

VOLUME LI

NUMBER FOUR

THE NATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1927

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PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

\$3.50 A YEAR

50¢ THE COPY

AMERICA'S DEBT TO THE HEN

BY HARRY R. LEWIS

FOR untold centuries the hen has been a companion of man in the onward march of civilization.

In America, where poultry husbandry has attained its greatest development, the hen has become one of our leading national assets, growing in the past fifty years from a neglected side line on the average farm to a position where she is considered by the farmer as a very efficient contributor to his yearly income.

The hen might be termed a universal favorite, in that a greater number of persons are interested and actually concerned with poultry than with any other form of live stock.

The hen is becoming more and more a source of our food supply. From 1920 to 1924 the increase in chickens in the United States was 43 per cent and the increase in egg production was 20 per cent.

In 1923 the farm value of poultry products exceeded by more than \$150,000,000 the value of all cattle raised, by nearly \$300,000,000 the value of wheat raised, and by approximately \$400,000,000 all fruit and fruit products.

The value of our poultry products is exceeded at the present time by only five other agricultural commodities — dairy products, corn, cotton, hay and forage, and swine.

The yearly value of the products of the American hen has already passed the billion-dollar mark.

The great bulk of poultry and eggs produced in the United States comes from the Corn Belt States of the upper Mississippi Valley. In fact, more than one-half of our poultry population, or approximately 200,000,000 chickens, is found in what are known as the North Central States. In this big, general-farming area practically every farm possesses moderately small flocks, ranging from 50 to 200 or 300 birds to the farm.

NEW SOCIAL CONDITIONS

For many years a considerable proportion of our poultry population was kept in back lots of city and suburban com-

munities by persons primarily engaged in some remunerative occupation. Poultry was raised largely for pleasure and as a hobby, and incidentally to insure a goodly supply of fresh eggs and meat for the family table. Until the close of the World War, the number of birds so kept numbered hundreds of thousands.

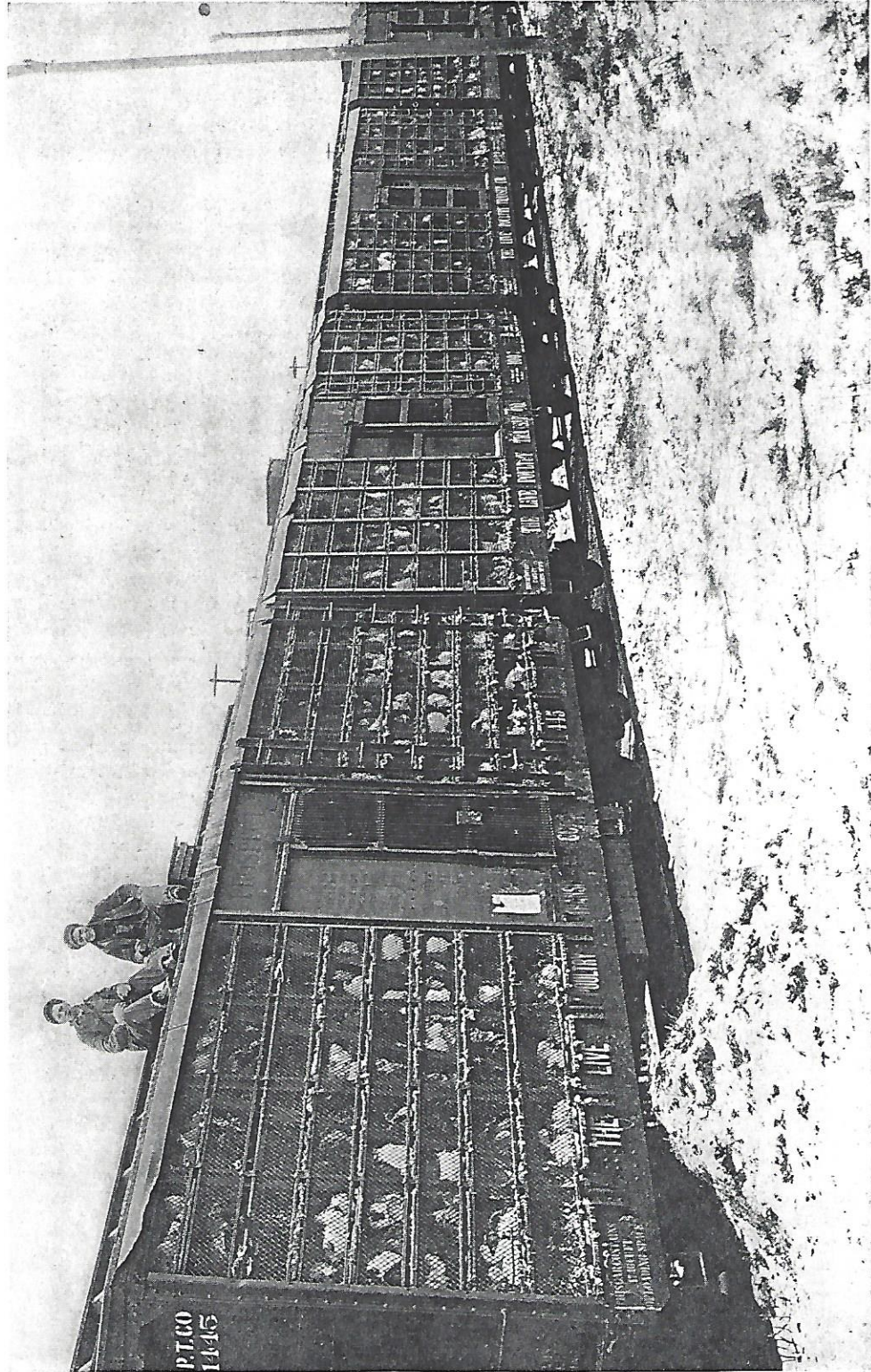
Surveys made a few years ago in eastern urban and suburban areas showed an average of one bird to every two people. Such flocks, averaging from 10 to 25 fowls, were usually well cared for and consisted of birds of high quality.

