

THE MEAT INDUSTRY OF AMERICA.—I.



AMERICA is the home of colossal industries. The American people have a genius for organization which has found expression in certain aggregations of men, machinery, and capital which are among the wonders of our twentieth century civilization. Conspicuous among these is the vast meat industry, which in the range of its operations, from the mul-

titudinous flocks on hillside and plain to the fresh meat or canned product as delivered to the individual householder, involves the employment of hundreds of thousands of men and the turning over of money that must be reckoned by the thousand millions.

The latest estimate of the value of meat animals on farms and ranges, made by the Department of Agriculture, January 1, 1907, is \$2,152,320,349. In 1905 the value of live-stock farms and ranges was estimated to be nearly eight billion dollars, and the capital directly related to meat production for export alone is \$10,625,000,000, or five-sixths as large as all capital invested in manufacturing in 1904. It is estimated that the farm value of the available slaughter of 1907 will be worth at the farm at least \$730,000,000.

In the development of the great industries of the United States to which we have referred above, there is a tendency to concentration at certain cities which, by virtue of their geographical location or other strategic advantages, are particularly well placed to serve as the centers of activity. Conspicuous among these is Chicago, which holds the same relation to the meat industry that Pittsburg does to steel. Sixty-four per cent of the population of the United States is east

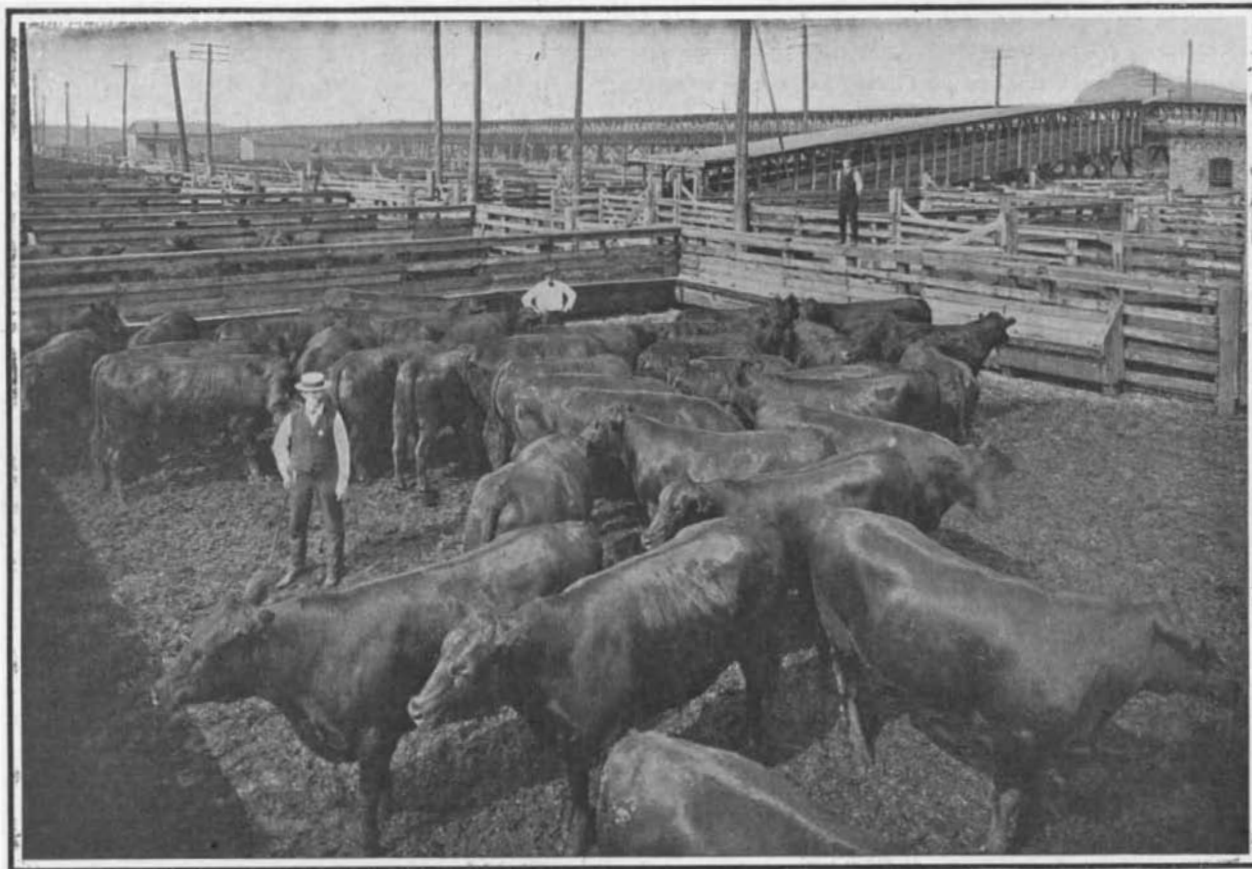
of Chicago; while seventy per cent of the farm animals lie to the west of that city. The great east and west transportation lines have their terminals there, as have also the southern railways and the lake transportation lines. The pre-eminence of Chicago in the meat industry is shown by the fact that since 1900 there has been marketed and sold in Chicago a yearly average of over 16,000,000 animals, valued at over three hundred million dollars, and that this number is about half the total combined receipts of the six principal live stock markets of the United States.

