

# THE HANDLING OF DRESSED POULTRY A THOUSAND MILES FROM THE MARKET.

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## HISTORICAL INTRODUCTION

Our grandmothers tell us of the time when the chore boy, wielding the farm ax, decapitated the chickens that had been hatched on the home farm and fed and cared for by the women of the family to be utilized for the feeding of the farm people. Our mothers tell us of the days when the family supply of fresh produce was purchased from the farmer, who brought butter, eggs, poultry, and fresh vegetables into the city from his near-by farm. But now we see the chickens that we are to eat on either the Atlantic or Pacific coast roaming the cornfields of Kansas and Iowa or the wheat fields of Minnesota or the Dakotas, or clustering around the mountain cottages in Tennessee and Kentucky; and instead of the rumble of the farm wagon bringing them to the family, we hear the patient, continuous chug-chug of the long freight train as it winds over the prairie and climbs the mountains on its way to the hungry millions who live far from the great producing section of that almost ubiquitous bird—the common barnyard fowl.

Formerly chickens were killed to-day and eaten to-morrow, because decay could not be checked for any length of time. Then, as the farms were pushed away from the edges of the growing cities, crushed ice was used to preserve the dressed birds until they could reach the consumer, a matter of a week, perhaps. Plate IX shows a barrel of ice-packed poultry, chickens and ice layer by layer, and a big lump of ice on top. The soaking of the birds in the melted ice, the dirty heads and feet, and the gradual dissolving out of the soluble parts of the flesh caused a loss in eating quality and induced decay.

The people increased in the cities faster, however, than the chickens multiplied on the near-by farms. The hauls soon became too long for farm wagons, and then the railway was called into service. Each year for 20 years or more the railroads have been carrying to eastern and western cities dressed poultry from a wider and wider radius. Texas turkeys and Oklahoma chickens are sent to New York and San Francisco, and, such are the wonders of the modern methods of handling perishable foodstuffs, they usually reach these distant centers in better condition than did the ice-packed chickens years ago

after traveling only a hundred miles or so. In these days of food shortage and enforced conservation of foodstuffs it is well to know something of the means by which distant sources of production are made available to the nation, and such delicate commodities as dressed poultry delivered in good order to a consumer living a thousand miles or more from the place where the chickens were raised and killed.

#### PREPARATION FOR KILLING.

Good handling of dressed poultry necessitates facilities which can not be maintained by the individual farmer. Dressed poultry is now a business by itself, and a great industry has grown up to attend to this work. Therefore, when the farmer's flock has reached a marketable stage he sells it to the poultry packer, or to his agent, and the birds reach the packing house located in the producing section in great wagonloads, as shown in Plate X, or by the carload, Plate XI. The latter illustration shows the type of "live poultry car" which is now being used when the birds must be carried alive for more than a day. Both wagon and car are being unloaded at establishments of poultry dressers.

The fowls are generally hungry and thirsty and are always nervous and tired; hence they are not in condition to be killed. Many of them are thin, because comparatively few farmers feed their poultry enough to fatten them. The poultry packers have established feeding stations where from 10,000 to 30,000 birds, housed in specially constructed feeding batteries, are given clean grain mixed with buttermilk for from 7 to 14 days. The 7-day feeding causes a great improvement in the flavor and tenderness of the flesh; feeding for two weeks causes young birds to double in weight if they are vigorous and of a desirable breed for food purposes.

Photographs of feeding stations and the batteries in which the birds are kept are shown in Plate XII. Note how light and airy are the stations. They are also clean, because dirt prevents the birds from gaining weight. What progress this wholesale feeding represents is better understood when the juicy, milk-fed bird is tasted and compared with the "ranger" chicken that forages far and near for a living and eats from the dunghill a large part of the time. The new system of crate fattening is an outgrowth of an old custom on many farms of feeding milk and clean grain for several days before killing.