The postwar period has witnessed the gradual disappearance of many of these back-lot poultrymen. City and suburban poultry houses have been remodeled into garages to shelter the family motor car, for the average suburban dweller no longer takes his pleasure in caring for chickens, but prefers to go to the movies, listen to the radio, or ride in his car.

This change in habits among a great mass of our population has fortunately been accompanied by the development of large commercial poultry farms and specialized henneries, which have found popular favor not only on the North American Continent, but in many Old World countries. The owners of such farms give their entire time to the care of their flocks and in many instances employ additional labor, the land areas of such enterprises covering from five to hundreds of acres.

Commercial poultry farms are especially successful near large centers of population, where the demand is for a strictly fresh, new-laid egg and fresh-killed poultry. Hundreds of such enterprises are being successfully operated in the Atlantic and Pacific Coast States. The eastern sections produce especially for the New York trade, and the Pacific coast sections, after meeting the demands of the larger Pacific coast cities, ship their eggs to the Atlantic seaboard, where they find a ready market at attractive prices.

The production of eggs under these conditions is rapidly assuming factory proportions.



Photograph courtesy U. S. Department of Agriculture

A LIVE-POULTRY TRAIN

The birds are brought from scattered points to concentration centers, where they are loaded into specially designed freight cars and moved rapidly to the poultry terminals of the large cities. Each car will accommodate about 4,000 chickens and is equipped with a water tank, a grain crib, and a "stateroom" for the attendant, who is sent by the shipper to accompany and care for the fowls. This method of transporting live fowls has proved very successful, the average shrinkage by loss of weight in transit being only about 5 per cent. The eggs laid en route are a perquisite of the attendant.

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There is greater uniformity and more systematic breeding of poultry in the United States and Canada to-day than anywhere else in the world.

Revolutionary changes have been going on in the poultry industry for ten years. Less and less attention is being given to the purely "fancy" and to the breeding of exhibition fowls, and more and more stress is being laid on their economic value in the production of human food.

The rapid growth of egg-laying competitions has changed public interest. It is less than 20 years since the first egg-laying contest was held in America; at present there are approximately 40 successful competitions in operation, with new ones established every year.

These contests have rendered a great service to the poultry keepers of America, centering interest upon the individual ability of hens to lay eggs. Previously all production records had been considered chiefly in terms of flock average.

Contest experience has shown that successful breeding depends upon isolating the high individual producers and developing from them a strain of birds which breeds true for high egg production.

The efforts of the Federal Extension Service in conducting poultry schools, culling demonstrations, and model farm flocks throughout the rural communities are teaching the lesson that any poultry flock, properly hatched and reared and intelligently fed, can be made to lay during the season of the year when eggs are scarce and hence high.

The farm poultrymen are beginning to apply sound principles in the management of their flocks and are organizing coöperatively to move their graded eggs quickly to the large consuming centers.

THE NATION'S EGG BASKET

The little White Leghorn hens of the Petaluma district, in central California, have become world famous because of the intensive conditions under which they are kept, hundreds of thousands being massed in one small valley; the entire community depends upon commercial egg farming for a livelihood.

Petaluma is known as the "Nation's Egg Basket" because of the vast number of pure white eggs which are produced in

that section and shipped throughout the United States.

In 1926 the Leghorn hens of the Petaluma district, an area about 12 miles wide by 30 miles long, produced fifty-one million dozen eggs and shipped more than 1,400 carloads of eggs to eastern markets.

Last year one egg of every 50 laid in the United States came from Petaluma.

An abundance of sunshine and plenty of green food the year round helps to keep the Petaluma hens in excellent health and good laying condition. The eggs come into the big coöperative egg-receiving plants daily, where they are carefully graded for size, color, and condition of shell. All soiled eggs are run through the sand-blast machine for the removal of foreign substances, after which they are carefully packed and sent on their way, by fast freight or express, a distance of 3,000 miles, to our eastern markets.

At the peak of the season one packing plant in Petaluma receives and candles as many as a million eggs a day.

THE RISE OF THE MAMMOTH INCUBATOR

It was not so many years ago that the American hen ruled supreme in the capacity of incubator and brooder, faithfully sitting out the 21 dreary days on the nest, cautiously leading her tender brood of fluffy youngsters through the early stages of their development, and forsaking them for the laying nest after they had reached the age of self-protection and self-support. Times have changed.

The hen is too valuable to-day as an egg machine to allow her to waste weeks and months in hatching eggs and brooding chicks. Then, again, the hen is too fickle, too unstable, too variable in her whims and desires, to entrust to her the hatching of chicks on a large scale. Due to its greater efficiency, the modern incubator has gradually replaced the hen.

The rapid increase in poultry and the growing demand for baby chicks have called for the development of incubators of much greater capacity than formerly.

Credit for making possible our great commercial poultry industry should go in large measure to the modern mammoth incubator, equipped with automatic ventilation and temperature control, with labor-saving devices to eliminate hand-turning



Photograph by Arthur O. Schilling

A FLOCK OF LIGHT BRAHMA CAPONS

The capon is of a docile disposition, and extensive flocks of them may be kept together. They grow large and their bodies develop uniformly, except for the comb and wattles, making them a choice and valuable food product. When prepared for market, certain of their feathers, including those of the neck, lower leg, and last two wing joints, are not removed and serve to distinguish this class of bird. Cockerels are most easily and successfully caponized when from two to four months old.