The meat industry of Chicago, from the purchase of the live stock to the shipment of the meat, in either the fresh or the cured condition, is carried on at the Union Stock Yards, which are located near the out-

town. The whole of this area, a half mile in width, and a mile in length, is paved with red brick; and here we see the first notable evidence of the effort to maintain the stock yards in a sanitary condition. The brick paving makes it possible to thoroughly clean both pens and streets, and this is done at regular and frequent intervals. At the time of our visit, although there had been several days of drizzling rain, the yards presented conditions of cleanliness superior to those which can be found in the farmyard of the average American farm, and comparable to those of a well-appointed livery stable.

Whatever may have been the conditions in the past, it is a fact that to-day the greatest care is exercised in the shipment and handling of the stock from the

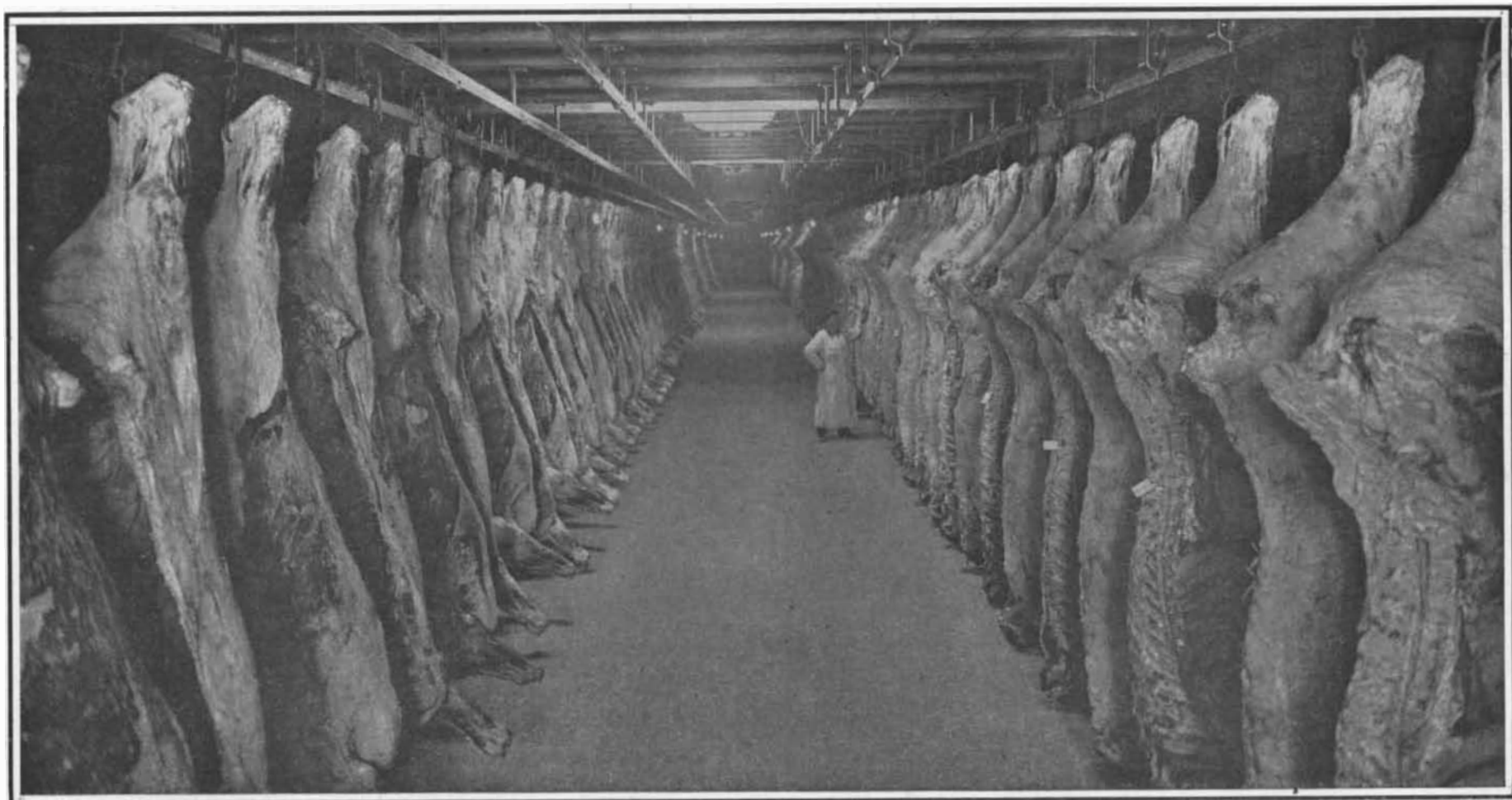
time it leaves the farm until it enters the packing houses. The price that the animals will fetch in the pens depends upon the condition they present under the eye of the buyer who represents the packing houses; and it is to the interest of the farmers, the cattle-men, and the commission men to whom the cattle are consigned at the yards, that they shall receive the best food and the most careful attention up to the very hour at which the sale is made. They are shipped in special stock cars, in which they are carried as expeditiously as possible to the stock yards, where they are unloaded and driven to the pens. Here they are at once fed and watered, each pen containing a feeding trough and a water trough into which a stream of fresh water is kept running. The cattlemen consign their



