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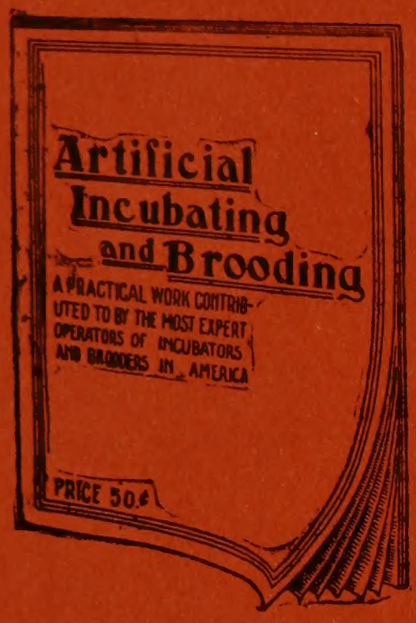

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G. A. McFETRIDGE, Bound Brook, New Jersey, inventor of the Star Incubator, and author of the book "Poultry" and other books.

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(There is not room on this page to publish to exceed **ONE-TENTH** of the main chapter headings in the book.)

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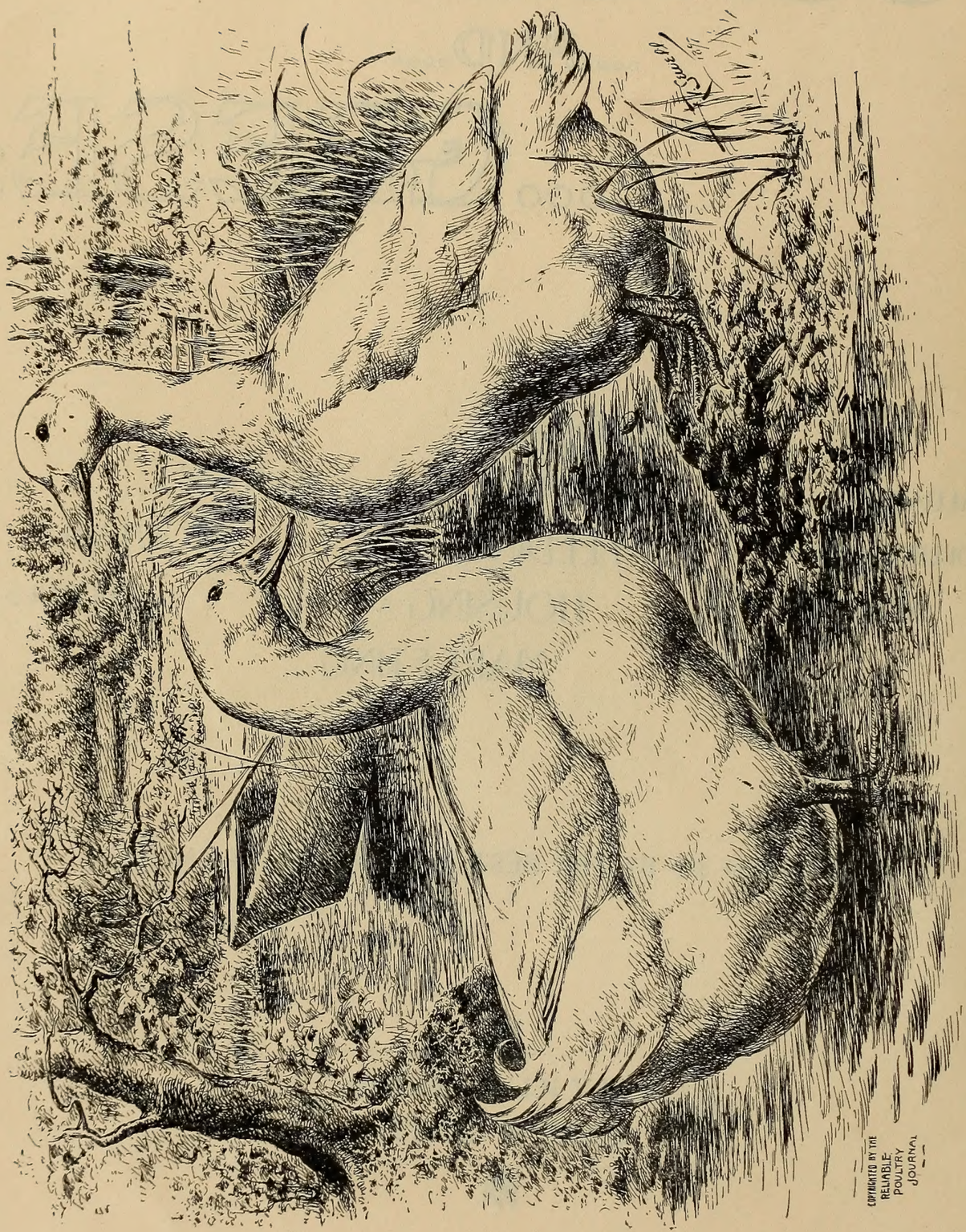


PEKIN DUCKS—MALE AND FEMALE.

THE FIELD IS YET UNFILLED WITH DUCKS AND GEESE.

The Market is Extensive and the Breeders Comparatively Few—The Field for Intelligent Effort is Wide and the Investment Required is Comparatively Small, but "there Must be a Head to the Firm."

SO LITTLE has been written about ducks and geese compared with that relating to the hen and her mate that people are apt to think this branch of the poultry trade unimportant. When breeders of fowls realize that ducks and geese are much less liable to disease and other troubles, and yet are equally remunerative, it is probable that the breeding of these water fowl will become more general. There have been few publications devoted exclusively to ducks and geese, probably because there are comparatively few persons engaged in this remunerative branch of the poultry industry. These prominent few are making money, no doubt of it, and it is our intention to present some facts in this connection to our readers. In no business or profession is so much valuable information freely given as in poultry raising. Men give of their best knowledge, not stopping to consider whether or not competitors will thereby be created.

If it has been decided to breed ducks or geese, a thorough study of this book will not only place the beginner upon the right path, but will assist him to overcome the obstacles to be met. There are difficulties; if there were none, the business would not be so remunerative to the thousands who will yet derive an income from poultry.

There are few farms without some ducks and geese, because they can be kept in small numbers with little trouble, and there are few breeders who properly understand the care of them, yet even these make it pay in their small way. Of course, through a lack of knowledge, they are missing much wealth that might be devoted to the swelling of their bank accounts. The golden egg is lost to them just as sure as if they had killed the goose that is said to have laid it.

There is money in ducks and geese. Did you ever notice that the old lady in the village continues to breed her few geese just as she has done for many years? Because they help to pay the rent. They cost her little for food; they roam the pasture and live almost entirely during the summer on the green stuff and insects they obtain, and the attendant labor is not noticeable.

It is different when breeding in large numbers. Labor must be economized. There must be a head to the firm who is not simply a sleeping partner. As the stock increases, the accommodation must also increase, and the attention and observation must be continuous. It is necessary to know what you are doing now, and what you will do next. The business must have a leading spirit. The only thing that is claimed to be able to run itself is perpetual motion, and that has not yet been discovered. In a small flock of, say, a dozen birds the loss of one duck passes nearly unnoticed—it is simply a coin from the top of your pocket; but lose one from every dozen in a flock of two thousand and it represents a loss of from $300 to $800; therein lies the secret of success or failure with a large poultry plant. There are duck farms in this country having a yearly output of from 5,000 to over 15,000 ducks. Does it seem reasonable that a novice could manage a farm of such proportions? Does it not appear that there is something wrong in the upper story of the inexperienced man who would attempt it? Yet, such things happen and failures are naturally recorded. If a man will but begin on a small plant and gain experience with the gradual growth of his business there is open to him in this poultry industry an attractive means of livelihood.

Many breeders fear to venture into duck culture because they consider they have not the natural facilities; they have no stream or pond to provide exercise for the ducks. We have seen ducks thrive wonderfully where there hasn't been a pond within a mile.

We are becoming impressed with the fact that it is not—What will a duck stand, but—How much will it stand? It seems wonderful how they thrive under what appears to be adverse circumstances. On one occasion we came across a dozen ducks enclosed by 18-inch boards on a sandy space about 4 or 5 feet by 12 feet. The dirt was (to them) knee deep; cabbage and other green foods were part of the general mix-up, and the ducks appeared to enjoy it. They were ready for market, perhaps ten weeks old, and had been in that enclosure (which was occasionally shifted) ever since they were hatched. We do not advise that ducks require mud to induce growth, far from it, but we do want it to be understood that in circumstances under which chickens would die, ducklings consider themselves in clover.

METHODS OF AN EXPERT.

Mr. James Rankin, who has one of the largest duck ranches in the country, and is in the front line of successful breeders, affords his ducks no water except for drinking purposes. They have been bred in this way so long that it seems unnatural for them to swim. It is said that Mr. Rankin once sold some ducks to a gentleman, who after some time complained that they were not what he expected. He said that he could not induce them to enter the beautiful pond he had prepared in front of his house and, that after driving them in, it was necessary to stay right with them or they would not remain in the water. The story goes that Mr. Rankin explained to the gentleman that he did not breed ducks for swimming exhibitions, but for utility purposes. Now whether this is so or not, it is quite true that ducks can be successfully bred without facilities for swimming. We have frequently been asked if eggs would be fertile when laid by ducks which are afforded no such liberty. The fact that Mr. Rankin has built up a prosperous business and that his ducks are vigorous and of great size is sufficient reply to that.

An idea of Mr. Rankin's methods will be of interest, especially when related in his own words. He says, "As we grow some 10,000 ducks and chicks each season and carry over 1,500 breeding ducks, besides hens, it will be seen that we do quite a little business.

"Though we run twelve 600-egg incubators, besides smaller ones, we use but a comparatively small proportion of the eggs these birds contribute.

"The eggs require twenty-seven days to hatch, consequently we fill, as well as test a machine-full every two days. The eggs are tested the third day, the infertile ones sent to market together with the culls, which latter are the very large, the rough shelled, and porous eggs. The eggs are usually from 90 to 95 per cent fertile, and when good we average to hatch about 92 per cent of all fertile ones. The

little birds are taken out of the machines about forty-eight hours after they are hatched and placed in the brooding house. This building is 140 feet long, 15 feet wide. From the heater at one end runs a flow and return two-inch pipe. These pipes are utilized as brooders by being partitioned off every six feet, the pen in front being of a corresponding width. Into a brooder of this size we put 150 ducklings, thus giving the building a capacity of 3,000 ducklings. Now we have two cold houses, each 75 feet long, in which we use no artificial heat, and when the long building is full, as fast as a new hatch comes out we drive out the oldest ducklings to make room for them into cold buildings, which together have a capacity of about 2,500 more. We always put the newly hatched ducklings next to the heater, running the others down toward the other end, for though the heat of the brooders is uniform the entire length of the building, yet the building itself is much warmer nearest the heater, as that of

VIEW OF BREEDING DUCKS ON MR. RANKIN'S RANCH.

itself radiates a great deal of heat. As the little ducklings need more heat than the older ones, we run them within two or three inches of the warm pipes, while the distance at the lower part of the building is increased to 9 or 10 inches. By the time all are full of ducklings the oldest are some 9 or 10 weeks old and ready for the market, dressing at that age, from 10 to 12 pounds per pair.

"We have been marketing these birds in New York and Boston for the past six weeks at the rate of 200 or 300 pounds per day. The maximum price this season was 30 cents per pound, but as the birds get plenty the price falls. It is now (June 5) 20 cents per pound, and may possibly go to 15 cents before the season is over, but as we can grow a pound of duck for 5 cents at the present prices of grain, it would still leave a large margin of profit.

"For the first three or four days the young birds require as much heat as chicks, but after that they will endure more of cold. In ducklings properly hatched there need not be a loss of more than 1 per cent. For several days the food should consist of bread crumbs mixed with hard boiled eggs, chopped fine, four parts bread crumbs, to one of egg. We use the eggs in which the germ has died after the third or fourth day; there will always be several in each hatch. After they are a few days old they may be fed equal parts of oat and cornmeal and wheat bran, giving them all they will eat, clean, four times a day, and no more. Always mix a little sharp sand in the food, as they will not assimilate their food and soon become leg weak. Give the birds all the green feed they will eat, such as green rye clover, refuse cabbage, together with boiled turnips and potatoes. As the birds grow older the quantity of cornmeal should be increased until when fattening it should compose three-quarters of their food supply.

"It is well to grow chicks and ducks at the same time, as the one business does not interfere with the other. The machines can be used to fill your buildings with chicks before the ducks begin to lay, say in December. The ducks can be grown to 5 pounds in nine weeks, while the chicks require nearly double that time to reach the same weight, and while the price of ducks gradually falls that of the chicks always rises, so that a good 5-pound chick is worth 35 cents per pound in Boston and New York markets to-day, and will probably keep at that figure for the next six weeks. It costs about 2 cents per pound more to grow a chick than a duck, but the business of growing them both we find very profitable, when grown artificially. When we have a little more leisure we may show you the great superiority of the artificial over the natural methods of growing poultry."

CAPACITY NEARLY DOUBLED.

Subsequently Mr. Rankin wrote with reference to the foregoing and said:

"Were you to visit our place now you would be surprised to find that we have nearly doubled our capacity in the shape of buildings and facilities for growing poultry. We have found during the past thirty years that the poultry department made us by far the best returns of anything on the farm, and especially during the past few years of unusually low prices of all farm products, together with the high prices of our modern degenerate labor, the profits from our poultry have been greater than ever. Consequently we have been gradually increasing our plant.

"We have found that floods and droughts, extremes of heat or cold, interfere very little with the successful growing

of poultry, and that it is not only the surest crop we grow, but that the difference between the cost of production and price it commands in market is greater than that of any other farm crop. With the cheap grain market and our improved facilities for feeding and growing our young birds we are confident that poultry can be grown cheaper than ever.

"In our new brooding house, which is 125 feet by 28 feet wide we have endeavored not only to reduce the labor to a minimum, but to facilitate the health and rapid growth of the young birds beside. We ran a four-foot walk through the center of this building with the pipes and brooding boxes on each side, thus giving it the capacity of a single brooding house 250 feet long. Between the walk and brooding boxes there is an 18-inch space leading into the brooding boxes by a hanging door. In this space the little birds are fed and watered from the walk. They are allowed fifteen minutes to feed and water, when they are to be shut back into the brooder. Then the troughs and feeding runs will always be kept sweet and clean. Of course the birds have a nine-foot run on the other side of the brooding boxes.

"This building was filled to its utmost capacity—some 5,000 young birds. Our old (single) brooding house, with a capacity of 2,500, was full at the same time; also many other smaller buildings.

"We have been busy hatching and killing all through the season, but have now shut up our machines, as the laying season is about over and our birds are beginning to moult. Our ducks commenced laying the past season in November and have been laying steadily ever since. We shall winter 2,000 ducks this coming season, and of course are selecting the very choicest for that purpose. By judicious selection and careful breeding for the past twenty years our birds have increased both in size and symmetry until we are now really proud of them. One young drake, last June, tipped the scales at 9¼ pounds at ten weeks old, and a young duck of the same age at 8½ pounds. We feel justly proud of this, because twenty years ago it was a very difficult thing to find birds that would weigh 7 pounds at that age, even from our best imported stock."

The Reliable Poultry Journal has an interesting descriptive article relating to one of the largest duck ranches, where sixty incubators are in use, and 15,000 Pekin Ducks have been raised in one season. It is as follows:

VIEW ON ATLANTIC DUCK FARM, SPEONK, L. I., N. Y. A. J. HALLOCK, PROP'R.

ANOTHER EXPERT'S RANCH.

"One of the pleasantest places on Long Island to visit is the home of Mr. and Mrs. A. J. Hallock, near Speonk. Mr. Hallock may be said to have been born in the duck business. His father began growing Pekin Ducks way back in 1858 on the same twenty acres now occupied by the son, and tens of thousands of choice Pekin Ducks have been produced on this farm. Mr. A. J. Hallock has grown up in the business. His father died some years ago. For a number of years past he has produced from 14,000 to 16,000 ducks each year, and up to the present time has no doubt sold more choice exhibition ducks than any other man in the business. He was one of the first men to realize that there is a fancy in ducks. All Pekin Ducks may look alike to the person who does not know very much about them, but a competent judge of a good Pekin knows there is a vast difference, and it is this difference that interests Mr. Hallock.

"Ordinary Pekin Ducks (fair breeders) can be bought at from $1.50 to $3 each, but there are other ducks that bring from $5 to $15 each, and sometimes as high as $25 each. Mr.

Hallock has sold a goodly number of choice breeders and exhibition specimens at high figures, and has ducks to-day that it would take a long price to reach.

"The fact that he himself holds these best specimens at high prices is proof enough that they are worth it. He knows what they are worth and if they were not worth what he sees in them, he certainly would sell them at ordinary prices. A man who is not posted in the standard poultry business will say it is ridiculous for any one to ask $100 for a "rooster," but the fact remains that foremost breeders do ask this price for their choicest breeding males, sometimes refusing to sell even at this price, and they above all others know that the value is in the bird; at the very least they believe it is, hence will not part with the bird unless they get their price. Furthermore, some birds are almost without price. This is true to such an extent that if you wanted to buy a successful specialty breeder's twelve or fifteen best birds, you would have to buy him out of the business, for that is what it really means when a breeder of this kind sells his 'very best.'

"Said Mr. Hallock, 'You speak about the science of breeding fowls. Let me tell you and all other interested poultrymen that there is just as much science in breeding Pekin Ducks as in breeding Barred Plymouth Rocks, Light Brahmas or any other breed or variety of chickens. As a matter of fact, it requires even greater interest and more painstaking methods, for the very reason that all ducks look alike to the person who does not know a good duck, hence people are more disposed to be careless and indifferent in the matter. Breeders have finally found out that it is just as hard to breed properly colored Black Langshans, Buff Cochins and 'stay white'—as you call them—White Wyandottes, White Plymouth Rocks and White Leghorns, as it is to breed properly colored Barred Plymouth Rocks, Silver Laced Wyandottes, and so on. Ordinarily, people do not understand this nor believe it, but it is true just the same, and it is the same with Pekin Ducks. Pekin Ducks have their right color, right shape, proper hardness and closeness of feather, proper color of beak and legs, and if any man tells you these points are easy to breed into and establish in a strain, he simply does not understand the matter. All this can be done, but it takes time and study. A few years ago I did not take much stock in this matter, but to-day I do. The fact that my ducks win at such shows as New York year after year is not accident, I assure you, but the result of hard work and perseverance.'

IMPROVING THE STRAIN.

"As evidence of Mr. Hallock's interest in improving his strain of Pekin Ducks, of keeping them strictly up-to-date and insuring fertile eggs, we saw on his place during this visit seven English Pekin Ducks recently imported by him from England. They are large, fine, shapely ducks, and he is raising as many as possible from the pen this year for the purpose of crossing them with his Pekins, thus to introduce new blood and maintain the vigor and prolificness of his strain. Mr. Hallock has also imported two trios of Indian Runner Ducks, a trio of brown and white and a trio of fawn and white. We saw these Indian Runner Ducks, also about sixty to seventy young ones he is raising this season.

"These Indian Runner Ducks are the Leghorns of the duck family. They lay eggs apparently for the pleasure of it. Mr. Hallock showed us a letter from Mr. William Pickering, Esq., the English gentleman of whom he bought the two trios of Indian Runner Ducks. In this letter Mr. Pickering states that five ducks of this variety owned by him laid 967 eggs in 1897, or within thirty-three of 200 eggs per duck in 365 days. Mr. Hallock has kept a record of the eggs laid by one of his brown and white Indian Runner ducks. She had laid as follows, up to the date of our visit: March, 33 eggs; April, 30 eggs; May, 30 eggs; June, 28 eggs; July, up to the 19th, 15 eggs, or 136 eggs in 142 days. Twice during March she laid two eggs in twenty-four hours. The other brown and white Indian Runner Duck was lame and did not lay so well, nor did the fawn and white Indian Runners lay as well as did the duck whose record is given from March 1 to July 19. These ducks are fully one-third smaller than the Pekin, but are much more active. They hurry about over the ground catching flies on the wing and hunting far and near for food. They are handsome ducks, and inasmuch as duck eggs sell readily and at good prices in many markets we shall be surprised if the Indian Runner Ducks do not become quite popular in this country.

"Mr. Hallock has raised the past season between 15,000 and 16,000 Pekins. He is now using thirty Prairie State Incubators and thirty Cyphers incubators. Duck raising is Mr. Hallock's sole business. He gives it all of his time and attention. He proposes to make a specialty of selling exhibition and breeding ducks and eggs therefrom for hatching and will reserve 3,000 to 4,000 choice birds for the trade and for his own use. He sells all stock on approval, and takes the best care he knows how of the interests of his patrons. Last season he sold in the neighborhood of a thousand breeding and exhibition ducks, also several thousand eggs for hatching, and states that if he had a dissatisfied customer he does not know it. Mr. Hallock talked favorably of coming west to Chicago with fifty to seventy of his Pekins and Indian Runner Ducks, and we hope he will see his way clear to do so. We know that it would pay him handsomely, and he will there get acquainted with alot of fine western poultrymen.