DEMONSTRATING TO POULTRY CLUB MEMBERS HOW TO CULL A FLOCK

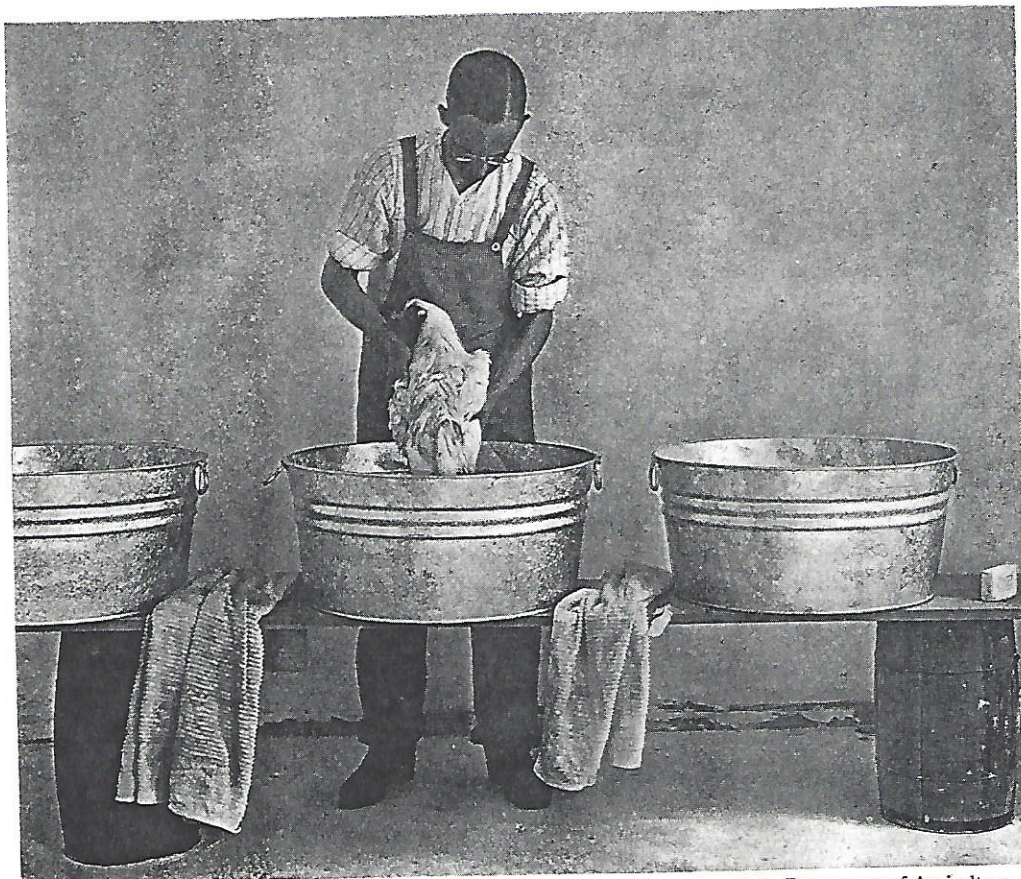
It is essential to successful poultry farming that the owner of a flock should be able to segregate his laying hens from the nonlayers, and thus reduce the cost of maintenance by weeding out the unproductive birds (see text, page 460).

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Photograph courtesy U. S. Department of Agriculture

A BATH BEFORE THE SHOW

A product of the Department of Agriculture's poultry experiment station at Beltsville, Maryland, has her plumage laundered prior to a public exhibition. The hen's feathers are thoroughly washed with soap and water in two tubs and then she is rinsed in three other tubs of clear water. A turkish towel is used to dry the plumage before biddy is shipped to the show.

and hand-cooling, with eggs stacked deck upon deck or tier upon tier, efficiently heated with coal, kerosene, or electricity.

Such an apparatus is far removed from the old Egyptian egg ovens, where the eggs were placed in earthen containers on shelves, turned and cooled by hand, and heated by smoldering fires (see page 467). The comparison expresses significantly the progress which the industry has made in mass production.

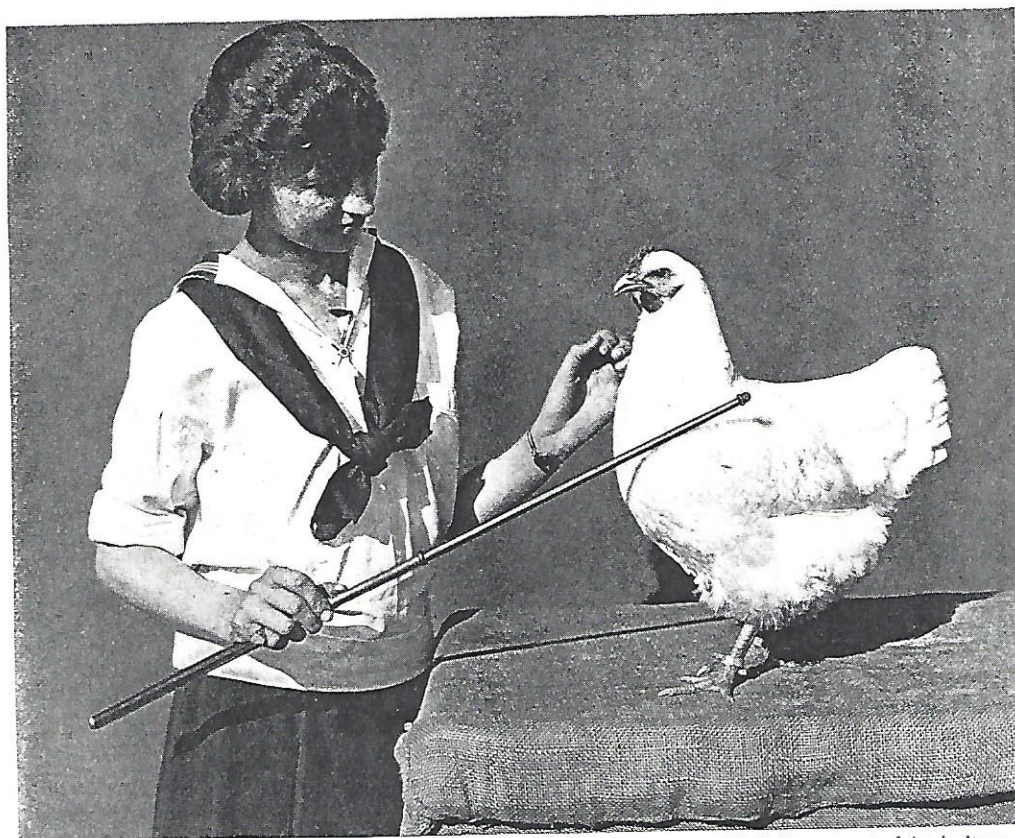
THE TIDAL WAVE OF BABY CHICKS

Parallel with the development of the mammoth incubator, there has been evolved the colony brooder, heated by coal or kerosene, with a capacity of from 300 to 1,000 chicks under each stove. One

operator can effectively manage from 12 to 15 such brooding units and can successfully carry through the brooding period from 10,000 to 15,000 chicks.