The stockyard pens, where the cattle are purchased for the packing houses. One of the United States inspectors who examine the cattle on the hoof is seen in the foreground.

skirts of the city. The yards cover exactly a square mile of ground. One-half of this area is covered with cattle pens, and the other half by the huge establishments of the packing houses. The pens are surrounded by stout stockades about shoulder-high, and they are laid out in blocks with streets and alleys, in much the same fashion as an ordinary American

stock to the various commission houses, and for receiving and selling the stock there is a charge of respectively twenty-five cents and fifty cents a head. The purchase of the cattle is made by buyers, of whom each of the packing houses maintains a regular staff. To enable the writer of the present article to judge of the condition of the yards and determine for himself how far the



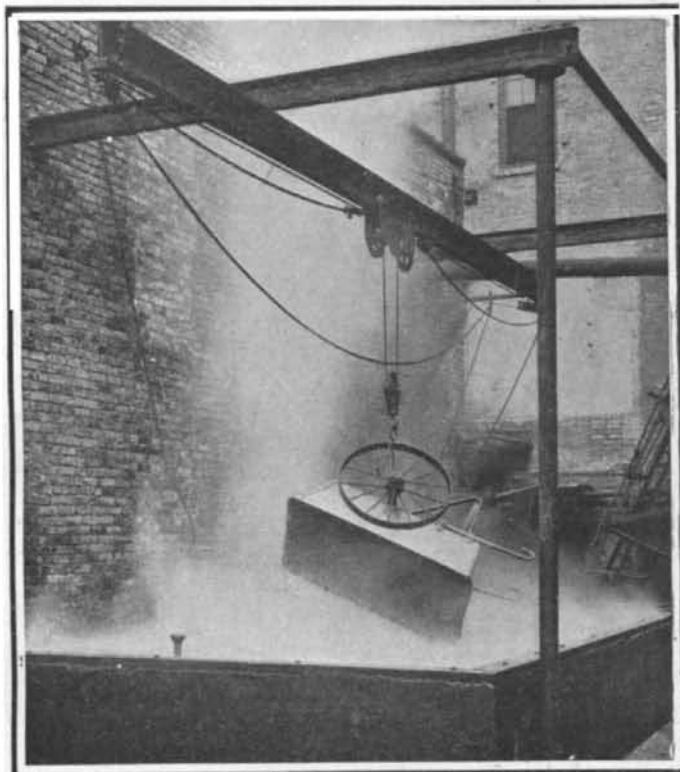
The beef, dressed ready for shipment, is hung for two days in this room, which is maintained at a temperature of 33 deg. F.

The chill room. Capacity, 3,000 sides of beef.

conditions of buying and selling warranted the oft-repeated statement of the newspapers that the market is controlled in the interests of the packing houses, he secured a horse and took an opportunity to ride into the pens and listen to the bidding as carried on between the buyers and the commission men. It must be confessed that the observations of that two hours