"In company with Mr. Hallock we paid a pleasant visit to the Seawanhaka Poultry Farm, W. H. Fordham, proprietor. This plant is located within hailing distance of the Speonk railway station. It consists of several acres, and Mr. Fordham has raised this past season upwards of six thousand ducks. His plant is two years old, and Mr. Fordham is making good progress. His ducks are large, in fact, extra large. He sells them at reasonable prices, and as he is aiming to build up a permanent business, he will, we believe, take extra pains to please his customers. At the time of our visit he was busy killing and dressing ducks for market, and his ducks when picked and placed on the scales averaged, at eleven to twelve weeks, better than five and one-half pounds apiece. Mr. Fordham also breeds White Wyandottes, Black Langshans and White Leghorns. He breeds them both for practical and fancy purposes, but mainly for practical purposes. He has bought choice stock in these breeds and is raising a considerable number for sale."

5,000 DUCKS ON TWO ACRES.

We wish to impress it upon the reader that grit is the most essential accompaniment to successful poultry keeping, not only as existent in the crop of the fowls, but as forming a great part of the poultryman's personality. An instance of what it has accomplished is presented in the person of Mr. George H. Pollard, of South Attleboro, Mass.

To successfully produce 5,000 ducks on less than two acres of ground is proof enough that Mr. Pollard is up and coming. This is precisely what he did the past season, with the assistance of two helpers, and he did it smiling. He has that way about him. Blessed with good health, and understanding fully that if Pollard does not help himself, no one else will do it for him, he keeps up with his work. He is careful not to bite off more than he can chew. He does not permit his work to pile up until it gets beyond his control. It was worry that killed the cat. Too many men, too many poultry-raisers, "hog" matters; they try to do too much and fail altogether.

Said Mr. Pollard: "I am satisfied that as high as 8,000 ducks can be raised for market on two acres of ground." It

should be remembered that "ducks for market" means that they are shipped away when ten weeks old. Years ago Mr. Pollard bought the two-acre plant of an enthusiast who put over five thousand dollars into it and sold out to Mr. Pollard after a two years' trial at it, "on account of his health." Said Mr. Pollard, with some emphasis: "I soon found out what ailed his health!"

After getting possession it took Mr. Pollard two years to find out what had hit him. He very soon discovered that life on a duck ranch, for a green hand, was not what it is sometimes cracked up to be. He found the breeding stock run down in vigor and given to sickness. Those first two years rounded up a costly experience, but the third year found him well on his feet, with new blood, strong stock and the "kick in the eggs." A less persistent man than Mr. Pollard, a man without his solid good sense would, in turn, have wanted to sell out "on acount of his health;" but the man for the place was at hand.

VIEW OF PORTION OF THE DUCK RANCH OF GEORGE H. POLLARD, SOUTH ATTLEBORO, MASS.

Ducks from the Pollard farm are sold in Pawtucket, Providence and Boston. Mr. Pollard learned much about the practical side of poultry, and how to market fowls and eggs, during the twelve years that he spent driving a wagon and buying up produce of this kind to re-sell. He bought in this way through the country, and sold to retail dealers in Pawtucket and Providence; also to private customers. It was, no doubt, in this business that he got the training that has enabled him to succeed so well in raising poultry. He learned in that business not to expect too much, not to be easily discouraged, not to figure his profits in dollars or tens of dollars, but to keep up a constant watvhfulness to earn and save the nickels and dimes! A great fault with new hands at the poultry business is that they seem to mistake it for Wall street speculation or owning a gold mine. They count on buying a farm the first year, a spacious city home on Easy avenue the second year, and a steam yacht to boot. Instead of this, they either begin all over, or sell out to some one "on account of their health."

While on the wagon Mr. Pollard learned, for instance, that Plymouth Rocks and Wyandottes, on account of their appearance when dressed, sell on sight at paying prices, where unsightly stock (mongrels) can be sold at low prices and with difficulty. He learned that it is a matter of importance to have stock that is offered for sale in the most attractive and appetizing shape possible; so he breeds such fowls as can be made the most presentable, then spares no pains to make them pleasing to the eye.

All ducklings sold from this farm are dry-picked. "They keep better, keep their color better and look better on sale," explained Mr. Pollard.

These ducks are hung up by the feet, a sharp knife is inserted in the roof of the mouth, pushed backward into the brain and given a side cut that severs a large artery. They soon bleed to death and the end is said to be painless. Probably so; but getting along towards "the end," there's tne rub. Anyway that is how the trick is done. The feathers are jerked off dry while the body is yet warm. The picker pulls the feathers off very rapidly as long as he can get a fair hold on them; then he wets his hand in cold water, wets the down and small feathers, rolls these up in wads by a twist of the wrist and thus gets a better hold on them and hastens matters. An average fast picker can pick forty to fifty a day and the standard price for picking is six cents per duck. On Long Island it is five cents per duck.

As far as he can Mr. Pollard works up a private trade. He has sold ducklings as high as sixty cents a pound, but that is exceptional. The first shipment he made to market this year brought him thirty-five cents per pound. These were hatched March 2 and marketed the last of April. At eight weeks old they averaged ten and one-half pounds per pair. He has had lot after lot average eleven and one-half

pounds per pair, "but," said he, "these are what I call my good luck flocks." The day before we were there, Mr. Pollard shipped twenty-five ducklings that weighed, dressed, 153 pounds, net weight. They were nine weeks and two days old.

A large number of the best young ducks are saved out each year as breeders for home use and for sale. We saw a flock of 105 of these that one of Mr. Pollard's helpers had bought at $1.50 per head—a young man who has learned the trade and is going into business for himself. The ducks in this flock averaged seven pounds each, the drakes eight and one-half to nine pounds each.

On the sixty-acre farm he has recently bought Mr. Pollard has an ideal spot for a duck ranch. There is running water aplenty, acres of meadow land and an orchard for shade. The location is all that could be desired. The house stands high and dry on a knoll; a southern slope that nature will cleanse with her rain leads down to the brook of running water, and across the ponds made by damming up the brook, accessible to the ducks (breeding stock) is a grassy slope and an orchard. It is the spot of a thousand.

PEKIN DUCK RUNS SHADED BY PEACH TREES ON F. F. DAVISON'S FARM, SHOUSETOWN, PA.

HATCH YOUR BIRDS EARLY.

It has been shown that to secure the greatest profits ducks must be hatched as early in the season as possible, so as to be placed early on the market when prices are high. About the highest price paid in Boston or New York is 35 or 40 cents a pound. This drops later in the season as low as 12 to 14 cents. If a duckling can be raised and made to cover expenses at 12 cents a pound, then what an enormous profit there is for the breeder who can place his birds on the market in good condition when prices are high. A rose produced at an unnatural season will cost about five times as much as one which grows naturally. The profit derived from this is the remuneration received by the grower for his experience and accumulation of knowledge It takes equal experience and knowledge to secure best results in the poultry industry and the financial returns are proportionately large. At 10 weeks old ducklings should not weigh less than 3½ to 4 pounds, so that the profit received on the early birds would be quite satisfactory, although it must not be assumed that 35 cents a pound will be received every year or even during a protracted period of any one year. It is better to reckon on 30 cents as the maximum price and place the average at 20 cents per pound during the season. The price will depend largely on the success in fattening the duckling, and the attractive appearance it possesses when dressed. The class of dealers to whom the birds are sold will also affect the price. The best production will demand the best trade and the best price without doubt.

Ducks should be fed on a different plan to fowls. They have no crops and therefore should receive less grain. Some breeders discard grain altogether. If your ducks are watched while feeding it will be noticed that they gobble a mouthful of food, and wash it down with water, another mouthful of food, then another of water. It is therefore necessary to have water near them when feeding, so that they may feed naturally. The observant intelligent man will endeavor to imitate natural methods, and that will lead to success.

Beginners should not experiment. We have been guilty of this failing, and it has generally resulted in loss. Let somebody else do it.

Experimenting is attractive to intelligent persons; it is all right if you can afford it. Certain crosses in color, shape, size or quick maturity have often been made, and this should be inquired into before practicing what may be simply a repetition of somebody's else work. Mr. Rankin said he tried nearly all the crosses of principal varieties before he became satisfied that the Pekin Ducks could not be improved upon. His experimenting cost him about $500 in at least one year—presumably the loss attendant upon decreased sales and prices.

The best stock should be kept for breeding purposes. It is amistake to sell out periodically the most valuable birds, and it results in future loss. Breeders who exhibit and win year after year invariably breed from their best birds, and will not dispose of them, except at very high prices. Breeding for market should be conducted on similar lines. You will increase the profit perceptibly by breeding from your best birds and so hastening maturity and increasing the size.

If ducks are allowed to become puny, they will never pay for the trouble expended on them.

We recall a flock we purchased some years ago, when we did our best to coax them to grow, but it was no use. They had been supplied with no grit and had been handled and excited considerably by inexperienced persons.

No shade had been furnished and they never properly matured. They cost more for food than they were worth. That was one of our experiments.

Ducks or geese should not be kept in a pen or run with fowls. They may be enclosed by a low fence, so that if the fowls intrude they can easily fly back again. It will not do to keep them together, the fowls will be worried continually and much annoyance will ensue.

Although it is a great mistake to keep ducks and fowls together in the same enclosure, they may profitably be reared upon the same farm, on the principle that when ducks are in fowls are out, and vice versa. Mr. F. F. Davison, well known as a successful breeder says: "Try with your chickens a few Pekin ducks. They require less care, grow faster and will bring quicker returns than chickens, and will tide over the dull times between the egg-selling season and the fall when fancy chickens are in demand. But my advice to all in the chicken business is to plant fruit trees, vines and bushes. Even if you are on a rented place and have a fair number of years (five to ten) it will pay you to plant grape vines, or even peach trees."

GEESE ARE HARDY.

Geese are extremely hardy and long-lived. They thrive on low lying lands which would not be suitable for fowls. Old pasture is best suited to their requirements, as they crop the grass very short and would likely destroy the roots of newly sown grass. They must be afforded liberty and lots of grass range. They are very coarse feeders and will eat nearly anything in the shape of green food.

The gander likes to follow his own sweet will in choosing his mate, and it is some times difficult to induce him to transfer his affections; so that it is necessary to mate them some little time before the breeding season opens. Geese have been known to breed at a great age. It is better, however, to discard them after eight or ten years. Young birds do not breed as satisfactorily as old ones.

Although it is desirable to hatch early, it is not always advisable, as it depends upon the climate and location. Goslings need grass and do not thrive unless green food is supplied when they cannot get range. Where a grass range can be obtained in early spring, by all means hatch them early.

Many breeders who cannot afford range sufficient for raising geese, make it their business to visit the farmers early in the fall and buy up all the young stock they can obtain. These are taken home and fattened and as they are then confined in houses, no range is needed for this branch of the business. In such cases the markets need to be studied so that the birds will be at the top notch just when prices are highest; after they are at their best, further feeding is done at a loss. Mr. George H. Pollard, in the Reliable Poultry Journal, gives an idea of the extent of one of these fattening stations. He says:

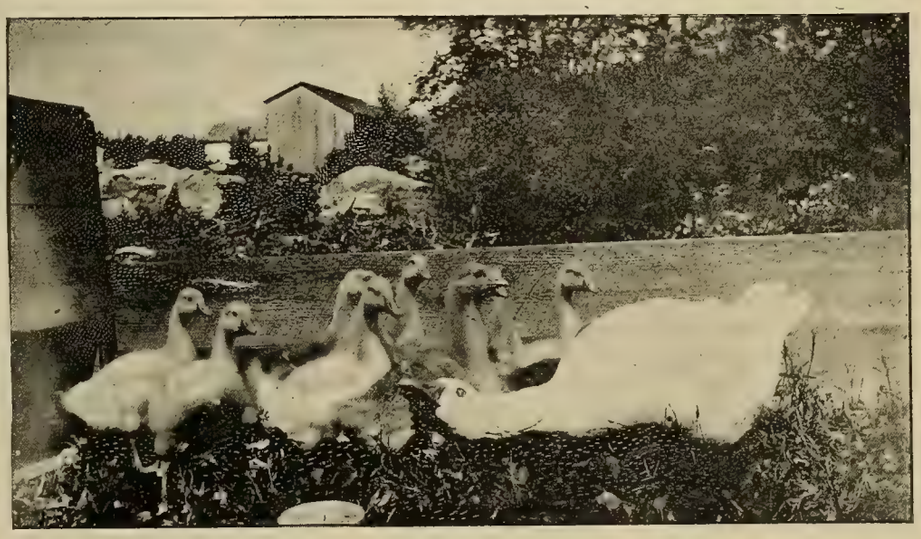
"We had a call recently from Mr. George M. Austin, who may well be called the 'grand old man' of the live poultry business of New England. For fifty-eight years Mr. Austin has been a constant and prominent factor in the poultry interests of Boston, and during that period has killed and shipped more near-by poultry to the Boston market than any other man now living. In the early years all poultry was brought to market in wagons over the country roads, and an all-night drive was the preliminary exercise required of the seller. In those days competition was brisk for the early arrivals, and there was great strife as to who should first reach the market and display the finest stock. With the opening of the railroads, marketing took on a different phase and constant change in methods has been necessary to keep up with the procession. While annually killing many thousands of fowls and chickens, Mr. Austin has made his greatest success in the fattening and marketing of geese. For many years he has been at the very head of this business and is well known in Boston and New York markets.

"Many years ago the geese came altogether from southeastern Massachusetts and southern Rhode Island, where they were hatched from small flocks averaging perhaps from six to fifteen breeding birds, which were generally kept by small farmers or workmen who had a plot of pasture land which was used for their range. The eggs were set under hens, about five to a hen, and the breeders were kept laying in order to get as many eggs as possible. In some cases the goose was allowed to round-up the season by sitting on a limited number of eggs. Usually, however, they were too fierce and ugly to give satisfactory service in this capacity and hens were much to be preferred.

HATCHING AND REARING.

"Then, as now, after the goslings were hatched they were kept with the hens, who served as a hover and a rallying point for them. After the first few days they need little heat and are most apt to be found squatting quietly about the hen instead of under her. They are quaint little creatures with lots of intelligence. As they grow they are given freer range and fed some cracked corn and a very little beef scrap. When about fully feathered for the first time they are gathered up by buyers and carried in carts to Mr. Austin's farm in Mansfield, Mass., where they are fed a fattening food of scalded meal and beef scrap, whole corn, green food, etc. They are bought by the piece and bring from $1.25 down to 75c a head, according to the season. While fattening they are kept in flocks of fifty to seventy-five, in fair sized pens. Food and water are carried about on low-wheel horse carts. There have often been as many as 10,000 geese on this farm at once. The grain was bought in carload lots. When properly fattened, which is in about four weeks, they are killed and marketed.

"While for many years New England produced all the geese used here, of late years many have been shipped in from the west alive and have been fatted and killed in addition to those hatched in this section. Many also come from Canada. Mr. Austin is the pioneer in this trade, it having happened that some sixteen years ago about 800 geese were shipped from Prince Edward's Island to be sold through commission houses in Boston. While the local dealers were haggling over the price, thinking to get them at a much lower figure than their real value, Mr. Austin learned of their arrival and at once bought the whole 800 and shipped them to his farm. The quality was so good that he immediately took steps to import many thousand every year. They come by rail in carload lots, are unloaded at the nearest station, and are driven along the country roads in flocks of from two to four thousand, until they reach the farm, where they are put on fresh pastures and allowed to recuperate from their journey before being placed in the fattening pens. At the sight of one of these droves of several thousand geese, guided by men dressed in overalls and armed with poles, pictures of the old-time dainty lasses with gilded crooks guiding the wayside flock of poetic-looking geese fade into utter insignificance. There is no special breed which seems to have the lead in excellence, indeed there are very few pure bred geese found in these flocks. The white geese dress the cleanest, and the cross between the gray and white goose producing what is commonly called a 'pied goose', seems to be the favorite with the dealers in this line of birds. The



EMBDEN GOOSE WITH BROOD, AT EXPERIMENT STATION, KINGSTON, R. I.

India or African geese, while very common, are extremely hard to dress and do not show so clean a carcass as the lighter feathered birds."

THEY NEED FRESH AIR.

Geese will not stand confinement for any length of time. Even in the roughest weather they are satisfied with a shed. If it is necessary for them to be housed, they should be confined by degrees so as to become gradually used to it, especially if the mating season is near. Geese are peculiar and do not like their inclinations to be crossed. A good idea when housing is to feed them in a run where they have access to the house. After a few days they may be closed in the run at night, and finally may be placed in the house. They should have freedom during the day, if the weather is at all propitious. Provide clean and dry litter for them. It is a common idea with inexperienced persons that geese and ducks will do all right on a damp floor with wet litter. This is a great mistake. They will contract rheumatism, which in the course of time becomes chronic and renders them quite lame. Of course that affects the laying and also the fertility of the eggs. The best plan is to feed and water them outside, weather permitting, so that the bedding will not continually be dampened.

The expenditure for houses is comparatively small. In severe weather, which would freeze the comb of a Leghorn, ducks and geese are not affected. So far as the stock is concerned there need be no worry, but of course, if eggs are wanted in winter the houses must be comfortable. Lots of fresh air—no breezy chinks or broken panes of glass, but rather open doors and windows during fine weather. A low house with very little inside furniture suits the ducks, so that in the matter of building and furnishing there is not such a drain upon the pocket as in the case of fowls.

Breed thoroughbreds. It is a great mistake to imagine that because a certain mongrel bird happens to be larger than an individual thoroughbred, therefore, mongrels are preferable. It is well known that some thoroughbred stock which has been inbred without regard to the vigor of the birds has become diminutive and weak. It is natural in such case that a cross with some other blood will improve the stock, but thoroughbreds should not be so inbred as to cause weakness in any particular. When breeding for market purposes the idea should be to select the early maturing and large birds, and if this is done, even although you are inbreeding continually, no evil results will arise. Should you deem it necessary at any time to procure new blood for your flock, let it be at least a thoroughbred and not a cross-bred. In any case if there is an advantage in point of size of cross-breeds, it ceases after the first cross. If the crossing is continued, the stock will dwindle in size and depreciate in value. It stands to reason that the breed which has been carefully selected by experienced men for market purposes has an advantage over the breed that is taken haphazard by a beginner. Therefore, secure the advice of an experienced breeder, take advantage of his judgment and allow him to know a little as to the requirements of the breed. Shape has much to do with marketable properties, and a breed that has been adopted by prominent breeders certainly is the breed best suited for the purpose.

In an article which appeared in the Providence (R. I.) Daily Journal, mention is made of this cross-breeding and the attention of the reader is directed to the fact that if crosses are at any time attempted, the stock used should be thoroughbred on both sides. As the article is of interest it is here given:

"Few people in the cities and in the northern portion of Rhode Island realize the importance of the geese raising industry in this state. For a long time great quantities of geese have been raised in the southern part of the state, and their fame has almost, if not quite, equaled that of the Rhode Island turkey in the city markets of the east. Along the shores of Naragansett Bay and the Sound, about Tiverton and Little Compton, geese are more generally kept than in any other part of New England. In the region of Naragansett Pier, Point Judith, Westerly and Stonington geese are produced almost as extensively as about Little Compton. In these sections dealers who buy up geese from near-by producers, fatten great numbers, and with such success that geese from southern Rhode Island bring more in Boston and New York than those from any other part of the country. Here geese raising, having been followed for years, the raiser has such an understanding of the business that he knows just what to do and how to do it to make it profitable. The details are little understood by outsiders, and very little is known of the industry outside of the dealers and marketmen. It is, therefore, of general interest to know how Rhode Island gets to the front in this as well as many other matters.

"It is well worth knowing what breeds are used, how they are bred, fed and prepared for market. The old stagers have found that some breeds pay better than others, and that certain crosses grow faster and larger than pure breeds. Some cross certain breeds with the wild Canada gander and produce a hybrid which is superior in flavor and brings a much better price. Success in the production of the wild geese and their crosses is not gained by every one, but only by those who understand their peculiar nature and humor them in their requirements."

FATTENING AND MARKETING.

To be of greatest value for fattening purposes the birds should have good frames, whether they are ducks or geese they need size. In the case of turkeys it is different; they have been bred to such a tremendous size that a turkey which is fit for exhibition purposes, is too large for family use upon the table. In an ordinary sized family it is only after having been brought to the table day after day that it is consumed and the family begin to tire of it. In choosing turkeys, therefore, the house-wife usually selects a medium size bird, even if she has a large family to provide for. Large geese are easily disposed of, as the size suits the requirements of the family table. If they have been raised on a good range where the frame has developed and the appetite has grown with it, there is a foundation to work upon and a form upon which can be molded a desirable quantity of breast meat. Similarly with regard to ducks —the larger the frame the better the consumer will like it. It is not so desirable to place a large amount of fat upon a bird as it is to have a great proportion of meat. Care must be taken not to excite the geese when they are about to be confined for the purpose of fattening. Having been used to a range there is no doubt the confinement will affect them for a time and for the first two or three days their food should approach as nearly as possible that which they have been in the habit of getting. Excitement will run down the weight on a bird just the same as it will on a human being. Although ducks may not feel the change so much, still they also are excitable birds and need careful attention and little handling. The method of fattening will be described on subsequent pages of this book.

Careless marketing is one of the greatest sources of loss or rather lessened gain, both in the matter of choosing your market and preparing therefor.