After the feeding period is over the birds should be starved for 24 hours, having a plentiful supply of clean water only. This practice results in almost completely emptying the intestinal tract of foods in process of digestion and of waste products to be thrown off, and has been found to be far better than the practice of eviscerating when the bird is killed.

It may be said in passing that the viscera should not be removed until the bird is about to be cooked. A habit has developed, especially in cities, of permitting the butcher to draw the birds before sending them to the consumer. If the housewife had the drawing done in her own kitchen the bird would be in a more sanitary condition and she would frequently find evidences of unfitness for food that disappear with the removal of the entrails.

#### PROCESSES OF KILLING AND PICKING.

When farmers prepared the poultry for market the process of killing and picking was an individual matter. Some simply chopped off the head, dipped the carcass in water heated to the steaming point to loosen the feathers, rubbed these off, and, if the weather was cool, kept the bird out of doors or in a well-ventilated room until it was taken to market. Poultry so prepared has a greatly shortened keeping time, and the eating quality is lowered even before decay has begun, because the desirable "ripening" that does so much to improve flesh does not occur.

The undesirable methods used heretofore are many and various, but they are being so rapidly replaced by better methods that it is scarcely worth while to give space to their description. Rather let us pass at once to what are now the best procedures known for the dressing of poultry to preserve quality and prevent decay, for these methods only can be used if the bird is to travel long distances and be kept fresh for from two to three weeks before it reaches the table of the consumer.

Plate XIII shows the dressing of poultry in a house west of the Mississippi River. The output is marketed in New York City. In this house men kill the birds by cutting the jugular vein with a slender, straight-edged knife, especially constructed for the purpose.<sup>1</sup> Then that portion of the brain tissue which controls the muscles holding the feathers in place is destroyed by a thrust of the same knife, and the feathers are so loosened that they are easily pulled out. The cutting of the blood vessels in the proper way permits the blood to drain out of the carcass until it is practically blood free.<sup>2</sup> This is essential, if the bird is to keep well, and is a part of the process of dressing that is too often faulty. In order to accomplish this bleeding the vessels must not only be cut properly, but the bird must be held head down while removing the feathers. The scheme used in the killing room shown in Plate XIII permits this, prevents the feathers from being contaminated with blood, and enables the killer to handle

<sup>1</sup> A Knife for Killing Poultry. Bureau of Chemistry, U. S. Dept. of Agriculture, 1910.

<sup>2</sup> How to Kill and Bleed Market Poultry. Circular No. 61, Bureau of Chemistry, U. S. Dept. of Agriculture, 1910.

the bird very quickly, less than 2 minutes being required for killing and the removal of all except the fine down and pin feathers. When the feathers have been removed, the bird, still hung by the feet, is taken by women and "pinned" or "tipped," as the western phrase goes; that is, the fine down and the close-growing feathers are picked off one by one.

The system of killing shown in Plate XIII is known as the "frame method" and has resulted from a selection and combination of the best features of the "string" and "bench" systems. String killing has been most commonly used and is illustrated in Plate XIV, figure 1. The bird is hung by twisting a cord around the feet, "bled" and "brained," and the feathers removed while it hangs head down. A vessel fastened to the head of the bird catches the blood. "Bench killing" is shown in Plate XIV, figure 2. Here the head of the chicken is held by means of a hook, the legs by the hand of the operator. After killing, the feathers are removed, as shown in the illustration.

"Frame killing" keeps the bird upright, prevents its coming in contact with rough or soiled surfaces as with the string method, and holds the bird even more firmly than does the bench method, because the feet, as well as the head, are supported.