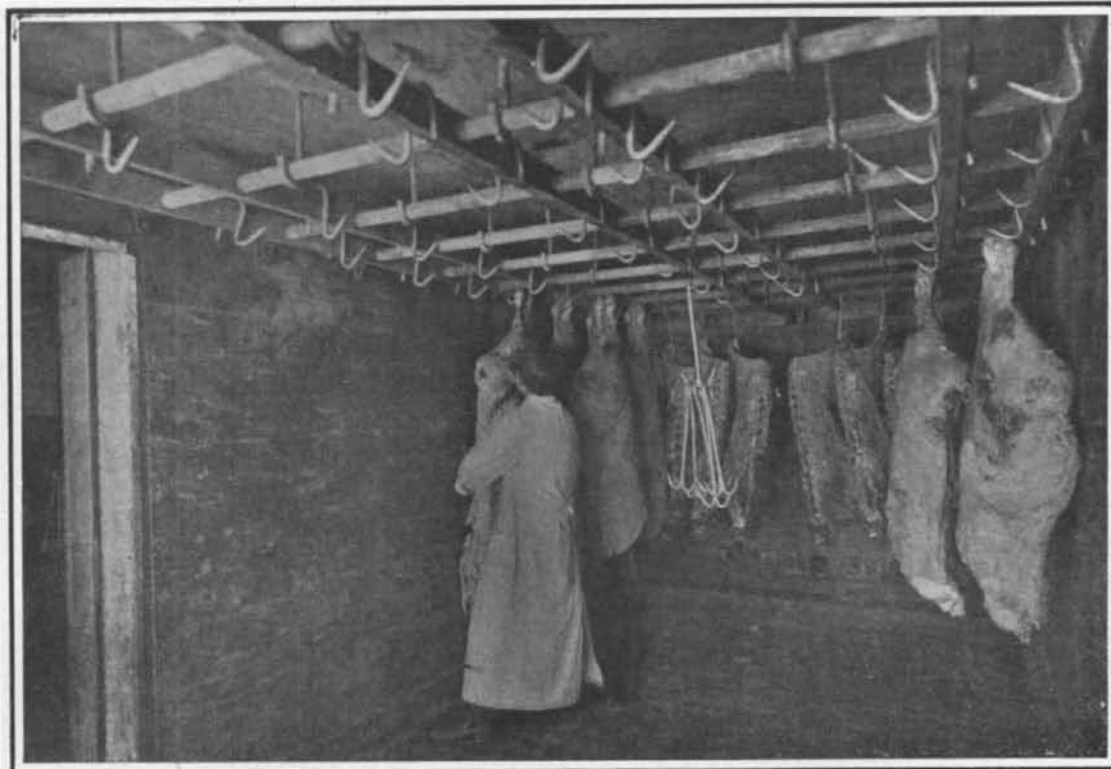
stock raisers. As regards the buyer, it may be said that the margin of profit is so small, being about two per cent in the case of Swift & Co., whose buyer the present writer accompanied during the morning's work, that the prosperity of the house may be said to depend more upon his judgment of the condition of the cattle, and skill in securing the lowest prices,

later," says the buyer, and drives out of the pen, explaining to the writer that in his judgment the market will be lower as the day wears on. We next entered a pen containing what the buyer defined as prime, corn-fed cattle. Question: "What are you asking?" Answer: "Seven seventy." "Make it seven fifty." The commission man refuses to come below



The trucks in which the meat is handled are periodically sterilized by plunging them bodily into a vat of boiling water.

Sterilizing a box truck.



This interior view of a refrigerator car shows how the beef, during its journey to the branch distributing house, is hung in a refrigerated atmosphere similar to that in the chill room.

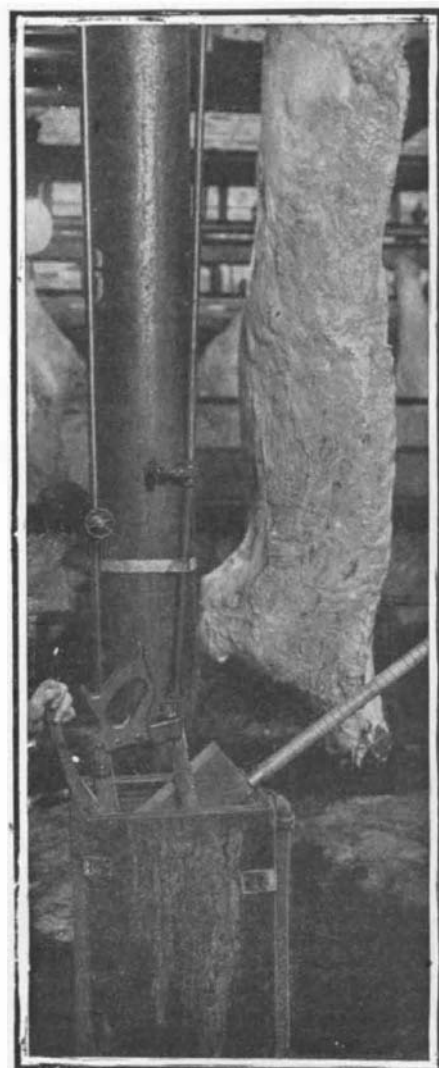
Loading the beef into the refrigerator car.