In the first place, if the middleman is dealt with, his profit comes between you and the retailer. This means there are three profits to be made upon the bird before it reaches the consumer, sometimes there are four, namely—the breeder, the huckster, the commission man, and the retailer. It is not often convenient to deal directly with the consumer,

but frequently the retailer may be dealt with advantageously. If the stock has been well grown, well fattened and well dressed there will be no difficulty in disposing of it at a good price. A continual supply will create a continual demand. If the supply fluctuates so that the dealer cannot rely upon getting what he needs, he must secure a supply elsewhere and your business is cut into by other persons, if not lost altogether. The consumer soon notices the presence of attractive supplies in a store and will naturally be drawn towards the place which exhibits such goods, so that the dealer's interest and yours in keeping a constant supply are surely mutual.

To reach a decision in the matter of choosing a breed, the reader will require a knowledge of the variations of form and color of the different birds.

A detailed discussion of varieties is not the object of this book, but sufficient information is given to suggest a clear idea of the general characteristics of such ducks and geese as are recognized by breeders in this country. A short description will illustrate their chief differences.

Varieties of Ducks.

THE PEKIN DUCK. The Pekin is the most popular of all varieties of ducks. It is a creamy white, with long sloping body and has been bred extensively for market purposes, until now it is considered by many to be the ideal market duck of America. Its bill has a slight curve, in which it differs from the Aylesbury. Its legs are a dark orange.

Standard Weights—Drake, 8 pounds; Duck, 7 pounds; Young Drake, 7 pounds; Young Duck, 6 pounds.

THE AYLESBURY DUCK. The Aylesbury is slightly larger and whiter than the Pekin. Its body is long and deep. The bill is straighter than that of the Pekin, and the legs a lighter orange. It is a first-class market bird, largely bred in England for that purpose.

Standard Weights—Drake, 9 pounds; Duck, 8 pounds; Young Drake, 8 pounds; Young Duck, 7 pounds.

THE ROUEN DUCK. The Rouen is equal in size to the Aylesbury. Its body is long, deep and wide. It is parti-colored, the plumage of the drake being composed of a gray mixed with green and rich brown. The broad bars of rich purple, edged with white on its wings, render it especially attractive. The color of the duck is chiefly brown of different shades. It possesses purple bars on the wings.

Standard Weights—Drake, 9 pounds; Duck, 8 pounds; Young Drake, 8 pounds; Young Duck, 7 pounds.

THE CAYUGA DUCK. The Cayuga is one of the best of the other varieties. It is similar in shape to the Rouen, though not so large. In color it is a glossy, greenish black, with black legs. This fact lessens its value as a marketable duck, both with regard to its body color when dressed, and the color of its legs.

Standard Weights—Drake, 8 pounds; Duck, 7 pounds; Young Drake, 7 pounds; Young Duck, 6 pounds.

THE GRAY AND WHITE CALL DUCK. In Call Ducks there are two varieties, the gray and the white. They are not a market fowl, but are used more for exhibition purposes. They are quite small and have no average weight allotted to them. In the Gray Call drake the breast is brown, the body chiefly gray. The wings are brown with a purple bar, edged with white. The duck is chiefly brown, but has similar bars upon the wings. The White Call duck possesses a like form, but is white in color. They both have orange colored legs.

THE EAST INDIAN DUCK. The East Indian Duck is used as an exhibition bird and is not bred for utility purposes. Its legs are dark. The plumage is a glossy, greenish black both in the drake and the duck. They are allotted no fixed weight by the Standard of Perfection, in fact their value lies partly in their diminutiveness.

THE CRESTED WHITE DUCK. The Crested White Duck is of medium size and possesses a large crest upon the head. It has a good plump body. The plumage is pure white and the legs light orange. Although this duck is of fair size it cannot compete with the Pekin and Aylesbury for market.

Standard Weights—Drake, 7 pounds; Duck, 6 pounds; Young Drake, 6 pounds; Young Duck, 5 pounds.

COLORED AND WHITE MUSCOVY DUCKS. In Muscovys there are two varieties, the colored and the white. They are of good size, with a long, broad body, the sides of the head are covered with caruncles, giving it a singular appearance. In the colored Muscovy black predominates, but is mixed with white. The legs are dark leaden color. The legs of the white Muscovy are yellow and its plumage white.

Standard Weights—Drake, 10 pounds; Duck, 9 pounds; Young Drake, 8 pounds; Young Duck, 7 pounds.

THE INDIAN RUNNER DUCK. The Indian Runner duck is a small variety of the utility breeds, and is noted for egg production rather than market purposes. The body is long, having an erect carriage. The color is light fawn or gray shading to white. It is noted as an egg producer. The weight of the drake is four and one-half pounds and the duck four pounds.

Varieties of Geese.

There are seven varieties of geese, of which two only are commonly bred. A short description of them follows:

THE TOULOUSE GOOSE. The Toulouse goose is one of the most popular varieties, in fact, is most extensively bred. The body is of medium length, but deep. In color it is gray shading to white, except on the wings, which are a dark gray or brown. Its legs are a deep orange.

Standard Weights — Gander, 20 pounds; goose, 18 pounds; young gander, 18 pounds; young goose, 15 pounds.

THE EMBDEN GOOSE. The Embden is becoming more popular. Being white it presents a better appearance when plucked than the Toulouse. The plumage is pure white, with orange legs.

Standard Weights — Gander, 20 pounds; goose, 18 pounds; young gander, 16 pounds; young geese, 14 pounds.

THE AFRICAN GOOSE. The African has been frequently and successfully crossed with birds of the foregoing breeds. A large knob on its head gives it a singular appearance. In color it is gray, with dark orange colored legs.

Standard Weights — Gander, 20 pounds; goose, 18 pounds; young gander, 16 pounds; young goose, 14 pounds.

THE BROWN AND WHITE CHINESE GEESE. In Chinese geese there are two varieties, the Brown and the White. They are much smaller than those already mentioned. The names describe their respective colors. Legs are orange. They are considered one of the best egg producers among geese.

Standard Weights — Gander, 14 pounds; goose, 12 pounds; young gander, 10 pounds; young goose, 8 pounds.

THE WILD OR CANADA GOOSE. The Wild or Canada geese have frequently been used as a cross, but it has been found difficult to mate them with other varieties. In color they shade from a dark gray to a white, with head, neck and tail black. The legs are also black.

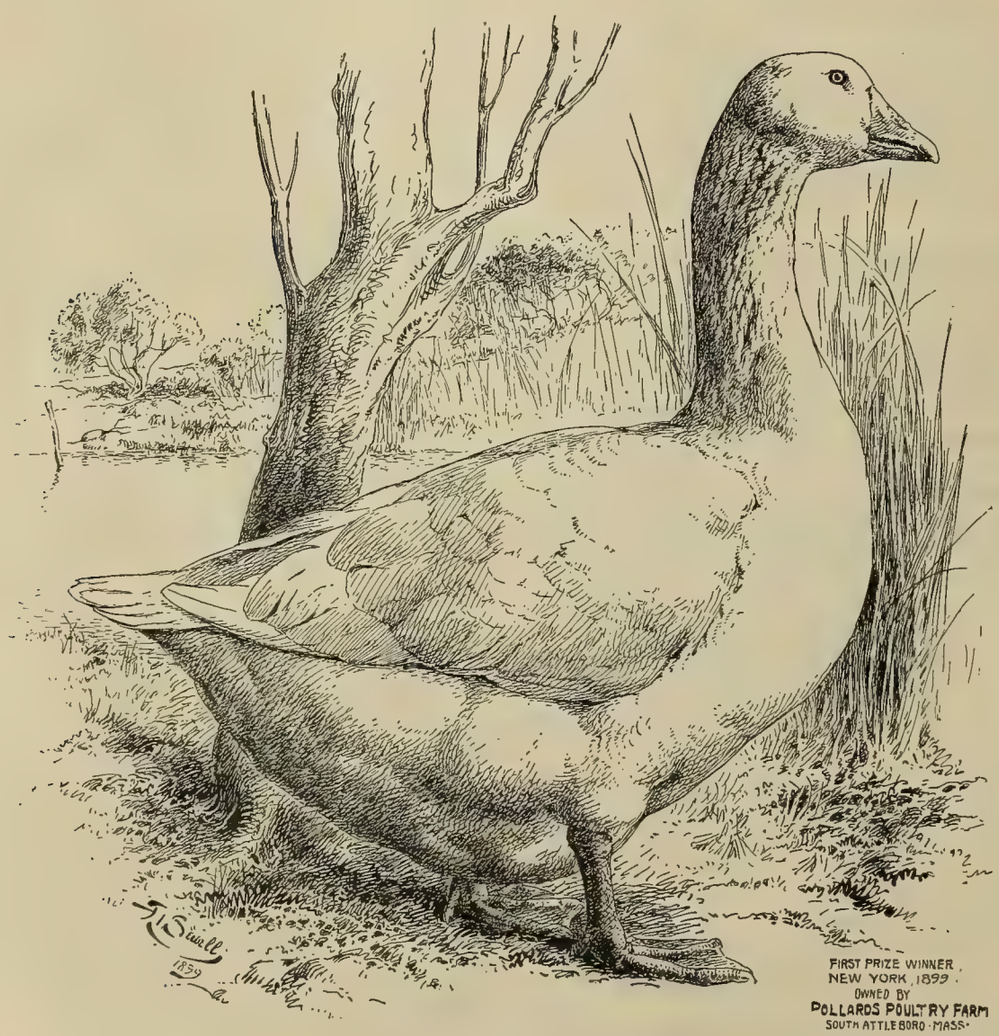
Standard Weights — Gander, 14 pounds; goose, 12 pounds; young gander, 10 pounds; young goose, 8 pounds.

THE EGYPTIAN GOOSE. The Egyptian goose is even smaller than those just named. It is not generally bred. The color is principally black and gray, with white shoulders striped with black; tail glossy black. The shanks are yellow.

Standard Weights — Gander, 10 pounds; goose, 8 pounds; young gander, 8 pounds; young goose, 6 pounds.

We are confident of the stability of the poultry industry. People will eat, and the fact that there is never an over-supply of the best stock illustrates the old saying, that "there is room at the top." We believe that a close study of the following pages, a wide-awake endeavor to get at the meat of the subject will result in placing the intelligent reader in a position to begin breeding without fear of failure.

Before vacating the field we would ask: Is it not rational to suppose that experience is necessary before beginning on a large scale? Is it not wise to allow that successful breeders speak from experience—that they economize labor to the minutest degree, and that therefore, it is absolutely necessary to perform such details of labor as they suggest? Leave nothing undone!



A PRIZE-WINNING EMBDEN GOOSE.

DUCKS AND DUCK RAISING.

Old Time "Puddle" Ducks Compared with the Present-Day Pekin—Notes Upon the Muscovy, Rouen, Aylesbury and Indian Runner.

Locations for Duck Farms, with Instructions on Housing, Feeding, Mating, Hatching, Brooding and Fitting for Market.

BY GEORGE H. POLLARD, SOUTH ATTLEBORO, MASS.

VERY few exact conditions are necessary in the production of ducks, either for market or breeding purposes. There are, however, some few details to which care must be given and the results will be largely in proportion to the intelligence which is shown in the adaptation of these details to the end in view. In the early years before the duck industry had grown to its present large proportions the birds shared the common lot of poultry in general and were without other shelter and attention than such as they had in common with hens, geese and turkeys, which generally made up the miscellaneous flock that was usually housed in rather limited quarters. The ducks were apt like the others to be of various hues and of different sizes. Uniformity of size and coloring were qualities seldom found.

Prior to the year 1873 such ducks as were raised for the market were either of the small white variety commonly called "puddle ducks," or were a combination of the Rouen, and the white ducks mentioned, or more seldom the Muscovy. The market demand was light, such as there was being found in large cities and it came mostly from the foreign population, which had brought from the home shore a taste for water fowl. This liking was not general in the community at large and the market in consequence was very limited and prices were low. The birds were small in frame and had very little flesh carrying capacity. The quality of the flesh was poor. About the year above mentioned came the first importation of Pekin ducks. These very soon caught the attention of the market dealers and caused immense development of the industry. Their larger size and broader frames with a greater proportion of meat created a demand which had not before existed. The quality of the flesh under the cultivation which was adopted gradually improved until it became attractive not only to the epicure and high-liver, but for the family table as well. The Pekins of that date, while of the same creamy color and general body type, were yet much different from those of the present day. They were long in body and neck, were coarse boned and lacked the present flesh development. The improved type of the present day is broader in breast and back, deeper in body, shorter and finer in neck and bones, and carries a much larger proportion of meat, while the waste has been cut down in proportion. The present day Pekin as compared with other breeds of ducks is altogether superior in every market respect. There is no real competitor.

MUSCOVY, ROUEN, AYLESBURY, INDIAN RUNNER.

The Muscovy, which in some sections of the country is used quite largely for market purposes, is not so desirable and does not bring such high prices in first class markets. The Muscovy, while very full, plump breasted and meaty, varies too much in size. The male bird at its best weighs from seven to eight pounds, while the female only weighs from four to four and one-half pounds. This is a serious fault, as at the killing time they have not the uniformity in appearance and weights that is necessary to secure the highest prices. It is obvious that under these conditions a uniform shipment can not be made except where it is made up altogether of the ducks or drakes. The flesh has a somewhat coarser appearance than that of the Pekin, while the head has a particularly offensive appearance. The feet and legs are flesh colored or nearly white.

The Rouen ducks are beautiful in colors while alive, but are far from attractive when dressed for market at from ten to twelve weeks old. The dark brown and the colored pin feathers leave a decidedly discolored and ill looking carcass which does not appeal to the taste of the fastidious. While the quality of the flesh may be as good, and the flavor quite as appetizing, the fact yet remains that the average buyer chooses quite as much from the appearance of the article as they do with regard to its flavor and tasteful qualities.

The Aylesbury duck, which is very popular in England, has failed to achieve the same position in this country. It closely resembles the Pekin, differing most in the color of the plumage, which is a pure white as compared with the creamy tint of the Pekin. The Aylesburys also have flesh colored bills and legs. The pure bred Aylesburys are very uncommon in this country and little is known of their qualities except by hearsay.

The Pekin and Muscovy cross some years ago met with considerable favor. It was however on the whole not a success. The fact that after the first cross the birds could not be bred further naturally detracted from its popularity.

One of the present aspirants for the place of the Pekin as a profitable bird is the Indian Runner duck. These birds are of medium size, lightly built, and in the duck family approximate the position of the Leghorn in the poultry yard. They are said to be light feeders, remarkably heavy layers of fair sized eggs and very prolific in reproduction. They are very quick in their movements. Their size and shape, however, prohibit them from ever becoming in any way the rival of the Pekin for market purposes, and this is the only really profitable branch of the duck business. Keeping ducks for egg production and the sale of the eggs for market purposes will never prove profitable in the eastern and New England states. In some of the western and southern states where grain is low and especially in the south where shelter is comparatively unnecessary there may possibly be fair profits in the production of duck eggs for market purposes. In the New England and eastern states, however, where grain is high and shelter must be given the sum received for eggs alone is too low to make the venture profitable. While there are a few weeks in the year when their eggs sell at considerable premium over hens' eggs, on the average there is no very great demand and they do not sell readily, especially after the advent of the warmer months.

Then again the egg production is limited to a much shorter period than is that of the hens.

LOCATION, MARKET, STOCK.

Having decided upon the production of ducks some few details of location should be settled. While, as has been said, no special conditions are absolutely necessary, there are yet some points which will add much to the ease of the work and the general profits of the operation. One of these is the location of the plant near good railroad facilities and large grain markets. The grain is the raw material which is to be made into market products, and as upon any large scale of business immense quantities must be used, it is best that the location shall be such that the grain can be not only readily procured, but that the prices shall be as low as possible. A difference of but a cent or two on a bushel would amount to a considerable sum in the course of the year. Then again the product must be shipped daily, or at least every other day for a number of months and ready access to freight or express facilities reduces the expense of carriage and saves immensely in time. The plant may be located on nearly any kind of land; but the best conditions are found where the soil is rather light and gravelly; this naturally gives the best drainage and tends to keep the runs and yards cleaner and sweeter. Where such land can be had together with water ways or runs the natural conditions may be considered much better than without the water.

If the business is to be entered upon in the fall of the year or in the early winter, the best and cheapest way is to buy breeding birds, and from these birds the eggs may be secured wherewith to keep the incubators filled. The production of the eggs being under the control of the breeder they are more apt to be strong and fertile and to result in better hatches than where they are bought at a distance and delivered by express or other carriage. In general eggs hatch better where not subjected to the jarring and shaking incident to extended journeys.

If, however, the business is to begin in the spring or early summer, the more economical and better way would be to buy eggs from reliable dealers and poultrymen and to hatch from these the breeding stock for another season. The reason for this course is found in the fact that good breeding birds in the spring of the year are very hard to get. Such as have been kept through the winter are held at high prices and often can not be bought at all. It is plain that birds mated up and selected for the use of the owner will not be readily disposed of at such prices as would make them a profitable investment for the buyer. Eggs from these birds, however, may be bought at reasonable figures and the buyer will thus secure the best of stock at the season when he most needs it, and at prices which will permit of their profitable use. It is understood of course that the business of hatching will be done altogether by incubators and the rearing will be in brooders. To the adoption of artificial incubation must be credited the large growth and expansion of the duck industry. Without this method it could never have flourished to such an extent, nor arrived at its present development.

Of all birds artificially incubated the ducklings are the hardiest, strongest and easiest to raise. The eggs incubate very successfully. It would have been impossible to have achieved the present large results in the business by the use of natural methods. Ducks are at best unsatisfactory sitters, and generation after generation of non-sitting has produced birds which in a large measure lost the desire to incubate, and while they lay very steadily a remarkably small proportion of them have any desire to sit during the first laying season. Older birds of from two to three or four years seem to exhibit the desire to sit in proportion to their age.

HOUSES, YARDS, MATING.

If it is chosen to begin with birds the house should be constructed and yards stretched so as to in the best way fit the intended uses. The plainest kind of houses are the best for use in duck culture. Ornate, expensive or ornamental buildings are to be avoided as their use only increases the cost and expense of maintenance, while no better results are achieved than with the cheapest reasonable grade of buildings. The houses need not be particularly warm, but should be wind proof. They are ordinarily built of one thickness of unmatched boards with roof and sides covered with some of the better grade of building paper. They may of course be shingled. It will be found, however, in all ordinary climates that a water tight roof with battened back and sides will answer the purpose quite well. The birds do not seem to mind the clear cold, but dampness and uncleanliness are decidedly detrimental features in a building. The most common style of house is built with the roof slanting from the front to the rear, and is approximately 7 feet front with a height of 4 feet at the back, while three feet will

answer. The handiest width, all things considered, is about 12 feet. But little glass is required. Windows of sufficient size to admit light being all that is needed. Generally one sash of six lights 9x12 is enough for each 8 or 10 running feet of the building. These should admit of opening for ventilation, which is necessary in even the coldest of weather. These buildings are built without walks, the attendant stepping over the pen partitions, which need only be about 30 inches in height. The occasion for feeding inside are so rare that it is a distinct waste of floor space and an added expense to plan for walks or aisles through the house. In planning for the houses for breeding stock about seven square feet of floor space should be allowed to each bird, and the best results will probably be found in penning from twenty-five to thirty-five birds in a flock. The usual proportion is one male to five females in the early part of the season, while later the males may be removed until the proportion is one male to eight, or if they have a water run, one male to ten females.

If yarded, which they must be if separate pens are kept, the runs may be enclosed with wire netting 2½ to 3 feet in height. They may be kept fairly well with two feet netting, but the few inches added height means a sure thing and prevents the mixing up of the breeding birds, which is apt to occur at the height of the season. While many of the leading market breeders have no water runs for their birds, we have yet to find a case where they did not think that such would be of great value and would result in a better percentage of fertility together with stronger germs in the eggs from the breeding birds.

HATCHING, BROODING.

The breeding birds may be fed a ration of two-thirds wheat bran and one-third Indian meal, with ten to twelve per cent of best quality beef scrap, the measure to be by bulk and not by weight. Green food may be fed in abundance, and any kind which is available may be used. Cut clover is one of the best and gives very good results. It may be steamed with hot water, and twenty-five per cent in bulk may be added to the grain food. Boiled turnips, potatoes or other vegetables may be occasionally used. Green cabbage chopped fine is relished and some of the most up-to-date breeders are using ensilage made from corn. They should be fed twice a day, that is night and morning, all they will eat clean of this mixture, and in the coldest winter weather or in the heavy laying season many breeders make a practice of giving a noon-feed of whole or cracked corn or oats. Where they have abundant green food however this is, we think, unnecessary. The breeding birds may run together in large flocks until about the first of November, when they should be separated to smaller flocks and properly mated. Prior to this mating they may have been fed a lighter ration composed of about the same grain proportions but sparingly of the animal food, not over five per cent of scrap being fed. It is not advisable to force their laying in the fall or early winter, nor at any time, as the first eggs, those that come in November, December and January, are very unfertile and the hatching results are not high enough to offset the loss of stamina and vitality which comes from too high and forced feeding of the breeding stock. A large stock of their vitality is exhausted in laying at a season of the year when best hatching results can not be had. Later in the season, say beginning in February, the eggs will be more strongly fertilized and will hatch better. This gain will continue through March and April, which are the best hatching months, and will gradually go back after the middle of May. Through June and July the eggs will be almost worthless for hatching purposes. No method of caring for or feeding the birds has ever been discovered which will cause them to produce hatchable eggs for long after the natural breeding season is over. In this respect they differ distinctly from hens and some other fowls. During cold months eggs should be carefully gathered and care should be taken that they are not chilled. They may be kept for considerable lengths of time before they are incubated, but the best results will generally be gained with eggs not over a fortnight old. Where they are kept for any length of time they should be turned every few days and their position so changed that the yolks will not settle. No special directions or their treatment during incubation need be set down, as the makers of all incubators give distinct and exact directions for their use in incubating both duck and other eggs.