The real romance of modern poultry husbandry has been the unprecedented growth in the production and shipment of readymade baby chicks. Hatched in mammoth incubators on breeding farms or at commercial hatcheries, the chicks provide the most economical and convenient method of securing one's foundation stock, of enlarging one's flock, and of providing future generations of layers.

Formerly, hatching eggs were the medium whereby one poultryman purchased stock from another; but some 25 years ago, from the little village of Stock-



Photograph courtesy U. S. Department of Agriculture

POSING AND TRAINING A BIRD FOR THE POULTRY SHOW

Some birds are natural posers, but most of them have to be taught the art of showing themselves to best advantage. This aristocratic White Wyandotte is nearing the end of a course of training that lasts from a week to ten days, during which she is first cooped, then tamed by frequent handling, and finally made to assume various postures to display her best points.

ton, New Jersey, in the Delaware River valley, the first baby chicks were shipped.

For a number of years one poultryman had been supplying chicks in small quantities to his neighbors. The success which they had with this method of acquiring poultry stock soon spread, and little by little orders came for chicks from more distant points, until finally it became impossible to make deliveries in person over the increasing distances from which they were demanded. So it came about that this demand was met by putting the chicks into cotton-lined wooden boxes with holes in the top for ventilation. Twenty-five chicks were placed in a package and shipped by express to their destination. The experiment proved to be a success.

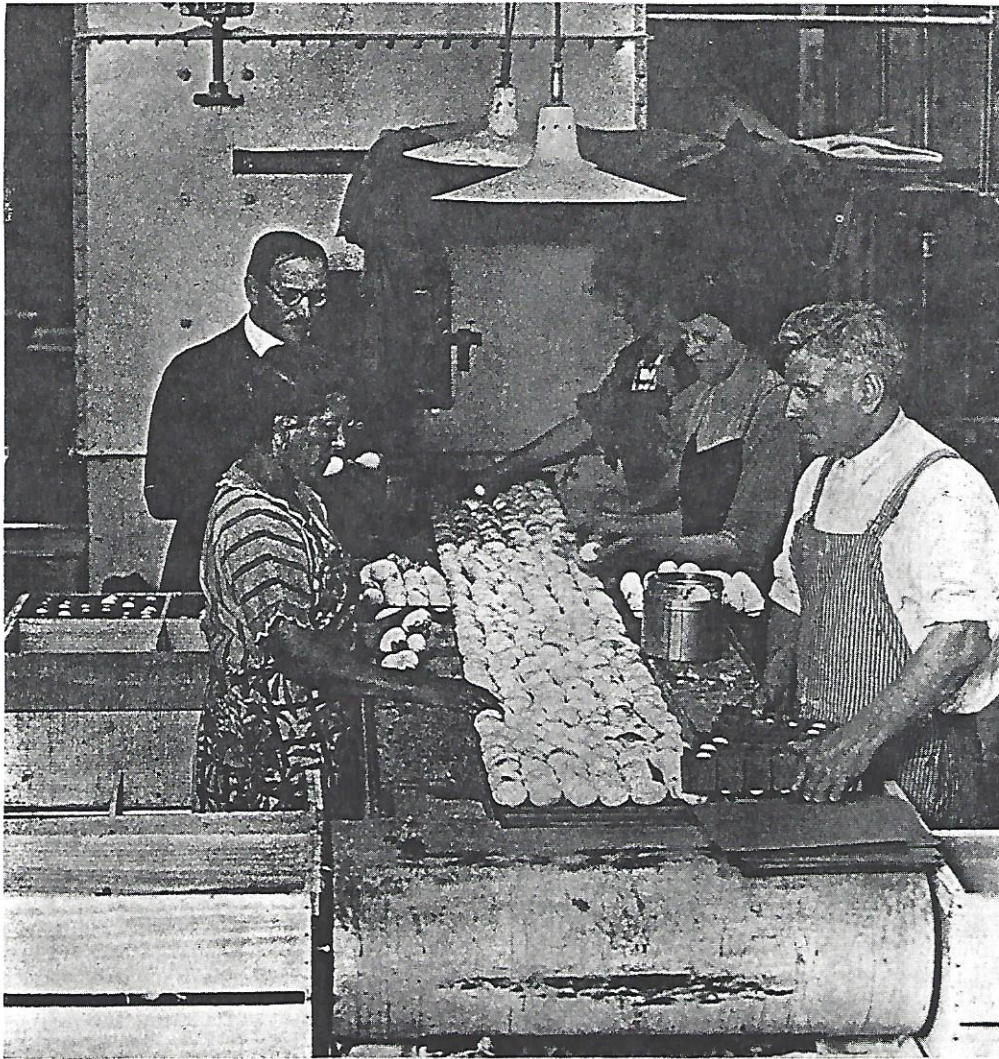
From this small beginning the industry gradually grew, until to-day there are in

the United States several thousand hatcheries, equipped to produce baby chicks for shipment and having a capacity of approximately two hundred million eggs at one sitting.

A JOURNEY WITH BABY CHICKS

At the end of the 21st day since the eggs were placed in the incubator the newly hatched chicks are ready to be graded, packed, and shipped. They are taken from the machines and moved to specially constructed, convenient tables in the packing rooms, each chick being handled separately to see that it is a normal, healthy individual. They are packed for shipment in specially constructed baby-chick boxes of from 25 to 100 chicks' capacity.

The boxes are made of corrugated paper



Photograph by Milton A. Ayers

A NEW METHOD OF CLEANING SOILED EGGS

This machine has been developed and installed by a poultry producers' organization of central California at a Petaluma plant. Fine sand is blown on the eggs by compressed air and cuts off any foreign substance which may be on the shell (see, also, text, page 455).

and are ventilated by means of small holes or perforations in sides and top to admit the proper amount of fresh air. Special ventilating strips are attached to the tops of the boxes to keep the chicks from smothering or suffocating when they are piled one on top of the other (page 462).