spent in the pens left the impression that the competition was keen, the commission men trying to get the best possible price for the farmer and the buyers the lowest possible figure for their respective houses. This conviction is deepened by the fact that the supply of cattle seems to be less than the demand for the trade, and always less than the capacity of the packing houses; that there is a natural rivalry between the houses themselves to show the largest output; and that, since the profit of the commission men is at a fixed rate of fifty cents per head, there is a natural desire on their part to sell all that they can at the highest possible figure; for the commission men who secure the reputation for obtaining high prices will naturally command the confidence and trade of the

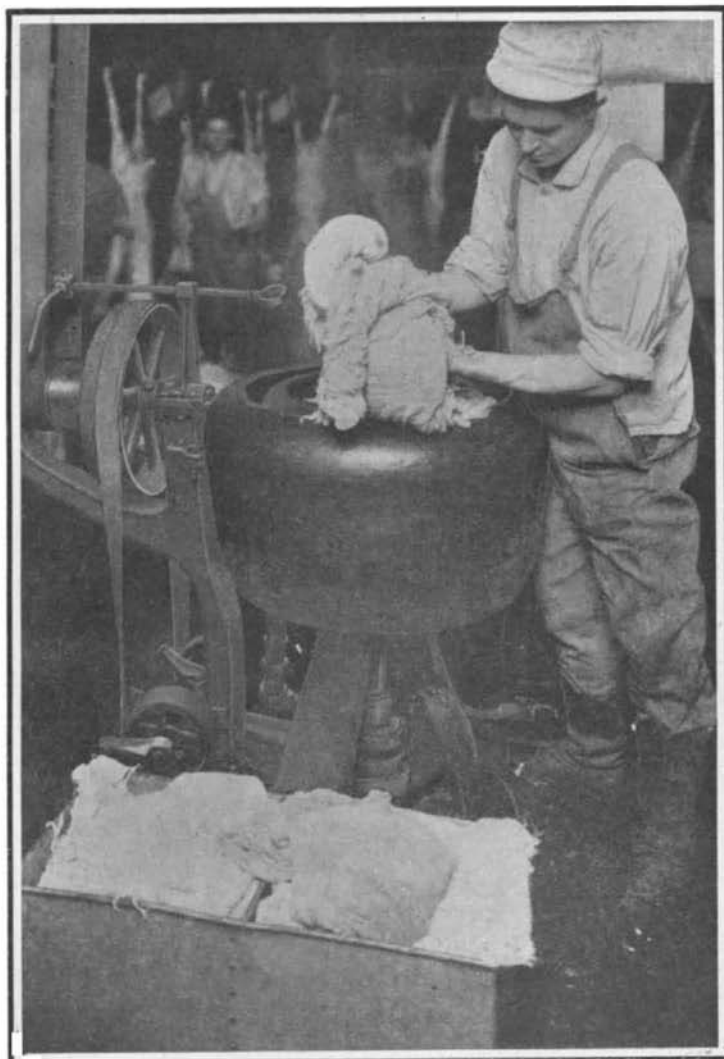
than upon the efforts of any single individual concerned in the business. It is claimed by the Stock Exchange Protective Association, which was formed to safeguard the interests of those who ship their stock to the yards, that the scale of trading morality is exceedingly high, and that an instance of "shady work" on the part either of commission men or buyers is practically unknown. The buyer, accompanied by the commission man, rides into a pen of cattle; looks them over with a rapid glance of his thoroughly practised eye, and quickly decides whether he will buy at the price demanded. In one particular case, of which note was made, the following laconic conversation occurred: The buyer: "Six fifty." The commission man: "Make it seventy-five." "See you

his first figure; but as we ride out of the pen, calls out "Sixty," and the buyer immediately answers "Weigh 'em," explaining that this signifies that the deal is consummated and the cattle are to be driven to the scales preparatory to going to the house of Swift & Co. for killing. We had the curiosity to ask the buyer what was the sum of money involved in a transaction that took less than thirty seconds to complete, and found that it amounted to over \$7,000.