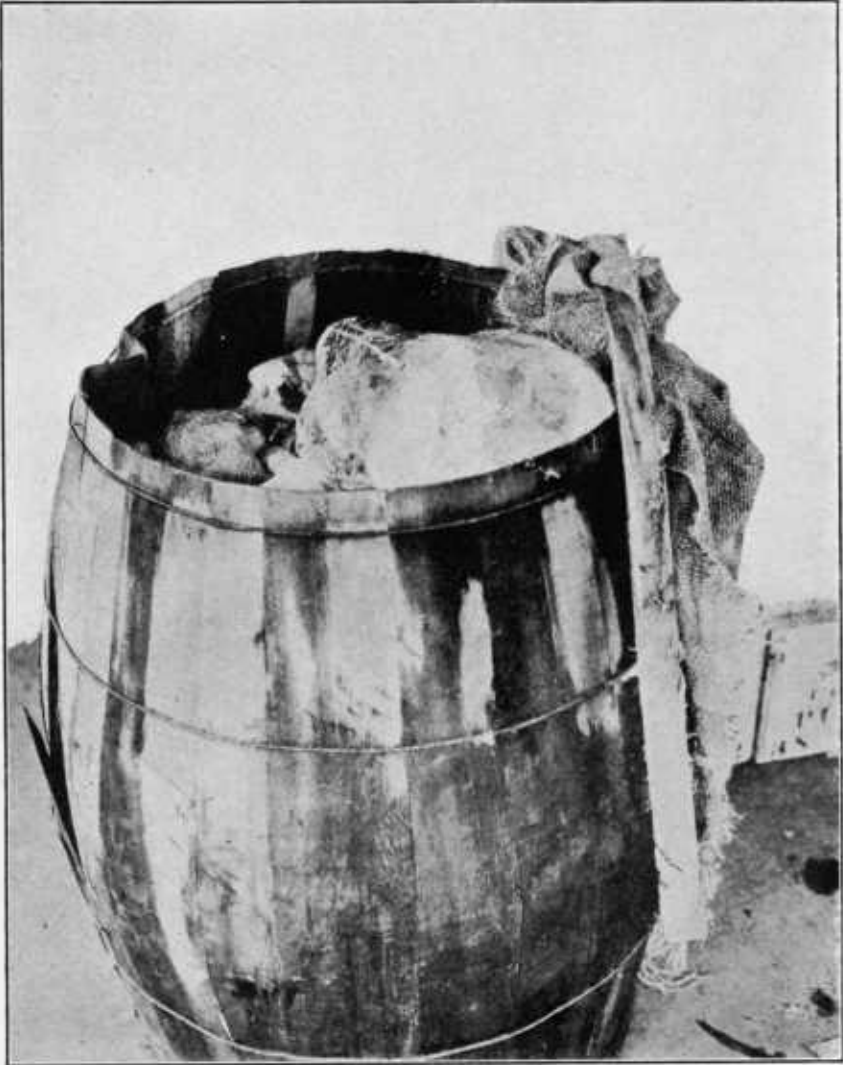
Cleanliness of handling is further emphasized by the system of pinning while the birds are hung on shackles, as is shown in Plate XV, figure 1. This scheme permits of quick, good work and is vastly superior to the old "lap" method, which is shown in Plate XV, figure 2. Pinning by the lap method means that the skin of the bird is constantly being rubbed over dirty, bloody surfaces and that it is frequently held by the neck, which prevents the draining out of the last portions of the blood.

Cleanliness being one of the watchwords of modern poultry dressing, the heads must be freed from blood and neatly wrapped in paper, and the feet must be scrubbed if they are dirty. This is generally done just before the birds are sent to the chill room.

#### CHILLING.

The up-to-date packer no longer uses ice to remove the animal heat. He uses mechanical refrigeration and provides clean, insulated rooms in which a temperature of about 32° F. is constantly maintained. The chickens are hung by the feet on racks<sup>1</sup> made entirely of metal, such as are shown in Plate XVI. This illustration shows, also, how a number of these racks stand in the chill room while the poultry is cooling, and the arrangement on the walls of the pipes carrying the cold brine on which the refrigeration depends. The four topmost pipes are doing the work, as is shown by the heavy covering of frost from the condensation of the moisture in the air.

<sup>1</sup> Public Patent No. 1,020,575, M. E. Pennington and H. C. Pierce.