After the ducklings are removed from the incubators they should be placed in brooders running at a temperature of about 90. The ducklings require less heat than chickens of the same age. What system of brooding is chosen will depend largely upon the personal preferences of the breeder. On the largest duck ranches the overhead system of piped brooder buildings is almost exclusively used and gives very good results. This system is simple and economical in operation and is inexpensive to install.

FEEDING THE DUCKLINGS.

The ducklings fresh from the machine should be placed carefully under the hovers which are already warmed to a temperature of about 90 degrees. Their food consists of 2-3 bran and 1-3 meal, to which has been added about 5 per cent of fine gravel or grit. The whole should be moistened with milk to a crumbly consistency or it may be made up of the above proportions of grain, into every quart of which has been stirred about two raw eggs. The whole mass, however, should be only crumbly and moist and not sticky and pasty. Water should be before them at all times, night and day, this is an essential point the carrying out of which will add much to the surety of profitable results. For the first 48 hours the little birds may be penned back to within 18 or 24 inches of the front of the hover that they may not stray from the source of the heat and become chilled. Oversight should be had of them at this stage and when they are found grouping and huddling together they should be placed under the hover and after one or two removals they will seek its shelter for themselves and there will be no further occasion or such attention. During the first 48 hours they should have the food before them at all times, care being taken that it is kept sweet and that no sour food is allowed to accumulate. It may be fed in little troughs or pans or such convenient receptacles as are at hand. After this they may be fed about five times a day all that they can eat and a little may be left over so that the weaker birds can get their full share before all is finished. They should have the full run of the pen as soon as they have learned to find their way back and forth to the hover. After they are three or four days old they may be allowed a run in the outside air during the warmer parts of the pleasant days, and after they are a week or ten days old they may be allowed access to the outdoor yard at all times. They will grow stronger and better if they are given the outdoor runs and there will be less mortality. Very litttle fussing will be necessary with them after the first four or five days. Constant attention, however, must be given to keeping the hovers and pens clean and dry. They will not thrive well in damp and dirty quarters. After the fifth day they may have a food composed of 2-3 bran and 1-3 Indian meal and 5 per cent of beef scrap. The gravel and grit may be discontinued, but a box full should be constantly within reach of the ducklings. The proportion of beef scrap may be gradually increased until they are getting at five weeks old 15 per cent and this will be carried up to the killing time. After the fifth week the proportion of meal may be

increased so that they are getting equal parts of bran and meal. No further changes in food ration will be necessary to get plump fat ducklings at ten weeks of age.

The heat under the hover should be at 90 when the ducklings are put in, the added animal heat will easily carry the temperature to about 95. It is unnecessary to exceed this degree at any time. After the first two or three days the temperature may run at about 90 and from this time it may be gradually lowered until at ten days it runs at about 80 degrees. It is better, however, to run the temperature of the hovers by the ducklings rather than by the thermometer. If the little birds settle down contentedly and quietly under the hovers the temperature is all right regardless of what the mercury indicates. On the other hand if they bunch together or refuse to go under the hovers it is either too cold or too hot. The experienced operator readily knows the proper condition by the conduct of the bird and pays comparatively little attention to the thermometer after the heat is first determined before the birds are placed under the hover. After this time they run the temperature with reference to the ducklings rather than the thermometer.

After the birds have reached the age of five weeks three feeds a day will be ample and they will not need the warmth of a hover except very early in the season. At this age after the first of April they may generally be removed to cold houses and in the summer time after the first of June at six weeks of age they will do very well without any other shelter than that provided by a roof or water shed. After the seventh week they will do very well with simply a brush shade or the shade which comes from trees and shrubbery. This shade is an absolute essential and must be had for both breeding stock and ducklings, and they will not do well or thrive without it. Exposure to the hot sun annually kills more birds than any other cause. This shade may be furnished either by trees naturally or by brush covers or board roofs. It matters little which or how, but in some way it must be provided. In the case of long, cold rain storms it is better to have some shelter.

Many of the producers give the young birds water only at feeding time. We, however, believe it is much the better plan to keep water by them at all times of the night and day. We believe that they will grow faster and be more contented and that the extra movements which it causes will not interfere with, but on the other hand will tend to hasten their growth. Many growers change the food when the ducklings are from seven to eight weeks old, using a larger proportion of meal and fattening foods. Our experience, however, has given us quite as good results by carrying them until the killing time of from 10 to 12 weeks on the ration which has been given. The little birds may have all the soft green food which they will eat and an occasional mixture of vegetables with the grains. This is best if intended for breeding stock, but if they are meant for the market alone it is unnecessary, and they will grow as rapidly and do as well on a strict grain diet and will make a harder, heavier flesh.

A CORNER OF THE POLLARD DUCK FARM, SOUTH ATTLEBORO, MASS.

FITTING FOR MARKET. In fitting the birds for most eastern markets the ducklings sell better if dry picked. This is done by sticking in the mouth, which allows the birds to bleed freely, stunning them by a blow on the head and removing the feathers quickly before the carcass cools. This operation, while difficult for the beginner, is yet easy in the hands of an expert, and good pickers by this method will clean from 40 to 60 in a day of ten hours. Something, of course, depending upon the stage of growth of the pin feathers. This growth is either accelerated or retarded by the proportion of animal food which is fed to the young birds. The duckling which has been fed a heavy proportion of beef scrap will begin to pin out quite perceptibly at ten weeks of age, while those fed a smaller

proportion of the animal food may be carried to twelve weeks with no freer growth. In the one case the birds should be picked at about ten weeks, in the other it would be more profitable to carry it until the stage when the pin feathers start freely, when it should be immediately marketed. Where they are allowed to go until the pin feathers get long and the second growth of feathers begin to come in freely they go off in flesh and weight and it takes about four weeks to get them around again in good condition. At the end of this period they will not have gained enough in weight to offset the added cost of care and food. The profitable time to kill them is at from ten to twelve weeks, according to the stage of growth and condition of their feathering. Very early in the season, while prices are ranging high, it may be more profitable to kill them at eight weeks, as at that time a bird of four pounds may be worth quite as much as a five or six-pound bird two or three weeks later.

On Long Island, where many ducks are annually killed for market, most of the dressing is done by scalding, the work of removing the feathers being done by women at an expense of about five cents for each bird. While the operation may be more rapidly accomplished in this manner, in most of the more fastidious markets the product does not sell so readily and will not stand exposure to the air without becoming discolored and ill-looking. In New England the average price paid for dry picking is seven cents per head. In the south much of the picking is done by colored women and such labor may be had for three cents a head and it is considered a very desirable occupation by the people who do the work. In the western and northwestern states a great deal of the picking is also done by women who are employed principally because they can be better depended upon, are steadier in every way and are more particular to do the work well than are the men to be found in these sections. In picking, the feathers are left on the wings from the second joint and on the neck for about one-half its length. The wings should be folded close to the sides and tied firmly with a string, the heads should be left on and the carcass undrawn. As soon as the feathers are removed drop the carcass into a barrel or tank of clean water, where they may be allowed to soak for from two to three hours, when the blood should be washed from the mouth and head, and they should then be placed in a tank or barrel of iced water and left to cool and harden. When treated in this manner the flesh will be much whiter, firmer and better looking than if cooled in dry air. The important point is to get rid of the animal heat as quickly as possible and the quicker this is done the longer the bird will keep. The color of the flesh should be white. A yellow or off color being very undesirable and not as in the case of chickens commanding a readier sale. This is the case with all water fowl. White-meated geese selling much more readily in fastidious markets than do the yellow-skinned birds which have been fed very freely on green foods.

The feathers from the Pekin ducks sell readily and vary in price from 25 cents some seasons, to 37 and 40 cents at other times. They form quite an item of profit and it is worth while to pay careful attention to their preservation. Quill feathers are thrown to one side and are comparatively worthless or market purposes. In shipping the birds to market, the head and neck should be folded back against the body and they should be closely and firmly packed in layers in either boxes or barrels. If they are to be shipped only a short distance they will carry all right without ice, but if to be shipped on long journeys they should be packed with first a layer of ducks, then a layer of broken ice, with another layer of ducks, etc., until the barrel or box is filled. In this way they may be shipped comparatively long distances with no fear of loss by heating, and they will arrive at the market in good condition.

GEORGE H. POLLARD.

FEEDING AND CARE OF DUCKS.

BY ELMER PUTMAN.

DUCKS are injuriously affected by too much sun, lack of a cool place to roost at night, and lack of water in warm weather. Ducks like clean water just as well as a man and will use cool water in preference to warm. Corn three times a day is too often for young ducks unless you are fattening them. Two-thirds of our duck feed is cut grass in summer and cut crab grass hay and corn fodder in winter.

If you give your ducks a chance to get water at night with grass or something in it they will do better than those that have no water from bedtime till breakfast. There is grass that ducks will not eat when running out, that if cut and fed to them they will eat lots of it. Many times a duck is wonderfully pleased to have coarse cracked corn put in a pail of water, so that it can gobble after it, and in this way it will eat only what is needed and no more. Old ducks prefer ground grain to whole grain except in cold weather, and a good mixed combination is preferred at all times. There are only two ways of successfully raising ducks, chickens and turkeys. One is to move in with them and stay from start to finish, and the other to take them in with you.

Ducks that are never picked will grow larger and have, as a rule, better offspring than those constantly picked. Ducks well raised will begin laying at five and one-half months old, or a little less. I had March ducks lay the last of September, and expect to have it so again. I believe they should be kept off the snow and ice as much as possible. Put them in a good dry place in cold weather, provide nice warm water, and see what they say when you call on them. Ducks are like chicks and turkeys, they like lots of ground bone. I have bought lots of it, more than 16,000 pounds.

You can get a duck to market four weeks earlier than you can a chicken, but the price is generally three to five cents lower. The only difference as to profit is the greater loss in raising chicks than in raising ducks. A little flax seed is good. Take a pint and a half and cook to a jelly. This much will fill a good sized pail and make enough for 300 head of adult stock. Mix in the soft food, say twice a week, and not more than three times. We prefer this to oil cake that is recommended by breeders occasionally. Ground meat scraps are good for ducks also unless when quite small. Here in this latitude ducks usually begin laying in January and continue till the middle of August. I also expect a few eggs in the fall, and ducks hatched from such eggs sell well the next March and April, usually about fifty cents apiece.

ELMER PUTNAM.

A BIG EASTERN DUCK RANCH.

An Account of a Visit of the Editor of the Reliable Poultry Journal to the Duck Ranch and Broiler Farm of Mr. A. J. Hallock, Speonk, L. I.

Information on the Breeding, Feeding and Management of Ducks for Market—Facts Worth Treasuring.

THE editor's visit to the great duck ranch of A. J. Hallock, located near Spoenk, on Long Island, was a decidedly satisfactory one. Spoenk is a mere station, situated seventy-one miles from New York City. A few well-to-do Gothomites own country homes thereabouts, but much of the land lies idle, held by speculators. Mr. Hallock's place is something like two miles from the station, reached by a roadway that is as forsaken and picturesque as any country road to be found far inland, or even in the roomy west.

Enroute to Speonk we saw from the car window several flocks of Pekin ducks yarded along the edges of ponds and streams, but we were not prepared for the scene which met our view when the roadway led us out of a strip of woodland into an open space surrounding what proved to be the Hallock homestead and cluster of poultry buildings. A slow running stream ranging in width from twenty to fifty feet emerged from the woods to the left of the roadway and ran parallel with it seaward, passing two houses, one occupied by a Mr. Wilcox, the other by Mr. Hallock. In yards which ran down a sandy slope and extended into the stream were from 10,000 to 12000 Imperial Pekin ducks. The yards are 25 feet wide by 150 to 200 feet long, and from our point of view we could see practically all of them—about three-quarters of a mile of ducks! On account of their access to running water these ducks were snow white, and the old ones looked as large as fair sized Embden geese. It was a sight worth going far to see.

Mr. and Mrs. Hallock were extremely kind. On their invitation we remained over until the next day and that evening walked with them to the shore of the ocean. It was "knee deep in June," the fields were full of daisies; the atmosphere was delightfully cool and refreshing. It is a pleasure to go back in memory to such scenes.

Mr. A. J. Hallock's father began to raise ducks for profit on the present homestead as far back as 1858, and it has been a continuous "quack, quack, quack," in those diggin's from that day to this. The business has developed with the years; dozens of other persons have taken it up, until at present Mr. Hallock tells us that each season fully 100,000 Pekin ducks are raised within a radius of five miles of the town of Speonk. When we were there Mr. Hallock had in the neighborhood of 9,000 ducks and ducklings, 1,100 of them breeders, the rest young stock. Several hundreds had already been marketed. He also had close to 3,000 chickens, a portion of them breeders, the balance broilers and roasters. During the season of 1894 the Hallock ranch produced 16,000 ducks from 700 breeders; in 1895 from 1,100 breeders they hoped to reach the 20,000 mark, but owing to the unprecedented infertility of eggs, they said in June that if they reached 12,000 they would do well. They suffered from infertile eggs the same as did the country at large. Duck eggs are, as a rule, well fertilized, but for some reason (late winter and extreme cold probably) even duck eggs were loth to hatch last spring.

INCUBATOR CELLARS.

The Hallock ranch comprises forty acres. On this ground are several brooder houses, a feed house, killing house, stock house, an incubator cellar, etc. The exact plans for building such a cellar are at the discretion of the persons chiefly interested, but in the way of general directions we submit the following:

Choose a well-drained location, free from seep-water, and excavate to a depth of two or three feet. Two feet is ample. For the walls brick or stone can be used. If these are not available, hard wood, or even pine plank will answer first rate, excepting that they will not be as lasting. Where the ground is dry, plank will last for years. Build the side walls up to a height of four or six feet, as desired, having these walls half way below and half way above the surface of the ground. Build the end walls up to a peak to fit closely under the roof.

The roof will need to be well built. Use for the roof 2x6 pieces, and if thought necessary brace it with two uprights, one placed at each end of the fairly good-sized skylight, which is placed in the center of the roof. Cheap sheathing will answer for covering the roof. On this, place six inches of loose straw; on the straw throw from six to ten inches of earth—that excavated—and pack it down well. Use double windows for the skylight, leaving four to six inches between them, and protect the top one with a wire screen. It is, no doubt, best to have a double, or vestibule door, as there will be less loss of heat when entering and coming out, but this precaution is not really necessary. The floor can be natural earth, or cement, if desired.

An incubator cellar built as above will preserve a remarkably uniform temperature, regardless of outside atmospheric changes, and in such places hot air and hot water incubators are on a par, both naturally being at their very best. Where persons think of embarking in the business on a large scale, we advise the use of a regular incubator cellar similar to the one here described.

Mr. Hallock's ducks, both old and young, have access to fresh running water, but there is not enough of it for them to swim their flesh away. Real young ducklings are not admitted to this water; they are four weeks old before this happy time comes. Mr. Hallock frequently gets his ducklings to weigh as high as six pounds each at ten weeks old; five pounds each is a common weight. He marketed his first last spring on April 17. Twenty-two of them then weighed ninety-two pounds, and he got for them 40 cents per pound. Some were marketed earlier in the season than this by other parties, and 45 cents per pound was obtained. The year before they started in at 60 cents per pound. Last spring the price remained at 40 cents between three and four weeks. It stayed at 30 cents over a month. On June 10, the time of the writer's visit, the price was 22 cents, with prospect of

staying there through June. In 1894 the price fell once to 12 cents. Sixteen cents is as low as it ordinarily gets. Mr. Hallock states that there is not much margin in the business at 12 cents per pound.

All ducks at these prices are shipped dressed and sold to commission merchants. The entrails are not drawn and only the soft, marketable feathers are plucked. The wing and tail feathers, and a few near the head are left. The head is not removed, nor are the feet. Hence the loss in weight on account of dressing them is small. As the season advances the ducks are packed in ice for shipment. A duckling when served makes four "cuts" only; at fashionable restaurants only two. Where the editor ate his paid meals during this trip ducklings are not served, at least not as a rule—the boarders prefer corn beef with hash in prospect.

VIEW ON ATLANTIC DUCK AND BROILER FARM, A. J .HALLOCK, PROPRIETOR.

Under no consideration are ducklings on these eastern ranches allowed to shed their first feathers before being marketed. Even Sabbatarians would work nights and Sundays before they would permit this, as it takes four weeks for the birds to get back their flesh. Growing new plumage is a severe drain on the system and uses up the nourishment the bird takes, diminishing the flesh. Women, girls and men are employed to pick the ducks and they make quick work of it.

FEEDING AND HOUSING.

On the Hallock ranch the food consists of cornmeal, bran, ground oats and middlings, also cut grass and cut green oats. By "cut" is meant chopped. Beef scraps are mixed with the rations for the breeding ducks and not too much green food (grass and oats) as this has a tendency to "soften them," producing looseness of the bowls and debility. They feed young growing stock on this ranch more cornmeal than is fed commonly. One-third cornmeal is fed to start with. The proportion is increased as the ducklings grow older. Bran, where too much is given, has a loosening effect. The birds are fed three times a day, after the first three weeks; before that they are fed four times daily. They are fed as soon as it is light enough in the morning for them to see to eat, again at noon, and a third time just before dark. Thus it is that the twenty-four hours are divided up about equally by the three feedings, and growth is continuous. No pains are spared to get the quickest possible growth out of the stock to be marketed. So-called celery-fed ducks are fed celery seed, which last spring cost sixteen to eighteen cents per pound. We may rest assured that no great amount of this seed was fed, but it is claimed enough is fed to impart a rich celery flavor to the flesh. On the breasts of these high life individuals, after they are dressed, are stamped the words, "Hallock Celery-fed Ducks." Corn beef must indeed taste flat compared to these toothsome water lilies. No high-toned editor would stoop to corn beef But high- toned editors exist only in the imagination, where board bills are not presented.

Mr. Hallock in 1894 bought and fed his ducks and chickens over 12,000 bushels of grain! Roll that morsel under your tongue for a few moments, then tackle this one: When we were there his men were each day feeding no less than 3,000 pounds of food to those same ducks and chickens. This looks like doing it by wholesale, does it not? But we state only the facts. It was a surprise party to us.

Food is distributed among the ducks by means of a tramway and car. The tramway emerges from the feed house and is built across the tops of the fences of the yards. The food is thoroughly mixed in big troughs by use of shovels and potato forks. Cold water alone is used and the food is mixed dry-wet. What food is not eaten up clean is removed in every case to prevent cloyed appetites.

The brooding houses on this ranch are very simple. Ducks, anyway, are one of the easiest creatures on earth to raise. They do not have lice; they do not have roup; they do not have cholera; they simply live, eat, drink and grow big. They are the hogs of the fowl family, when it comes to eating; but they make good use of the large quantities they eat. 'Tis true they will gulp down twice as much food as a chicken, if they can get it; but it has been repeatedly demonstrated that they grow twice as fast as a chick, so where is the loss? There is no loss. We claim, and can prove without difficulty that, as Charles F. Newman says, duck raising or farming is to-day the most profitable branch of poultry raising, when the daily market is to be depended upon.

The brooding houses above referred to are generally twenty to twenty-four feet wide and from 100 to 180 feet long. They have a double pitch roof, with low walls under the eaves, say four to six feet. Along the ridge they are twelve to fifteen feet high and under this ridge is a passageway four to six feet wide, extending the length of the building. On either side of this aisle are the continuous board brooders covering the hot water pipes which traverse the length of the building, cross over and return under the hovers on the opposite side of the aisle. Partitions divide the brooders and space in front of them into runs five or six feet wide and these inside runs open into outside runs varying in length up to 75 or 100 feet. In each brooder and connecting yards are kept from 100 to 125 ducklings down to 75 or 80, according to size. These little fellows have all the water they will drink, but none to swim in. No artificial heat is supplied in their brooder houses, except what comes from the heater located at one end and the long rows of pipes. Ducks are naturally hardy, but chicks thrive well under precisely the same treatment, in fact it is best that both should exercise in a cool atmosphere, even to going out of doors in midwinter.

Mr. Hallock believes firmly that there is good profit to be made out of broilers, roasters, eggs for market and eggs from pure-blood stock for incubator use. He has built a large hennery and this winter is carrying 1,000 hens as layers. He proposes to work into thoroughbred stock of White Plymouth Rocks, Black Langshans and Single Comb White Leghorns. His idea is to hatch hens eggs and raise broilers each season ahead of his ducks, as the latter do not begin laying until in February and March.

Asked what it costs per pound to grow ducks for market, Mr. Hallock put the cost at 5 cents per pound in food and labor, nothing computed for money invested, wear and tear of plant, repairs, etc. These items foot up considerable. The buildings, however, are inexpensive; only 15-inch high fences are required and the bulk of the money invested is turned over rapidly. "There is," said Mr. Hallock, "good money in the business." The prize winning Pekins exhibited year after year by Mr. Hallock at Madison Square Garden, New York City, are all hatched and reared by artificial means, and so has been their ancestry for many years back. Here, by the way, is a big hard fact for Mr. Felch to play foot ball with in establishing his claim that incubators and brooders are filling the country with inferior poultry.

CARE OF BREEDERS.