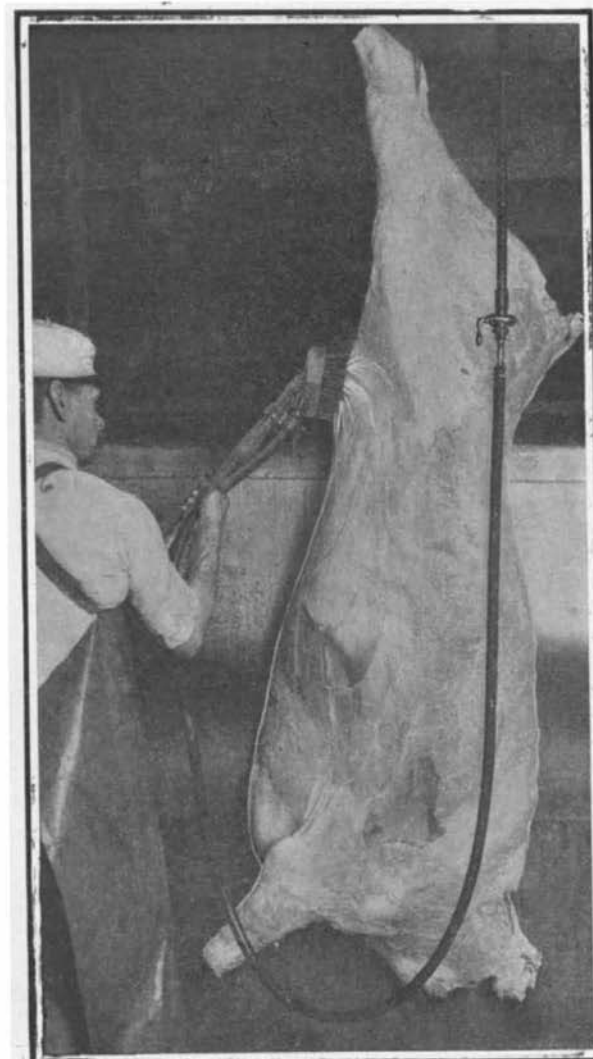
Before following the stock to the packing house, it will be well to make some general observations upon the scope and purpose of the vast buildings which occupy that other half square mile of ground adjacent to the pens. The complicated organization represented by these establishments has for its object the dressing



Tank containing bichloride of mercury solution in which dressing tools are disinfected.



Centrifugal drier for washing cloths used in the dressing of the beef.



Washing down the sides of beef with a brush through which flows a stream of fresh water.

and preparation of the meat, either by refrigeration or curing, in such a way that it will stand a journey to any part of the world and reach the retail dealer in a perfectly clean, wholesome, and palatable condition.

Broadly speaking, there are three methods of preservation, namely, refrigeration, curing, and canning. The present article will deal with the methods of refrigeration and curing as carried on at the establishment of Swift & Co., through whose courtesy we obtained ample opportunities to examine every detail of their plant during a recent visit to the stock yards. The art of meat preservation may be described as a process for the arresting of that law of nature by which all animal tissue, as soon as life is extinct, tends to become resolved by a process of deterioration into its chemical constituents. This can be done either by lowering the temperature of the meat to a point below that at which the bacteria are active, or by treating it with certain salts and substances which secure the same effect. It will be evident at once that the very first requisite in work of this character is that the animals must be absolutely healthy and in first-class condition.

One of the strongest impressions produced upon a visitor to the packing houses is that every possible precaution is being taken to insure the entrance only of healthy animals into the dressing room, and provide for the detection and removal of any that excite the slightest suspicion. This part of the work is in the hands of the United States government, and is under the immediate supervision of the United States Department of Agriculture. The inspection is divided into two kinds—the *ante mortem*, which takes place when the cattle are unloaded into the stock pens, where any animal which by its appearance or actions indicates that it is not in perfect condition is rejected or held for further examination; and the *post mortem*, which takes place after the killing, and consists in a careful examination of the various organs. The *post mortem* examination is made at various points during the process of cutting up, and is continued on the dressed and cured meats up to the very hour of shipment. The personnel of the inspection corps is made up of men who must have successfully completed a three years' course in veterinary medicine at a reputable veterinary college. The Civil Service Commission examines these graduates and about 50 per cent of those examined make the desired grade of 70. The salaries are generous and the promotion of men to higher positions is dependent upon ability. The force is divided into the head inspectors; the laboratory inspectors, who have to pass a civil service examination in bacteriology and chemistry; the inspector's assistants, who examine live stock, stamp the meat, seal the cars, and superintend the removal of condemned meat; and the meat inspectors, who are experts in pickling, salting, smoking, and otherwise curing the meat. We made it a point to converse with several of these men and found them to be intelligent and zealously interested in their work. They stated that the packing-house management was disposed to give hearty co-operation, realizing that the more satisfied the public was of the thoroughness and unbiased character of the work, the better it would be for the houses concerned.