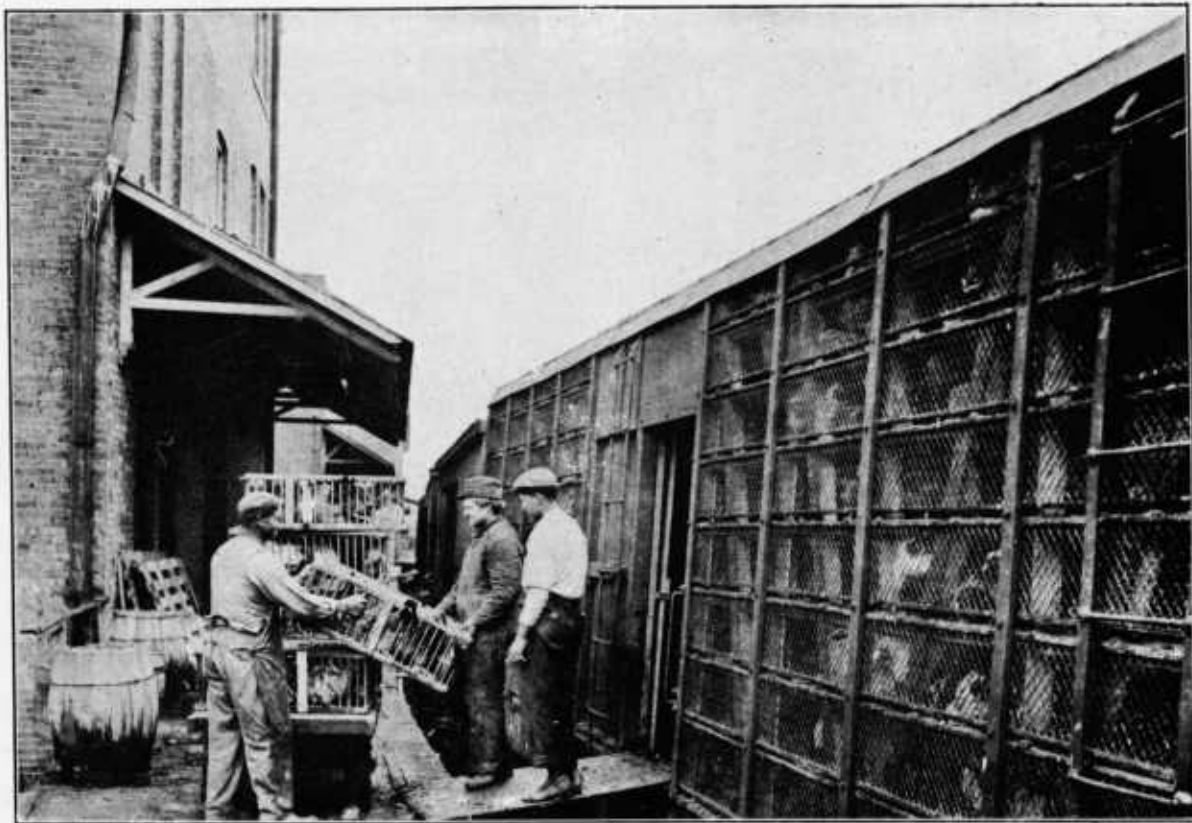
POULTRY PACKED IN A BARREL WITH ICE.



Yearbook U. S. Dept. of Agriculture, 1912.

PLATE X.

A WAGONLOAD OF LIVE POULTRY COMING TO A WESTERN PACKING HOUSE.



LIVE POULTRY BY THE CARLOAD.



FIG. 1.—A LARGE FEEDING STATION WELL LIGHTED AND VENTILATED.