The bottoms of the boxes contain litter in the form of excelsior, or else they are corrugated to give the chicks a toehold to prevent them from sliding around during the journey. The label is next affixed,

the cover attached, and the chicks are ready to go to the post office or to the express office for delivery to the customer's door.

IS SHE LAYING OR LYING?

The poultry departments of our many State agricultural colleges have been responsible during the past quarter of a century for the development of many scientific facts and practices, the practical applications of which have made possible commercial poultry keeping.



Photograph courtesy U. S. Department of Agriculture

PROCESSING EGGS FOR SHIPMENT TO A DISTANT MARKET

Eggs are "processed" by running them through a vat of specially prepared oil, which closes the pores of the shells and tends to keep the contents in good condition while in cold storage.

The ability which the poultryman now possesses to cull his birds on a basis of external character, to eliminate the non-producers from time to time as they appear in the flock, is an outstanding example (see illustration, page 456).

Weekly culling during the summer and fall brings about a reduction of the feed costs without any decrease in egg yield. Culling is done by observing the condition of certain secondary sex characters and body factors. The laying hen has a bright-red, full comb. When not laying, the comb becomes much smaller, appears shrunken and dry. The heavy-laying hen has a loose, pliable, soft abdomen. In the nonlaying hen the abdomen becomes small, shrunken, and hard.

The hen which is laying and has been laying heavily for some time shows absence of yellow pigments in shanks, beak, ear lobe, and skin, due to the fact that the yellow color which she obtains from her feed has been used up in the production of egg yolks. As soon as she ceases to lay, this color begins to return—first to the ear lobes, then to the beak, then to the shanks—so that there is the definite rela-

tion existing between amount of yellow pigment and productive condition.

It is by observing certain of these body characters that the poultryman can tell whether biddy is simply strutting around the pen looking handsome or whether she is really hard at work producing eggs.

TELLING BIDDY'S AGE

It is only in very recent years that a method has been found to tell the age of a bird. Formerly it was largely a case of computing age by the condition of the scales on the shanks, the length of toenails, and the general appearance of head and eyes. Age can now be quite accurately determined by observing the length of the primary flight feathers of the wing.

The pullet possessing a full-grown wing shows the tips of the feathers forming a graceful, symmetrical, even curve. With each succeeding year of age, there comes a definite shortening of certain of the primary flight feathers, following each successive molt or change of plumage. The expert is thus able to determine whether biddy is only a year or two old, and of a profitable laying age, or whether she has passed to that more remote age,



Photograph from Harry R. Lewis

180,000 BABY CHICKS IN THE MAKING

This is one of the five units of a mammoth hatchery located in Petaluma, California. The present capacity is 900,000 eggs, which is being doubled for the next season's operations. The completed plant will be able to turn out 1,800,000 youngsters every three weeks.

when to keep her as an egg-producing machine would be poor business policy.

LIGHTS ARE CHANGING THE PRODUCING CYCLE

Under wild conditions, hens lay but few eggs in the spring of the year to reproduce their kind. With the application of modern principles of nutrition and correct rations properly fed, combined with proper housing and sanitary conditions, it has been possible to lengthen the laying period by inducing the birds to lay earlier in the spring and to continue laying well through the summer and into the fall.

The application of artificial lighting has made it possible to change very materially this natural laying cycle, inducing a substantial production during the fall and winter, when prices are high.

The reason why birds lay few eggs during the short days of winter is that Nature did not intend them to reproduce their kind during this season, and hence their digestive systems, the crop and gizzard, do not have sufficient capacity to hold the required quantities of food to maintain themselves during the long winter nights and at the same time have an excess which they can call upon to produce eggs.



Photograph by Clifton Adams

TAKING DAY-OLD CHICKENS FROM AN INCUBATOR IN A COMMERCIAL HATCHERY
AT BRUNSWICK, GEORGIA

At the right is one of the ventilated corrugated cardboard compartment containers in which the baby chicks are safely shipped to distant points (see text, page 458).

The use of lights shortens the long night span and enables the birds to eat more, with the result that they nearly double their fall and winter production and lay from one to two dozen more eggs per year.

ALL COOKERY RESTS ON AN EGG

Eggs have long been rated a superior food because of their palatability, of the

ease and rapidity with which they are digested, and their adaptability in cooking. Their high mineral content, the quality of their proteins and fats, and certain growth-promotive properties were early recognized.

"Delivered in the original package" is a virtue and an outstanding advantage which puts eggs in the realm of human food beyond possible adulteration.

Eggs are one of the most important items in the daily diet of Europeans, whose per capita consumption of them is far ahead of that in the United States.

The place which eggs occupy in the European kitchen is admirably expressed by Stacpoole, an old French chef, who says:

"All cookery rests on an egg. The egg is the Atlas that supports the world of gastronomy; the chef is the slave of the egg. What is the masterpiece of French cookery, the dish that outlives all other dishes, the thing that is found on His Majesty's table no less than upon the table of the bourgeoisie—the thing that is as French as a Frenchman, and which expresses the spirit of our people as no other food could express it? The omelette.

"Could you make an omelette without breaking eggs? Then cast your mind's eye over this extraordinary Monsieur Egg and all his antics and evolutions. Now he permits himself to be boiled plain, and even like that, without frills, naked and in a state of nature, he is excellent. Now he consents to appear in all ways from poached to perdu; now he is the soul of a volau-vent, now of a sauce.

"Not a piecrust fit to eat but stands by virtue of my lord the egg, and should all the hens in the world commit suicide, tomorrow every chef in France worthy of the name would fall on his spit, for fish is but a course in a dinner, whereas the egg is the cement that holds all the castle of cookery together."