The cattle, after inspection and purchase in the pens, are driven along runways to the dressing floor. The animal is stunned by a blow with a large hammer and hoisted by means of a shackle attached to the hind legs onto the rail of an overhead tramway. While in an insensible condition it is dispatched by severing the principal arteries in the neck. It is then carried forward on the rail; and the operations of dressing follow in quick succession. First the lower joints of the legs are removed, and then the "sider" skins the animal as far down as he can without exposing the parts to contact with the floor. The animal is next opened and the viscera are removed. By means of saw and cleaver the beef is then split entirely in two through the vertebræ. The rough pieces of meat, the spinal cord and other portions are then removed by the trimmers. Next the separated parts are moved down the rail in front of long benches, where other workmen give them a thorough washing with hot water, using a stiff brush from the center of which a hose throws a stream of water against the meat, which is subsequently wiped thoroughly dry with clean cloths. By this time the beef is ready to be passed on to the chill room.

During these various processes the meat has been subjected to careful scrutiny on the part of a United States inspector. When the head is severed an inspector examines the glands which are the common seat of tubercular trouble. At the removal of the viscera another inspector is on the lookout for any indication of abnormality. If there is any evidence of disease, the inspector attaches to the animal a tag on which are the words "U. S. Retained." This tag is numbered to correspond with the number on the stub, which latter he forwards to the office of the inspector with his report. The suspected animal, with

any parts which may have been already separated from it, is placed in an iron truck, wheeled away under the eye of the inspector, and locked up in what is known as the "retaining room," the keys of which never pass out of the hands of the government officials. In this room the animal undergoes a final and more

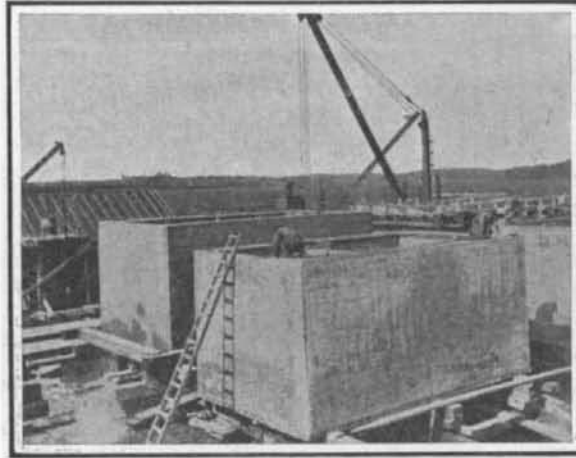


Fig. 1.—Building the caisson.

thorough inspection, and upon condemnation it is removed and completely destroyed.

Returning now to the sides of beef which have been dressed, washed, and wiped, and have passed the inspection above referred to, the government inspector marks each with a metal or rubber stamp which reads "U. S. Inspected and Passed," and the sides are then

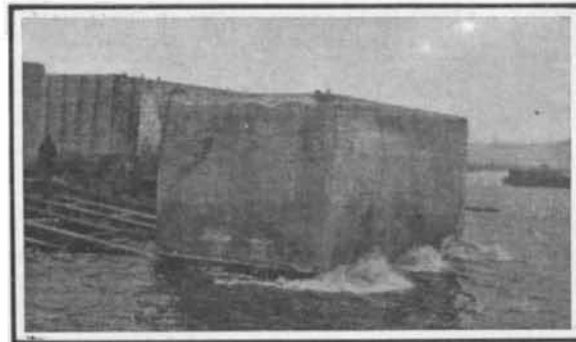


Fig. 2.—Launching the caisson.

wheeled along the overhead rail into a vast apartment known as the chill room, where they are held at a temperature of about 36 deg. F. for forty-eight hours. In the chill room, at the time of our visit, some three thousand sides of beef were hanging. Here, during the time the beef is maintained at the temperature stated, it is subjected to a continual circulation of cold air

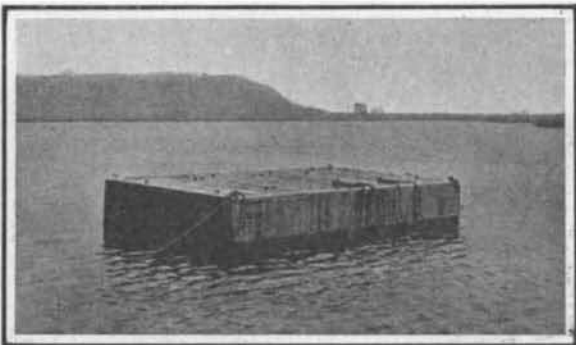


Fig. 3.—Ready to be towed into position.

by a process known as the moist refrigeration method, which is designed not only to reduce the temperature of the air, but also to rid it of bacteria, dust, and other impurities. The cooling and cleansing of the air is done in a large chamber immediately above the refrigerating room. Here are suspended, in long rows extending entirely across the chamber, thousands of



Fig. 4.—Section of completed breakwater.