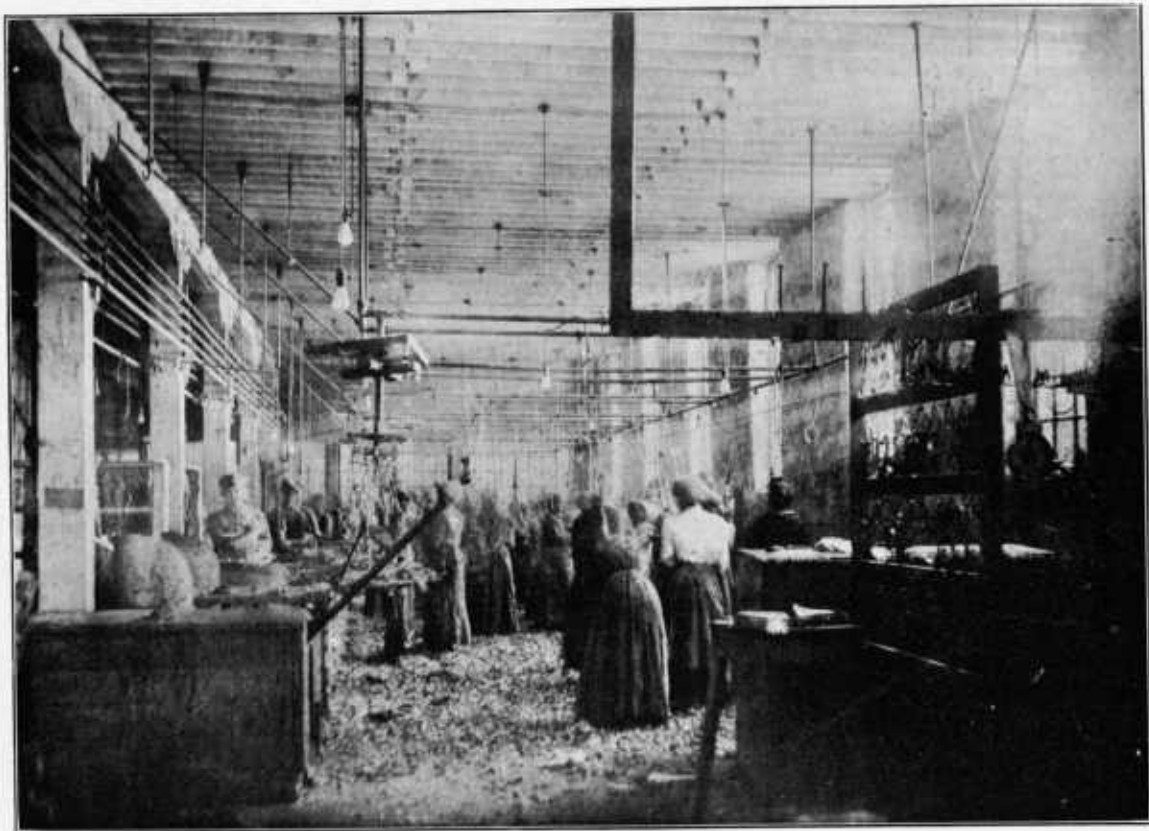


FIG. 2.—A FEEDING STATION 300 FEET LONG, ACCOMMODATING 30,000 BIRDS.



FIG. 3.—AT FEEDING TIME IN THE FATTENING STATION.





A POULTRY-KILLING ROOM.



FIG. 1.—"STRING" KILLING AND PICKING.



FIG. 2.—"BENCH" KILLING AND PICKING.



FIG. 1.—REMOVING SMALL FEATHERS WHILE THE BIRDS HANG BY THE FEET.



FIG. 2.—HOLDING BIRDS ON THE LAP TO REMOVE SMALL FEATHERS.



METAL POULTRY-CHILLING RACKS, STANDING IN A MECHANICALLY COOLED CHILL ROOM.



Yearbook U. S. Dept. of Agriculture, 1913.

PLATE XVII.

GRADING FROM A HANGING RACK IN A NATURALLY LIGHTED MECHANICALLY REFRIGERATED PACKING ROOM.