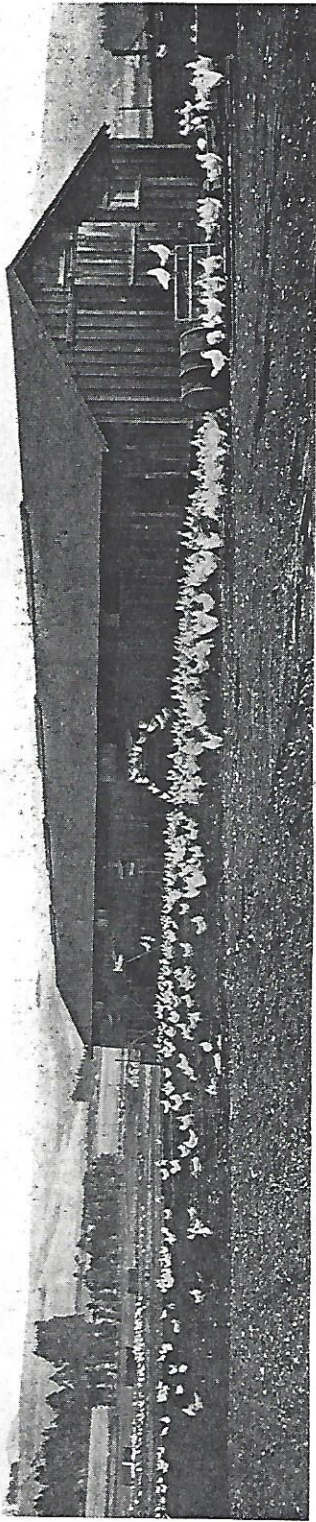
Photograph courtesy U.S. Department of Agriculture

A POULTRY CLUB MEMBER WITH A TRAY FULL OF WHITE ROCK BABY CHICKS: VOLUSIA COUNTY, FLORIDA

We cannot but marvel when we review what has been attained in the development of our domestic species of poultry through scientific mating and rearing.

To-day, through selection and breeding, man has produced veritable egg machines and types that embody practically every shape and conformation of body which might be desired, every conceivable color pattern, together with numerous oddities.

Breeding, feeding, and management have, through succeeding steps, developed individuals which lay more than 300 eggs—in one instance 351—in 365 consecutive days. Whole flocks average 200 eggs or better. An average during the past season of all of the egg-laying con-



Photograph from Harry R. Lewis

A PETALUMA HENHOUSE FOR 2,000 WHITE LEGHORNS

The "Little White Hen" has brought such fame to this California community that a "Petaluma Egg Day" is held every August, when egg-grading and candling contests, parades and floats, bear witness to the Leghorn biddy's place in the hearts of her townspeople.

tests of the United States and Canada showed a yield of 150 to 160 eggs per bird per year (see, also, page 411).

It is the ability of man to breed a bird capable of returning this maximum egg production, and at the same time being possessed of a body well fleshed and of fine quality, which has given domestic fowls the great economic position which they now occupy.

THE HEN IS AN ECONOMICAL PRODUCER OF HUMAN FOOD

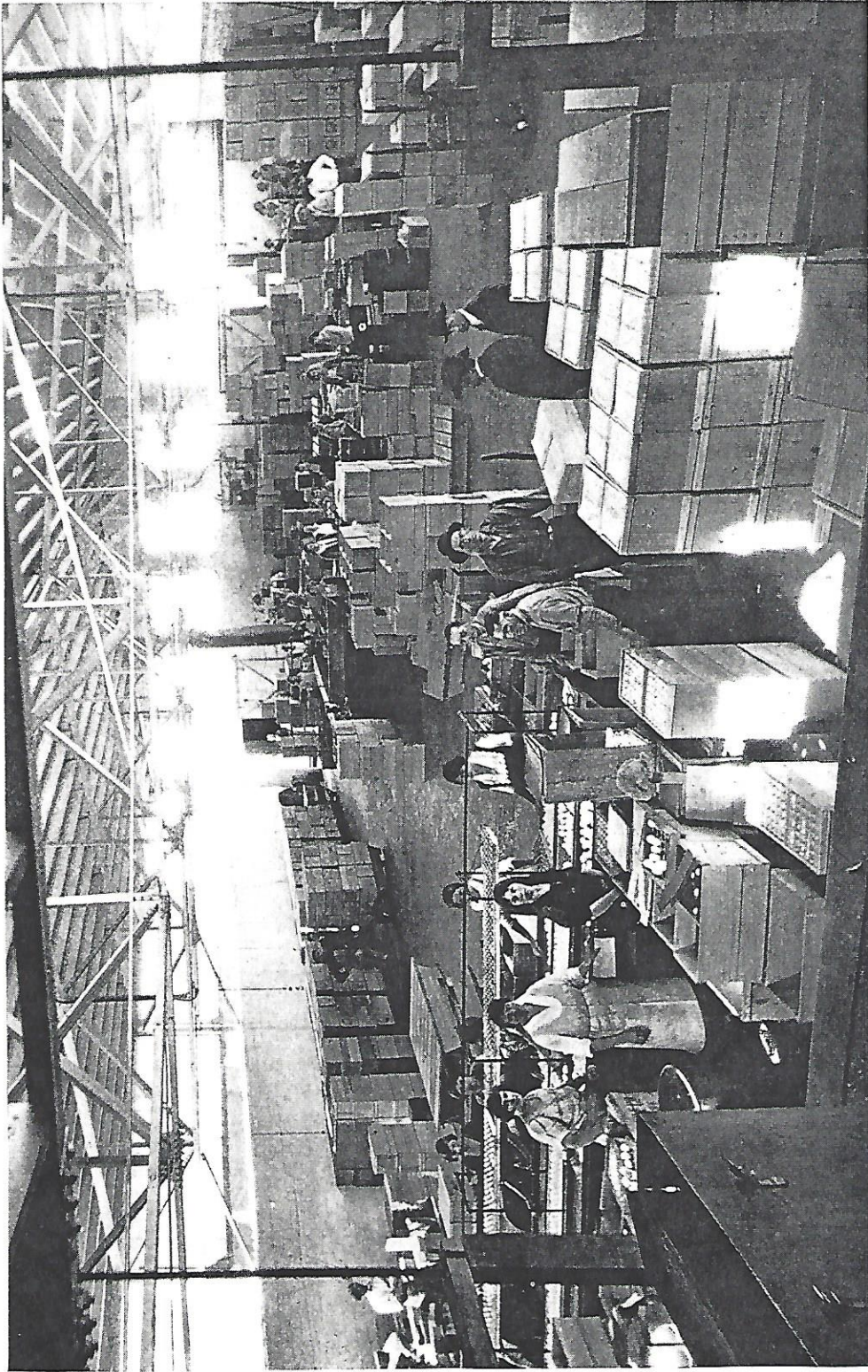
Following the World War, the American hen helped to save the day for thousands of farmers in our Middle West States, who, through crop failure, shortage of labor, and low prices, were unable to carry on with the reduced income from their normal crops.