Said Mr. Hallock: "You western people can readily see why we do not care to sell good breeding ducks in the late winter and early spring for less than $4 or $5 each. These ducks, being our earliest ones, we could have sold when ten weeks old at an average of $1.25 each. After we keep them nearly a year, and when they are full of eggs, we prefer to keep them rather than coop and ship them at $2 to $3 per head. It pays us much better." Mr. Hallock has refused $15 each for exhibition males. The best are invariably in strongest demand.

The sandy soil on Long Island is, so far as duck raising is concerned, a blessing in itself. These duck yards are kept clean by nature. Every shower of rain cleanses them.

Mr. Hallock does not believe the small area of water his ducks have access to retards their growth. Access to clean water certainly makes the ducks appear to much better advantage, for they are then sure to keep snowy white. A clean duck looks larger by 20 per cent than one that is begrimed.

Sometimes the ducklings from the same hatch do not grow uniformly. In this case the undersized ones are shifted back among the younger ones, where they stand an equal chance for food. They will then often forge right ahead and nearly catch up in size with their brothers and sisters.

None of the breeding ducks are kept after they are three years old, and most of them are marketed after their second season. Old ducks begin to lay later in the season each succeeding year, and it is important on a duck ranch that they have eggs as early as possible. But when the old ones begin to lay they lay just as well as do the younger ones. Mr. Hallock every spring saves his breeders from his earliest hatches as he finds that they give him the strongest eggs the following spring.

In bitter cold weather the houses in which the breeding ducks are kept are closed at night, but the birds are given their liberty during the daytime, except when severe storms prevail. Ducks that are allowed to run out are found to lay eggs that are more uniformly fertile. The more exercise the breeding ducks take the better, the same as with the chickens. Their eggs vary in fertility from month to month. This is hard to account for, but the fact exists. Last year Mr. Hallock sold duck eggs at $8 per hundred, regardless of the number taken; this season he will ask $10 per hundred for them, as he finds it pays him better to hatch the early supply than to sell them.

Mr. Hallock has grown up in the business. He employed four men and a number of women on his ranch. He has a wife and three children, an interesting family, and a very pleasant home located within hearing distance of the ocean. It is plain to be seen that he is satisfied with the business he is in. That he is making money out of poultry, and is on the road to greater profits, is also plain. On behalf of the R. P. J. readers and on our own behalf we again thank him and his estimable wife for their hospitality to us, a stranger, and for the information so freely given.

PEKIN DUCKS FOR PROFIT.

Poultry Raising is Now a Trade—Operating Duck Egg Incubators—Care of Breeding Stock—How to Turn $5,000 Worth of Corn, Wheat and Bran Into $10,000 Worth of Ducks, Chicks and Eggs—Formulas for Feeding Laying Ducks and Young Ducks.

BY JAMES RANKIN, SOUTH EASTON, MASS.

THE wonderful growth and increase of the duck business in this country during the past fifteen years has been phenomenal, and though it has been multiplied many times over (and never more so than during the last season), yet the demand exceeds the supply. Though the prices for dressed birds the past season have ruled a trifle lower, which was the case with all kinds of poultry, the unusually low price of grain has more than made up the deficiency. Now, Mr. Editor, if it will be of interest to your readers, we will briefly describe our method of growing and marketing Pekin ducks. Though we have grown ducks more or less all our lives principally for our own use, we started in some twenty years ago with thirty Pekin ducks to make it a business. From those thirty birds we grew more than fifteen hundred young birds for market, and we distinctly recollect the job we had in getting rid of them. The marketman would look at us in surprise, and say: "There is no call for that stuff. We don't want it." Now, though growing ten times as many, we cannot fill our orders from those same men, and it is not alone what we grow, but the hundreds of thousands of birds that are grown by others all over the country.

Our methods at first were crude, and we met with some losses. It was weak legs, sore eyes, hump backs and other troubles, the cause and remedy for which we finally discovered. Too highly concentrated food, together with too little animal food, without the proper amount and quality of grit to enable the young birds to grind and assimilate it, accounted for a large share of all these troubles, and are responsible now for nearly all the letters with which we have been flooded the past season, all containing the same refrain: "My ducklings are weak-legged; many of them can not stand, and are dying. They have dysentery, sore eyes, and abnormal livers. What shall I do?"Now, in covering all these points through the pages of the Reliable Poultry Journal, we confess to being a little selfish, in the hope that it will relieve us at least of a share of our correspondence, for though our little book, "Natural and Artificial Duck Culture," answers all these queries in detail, yet, it reaches but a small part of the poultry fraternity.

POULTRY RAISING A TRADE.

It is well known by this time that the poultry business is as much a trade as any other department in life, and a man in order to succeed must possess, at least, two traits to qualify him for the business—intelligence and energy. His buildings should be neat and commodious, constructed with a view of reducing the labor to a minimum, also of securing good drainage. Above all, start in with good incubators and good brooding apparatus. Secure first-class stock to start with. Debilitated, degenerate stock will never produce healthy young birds, and it is worse than useless to hatch thousands of young birds that come into the world with enfeebled constitutions and in no condition to live. But there are other sources of mortality aside from this. Cheap and improperly constructed incubators, with greatly varying temperature in their egg chambers; defective brooders, which mean extremes of heat and cold on the young birds—all contribute their share toward the death rate.

I have never thought that the variety of food given was as responsible for the poultry growers' troubles as the care, cleanliness and proper control of heat in both hatching and brooding the young birds. It is true that under proper regimen and diet, young birds will grow faster, develop better and weigh more at a marketable age than if the food ingredients were not right, and the old birds will also contribute a large number of highly-fertilized eggs when the food conditions are right. Our food formula for ducklings in different stages of growth, also for laying and store birds, I will give later on, and confine myself now to the care and treatment of the birds.

Highly fertilized eggs should be used, if possible, as it will mean strong ducklings and more of them. See that the heat in the egg chamber is uniform. Use accurate glasses, and place them on the eggs in the center of the egg chamber. Run them at 102 degrees the first two weeks and 103 after the animal heat begins to rise. The eggs should be cooled a little once each day after the first week, and longer after the animal heat rises. A little moisture should be used after the eighteenth day, ventilating a little more towards the end of the hatch. Observing these rules, with a good machine and good eggs, the operator should hatch from 65 to 70 per cent of all the eggs used.

Do not feed your ducklings till after they are thirty-six hours old. Feed four times a day and no more at a time than they will eat clean, in fact, keep them a little short, especially during confinement in inclement weather, as it is an incentive to exercise, which they need in order to assimilate their food. Do not put more than one hundred in a pen; seventy-five would be better. Bed the little fellows, until ten days old, with hay chaff or cut straw, then with sawdust (if to be had), as the latter is both a good absorbent and disinfectant. Keep the pens dry and clean, both outside and in. The welfare of the ducklings depends upon this. Be sure to give shade in warm weather. It is not necessary to keep water by them, but give all they will drink, while feeding. The birds should be ready for market at ten weeks old. Breeding birds should be selected from the early hatched birds (I always select the largest and choicest), handling every one carefully. It is true that the early hatched birds are worth more in market, but I must keep them to breed from, as they will develop into larger and better birds than those hatched later, as the cool, temperate weather of the early spring will facilitate their growth and maturity much better than the extreme heat of mid-summer. The birds cost me more, but it is policy in the end, as they reproduce much sooner than the later ones.

CARE OF BREEDERS.

The birds selected for breeding should be turned out to pasture or in large grassy lots, if possible, and fed on adulterated food. By this I mean bran, Quaker oat feed, with a little meal and grit. About November 1 these birds should be yarded for winter work. The yards should have been previously prepared for their reception. About August 1, after the old birds are through laying and beginning to molt, they should be taken out of the yards and turned out to pasture. The yards are turned and sowed to barley, which crop serves a double purpose—that of disinfecting the ground and giving a heavy crop of green food for the birds. This green food is cut fine and mixed in their daily rations. When the time comes to yard the birds, this crop has all been cut and the yards are in fine condition for them. These yards are one hundred feet long and the same width as the pens in the building. Whenever we have room, the yards are run out fan-shape, which of course makes them larger. Our green food now consists of green rye, obtained in the way described. As fast as our yards are emptied of ducklings, they

VIEW OF WEST SIDE OF LANE, RANKIN'S DUCK RANCH.

are turned and sowed quickly to rye, as this is a crop which resists winter's frosts. We now have about two acres of this rye, a perfect mass of green, about eighteen inches high. This largely constitutes our green food for winter. Just before a snow storm we cut large quantities of it and pile it up in a frozen state in some shady place, where it can be drawn upon at will.

Should this supply be exhausted while the ground is covered with snow, we always have several tons of fine clover rowen, cured for the purpose. This, with a few hundred head of refuse cabbage, carries us through in good shape. I dwell particularly on this green food because it is one of the necessities for the production of strong, highly fertilized eggs. Every one knows how necessary green food is for hens during winter confinemnt, yet it is even more essential for ducks. I now mix 15 per cent of this green rye, cut fine, with the other food.

IT DOES NOT PAY TO CROSS PEKINS.

I am often asked if crossing the Pekin with other birds will not produce a better market bird than the thoroughbreds. In reply, will say that I have crossed the Pekin in every conceivable way with other breeds, with an eye to securing a better market bird, but with unsatisfactory results. The birds either came out with weakened constitutions, were longer maturing, and had dark pin-feathers or unsightly blotches on the skin. This experience has more than ever convinced me that there is nothing, as yet, in the shape of a duck that will supercede the Pekin as a market bird. There is no bird that is under better control or that will respond sooner to generous food and care than the Pekin duck. Her fecundity is wonderful. Not even the far-famed Minorca or Leghorn can compete with her as an egg-producer. Beginning, if you wish, at four and one-half months old, she will contribute her quota of one egg per day, with but little intermission, for nearly ten months, and as an egg-producer for market alone she is more profitable than the hen. There is not a day in the year that we are without duck eggs. When old birds begin to molt and are barren, the younger ones commence their work.

We have, this season, got out about 12,000 young birds, and have been busy marketing them for the past four months. We have some 2,000 young birds not yet marketed and 2,000 more early hatched, the largest and choicest, carefully selected for breeding purposes. The latter are turned out to pasture, as it were, in large yards of three-fourths of an acre each, with about 200 birds in each yard. These birds are kept strictly for our own use and for filling orders when received. Drakes and ducks are kept in separate yards as far as possible.

They are given grass, shade and range, fed lightly on one part meal, two parts bran and one part Quaker oats, morning and evening, with a lunch of corn and oats at noon. The feed is mixed in a large box on a low truck, about twenty bushels at a time, and driven around to the different yards.

These birds are placed in the breeding yards early in November and are fed to superinduce early laying. The feed then consists of three-fifths meal, bran, oat-feed and ten per cent beef scraps with boiled turnips, green rye, refuse cabbage, clover rowen, etc. The birds will usually commence laying the latter part of November and continue till August 1, and can be depended upon to give us 140 eggs each. The first eggs are not apt to be fertile, but the fertility rapidly increases till our January eggs give us first-class hatches. When the little birds first come out they are put in our brooding houses, the little ones being placed nearest the heater, for though there is very little difference in the heat of the brooders, yet the building itself is always warmest near the heater, as that radiates a great deal of heat.

At about ten days old we let the little birds out in the middle of the day when pleasant. When first hatched out they are fed on one part hard boiled eggs (chopped fine) to four parts of bread crumbs, into which a little course sand has been mixed. When a few days old green stuff should be fed to them. They are fed four times a day till six weeks old, then three times. Gradually the quantity of meal is increased as the birds grow older. At eight weeks they are

fed three-fourths cornmeal and a little more scraps while fattening. If they are of good stock and well fattened they may be depended upon to dress twelve pounds per pair at ten weeks old. The price in New York this season for first shipments was 35 cents per pound, gradually falling, until now it is 14 cents, but even this leaves a good margin of profit, as we find it a cash business, subject to neither droughts, frosts or floods. We have been running this Pekin duck business now for over twenty years, and find the demand is growing better every year. By careful selection of the choicest from among so many we have increased the size and improved the symmetry of our birds so that they are larger and better than our imported birds.

Our yards are carefully disinfected every year by being turned up and sown to barley, of which we get a rank growth while the birds are turned out to pasture. The yards occupied by our young birds are swept once or twice each week, usually before a storm. These sweepings amount to many tons each season and are spread evenly over our grass farm, giving us enormous crops of good hay. Twenty years ago we cut but six tons of hay, now we cut 125 tons. That is what poultry has done for us. Indeed, we know of no better renovator for a run-down farm than poultry.

FERTILITY OF EGGS.

Of course we produce many more eggs than we can use for incubating—the present season over 50,000 eggs. These eggs have gone to every state in the Union, including many shipments to California, all parts of Canada, also to Bermuda, England and Ireland; and yet we have not been able to fill our orders. It is a pleasant thing to find that the same customers deal with us year by year. We always send surplus eggs in case of accident through rough handling, and we never send out eggs without guaranteeing their fertility, and as we test a 600-egg machine every other day we know exactly how fertile our eggs are and just how many extra eggs to send.

We would say here that more depends upon this egg business than your careless operator ever dreamed of. An egg may be fertile and yet no hen or incubator can by any possibility hatch it, because, though the germ may start, there is not vitality to carry it through. Should you by chance hatch a chick from one of these weak eggs no brooder nor any amount of petting or coaxing can ever induce it to live. The condition of the mother bird that furnishes the egg controls the hatching, the thrift and future development of the chick.

Now it is the early hatched chick that will always make the greatest returns in dollars and cents, and the eggs from which they spring must be furnished during the winter when the mother bird is confined to the building from the inclement weather outside. This is the time when extreme care must be used. Overfeeding with highly concentrated food will give you eggs from which perhaps a few weakly chicks may be hatched only to "shuffle off this mortal coil" before they are a week old, and not only that, but this course, if persisted in, will soon produce languid movements, lustreless plumage, torpid livers, roup, cholera and all their attendant evils.

It is against this contingency that we are to provide in the fall in the shape of green rye, turnips, small potatoes, refuse cabbage, clover rowen—cured for the purpose—and by feeding sparingly of food abounding in protein and the albuminoids, keeping the fowl a little hungry to induce exercise; in short, making it as near summer or them as we can as far as food is concerned. Follow this course and you will have a strong, healthy egg that will hatch under any favorable circumstances.

You would be surprised at the amount of food of this kind that we accumulate in the fall for winter use. The thousands of bushels of roots, the cabbage, the tons of clover hay and green rye to supply this winter's demand.

The same care in regard to the food of the parent must be used in the growth and development of the young birds when out. It seems to us when times are hard, business dull, money close and bills almost uncollectable and thousands of thousands of willing hands idle throughout the land, that the poultry business is more promising than ever, as it is always a cash product with money turned every three months. With the demand for dressed poultry, as far as we are concerned, always in excess of the supply, with the returns far greater than from any other farm product, we think that every farm should have its poultry department.

HATCHING AND FEEDING.

The first thing the amateur needs is first-class breeding stock or eggs from the same. There is sure to be a sad loss among young ducklings bred from debilitated stock. Good stock should be secured to start with, and when properly fed and cared for there need be no fear of loss. Again, it is a very easy thing to kill your ducklings before they are hatched, or in other words, bring them into the world in such shape that their early decease is a foregone conclusion. Suppose you run two machines side by side, supplying both with eggs from the same stock. One machine is run carefully without variation and gives you a ninety per cent hatch of strong, healthy ducklings, every one of which is bound to live until the knife ends its days. The other machine is allowed all manner of latitude during the process of incubation and gives you a forty or fifty per cent hatch of weak, debilitated little birds, a large per cent of which no amount of petting and coaxing can induce to live.

A brooding arrangement adapted to chicks will answer equally well for ducks. The little birds should be at least thirty-six hours old before taken from the machine and placed in the brooders, which should be previously prepared for them by placing a board (four or five feet long and ten inches wide, with half-inch sides to it) close to the brooder in front, with a little water-fountain so arranged that they can get their bills in, but not their bodies. The birds should be confined to this small space in front of the brooder for the first day, when they can be given the free range of the pen.

As I have said, the first food should consist of bread or cracker crumbs slightly moistened, and about ten per cent of hard boiled eggs, chopped fine, shell and all. We use infertile eggs for this purpose, and those slightly started. Mix in this food about five per cent of very fine gravel, or coarse sand. Do not place grit by them and expect them to eat it, but mix it in their food and compel them to eat it, as it is the most essential part of the whole thing. Scatter this food on the board and place your ducklings on it and they will be busily eating within ten minutes. One hundred to one hundred and fifty little birds can be put in one brooder six feet long. When two or three weeks old, seventy-five to one hundred is a plenty for one pen.

The heat in the brooder should be kept at about ninety degrees for the first day or two, when it should be gradually reduced as the birds grow older. We do this by always placing the newly hatched birds nearest to the heater, moving them toward the other end of the building, to make room for each successive hatch. The building is always warmer next the heater. The distance from the floor to the pipes under which the ducklings nestle is usually from two and a half to three inches. It is easy to reduce the heat in the brooder, as the birds grow older and move toward the other end of the building, by increasing the distance from the pipes. Hay, chaff or finely cut straw should be used for the little birds until they are ten days old, when sawdust may be substituted if the former is not to be had. It is not safe to use sawdust too soon, as the little birds are apt to eat it. After

the second day rolled oats and bran can be substituted. A little finely chopped rye or cabbage can be safely used at ten days old. At ten days, feed one-fourth cornmeal, the rest wheat bran with a little rolled oats mixed in, not forgetting the grit, about ten per cent of ground beef scraps or other animal food and a little green food. At six weeks old feed equal parts bran and cornmeal with a little quaker oats; feed also grit and beef scraps. At eight weeks old give one part bran to three parts cornmeal to fatten them, with the grit and beef scraps, but not any green stuff.

The birds should be ready for market at ten weeks old and should dress to average from eleven to twelve pounds per pair at that age. The birds should be fed four times a day until six weeks old, then three times is sufficient. They should be watered only when fed until six weeks old, then they should be watered between meals also. Feed no more than they will eat up clean, and keep them a little hungry. They will thrive better so. Keep the pens dry and clean, allowing no filth about. Give them all the exercise you can during the inclement weather or winter.

I will now give my methods and formulas for feeding the young birds (at different stages of growth) for eggs, also for breeding birds:

FORMULAS FOR FEEDING.

For Breeding Birds (Old and Young During the Fall)—Feed three parts wheat bran, one part Quaker oat feed, one part cornmeal, five per cent of beef scraps, five per cent of grit, and all the green feed they will eat, in the shape of corn fodder (cut fine), clover, or oat fodder. Feed this mixture twice a day, all they will eat.

For Laying Birds—Equal parts of wheat bran and cornmeal, twenty per cent of Quaker oat feed, ten per cent of boiled turnips or potatoes, fifteen per cent of clover rowen, green rye or refuse cabbage, chopped fine, five per cent of grit. Feed twice a day all they will eat, with a lunch of corn and oats and oats at noon. Keep grit and oyster shells constantly by them.

For Feeding at Different Stages of Growth—The first four days, feed equal parts of rolled oats and cracker or bread crumbs, ten per cent of hard boiled eggs, chopped fine, five per cent coarse sand. Feed four times a day, what they will eat clean. Brooder heat, ninety degrees.

When from four days to three weeks old, feed equal parts of rolled oats and wheat bran, ten per cent cornmeal, five per cent coarse sand, five per cent of fine ground beef scraps, soaked, finely cut green clover, rye or cabbage. Feed four times a day. Brooder heat from eighty-five to seventy-five degrees.

When from three to six weeks old, feed equal parts of cornmeal, wheat bran and Quaker oat feed, five per cent of fine grit, five per cent of beef scraps. Mix in green food. Feed four times a day.

When from six to eight weeks old, feed three parts cornmeal, two parts wheat bran, one part Quaker oat feed, ten per cent of beef scraps, five per cent of grit. Feed three times a day.

When from eight to ten weeks old, feed two-thirds cornmeal, one-third equal parts of wheat bran and oat feed, ten per cent of beef scraps, five per cent of grit, oyster shells and less green food. Feed three times a day. They should now be ready for market.

We never cook the food for our ducks after they are a week old, but mix it with cold water.

I wish to emphasize several points again. Do not forget the grit; it is absolutely essential. Never feed more than a little bird will eat clean. Keep them a little hungry. See that pens and yards are sweet and clean, for though ducklings may stand more neglect than chicks, remember that they will not thrive in filth. If anyone fails in this business it must be through his own incompetency and neglect.

With us, it is the surest crop we can grow. Independent of the elements, affected neither by floods or droughts, heat or cold, a concentrated cash product turned every three months, it makes the best returns of any crop on the farm.

JAMES RANKIN.

DOUBLE BROODING HOUSE—NORTH SIDE—RANKIN'S DUCK RANCH.

RAISING PEKIN DUCKS.

Procure Large Frames by Proper Food and Care—Exhibit Utility Birds—Selecting Birds for the Show Room—Breed With an Object.

BY EDWARD W. GRAHAM, OF KIMBALL & GRAHAM, DENVER, COL.

THAT duck culture is profitable, the large and prosperous duck farms all through the east prove. Western farmers and breeders have only recently begun to realize that duck breeding is one of the best paying branches of the poultry business. Although easy to raise to a marketable size, it requires some knowledge of their disposition and character in order to obtain the best results. The idea is much too prevalent that ducks do not require any particular care until ten days or two weeks before being marketed. Whether intended for market, breeding or show purposes, the duck must be handled and fed with the intended purpose in view.