BOX-PACKED POULTRY READY FOR SHIPMENT

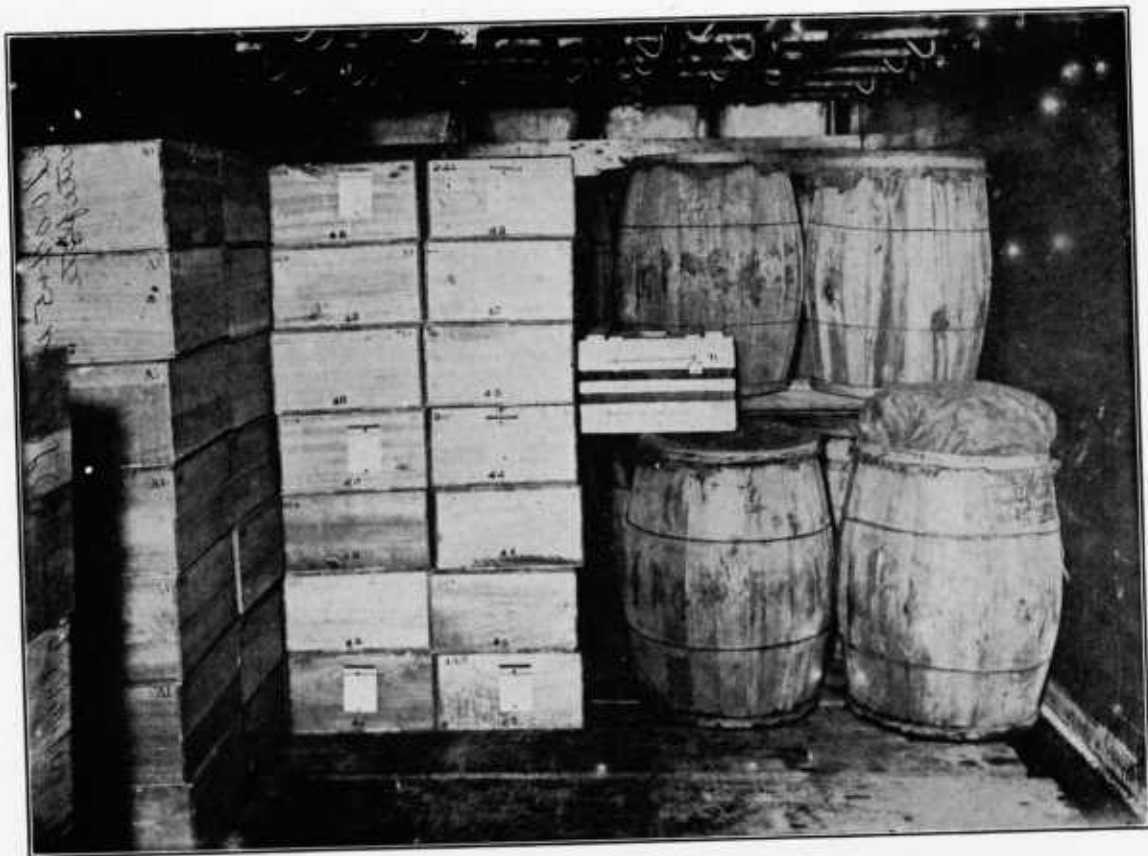


DRESSED POULTRY PACKED IN CARTONS.



PUTTING ICE AND SALT INTO REFRIGERATOR CAR.





Yearbook U. S. Dept. of Agriculture, 1912.

PLATE XXI.

A REFRIGERATOR CAR LOADED WITH POULTRY IN BOXES AND BARRELS.

Low temperature, as we know from household practices, is used to inhibit decay, which it does by slowing bacterial growth and enzym action. When chickens are alive their temperature is 103° F. This must be reduced to 32° F. or less before the birds can be packed for long hauls in refrigerator cars.

The time required to chill the fowl is usually about 24 hours, and the packer must be sure that the viscera, as well as the skin and flesh, are free from heat before the birds leave the chill room. It is the failure to observe this requirement that is responsible for much of the bad-conditioned poultry in our markets. The range of temperature permitted, too, is small. Below 30° F. the flesh is frosted; above 35° F. decay proceeds too rapidly to permit of long hauls to distant markets and a routine of marketing such as our urban life now requires. Of course, the birds can be frozen hard after they are chilled, and so shipped, and this is a very excellent plan, especially if the haul is across a hot country.

