up out of danger. In certain sections of the country where coyotes, wolves or foxes are plentiful, mature stock may be lost from this source. About the only remedy is to attempt to free the range from the animals which cause the loss and to provide roosts which are high enough to place the birds out of the reach of these four-footed thieves.

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