Many of our western breeders allow a duck to hatch her own eggs and permit her to parade her family down to the duck pond or nearest stream. She is then allowed to raise the youngsters according to her own sweet will. As a result of this we have many small ducks in the west.

Suppose we intend to raise ducks for market. The eggs are hatched under a hen or in an incubator, and the hen is allowed to raise her own flock, or they are placed in a brooder. We should begin at once to feed for market. The first thing we want is a large frame, and in order to get this we must feed such foods as will produce bone and muscle, not fat. Perhaps we can best illustrate the effect of proper food and care by stating the manner in which we cared for and fed our Pekins last season, and the results.

The first correct move is to secure eggs from as large and fine breeding ducks as possible. This being done the rest remains with the breeder. We will take for instance a flock of twenty-three Pekins that we hatched May 16, last. They were allowed to remain in the nest twenty-four hours after being hatched, and were then taken out and carefully examined for the large gray head louse. Being freed from or being found free of this pest, they were placed in our brooder house and fed a little lettuce.

For the first four or five days they were fed on lettuce and baked mash or Johnny cake, composed of one part cornmeal, one part ground oats, one part bone meal, two parts wheat bran. They were now strong enough to stand feeding for frame. This was done by adding alfalfa or clover and green cut bone to their feed. In cutting the bone, care was used to avoid including any fat and only a limited amount of meat was allowed to cling to the bones before being cut.

The youngsters were allowed all the water they could drink, but none in which to swim. The drinking vessels were so arranged that the ducklings could get only their bills into them. Nothing retards the growth of a young duck like being allowed to swim in water before being fully feathered. They were allowed plenty of room in which to exercise, but were not allowed to roam. As a result of this care we had youngsters weighing five and a half pounds each at ten weeks old. Please bear in mind that these ducks were not fat, but they were meaty. If we had been feeding for market we should have added cornmeal at least once a day to their rations, beginning when they were seven weeks old. When these ducks were fully feathered, we allowed them the use of a small pond, as we wished them for breeders. Ducks intended for breeding purposes will give better satisfaction in every way if allowed a little water to swim in after they have their full plumage, but market ducks should never be allowed more water than they can drink.

EXHIBIT UTILITY BIRDS.

These Pekins were placed in the show room November 29, being just six months and thirteen days old. They weighed from seven and a half to ten pounds each, and scored from 97 to 98½ points. We are not publishing these scores to advertise our Pekins. The point we want to make is this: A duck is one of the few birds that scores higher the more it weighs, other things being equal. Of course this is not true when weight comes from fat, but when the weight comes from a large body or frame, this will be found to be usually correct.

A fat duck seldom shows good shape, while the large framed birds (only in fair flesh) show the best and most symmetrical forms. We are fully aware that many breeders of exhibition Pekins try to keep their ducks as near as possible to standard weights (for ducks under one year six pounds and drakes seven pounds) claiming that a large bird cannot show as good shape, and consequently cannot score as high. We have demonstrated the fact that this theory is incorrect. Our largest bird, a duck, weighed ten pounds and scored 98½ points.

Whether raised for market, breeders, or show birds, ducks can be successfully handled as we have outlined. If for market they should be fatted about three weeks before being marketed; if for breeding purposes they should never be fat.

When getting ducks into condition for the show room, do not choose your exhibition birds and separate them from the flock, for if you do they will immediately refuse to eat and become restless and dissatisfied. The same is true when selecting ducks to fatten for market. If for the show room, leave them with the whole flock until ready to take to the exhibition hall, then wash in cold water with a very little bluing added. The bluing causes the plumage to show clear and white. If intended for market, fatten the whole flock together without changing their quarters. It will be necessary, on this account, to keep only birds of an age in one flock and not too large flocks.

Pekins, kept in fair flesh and not allowed to grow fat, are practically free from disease. They should be warmly housed in winter and not crowded. If kept growing from the egg up, they should lay and lay steadily when eight months old. In mating your pens allow a drake to three ducks up to May, and then a drake will care for four or even five ducks. The coming season shows every indication of a great boom in the west, in duck culture. Of course, when we say duck culture, we mean the Pekin duck, as they have no equal.

EDWARD W. GRAHAM.

GROWING PEKIN DUCKS.

Ducks are Quick Growers and Easy to Raise—Plan of Feeding and Preparation for Market.

BY MRS. A. M. BUSH, ARVADA, COL.

IT IS a remarkable fact that western poultrymen do not take the interest in ducks that their importance deserves. Probably some breeders have had a few ducks in their yards at one time "just to give them a trial," and without taking into consideration the difference in them from other varieties of poultry, have found them a continual nuisance, as they greedily eat the whole allowance of food from the expectant chickens and dabble in the drinking vessels, so they have to be constantly cleaned and replenished.

It is a remarkable fact that western poultrymen do not take the interest in ducks that their importance deserves. Probably some breeders have had a few ducks in their yards at one time "just to give them a trial," and without taking into consideration the difference in them from other varieties of poultry, have found them a continual nuisance, as they greedily eat the whole allowance of food from the expectant chickens and dabble in the drinking vessels, so they have to be constantly cleaned and replenished.

With great injustice to the ducks, they have let such an experience as this prejudice them forever against this class of poultry, while if they had begun right and kept each variety by themselves they would have found that the ducks are more easily raised, are not troubled by vermin, grow faster, are ready for market sooner, command a better price per pound and are more easily confined than chickens. After a fair trial they might even give up chickens for market (as the writer has done), keeping the hens principally for incubating duck eggs and supplying the table with fresh eggs.

A most satisfactory fence is made of one-inch mesh wire netting, eighteen inches wide, fastened on pointed sticks two feet long, which are driven into the ground the extra six inches. One roll of the netting, 150 feet long, will inclose a place large enough for seventy-five or one hundred ducklings. If possible these runs should be put on an alfalfa or clover field. In a few days the ducks will eat all the green stuff, when the netting can be rolled up and stretched in a fresh place. This constant changing of their runs keeps their quarters clean, and consequently keeps them healthy, as the only disease that is at all troublesome to ducks here is what is known as abnormal liver. This trouble is caused by filthy quarters, impure water, sour food and lack of grit. Knowing the causes, it is easy to avoid this trouble. Provide shelter from the hot sun, also roosting coops in each run.

My plan of feeding is as follows: When twenty-four hours old the ducklings are removed to the brooder and fed the following mixture: Five parts of bread or cracker crumbs and one part of hard boiled eggs, with a little fine grit added. The eggs fed are the infertile ones tested out at the end of the fifth day and kept in a cool place until they are used. After four or five days their food is a mixture of bran, oats and corn chop, equal parts, with about five per cent beef scraps and some grit and chopped green stuff added. This mixture, with the addition of more meat and all the chopped clover or alfalfa they will eat, is continued until fattening time. It takes about two weeks to fatten ducks, when a greater proportion of corn chop is used and very little green stuff. As the birds are apt to lose their appetites when so large a proportion of corn is used, mix in some charcoal and old plaster, pulverized.

PURE-BRED PEKINS FOR MARKET.

With such care they ought to weigh at ten or eleven weeks, ten pounds per pair if they belong to the Pekin variety, which has proved most profitable in the hands of experienced breeders, being the quickest growing and presenting the most attractive carcass when dressed. Besides their attractiveness for market, which is a merchantable commodity, they are delicious in flavor, no finer meat being put upon one's table than a fat duck nicely roasted. As we have, comparatively speaking, no artificially grown ducklings in the Denver market we do not obtain the high prices eastern breeders receive for their early birds. The best I find is about twenty cents per pound; while later in July the price is only fourteen to sixteen cents per pound dressed. As the estimated cost per pound is only about 4½ cents, it can be readily seen that there is a good profit in duck growing.

Market ducks are usually scalded before picking. One breeder says that after beheading a fowl, he plunges it in a boiler of hot water, holding it under about two minutes. The feathers are thus loosened by the steam and come off easily, the water not having penetrated to the skin. Ducks at the ordinary age, picked in this manner, are usually as easily dressed as chickens. The feathers are quite valuable, bringing from 40 to 50 cents per pound. Being pure white they command a good price and have a ready sale. The breeding ducks may be picked two or three times after the laying season is over, but only about every six weeks when the feathers are "ripe." They should not be picked in a cold climate during winter weather.

The size of the mature Pekin duck is required by the Standard to be eight pounds for the male and seven pounds for the female. These weights are required for them, but there is no necessity to stop at that. We can with proper care make a quick growing strain of ducks weigh ten or eleven pounds each and not lose in symmetry. Getting down to actual experience, I have had some of my heaviest specimens score the highest. So it is to the interest of all breeders to select their breeding stock carefully, keeping only the heavy, deep breasted and compact specimens, also having due regard for the exhibition requirements. Each year if one small flock be kept, buy drakes of another strain so there will be no inbreeding.

To those who hatch artificially, early maturity is particularly desirable so they will be in the full tide of egg production by January. In the matter of egg production the Pekin duck is a close rival of the hen, laying from 100 to 140 eggs in season, the number of eggs depending entirely on the food and care given.

Many people have an idea that ducks will only thrive where there is a pond or water course. This has been found to be erroneous, as a young duckling will thrive better if kept away from water until nearly feathered out. The water dishes should be so constructed that the ducklings may drink freely without getting wet. When they get older we find wooden buckets very convenient drinking vessels. If there is a pond or brook on the farm, so much the better for the mature stock, as they are thus enabled to keep their plumage clean, but the lack of a water course should not deter any one from entering the ranks of a duck raiser.

MRS. A. M. BUSH.

PEKIN DUCKS FOR EGGS.

A Profitable Fowl for the Marketman—Plans for a House that is Inexpensive and Convenient.

BY L. E. KEYSER, SAYRE, PA.

THAT egg production is the most profitable and less laborious branch of the poultry industry is, I believe, generally conceded. Then, if eggs are the chief object, it seems to me that ducks could in many instances be made more profitable than chickens. The best strains of Pekin ducks will lay nearly if not quite as many eggs as the best strains of fowls — some averaging from one hundred and fifty to one hundred and seventy-five eggs in a year—and the price of duck eggs is nearly always twice that of hen eggs. It is true that ducks will consume nearly twice as much food as hens, yet they can be kept very cheaply if their runs are sufficiently large. A duck requires a large amount of coarse food, principally grass, and from fifty to one hundred ducks can be kept upon an acre of land the greater portion of the year, if it be in good grass, with only a small grain and meat ration.

The houses for ducks may be less expensive than hen houses, the only requisite being that they be warm and dry. For twenty-five ducks a house sixteen to twenty feet long and eight feet wide is sufficiently large, and it can be built low and banked with straw and earth for protection during the winter. I find that four feet high by two and one-half feet at the eaves, with a shed roof, makes a convenient height. By having the house narrow it is easily cleaned, as those parts not accessible can be reached with a hoe or scraper. The house should be well lighted and made as warm as possible.

A very convenient house of the dimensions given can be built of tongued and grooved hemlock lumber planed on one side and lined with building paper, the frame being made of two by four set sidewise so as to form a two-inch dead air space between the paper and the outer wall. In the front is a three-foot door and two windows two feet six inches by four feet, double glazed, one on each side of the door. There are also three small doors or exits with slides which can be closed at night. It has an earth floor, raised six or eight inches above the surrounding ground, and is built on three by six sills, so that it can be easily moved if desired. If the house faces the south or east and is well banked at the rear and ends with straw, cornstalks, or something of that kind, and plenty of straw used for bedding, it will be sufficiently warm. Such a house will cost about $12 aside from the labor.

Ducks are more easily confined than hens, a three-foot wire netting with a six-inch bottom board is sufficiently high. I do not think ducks do as well as hens when confined in close quarters, but swampy land that is unfit for other fowls can be devoted to ducks if it is so situated that the house can stand on high and dry land. If you can give them a small pool to paddle in so much the better, but they will do nearly as well without water to swim in as with it.

Ducks should be hatched under hens or in an incubator as early as possible, and as soon as they can be distinguished the drakes should all be sent to market except those designed for breeders. It is no more necessary to have drakes running with ducks than it is to have cocks running with hens during the laying season. On account of their quack, ducks are objectionable to many, but for real profit I think they can make our best breeds of fowls take a back seat.

L. E. KEYSER.

DUCK RANCH OF WM. H. TRUSLOW, STROUDSBURG, PA.

RAISING AND MARKETING DUCKS.

An Interview at the Mid-Continental Exhibition With Mr. Charles F. Newman, of Staten Island, New York, Who Marketed Over 12,000 Pekin Ducks in One Season.

WHILE in attendance at the Mid-Continental we had the pleasure of seeing some of the finest specimens of Imperial Pekin Ducks that have ever come under our notice, and of making the acquaintance of the man who bred and owned them, Mr. Charles F. Newman, of Huguenot, Staten Island, New York. A three-year-old pair of Pekins exhibited by Mr. Newman weighed twenty-six pounds, the drake weighing fourteen pounds and the hen twelve pounds.

ON THE RELIABLE POULTRY FARM, QUINCY, ILL.

Mr. Newman is the owner of a sixty-acre farm on Staten Island, fronting on salt water. Twenty acres of this farm are given up to Pekin ducks, and the past season he raised and marketed between 12,000 and 13,000 ducklings. All ducklings raised for market are sold when between eight and ten weeks old. Such ducks as Mr. Newman breeds then weigh, on an average, five pounds each. At a point between eight and ten weeks of age Pekins weigh more than they do a little later, after their first molt, as feather-production decreases their weight. They are, therefore, marketed just before they begin to drop their first coat of feathers.

Mr. Newman begins to hatch out ducklings in January and continues steadily through to the middle of July. Sixteen incubators are used on his farm, ranging in capacity from 200 to 800 eggs. He keeps 520 layers, or breeders, and these, only, are given the freedom of water. Young ducks are never allowed by him to "go swimming," or to get to water in any way except to reach it with their bills to drink. Swimming is often fatal to very young ducks, and prevents their laying on flesh as rapidly as is desired for marketing.

Brooding houses heated by the Bramhall, Dean & Co. hot water pipes are used, from twenty-five to forty ducklings being allowed to each pen, the indoor pens ranging in size from 4x14 feet to 10x14. Connected with these pens are outdoor runways ranging in size from 4x20 to 10x20. Boards one foot wide, stood on edge, are all the fence required to confine young Pekins.

On this farm soft food is fed, no whole grain ever being given to either old or young. The food used consists principally of vegetables, including turnips, beets, potatoes, cabbage, green rye (so long as it remains tender), clover, green corn, etc. Green corn is a favorite food in season. It is sown in rows and cut down when knee high. It is put through a clover cutter and fed with other foods, in the form of a mash. It lends a tenderness and fine flavor to the flesh. Besides vegetable food, a dry-wet mash, consisting of cornmeal, bran and middlings, is fed, together with meat scraps. This dry-wet (not sloppy) mash is fed to ducklings the first week. After the first week meat may be added with safety. Spratt's dried meat is used extensively by Mr. Newman, also mixed in the food each day, and oyster shell is fed to both old and young.

Said Mr. Newman: "Tell your readers to feed young ducks five times a day during the first ten days. After this feed them three times a day. The old ducks feed twice a day, morning and evening. Give them all they will eat up clean, but no more. Never leave any food before young or old. As soon as they walk away, clean out the troughs and give them what remains with the next feed.

"Use troughs ten to twelve feet long. Use a foot-wide board for the bottom, with four-inch sides. Build a lath fence twelve inches high and nail this to the sides and ends of the trough, leaving the top open. Have the laths far enough apart to allow the ducks to get their heads through to eat. Have your water vessels close to the feed troughs, as nearly every time a duck takes one mouthful of food it wants about four swallows of water to wash it down with. I use six inches of the bottom of a barrel for a water vessel, setting it down in the ground half way. Place laths over the water troughs to keep the ducks from getting in with their feet.

"We feed our old ducks, our breeders, the same as the

young, only heavier. You can get breeding ducks too fat by feeding whole corn. Feed no whole grain at all. Fish food is excellent for ducks, that is, for breeding stock, but not for young ducks intended for market, as it will taint their flesh.

"Ducks and ducklings are surprisingly free from disease. Our one trouble is leg-weakness, caused by cold or over-feeding—too much cornmeal. In case of leg-weakness, feed less cornmeal, more grain food, and give them plenty of bonemeal. Do not give young ducks milk in any form, except when mixed with other food, as they will dip their heads in it and get it in their eyes, causing sore eyes, and thus disfiguring them.

"In the indoor pens use sand or chaff for litter and use enough of it, and change it often enough to keep the quarters clean. We clean out thoroughly once a week. Use litter in the outdoor yards also, for your pens must be kept in a healthful condition.

MARKET DEMAND.

"Yes, the greenish colored eggs are all right; the older ducks are more liable to give you these eggs, but we get mostly white ones. The green eggs often hatch out the largest ducks.

"Never handle ducks or geese by the feet, always by the necks. Their legs are very tender. Ducks are extra timid. Do not frighten them. Speak to them whenever you go near them and they will become accustomed to you. Never go to them at night if you can avoid it, and in case you do, leave your lantern behind. To catch them, drive them in a corner and use a bent wire, catching them by the necks, the same as a farmer's wife catches chickens by the legs.

"All our ducks that go to market are dry picked. We hang them up by their legs, insert a knife in the root of the mouth, cutting the big veins, then stick the blade into the brain to end their suffering, and pluck the feathers while the body is struggling. At this time they let go of the feathers easily.

"As a rule we secure our best prices in April and May. We then get as high as 40 cents per pound, the price running down to 12 cents in August. The average price last season was 18 cents per pound. Our ducklings average five pounds each when dressed. It costs us to raise a duckling to marketable size—well, simply say that after fifteen years' experience, I bear witness that duck farming is, in my judgment, the most profitable branch of the poultry industry. The market is certain. My farm is not the largest in the east, not by considerable; there is one farm that markets 35,000 ducklings a season. Not many years ago there was a small demand in the eastern cities for ducks. The people did not then know what a rare morsel an eight or ten weeks' old duckling is. A paying business can be worked up in a short time in any city. I have seen it tried with success. Chicago ought to have near it half a dozen duck farms; so ought St. Paul-Minneapolis, St. Louis, New Orleans, Buffalo, Cleveland, Cincinnati, and many smaller cities. I would be willing to be the first to start in near any one of them."

PEKIN DUCK FARMING.

Facts on Buying, Breeding, Feeding and Caring for Pekin Ducks From One Who Raises Them Successfully.

BY CHARLES F. NEWMAN, HUGUENOT, S. I., NEW YORK.

THE Pekin duck (I speak only of the pure Pekin) is, in my estimation and experience, the most profitable of any variety and, indeed, the only profitable duck. It grows the largest, matures the quickest, has the finest plumage, lays the most eggs and dresses the easiest and nicest for market.

Its color is a glossy, creamy white. Station erect, neck not extremely long and slightly curved, head well formed, broad orange beak and dark, bluish gray eyes. An important point is the breast, which should be protruding, large, broad and deep. The back is slightly curved and wide. The body should be long and wide to the stern, not running out peaked toward the tail. The wings are short, only covering the back, with wing points ending about at the beginning of the tail, which ought to be short—on drake slightly turned upwards, and when in good plumage showing two curly feathers on top. The average weight of the drake is about 9½ pounds.

The duck is shaped like the drake, only she is deeper in the stern, full and square. At the laying season, when in good condition, the back part of the body will very nearly touch the ground. The feet of both duck and drake are red without any black.

The American Standard of Perfection requires a clear orange beak without any black, which is a hard thing to secure and it is rare to find such even in the largest flocks of the best specimens.

In drakes black on the beak ought to be a disqualification, but in ducks it is unavoidable, a little black streak on the beam will show on 95 per cent of ducks when mated or when they lay their first eggs. You will find this so in the largest and best specimens, while the small ones will keep their clear beaks the longest. The weight of the duck ought to be eight pounds on the average, but I should add that the weight depends on the time of year. In mating time the vigorous drakes will prove considerably lighter, while the old and lazy ones will hold their weights. At this particular time the ducks will keep the average weight and exceed it until they have been laying some time, when they will lose weight.

SELECTION OF BREEDING STOCK.

I will now consider the selection of breeding stock, as the time is at hand when this should be attended to. If you intend to purchase ducks for breeders, or if you wish to mate those you have, now is the time to do it. By waiting you lose both time and money. The birds want to mate from now on, and make themselves at home if put into new quarters. By moving them from one place to another later on you will stop them from laying for some time. If you purchase ducks for breeding see that you get early March and April hatched ones—not any later, as the former will give you the best service. Mate this year's ducks to yearling or two year old drakes. A good breeder will always select his breeding stock from the earliest hatched litters without regard to the tempting

market price for the young stock, for we want them to lay as early as possible, as it is early spring ducks which bring best prices. I have received as high as 46 cents a pound and as low as 14 cents. I will explain why we select the earliest hatched for breeders. When a hen starts to lay in the early spring she lays the greatest number of fertile eggs and the germs are strongest. These are the eggs from which you and I want to hatch our breeders. Later on more eggs are infertile and the germ is weaker and the young which we do hatch are not as good by sixty per cent as those first hatched. As it is with the chicken hen so it is with the duck. The latter will begin to lay in December or January and her first twenty-six eggs are seldom fertile, but after that they are good and more fertile than hens' eggs.

I am now going to step on somebody's toes, I fear, but the truth must be told. If you buy breeding stock at $1 to $1.50 each, you may make up your mind you are throwing away your money, as no man can afford to sell you early hatched, selected birds at such prices, at this time of the year, for they would have brought him that much money when ten weeks old and he would get nothing for his care and feed for eight months. Nobody is in this business, now-a-days for pleasure alone or "for his health," and those who have gotten rich in the poultry business faster than a walk, you will have to search for with a lantern.