#### GRADING AND PACKING.

Having removed the natural heat from the dressed fowls, the next step in their preparation is to grade and pack in suitable containers for shipment. This operation should be performed in a room having a temperature of 30° F. and in this room the packed boxes may remain for several days while awaiting shipment.

No longer does the packer thrust old cocks, broiling chickens, and fowls indiscriminately into the big sugar barrel, pressing down the birds in his endeavor to pack tightly and so bruising flesh and tearing skins. Such a procedure prevents good keeping; therefore the shipper, far from his market, must not only avoid it but he must use a package that allows the birds to stay in good condition the maximum length of time. With this end in view, as well as to enable his customers to see at a glance the quality of his product, he has adopted wooden boxes, holding only 12 birds each. He also takes care that each bird of the 12 is an exact match for the other 11, both in weight and quality, and when he has a brand on the box and a reputation in the market, he even matches the color of the skins, that the package may present an attractive appearance. Such exactness involves experience and knowledge in grading the birds, and is by no means a simple operation. Plate XVII shows the interior of a packing room with graders and packers at work. Natural light falls on the rack from which the birds are being removed; each dozen as selected are weighed on the track scale and the weight stamped on the box into which the packer puts them. The boxes are lined with parchment paper to protect the skins and to prevent evaporation, and sometimes, especially if long storage is contemplated, each bird is separately wrapped.

Plate XVIII shows the appearance of these boxes of chickens. Broilers are breast up, and there is but one layer in the box; roasters and fowls are packed on their sides, and two layers are used. The boxes of broilers weigh from 15 to 24 pounds; roasters and fowls may run 60 pounds to the box. The ordinary barrel of poultry weighs 250 pounds or more. When one considers the delicate character of the skin and flesh of a chicken and the pressure that the poultry in a heavy package exerts upon itself, it is easy to see what advantages in the way of good carrying apply to the small box.

For very high-grade poultry the carton holding one roasting or two broiling chickens is being used to a limited degree (Pl. XIX). Like all individual wrappers put on at the source of production, it tends to keep the bird clean and sound skinned. It also insures to the housewife a package that has not been mauled by prospective customers nor soaked in water by the retailer to freshen up a dried-out bird, or perhaps to remove the odors of beginning decay. When high-grade poultry is to be kept from the season of production to the season of scarcity, as is necessary to feed this great country, the carton pack is highly desirable. The drying out of the flesh in the low temperatures of the cold store is very largely prevented and, what is even more desirable, the unbroken package can be sent hard frozen to the consumer. As the consumer becomes better informed on the subject of food supplies and their handling the packers will mark the cartons with the date of killing, as well as the brand of goods. Thus the purchaser will see that the bird has been killed during the season when the quality is highest—broilers before December and roasters between September and January—and that they have not been held in storage more than 12 months. The packer of high-class goods is now more than willing to put such information on his labels; the warehouseman desires it; the wholesaler wants such information; but the retailer can not risk giving the true story to the consumer because the prevailing ignorance would translate the truth into undesirability, and the purchaser would go elsewhere to purchase the same grade of goods, but accompanied by the verbal statement of "strictly fresh and nearby." The consumer does not realize when he clamors for true labels on foodstuffs that his own ignorance and prejudice are the greatest bars to the obtaining of his wishes.

#### SHIPPING METHODS.

But to return to the boxed poultry that we left in the refrigerated packing room waiting for its long journey to the consumer. How must that journey be made to insure good order on arrival? The answer used to be "speed," because the time that the produce would keep was so short under even the best of prevailing conditions that the whole course of marketing must needs be rushed. Now the

reply is, good handling and refrigeration, from start to finish; refrigeration evenly and constantly maintained, because cold is a great discourager of those all-pervading and ever wide-awake forms of plant life, bacteria and molds, without which we do not have decay.