Poultry keeping has been one of the few branches of agriculture which has continued at a profitable level during the reconstruction period, for the hen is one of the most economical producers of human food. No other animal on the farm more efficiently manufactures a finished product for human consumption from raw material.

A little Leghorn weighing around four pounds, if well bred and well managed, will in one year consume from 75 to 80 pounds of feed and produce eggs weighing from 25 to 30 pounds.

It is the history of all civilized countries that as the population becomes more congested in large urban centers, as the proportion of farmers and producers of foodstuffs decreases, as the land area available for live-stock production diminishes, a nation must look more and more to the small animal unit as a source of food supply. We must of necessity make poultry meat and eggs an ever-increasing part of our daily diet, for the reason that, of all the live-stock industry, poultry husbandry lends itself most readily to intensive methods in limited areas.

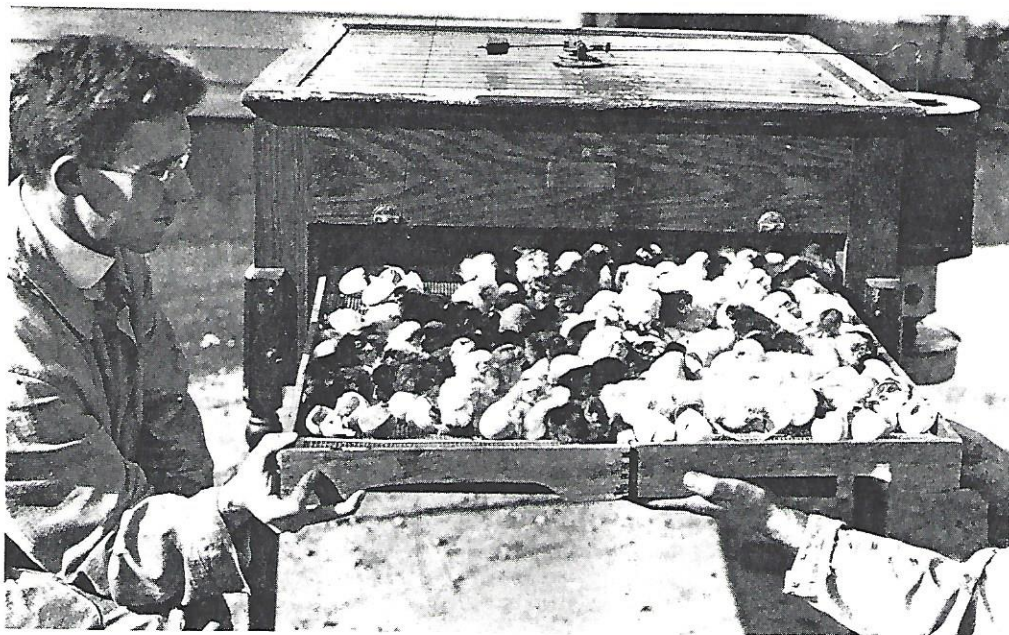
But poultry farming is a specialized form of industry. To be successful in this branch of agriculture, one must have intelligence and enterprise and be constantly on the watch against diseases that threaten the flock and be prepared for lower prices whenever the supply of poultry products overtakes the demand.



Photograph by Giroux

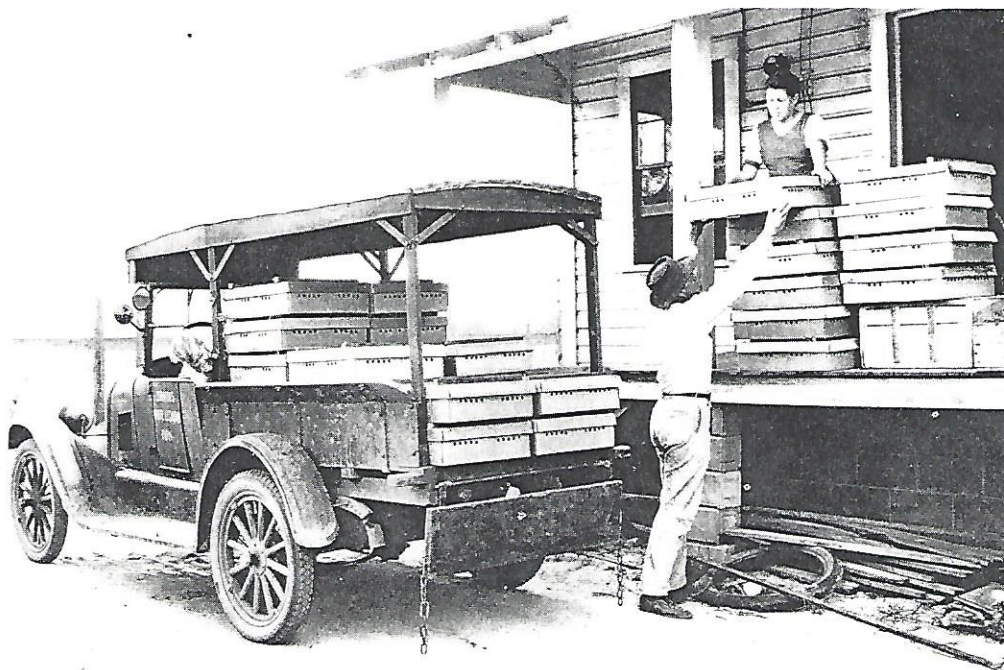
ONE OF THE EGG-RECEIVING PLANTS AT PETALUMA, CALIFORNIA

Eggs are delivered here the day they are laid and are carefully graded for size, color, and condition of the shell. Organized effort and standardized product have made California eggs, particularly those from the central California poultry farms, competitively profitable in the eastern centers. In 1926 there were shipped east from California 1,475 carlots of eggs (22,000,000 dozen), an increase of 23 per cent over the eastern carlot shipments of 1925.