As it is the season for the selection of the breeding stock I will write of them first.

Ducks do not need a warm house, a dry, well ventilated shed with plenty of litter on the floor will answer the purpose very well. It is their feet that need protection to keep them warm. Their bodies are covered with a thick coat of feathers, with plenty of down, and housing a lot of them together, enables them to keep warm.

As they always lay their eggs during the night or early in the morning, you need not fear they will be chilled, as a duck in most cases will make a nest in the litter and cover the eggs when she leaves the nest, or another duck lays in the same nest and she is soon followed by another, so the eggs do not have time to chill.

FEEDING THE DUCKS.

Now, about seven o'clock in the morning, you should have their feed and water ready for them in an outside yard, close to the duck house. Open the duck house and during the time they are eating gather the eggs. Keep the ducks in this inside enclosure, with the door of the house open until eight o'clock, and then if you want to give them their liberty let them go, as they will have all laid by that time.

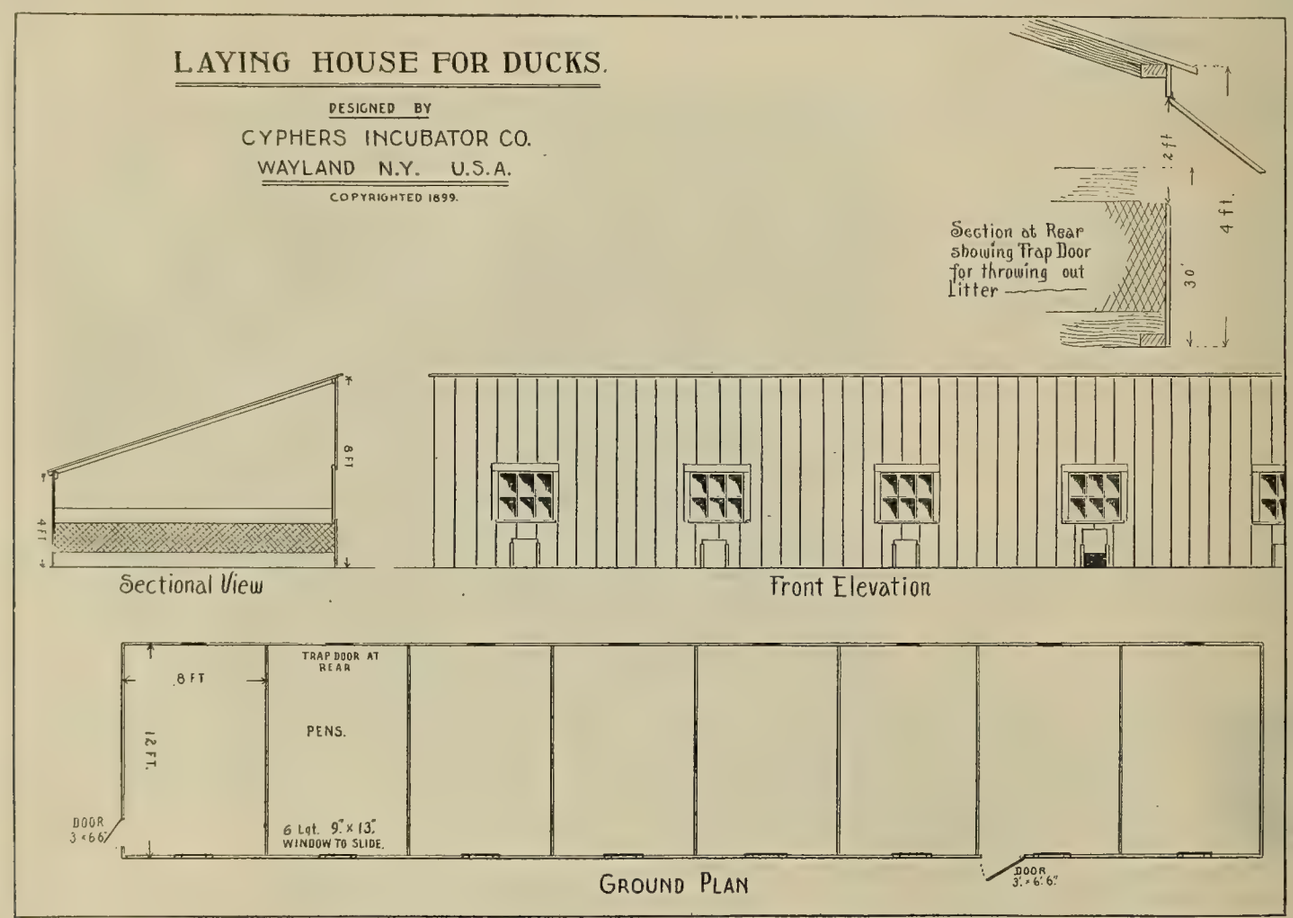
When we run a large number together we allow one drake to four females, it is better to have a few extra drakes in the early part of the season up till about March. Then reduce the number of drakes; I generally take away the most vigorous ones. Later on take away more until you have six or seven ducks to one drake. Now the drakes which you have removed from the pen and which you wish to keep over should be moved away out of sight of the ducks and for a time put on half rations — no meat or corn meal, only bran, middlings and plenty of vegetable matter. If confined together and fed a strong diet they will kill each other.

Avoid going near your ducks at night, particularly with a lantern, as ducks are very timid and it will make them uneasy for the whole night. Keep rats and other vermin out of their houses, for they are bitter enemies of ducks.

A fox terrier is an excellent dog around a poultry house, as he will keep the place clear of rats.

If you wish to catch ducks drive them into one corner of the pen, use a hook made of strong wire and hook them around the neck, pulling them toward you. Always handle ducks by the neck, never by the legs or wings, as you can easily wrench or hurt them by doing so.

The feed should differ at different seasons. I advise you not to feed ducks whole grain of any kind. Always give



them a mash. At this season of the year feed the breeders twice a day, giving them a mash composed of equal parts of bran and middlings, one-half part each of cornmeal and ground beef scraps, or meat of any kind. Take 15 per cent of this mixture and plenty of boiled potatoes, turnips or mangle-wurzels mashed and mixed all together in a dry-wet mash.

Use the feeding rack which is illustrated on this page, and you will find it very convenient. It is made by taking a twelve-inch board, about seven feet long, for the bottom. Nail four-inch wide strips on the sides and ends, making it like a box. Cut common laths, which are four feet long, into three parts and nail them up and down, about three inches apart. The ducks can only get their heads between the laths and cannot get in to dirty, waste or pack the food down. You can, in the same way, make a water trough for both young and old, except that for young ducks you will have to put the laths closer together.

Once more I say do not feed whole corn to ducks, as it is not the food to set them laying, and if they do lay, their eggs will not be so fertile. Feed plenty of meat, or fish, if you can get them, to breeders, but do not feed any fish to young stock intended for market, as the least bit of fish will impart a fishy taste to the duck meat and hurt your sales in the market.

It is rather late now, but you should always see to it that you have a piece of rye or clover sown for early spring use for young and old stock.

Feed old ducks twice a day, morning and night. Please mark this advice. Never feed your ducks whole grain. Always feed soft, mixed food. If you have a flock of ducks which will consume at each feed ten quarts of food, mix as follows: Three quarts of cornmeal; two quarts bran (fine) or feed flour; four quarts vegetables; one quart beef scraps.

Never leave any food around where the ducks, either young or old, can pick at it between meals, as they in this way lose their appetites. Feed them at regular times, morning and night, and dish out only what they will eat up clean. Should any food be left in the feed troughs, take it away and save it for the next feeding. Do not have your food sloppy and wet, only a dry-wet, so when you squeeze the food the food in your hands it will stick together and no water run from it.

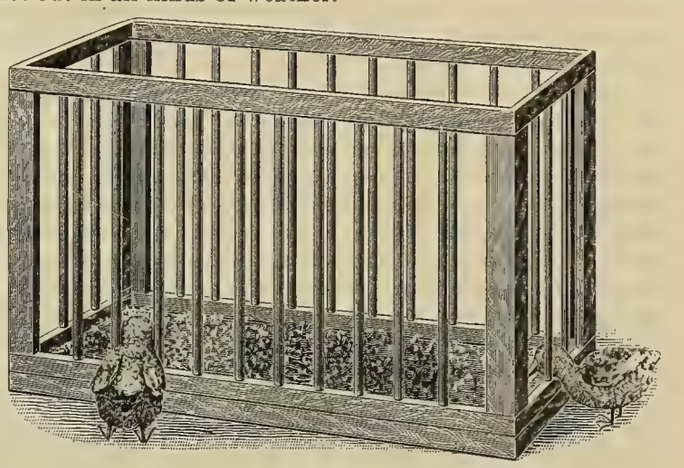
Do not think you can keep your ducks in good condition by giving them corn. It is the greatest mistake you can make, as you will have them fat and good for nothing, and you will not keep them alive very long. Your fat ducks will look healthy and nice one day, but the next day you may see them dragging themselves over the ground in agony, boring their beaks into the ground and they will soon die. An examination will reveal the fact that they were too fat. If it is during the laying season the females will be found full of small eggs, all of about the same size, that would never have developed or been disposed of.

Feed your ducks bone meal twice or three times a week, about one quart to the above mixture. Ducks do not need as much grit as chickens, for they are shoveling all day in the ground.

The ducks that are used as breeders should not be plucked, that is, robbed of their feathers, and so robbed of their strength. If you wish good breeders they must not be used to make feather beds. A duck that is plucked will lay only about half as many eggs, and the eggs it does lay will be weakly fertilized. Ducks naturally shed their feathers every four to six weeks, but this is done gradually and they need the best of care right at this period in order that they may gain their lost strength speedily.

The Pekin ducks are very timid and you cannot make pets of them, but they do learn to trust the person that feeds them. When you go among them, go carefully and speak to them. If you wish to catch a duck, drive them into a corner and catch him by the neck, using a stiff wire hook. Catch this hook around the neck and get the one you want without disturbing the others any more than is necessary. Never catch a duck by the legs, as they are easily broken or sprained.

During the laying season, keep your breeders penned up till about eight o'clock in the mornings, as by that time they will have all their eggs laid, but they should be fed and watered at the regular time. Have an enclosure in front of your duck house; 18-inch wire will keep them in all right. Your duck house should be dry and well ventilated, but not too warm. Old ducks enjoy rain and snow, and should be let out in all kinds of weather.



FEEDING RACK FOR DUCKS.

During the breeding season we mate one drake with four ducks until the last of April, then diminish the number of drakes, putting one drake with five ducks, but this depends on the number you have running together. When you notice the drakes biting the ducks too much around the neck, it is time to thin them out.

I do not know of any sickness common to ducks that is worth speaking about. If one duck gets lame, separate it from the others for a few days, when it will be all right. We keep ducks until four years old and then in the fall we discard them; they are in their prime during the second and third years. Ducklings hatched early in the spring will lay four or five eggs in the fall and begin again in January following and continue constantly until hot weather. Duck eggs are more fertile than hens' eggs. Select your breeders from those hatched earliest in the spring, as they are the most vigorous and strong. The ones kept for breeders should be fed the same as the old ducks and given the liberty of the place. You cannot keep duck eggs as long as hen's eggs, but they can be kept in a cool place for three weeks by being occasionally turned.

CARE OF DUCKLINGS. Whether to be used for market or for breeding purposes, my stock are all hatched alike, in incubators, and are all raised in small quarters. The first eight or ten hours after coming out of the shell, they receive no food, then I feed them hard boiled eggs. The ones tested out are good for this purpose. Mix this up with a little cornmeal and fine bran. For the first week give light food consisting of potatoes, turnips, beets, cabbage, etc., green rye, clover and green corn, which has been sown in drills and cut with the chaffing machine. These should be mixed with stale bread and fine bran, and a very little cornmeal and beef scraps. Mix as described for old ducks, dry-wet. If you use potatoes, turnips or beets, they should be boiled and mashed. After the second week gradually increase the amount of corn

meal and beef scraps. Feed ducklings three times a day and be sure to have plenty of fresh water near when feeding and be particular that no food is left in the troughs.

Ducklings should never be allowed to swim in water until fully feathered out, as it makes them weak and retards their growth. Between feeding hours give them weeds or some green stuff. They should weigh five pounds when ten weeks old if properly cared for. I have had some that weighed a trifle over six pounds at this age.

Keep your feed troughs clean. Prepare feed troughs as described elsewhere in this journal. They will keep your young and old ducks out of the troughs and no food is wasted. Do not forget to add bone meal, or dry ground bone to your food regularly. If this is neglected the duckling will be lame. Should they become lame, diminish the amount of cornmeal and beef scraps and feed more bone meal.

We raise our ducklings in small inclosures, the pens inside the brooder house being from four to eight feet wide and twelve feet long, the outside runs being from five to twelve feet wide and twenty feet long. These pens accommodate from twenty-five to forty ducklings. The pens must be well cleaned and aired and kept free from odor. When the weather gets warm the ducklings (when six weeks old) can be kept in pens protected only by a roof. Young ducklings sometimes get the habit, when setting their feathers, of pulling feathers out of each other. Those thus inclined should be placed in a separate enclosure.

If you have the right kind of Pekin ducks they will be fully feathered at the age of nine or ten weeks and are ready to go to market. If they are not marketed at this time you will have to wait four weeks longer, as they will begin to shed their first coat of feathers and get pin feathers and cannot be dressed. Well-dressed ducks bring good prices and find a market at any time. Poor, shabby-looking stock is not often wanted at any price.

We pick our ducks dry. They are then placed in ice water for two or three hours. After this they are placed in barrels, iced, and are ready for the market. As we only save the good feathers (not the wing or coarse feathers), we get from fifty cents to sixty cents per pound for them.

To kill a duck, hang it up by the feet, cross the wings over the back and then stick a sharp knife through the beak into the neck and give a long cut. Then stick the knife into the brain and give it a twist. Begin plucking the feathers immediately, as it can then be done easily.

The ducks may be distinguished from the drakes by their cry. The ducks make a sound resembling "walk-walk-walk," while the drakes give only a whistling sound.

As I have said before, in my estimation duck culture is the most profitable branch of the poultry industry. There is always a market for young ducks at a good price, but there are a great many people who do not know what a delicacy a ten-weeks-old duck is. Now, you raise some, kill and dress them properly, roast or broil an hour and invite your friends to dinner, and I tell you I would hate to be the person who comes late!

Another way to introduce them at home is to send a few nice ones to people whom you know will appreciate a good thing and will know it when they get it, for their Sunday dinner, and put your tag on it. Do this and see if you do not have twice as many to send next Sunday.

CHARLES F. NEWMAN.

ROUEN DUCKS.

Description of the Standard Male and Standard Female—Defects to be Overcome in Mating—Money in Duck Farming.

BY RUCKER BROTHERS, LITERBERY, ILL.

ROUEN ducks are said to have been originated from the wild Mallard, which they much resemble in color. The domestication of them has increased their size. The drakes are of commanding appearance, are decked with the most beautiful plumage, and are larger than the females. In color there is quite a difference. The drake's head and neck are a lustrous green, extending to a pure white band which extends nearly around the neck, with the ends terminating at back of neck. His bill should be long and fine and in color a greenish yellow, except the bean at the tip, which should be black on both male and female.

The color of bills is one of the most important points. A breeder should be very careful in selecting his breeding birds, as they have a tendency to run rather dark on bills. You will notice, if you look close, that most of the birds on exhibition are at fault in this respect, and it creeps out very often if the breeder is not particular in mating his birds.

The breast of the drake is a claret color extending well under the body. The under part of the body is a beautiful gray, extending toward the tail and growing lighter as it extends back to posterior, and ending in solid black under tail.

The back is ashy gray mixed with green and growing to a lustrous green as it extends to the rump. The wings have different shades of color, grayish brown, green, purple, blue and white, which gives them a striking appearance and attracts the attention of all admirers of water fowls. The primaries should be dark brown. This is another important point to look after, for there is a tendency to white feathers, which is a disqualification. This defect will crop out more than any of the other disqualifications and breeders should select breeding birds with good dark wings. This will decrease the defect a great deal, and if kept up for several years it will not crop out very often.

The tail should be dark brown, except in the old birds, which may be edged with white. The three center feathers should be curled. The shanks and toes should be orange colored, with a brownish cast.

This description gives the most important points of the drake and will furnish all interested persons an idea of what produces such beautiful birds.

The female presents a plainer appearance, yet is exceedingly attractive when viewed from a fancier's standpoint. The plumage is brown, richly penciled with a narrow ribbon of light brown, the more distinct the better. The females

are inclined to run a little light on neck, which should be guarded against, as any approach to a white ring is a disqualification. This and white feathers in the wings will perplex the breeder more than any other defects. Another noticeable thing is the two pale brown stripes on each side of the head, running from front to rear of the eyes.

The Rouens are not as popular as the Pekins, and the breeder when wanting to get any has got to scan the poultry papers very closely to find breeders to write to for prices and descriptions.

Why they are not more plentiful is a wonder to us, for we have bred and raised both side by side and fed them on the same food and same quantity, and gave both the same attention in every particular, and after all this we were unable to see any difference to amount to anything. The Pekins are favored in having only one color of feathers, which command a little better price than colored feathers do, but the Rouens are favored in weight, which the Standard places at one pound heavier than the Pekins. This brings them about equal in good points. As a fancier's fowl the Rouens are ahead, as it takes more care and precision to breed and keep them up to standard requirements. This is the fancier's delight and highest ambition.

Amateurs in breeding the Rouens should study the Standard carefully, and in so doing they will become interested, which will make the breeding of them a pleasure as well as profitable. There is a wide field for the raising of ducks, as the demand for good stock is increasing, and the breeders who produce good birds will find ready sale for them and their eggs at good prices. There is money in the raising of ducks if rightly managed. Take a look through your poultry papers and read of the immense duck-raising establishments that are springing up in different parts of the country, as well as the old established firms that have been running for years. Would these firms keep running if there was no money in the business? We think not. There is money in raising them, and there is plenty of room and many good locations for the breeding of them all over this wide country of ours.

In breeding ducks have good, comfortable houses or sheds for them, with yards attached so that you can confine them in the mornings until they have deposited their eggs. Ducks generally lay early in the morning, but some will drop their eggs anywhere they forage. It is a good plan to keep them in until 8 or 9 o'clock. After this time there will be but a few eggs scattered round. Give them plenty of range, so that they will get needed exercise and a variety of food, which are very essential to health and to make them lay well.

Ducks prefer a nest on the ground. A good plan is to stake a narrow board around the nest. This will keep the eggs from rolling around. Use plenty of straw in the house.

In setting eggs many prefer the common hen or incubator, as ducks are not the best sitters, and many of them prefer not to sit at all. After the young are hatched feed them lightly for a few days and keep them from getting wet, which is very destructive to them while young. Take 12-inch boards and stake them so as to make a pen around their coops on a green knoll. After they are a week old they may be turned out when the weather is fair, but look out for hard showers, which are destructive. After they get feathered out there is not much to look after but to see that they get suitable feed and plenty of it. This they must have if they make good, large birds. Young ducks eat more feed than young chickens, but they will grow more than twice as fast and be ready for market much sooner.

If you will put ducks and chicks side by side and give both the same care and attention you will be surprised how fast the ducks grow. They will grow right away from the chicks. This gives the ducks the advantage, as you can raise two lots in the same time you are raising one of the chickens. After the ducks get started there are but few that will not grow to maturity.

RUCKER BROS.

QUESTIONS AND ANSWERS.

Selected Pages from the "Questions and Answers" Department of the Reliable Poultry Journal—A Department Set Apart for the Use of Its Readers.

Questions on Ducks.

Sun Prairie, Wis.

Editor Reliable Poultry Journal:

Seeing that you open your columns to questions, I would like to ask a few about Pekin ducks.

George H. Starring.

Q.—With good care, how many eggs will they lay per year?

A.—From 80 to 110, depending on the feed and care. If improperly cared for and improperly fed, they will lay very few eggs per year, and under gross mistreatment they will scarcely lay at all.

Q.—What is fair or good treatment for ducks?

A.—Recent back numbers of the R. P. J. contain much valuable information on the proper treatment and feeding of ducks. Generally speaking, they should be yarded in lots of thirty-five or less, the lots ranging from a quarter of an acre upwards; should be given all the fresh water they will drink, and be fed three times a day on food largely made up of bulky substances, like vegetables, bran, and a moderate supply of cracked corn or cornmeal. No whole grain should be fed to ducks. Like geese, they will live on vegetable food, grass included, if nothing else is within reach, though they are very fond of grain in any form. Both ground grain in moderate quantities and meat food of some kind are recommended. All food fed to poultry of any kind should be free from mouldiness—in fact, it is well to have food fed to fowls in a condition fit for human beings to eat, so far as wholesomeness and cleanliness are concerned. This is especially true of little chicks, poults and ducklings. We may be a little extreme in this advice, but it pays best to err on the side of cleanliness.

Q.—If hatched in incubators, can they be raised in brooders as well as chicks?

A.—Yes, and they are easier to raise than chicks, as a general rule. This has been our experience. On all the big duck ranches in the east, as well as on those now in operation in the mid-west, thousands of ducklings sold annually on the market when ten to twelve weeks old are hatched in incubators and raised in brooders. When at George H. Pollard's duck ranch, Pawtucket, R. I., last year, he told the writer that he had lost during the season just closed only three per cent of the total number of ducks hatched, and he succeeded in raising 5,000 on two acres of ground.