To maintain refrigeration between the far-distant source of supply and the consuming center, we have developed a system of refrigerated carriers in connection with our railroads, and we are as dependent upon them for our food supplies as is England upon her ships. The traveling public everywhere is familiar with the appearance of the outside of the freight car which bears the word "refrigerator," as well as the initials of its line, but few of the many thousands who depend on those cars for their daily supply of foodstuffs know how they are constructed and made efficient for the work which they are to do.

Ice is used to produce low temperatures, and when below 40° F. is required, salt is mixed with the crushed ice. A compartment is built across each end of the car to hold the ice, and openings above and below, into the body of the car, permit circulation and consequent cooling of the air of the car. Plate XX shows the procedure of icing and salting. Rock salt is contained in the barrel which lies on the roof of the car. The hatches through which the ice and salt are put into the bunkers are also shown. In some places ice crushers are used instead of man power, which greatly hastens the icing process.

In order to keep the heat of the atmosphere from penetrating the car and so disseminating the cold produced by the refrigerant, insulation must be used in its construction. The modern refrigerator car is rapidly becoming a chill room on wheels, and it must be that if it is to serve the public to its satisfaction and to the financial profit of the railroads as well. During the long hauls in the United States the same car, with its unbroken load, must traverse the heat of deserts and the cold of high mountains, or go from the warm southland to Alaskan snows. It may be that the load carried must not vary in temperature more than 5° F., in which case ice is used in some parts of the journey and stoves in others.

Our chickens, however, seldom become too cold. It is heat that we must guard against when they are shipped; therefore the careful packer will ask the railroad to set the refrigerator car on his siding at least 24 hours before he expects to load, for no packer who works to prevent decay ever loads his poultry in a car having a high temperature or hauls chilled goods in wagons. Then he will examine the car to see that when the doors are closed not a ray of light enters, because that would mean inefficiency of insulation. He looks also to see that drain pipes are working and the general repair good, and, finally, after the car has been iced and

salted for at least 24 hours, he takes the temperature about 4 feet from the floor midway between the doors. If it is below 40° F., he may load his chilled birds with safety. Plate XXI shows the loading of a car with mixed boxes and barrels of poultry. The packages bearing tags are to be examined by the United States Department of Agriculture when the goods reach their destination and their condition noted. The small iron-bound chest contains a thermograph which registers the temperature of the car during transit. One tagged barrel contains dry-packed, the other ice-packed poultry. The latter is the barrel having a big lump of ice under the burlap covering. This experimental shipment was made to determine the relative keeping time of wet and dry packed birds and also to study the question of the height of the load in the car. The car shown in the photograph is loaded too high. About 4 feet is much better. A great many experimental shipments of poultry have been made by the Food Research Laboratory to learn the best available way to conduct every phase of the handling, and it is on the basis of this experimental work that the statements in the present article are founded.

The loading of a car containing 20,000 pounds of poultry—that is, the car lot of the West—can be accomplished in 30 minutes if the work is well planned. It should be done as expeditiously as possible to prevent a rise in the temperature of the car. Even with prompt loading it is well to have a heavy canvas curtain hung in the door of the car to keep the outside air from entering. A better plan still is to have a door in the packing room which opens on the loading platform, and then connect the car and the packing room by means of a canvas corridor.

Having loaded the car and again observed the temperature, that the packer may know under just what conditions his goods start on their long journey, the doors are closed and sealed. The railroad agent knows the perishable character of the freight, and he issues instructions to add ice and salt while en route that low temperatures may be maintained. Or the packer himself may designate when and how he wants his car iced. When the doors are closed they should remain closed until the market is reached. If the packer has dressed and chilled the birds properly, if the refrigerator car is well insulated and built, if ice and salt are added as needed during the haul, the load is just as sure to reach the market a thousand miles away—that is, about five or six days as reckoned by time—in good condition as is a carload of cast iron. After the chickens reach the market they have still to go through the hands of the commission man, the retailer, and, perhaps, the storage warehouse. But that is another story.