A GOOD HATCH

These purebred chicks are Barred Plymouth Rocks, Rhode Island Reds, and White Wyandottes.



Photographs courtesy U. S. Department of Agriculture

A FLORIDA FARMER AND HIS WIFE SHIPPING 3,500 BABY CHICKS ON ONE ORDER

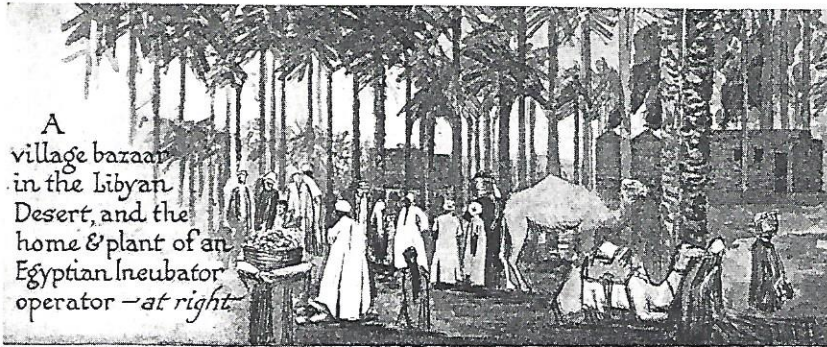
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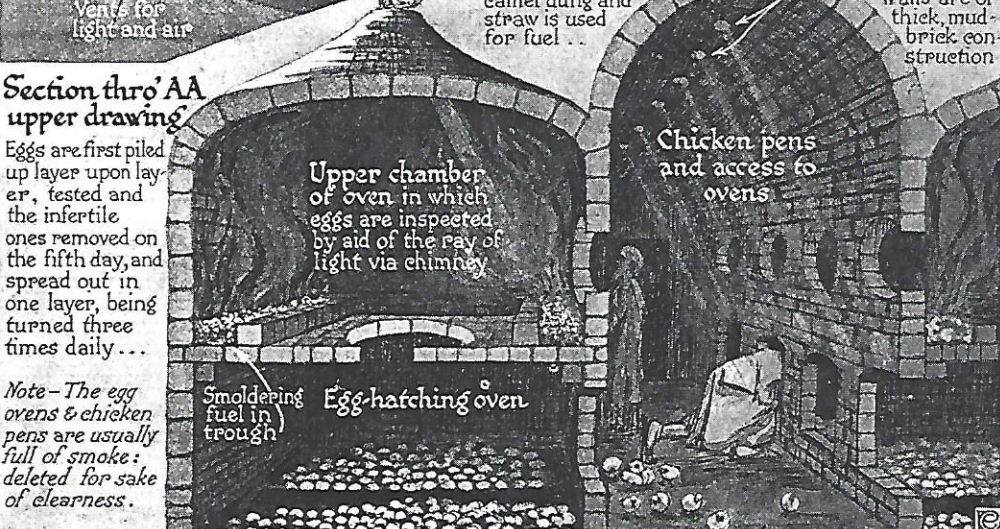
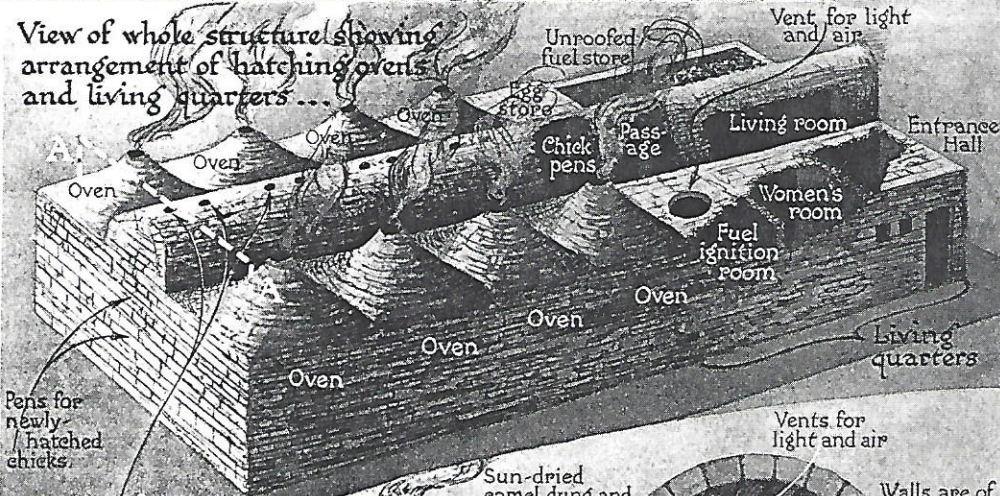
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A village bazaar in the Libyan Desert, and the home & plant of an Egyptian incubator operator - at right.

The ovens are worked from Feb. to Mar. each year. They vary in size. That shown has a capacity of approx. 15,000 eggs at a time. About 1/4 to 1/3 prove infertile. Residing within, operator is very sensitive to changes in temp. which is regulated by manipulating fire.



Section thro' AA upper drawing

Eggs are first piled up layer upon layer, tested and the infertile ones removed on the fifth day, and spread out in one layer, being turned three times daily...

Note - The egg ovens & chicken pens are usually full of smoke: deleted for sake of clearness.

Drawing by Charles E. Riddiford

A PICTORIAL DIAGRAM OF THE STRANGE AND INGENIOUS ARRANGEMENTS OF THE GREAT EGYPTIAN INCUBATORS

These hatching ovens have been in use in Egypt for many centuries and are much the same to-day as in the time of Moses. There are several hundred such establishments in the Land of the Nile, producing from 15,000,000 to 20,000,000 chicks a season. The operator usually lives in the incubator. He has no thermometer to help him regulate the temperature, but by the "feel" of the air recognizes when the fires need attention.