CONCRETE STEEL CAISSONS.

large sheets of burlap, over each of which trickles continuously a stream of cold brine. The air, drawn in from the outside, is caused to pass between the burlap, where any dust and bacteria which may be in the outer atmosphere are deposited, and the temperature is lowered to the desired point. After pass-

ing the burlap, the pure air falls by its own gravity through openings in the floor, arranged directly above the sides of beef in the room below. From the refrigerating room the beef that is to be shipped is wheeled out on overhead rails into the refrigerator cars, where it is hung in symmetrical rows on hooks suspended from the ceiling. At each end of the car is a narrow compartment walled off by boarding which extends from floor to ceiling, but is provided with openings at top and bottom for the circulation of the air; and in these compartments are placed tanks loaded with ice and salt. The air passes in through the vents at the top; is cooled; and falls by gravity to the bottom, whence it issues into the body of the car, a constant circulation of cold air being thus secured.

There are in various parts of the country over three hundred local Swift & Co. distributing houses, where on the arrival of cars the meat is wheeled out on overhead rails into refrigerator rooms, from which it is purchased by the various retail dealers.

CONCRETE STEEL CAISSONS.

A new type of breakwater is being built at Algoma, Wis., of reinforced concrete caissons. These caissons are huge hollow blocks of reinforced concrete, each weighing 120 tons in air. They are 24 feet in length, 15 feet in width, and 12 feet 4 inches in height. They are built over launching ways and are launched like a vessel. After launching they are towed a distance of twelve miles to the harbor, where they are used in the construction of a breakwater.

In the breakwater they rest on a foundation of piles which are cut off 11 feet 4 inches under water. When the foundation has been prepared, the caissons are brought into the proper position and sunk by the admission of water into the hollow compartments. After the caissons have come to a firm bearing, the water is displaced by riprap stone, and this is sealed over with four feet of solid concrete. A superstructure with its crown three feet above the caissons completes the breakwater, which is protected on both sides by riprap.

Fig. 1 shows several caissons on the stocks; Fig. 2 shows one of these large blocks being launched. One of the caissons is shown afloat in Fig. 3, and Fig. 4 shows the finished breakwater.

These caissons were invented by Major W. V. Judson, who holds a patent covering the invention, and under whose supervision the above breakwater was designed and built.

Disposal of the Heany Patent Fraud Case.

The Heany patent fraud case, which involved a Patent Office examiner, N. W. Barton; a patent attorney, Henry E. Everding; and the inventor, John Allen Heany, himself, has been decided at Washington. Barton withdrew his plea of not guilty, and pleaded guilty. Everding practically admitted guilt to some of the charges, but denied guilt of any wrongful act in connection with one of the applications. Heany offered no evidence whatever. A verdict of guilty was brought in against Barton and Everding. Heany, the inventor, was acquitted.

The case in question involves the tungsten lamp patents, and the ultimate outcome will be watched with much interest.

Official Meteorological Summary, New York, N. Y., December, 1908.

Atmospheric pressure: Highest, 30.53; lowest, 29.38; mean, 30.06. Temperature: Highest, 64; date, 12th; lowest, 20; date, 10th; mean of warmest day, 52; date, 1st; coolest day, 26; date, 10th; mean of maximum for the month, 40.9; mean of minimum, 29.5; absolute mean, 35.2; normal, 34.1; excess compared with mean of 38 years, 1.1. Warmest mean temperature of December, 42, in 1891. Coldest mean, 25, in 1876. Absolute maximum and minimum for this month for 38 years, 68 and -6. Precipitation: 3.21; greatest in 24 hours, 1.91; date, 6th and 7th; average of this month for 38 years, 3.38. Deficiency, 0.17. Greatest December precipitation, 6.66, in 1884; least, 0.95, in 1877. Wind: Prevailing direction, west; total movement, 10,712 miles; average hourly velocity, 14.4 miles; maximum velocity, 50 miles per hour. Weather: Clear days, 7; partly cloudy, 9; cloudy, 15; on which 0.01 inch or more of precipitation occurred, 10. Snowfall, 5.1; sleet, 4th; fog (dense), 12th, 18th, 31st.

A new system of road-making, which, it is claimed, will stand the wear and tear of heavy traffic, such as motor wagons, and be virtually dustless, is to be tried on a more extended scale by the Lancashire County Council. It has already been tested on short lengths of road, and after four years' hard use the road shows no sign of wear. It is made with small granite sets $3\frac{1}{2}$ inches to $3\frac{3}{4}$ inches, laid in intersecting circles. This method of paving is said to be much more economical than paving with ordinary granite. At the instance of the County Council the system is to be tried on a length of main road between Accrington and Haslingden.