Q.—What temperature must the brooder have for either?

A.—From 85 to 95 degrees, an average of 90 degrees being preferred.

Q.—Will ducks begin to lay without males with them?

A.—Yes. The male has nothing to do with their laying. He simply fertilizes the eggs.

Q.—How many ducks to how many drakes?

A.—One to four early in the season; one to five later in the season. The season begins in January and ends when the ducks stop laying, or in July and August, when they go into the molt in good earnest.

Q.—How can the male be distinguished from the female?

A.—It is the duck that goes "quack," "quack." The drake makes a low, whistling noise, but never quacks. Furthermore, the drake has two small feathers on the back, just in front of the tail, that curl up. Ducks do not have those feathers.

Q.—How much does it cost to keep a duck a year?

A.—This depends on your location, and on the price of the different grains and vegetables; also on the economical habits of the owner or feeder of the ducks. They will eat a man out of house and home if he will throw the stuff to them. Then on the other hand, ducks can be boarded cheaply if the owner is "onto his job," as the saying goes. Every fall and winter we buy inferior cabbage at $1 per load, the load consisting of a farmer's wagon with the side-boards on and the cabbage well stamped down into this large box. The past year we have used on our farm probably one thousand bushels of small sized, cull potaotes, bought of near-by farmers and gardeners at 15 cents per bushel. Both the cabbage and potatoes are fed liberally to ducks and chicks alike. We boil the potatoes. For meat food for ducks and chicks—chicks especially—our man goes to the slaughter house, taking with him two five-gallon milk cans, and for 15 cents he induces the butcher to set these cans under the cattle hung up for slaughter, the blood from their cut throats flowing into the cans. In other words, we get from sixty to seventy pounds of blood in this way at a cost of only 15 cents, blood that is worth 10 cents per pound to us, if a cent. After this blood coagulates we boil it in common gunny sacks. These sacks of blood are put into a large cooker and boiled for two hours or such a matter. Pieces of fire wood are placed on the bottom of the boiler to prevent the sacks of blood adhering thereto and burning. These sacks are then hung up and the water drained out of the blood. When the blood becomes cold it is a crumbly mass. We salt and pepper it, and mix it with soft food, and feed it to the ducks and chicks, both old and young. It is a superb egg food and a fine feather and bone maker. We doubt if boiled blood can be improved on for these purposes. Obtained as we obtain it, it is the cheapest good egg, bone and feather food obtainable, so far as our knowledge goes.

What Per Cent of Eggs are Fertile?

This varies with the season, with the location, with the treatment, with the feed and with the ducks. Everything that is good for ducks must conspire to produce fertile ggs; anything that is against ducks, their health and general well-being, will show itself both in the number of eggs laid and a lack of fertility. Ordinarily, and under fair treatment, duck eggs are as fertile as chicken eggs, ranging from 75 to 90 per cent, or even better. Eighteen hundred and ninety-six was a good season for fertile duck eggs. The season of 1897, judging by many reports received from different parts of the country, has not been a good season for fertile duck eggs. Ducks are very sensitive to changeable weather. In February or March a snow storm or downfall of sleet will stop the egg supply within twenty-four hours. Even as late as April and May, extreme changes in the temperature render the egg supply irregular. Last year duck eggs on the Reliable Poultry Farm ranged from 75 to 80 per cent fertile. This year they ranged from 60 to 70 per cent fertile, and of these, ten per cent were poorly fertilized, the germ not being strong enough to hatch out the duck.

Hatching Ducks For Early Market.

Withee, Wis.

Editor Reliable Poultry Journal:

I have received several letters from a New York commission house, also from a breeder of Pekin ducks in Massachusetts, stating that they usually begin marketing nine to ten weeks' old Pekins about March 15 to April 1. To do this it is necessary to start incubators about December 7 or 8.

I have a lot of first-class Pekin breeders, but they do not begin laying until about February 15. In what months must ducks be hatched to be laying fertile eggs the latter part of November, and is there any special care required in raising them, other than that given incubator chicks raised in brooders and warm houses? H. W.

Mr. A. J. Hallock, Speonk, L. I., N. Y., who, through his extensive experience in breeding Pekin ducks, is well qualified to advise in the matter, writes in regard to the foregoing inquiry: "We have had Pekin ducks lay when but five months old, but they can not be depended on to lay regularly before they are eight months of age, and then, if it is cold weather and there is much snow, it is difficult to get them started, and when they do begin to keep them at it. Cold feet are detrimental to egg-production with Pekin ducks, and unless their house is large, it will not do to confine them. Ducks in confinement fret, will not eat their food and will lay infertile eggs, or stop entirely.

Ducklings will thrive with the same care that it requires to raise chickens. The farms that market ducklings the latter part of March or the first of April keep hundreds of breeders, and a few of them lay early enough to produce a few ducks by April 1. This season many of the farms on Long Island did not ship any before May (much later than last year), which we believe is due to the unusually heavy fall of snow on this section of the island."

Ducks Fed Too Much Corn.

Merritt, Ill.

Editor Reliable Poultry Journal:

I write you for your opinion as to what is the matter with my ducks. In the first four weeks several have died. There is a dimness of the eyes about two days before they show any other symptoms. Next, the craw is puffed full of wind. Some get weak and totter around and refuse to eat, but will drink all the time as if they were feverisn. Others get helpless as if hurt in the back. The discharge from the bowels is white and greenish and very thin. They live about seven days after taking the disease, which has been fatal in every case. The symptoms are the same in each case, except the weak back, they can't walk, while the tottering ones go around until they die. They were in the best of condition until they got sick, when they die nothing but the frame is left. They have pure water to drink and corn to eat. If you have a remedy for the disease will you lease let me know? W. F. Stone.

We sent the above letter to Charles F. Newman, of Huguenot, Staten Island, N. Y., who has had a great deal of experience in the care of Pekin Ducks, asking him to locate thet trouble and suggest a remedy. His reply is as follows: "The trouble with your ducks beyond doubt is too much corn and overfeeding, causing them to die with apoplexy. Give ducks a mash and plenty of vegetable matter. Whole grain is not good for Pekin ducks." The successful duck raisers of the country do not feed whole grain of any kind. Ducks thrive best on bulky food.

Breeding Toulouse Geese.

Southgrove, Ill.

Editor Reliable Poultry Journal:

Can you inform me through the columns of the R. P. J. if a person can raise more geese from the large, Toulouse geese, or can he do better by crossing the Toulouse with some other kind? I should like to know what variety is easiest to raise. I have had some trouble this year to keep my stock healthy. I lost most of my young stock this year. They were from ganders and old geese. They would go lame when they were about a month old and die.

Will the cross breeds be subjects to lameness? Which would make the better cross, the Toulouse geese with the Egyptian ganders, or the African geese with the Toulouse ganders? Joseph Hodgkinson.

In reply to the question asked by Mr. Hodgkinson, Mr. J. H. Lewis, of Hanlin Station, Pa., whose geese the editor saw and told of in his write-up of eastern breeders last summer, has this to say: "My experience is that Toulouse geese bred in their purity are the easiest of any kind to raise. I raise almost every one I hatch out, barring accidents. I have raised several varieties, but prefer the Toulouse. I have had no experience with lame goslings, but I think the trouble complained of is due to the fact that the geese are either too closely inbred or the goslings are allowed to roam about too much and have too much water in which to swim. I never allow my goslings to go swimming until they are about full grown. I give plenty of water to drink, feed often when they are young and give plenty of grass to pick at, with grit before them all the time and a little salt in their food once a day. If this plan is followed and the stock is not weak from being inbred, I think the trouble complained of will be remedied.

"We would prefer the African goose and Toulouse gander cross to the Toulouse goose and Egyptian gander. The best cross to be made is to cross Embden ganders with Toulouse geese."

Ducks, Markets, Etc.

Rockville, L. I., N. Y.

Editor Reliable Poultry Journal:

Q.—When is the best time to put duck eggs in the incubator to raise ducks for market?

A.—Just as soon as you can get the eggs. Ducks on Long Island will not begin laying before January 15th or February 1st to any great extent, and the first eggs will give you your poorest hatches. Do your best to get eggs early and to have these eggs well-fertilized. In the duck business, as in other walks of life, "the early bird catches the worm." Long Island duck men begin marketing their ten week's old ducks April 1st to 15th, and get 35 to 40 cents per pound for the first shipments. This price holds out for a few days, when it drops to 30 to 35 cents, where it remains for a month or so It then gradually declines, until by August 1st to 15th the bottom price is reached, which during the past three or four years has ranged from 9 to 13 cents. There is money in ducks at even these low prices, but the duck men feel pretty blue if the price goes below 11 or 12 cents.

Q.—How old and heavy should young ducks be that are sent to market?

A.—Get them as heavy as you can at ten weeks old. The leading duck men now produce green ducks, as they are called, that weigh from ten to twelve pounds per pair at ten weeks old. Some get them even heavier than this, but we are giving the average for the best strains.

Will Run Themselves to Death.

Piqua, Ohio.

Editor Reliable Poultry Journal:

Last spring we purchased Pekin duck eggs from reliable breeders. We got excellent hatches and raised some fine ducks. Fifteen were kept in a small yard about 20x50 feet, well grassed. Soon after they were full feathered they were allowed their freedom, and within a half hour four were dead, seemingly with apoplexy. A few days later when again allowed the range, the same thing was repeated, and this in quite cool weather. Wherein did the trouble lie? They were raised on cracked corn and bran mixed with curd and sour milk, cracked corn about two-fifths by measure, no meat or bone, but plenty of grass, potatoes, etc. They were never fed more than about what they would eat up clean twice a day, with plenty of water and grit. They were not too fat. Very truly,

"Subscriber."

We are of the opinion that your ducks ran themselves to death. A number of times our men at the farm have tried the experiment of turning half grown ducks into larger lots, thinking it would be better for them. As often as they have done this they have had to return the ducks to limited quarters, for within half a day's time they would pick up several that could no longer stand on their legs, owing to exhaustion from running about and being run over and trampled on by the flock.

Where ducks are given full liberty from the time they are hatched, they do not seem to "run wild," as above described, but they do seem to go crazy when turned out from narrow limits upon a range, or into a large lot. If they did not run themselves to death it would still not be a practical plan to follow, for at best they run off much of their flesh, and it takes twice as much feed to have the desired results.

WILL POULTRY THRIVE ON GRAIN ALONE?

Abstract of Bulletin 149 of New York Cornell Station—Experiments Decisively in Favor of Animal Rations—Relative Efficiency and Economy of Animal and Grain Foods.

BY JAMES R. COVERT, OF THE U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

"WILL Poultry Thrive on Grain Alone?" is the title of the popular edition of Bulletin No. 149, recently issued by the New York Cornell Station, one of the stations conducting experiments with poultry. It gives in simple language the details of an experiment in feeding poultry in which animal and vegetable protein are compared. The author says: "In feeding poultry, as in feeding other animals * * * the nitrogenous compounds are the most expensive * * * In cattle feeding, the shifting prices of the various by-products allow us to discriminate to our advantage in the purchase of protein, and a still wider difference separates the cost of the nitrogenous materials in the many poultry foods. Fowls and ducks naturally eat considerable animal matter as well as vegetable foods. Can we economize here? Is the cheap protein of pea meal, oat meal, wheat bran, or linseed meal as efficient as that in the more expensive animal meal, dried blood, or fresh bone?" In the complete bulletin we note that "the natural animal foods eaten by fowls contain usually a high percentage of nitrogenous matter and not a large proportion of fat. * * * For instance, both earth worms and grasshoppers contain nearly ten times as much protein as fat, while ordinary fresh cut bone contains about equal amounts of protein and fat."

LOT A—SHOWING RESULTS OF FEEDING ANIMAL FOOD.

The time covered by the different experiments was divided into periods. In the trial with ducklings the periods were seven days each, except periods 1, 11 and 12, which were 5, 35 and 28 days respectively.

ANIMAL AND VEGETABLE RATIONS.

The animal meal ration was composed of the following feeding stuffs in the proportions named: Corn meal, twelve parts; wheat flour, four; ground oats, two; wheat bran, one; wheat middlings, one; pea meal, one; old process linseed meal, one; with wheat, corn, animal meal and fresh bone. The vegetable food ration consisted of the following: Pea meal, six; old process linseed meal, four; wheat bran, two; ground oats, two; high grade gluten meal, two; wheat middlings, one; and corn meal, one; with wheat, corn, and skim milk or curd. The animal meal ration had a slightly wider nutritive ratio than the vegetable ration; but about two-fifths of the protein in the animal meal ration was derived from animal sources. The amount of protein in the different rations was practically the same.

The trial with ducklings showed most clearly the advantage gained by the use of animal meal. The trial began as soon as the ducklings had learned to eat and was continued nearly fifteen weeks, by which time growth had become very slow. Lot A received the animal ration and lot B the contrasted vegetable ration.

The author of the complete edition says: "From the start the ration containing the large proportion of animal food gave much the better results, although during the first week not so much difference was manifest. * * * During the first ten weeks two and one-third times as much food was eaten by lot A as by lot B and the total increase in live weight was about four times as great. * * * The cost of food for each pound of gain was about 3.7 cents for lot A and 7.2 cents for lot B, a difference not far from 95 per cent in favor of lot A. The use of the animal meal increased the cost of the one ration, for while it constituted less than one-fifth of the total food beside the alfalfa, it represented considerably over one-third of the total cost of the ration. While the ducklings in lot A were thrifty from the start, at all times free from disease and made an even flock, those in lot B made an uneven growth and several died. The unevenness of size in the flock was very noticeable. At ten weeks of age the birds in lot A seemed to have reached the limit of the most profitable growth, for during the next five weeks the growth was slow, and growth at the same rate could not generally show a profit over the cost of food. * * * The average weight of one pound was reached by lot A three weeks sooner than by lot B, the average weight of two pounds over five weeks sooner and the average weight of three pounds over eight weeks sooner. At seven weeks of age the average weight for lot A was over three pounds, and for lot B less than one pound. At nine weeks of age the average weight for lot A was about 4.5 pounds, and for lot B about 1.5. At eleven weeks of age the average weight for lot A was five pounds and for lot B it was two pounds."

[Note—These experiments prove the advantage of using animal food in conjunction with vegetable food, and are not intended to suggest that the vegetable food should be dispensed with.—Ed.]

AVERAGE RESULTS OF COMPARATIVE FEEDING TRIALS WITH DUCKLINGS.

Lot A, Animal Meal.

PERIOD.	Average Weight per Fowl at End of Period.	Total Food per Day.	Cost of Food per Day.	Approximate Nutritive Ratio.	Average Gain in Weight per Fowl.	Cost of Food per Pound of Gain.
	Pounds.	Ounces.	Cents.		Ounces.	Cents.
1.....	.2	.2	.00	1:4.2	.6	1.6
2.....	.3	.9	.05	1:5.1	1.6	2.6
3.....	.4	1.4	.12	1:3.1	2.3	5.8
4.....	.9	2.8	.15	1:4.5	8.1	2.4
5.....	1.5	3.3	.20	1:4.6	9.0	2.5
6.....	2.2	5.3	.35	1:4.2	11.5	3.4
7.....	3.1	5.6	.39	1:3.8	13.9	3.2
8.....	3.5	5.2	.32	1:3.5	5.8	6.2
9.....	4.4	7.2	.37	1:4.3	14.6	2.9
10.....	4.8	8.7	.48	1:4.0	6.9	7.7
11.....	5.6	7.0	.39	1:3.6	14.8	14.1

Lot B—Vegetable Food.

PERIOD.	Average Weight per Fowl at End of Period.	Total Food per Day.	Cost of Food per Day.	Approximate Nutritive Ratio.	Average Gain in Weight per Fowl.	Cost of Food per Pound of Gain.
	Pounds.	Ounces.	Cents.		Ounces.	Cents.
1.....	.15	.2	.01	1:3.8	.5	.8
2.....	.2	.4	.02	1:5.8	.8	2.7
3.....	.2	1.0	.05	1:5.8	.1	...
4.....	.4	1.3	.07	1:4.5	2.2	3.4
5.....	.5	.9	.04	1:4.7	1.8	2.5
6.....	.7	2.1	.14	1:2.9	2.9	5.5
7.....	.9	2.7	.20	1:2.6	4.4	5.2
8.....	1.2	4.5	.34	1:2.7	4.4	8.6
9.....	1.5	4.7	.25	1:2.6	4.0	7.0
10.....	1.5	6.1	.30	1:3.0	.5	...
11.....	3.0	6.8	.34	1:2.8	19.7	9.7
12.....	5.0	9.2	.47	1:4.0	32.4	6.5

The author of the popular edition, referring to this trial, says: "Before the experiment had been long under way it was noticed that the animal meal birds were developing rapidly and evenly; but the grain-fed ducklings were becoming thin and uneven in size. It was sometimes almost pitiful to see the long-necked, scrawny, grain-fed birds, with troughs full of good, apparently wholesome food before them, standing on the alert and scrambling in hot haste after the unlucky grasshopper or fly which ventured into their pen; while the contented-looking meat-fed ducks lay lazily in the sun and paid no attention to buzzing bee or crawling beetle. The thirty-two meat-fed birds lived and thrived; but the vegtable food birds dropped off one by one, starved to death through lack of animal food, so that only twenty of the thirty-three were alive at the close of the fifteenth week of contrasted feeding."

In conclusion it should be noted that the chief advantage in using animal meal is the rapid growth induced by it, and the cost per pound of gain of fowls fed on it is also in its favor.

JAMES R. COVERT.

LOT I—SHOWING RESULTS OF OMITTING ANIMAL FOOD.

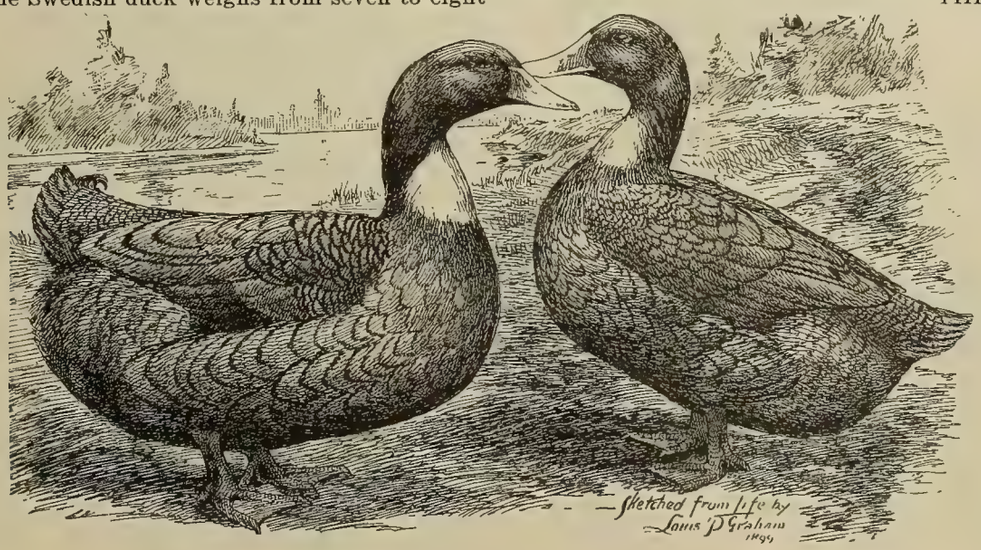
BLUE SWEDISH DUCKS.

BY THEO. F. JAGER, LEBANON POULTRY FARM, LEBANON, PA.

The first lot of Swedish Ducks, so far as is known, were imported into this country in 1884 by the writer. Later imports were made in 1899 and several since. The duck has a silver gray plumage. The back is sky blue; head and upper part of neck dark blue; throat pure white. The head shows a green sheen. The main flights are pure white. The long and stout bill is green with a black bean, and the feet are orange color. The Swedish duck weighs from seven to eight pounds in breeding condition, the drake often touching the scale at ten to eleven pounds. The duck is a very active bird, always on the lookout for insects. The young may be prepared for market in eight weeks, when they will weigh from four to five pounds each.

The Swedish duck excels both as a market fowl and an egg producer.

THEO. F. JAGER.



A PAIR OF BLUE SWEDISH DUCKS

PEKIN DUCKS FOR MARKET.

How to Grow Them Successfully—Where to Sell Them Profitably—Farm Raised versus Artificial Production—The Nursery, the Brooding House, the Laying Pen—Diseases—Stock Ducks and Layers—Foods and Rations.

BY H. E. MOSS, KANSAS CITY, MO.

IT WOULD seem almost superfluous to add anything further to the present supply of information printed in both pamphlet and periodical form on this subject were it not for the fact that so large a number who embark in the business, and to whom this literature is available, fail to secure the results anticipated. The writer has been called upon so many times to answer the question, "Why do my ducklings die? If they keep on dying at this rate I will have none to market," that he feels it a duty as well as a pleasure to render what assistance he can to those who are contending against difficulties which are so easily remedied. There must be obtained in order to succeed in the business, an absolute knowledge of the fundamental requirements as well as the details of their execution. There are a few essentials and they must be supplied, or losses follow. Losses come very quickly and without warning and nowhere is the ounce of prevention worth so many pounds of cure as in the duck raising business.

The successful raising of Pekin Ducks is one of the easiest, simplest and surest operations in the entire poultry business. This statement I am aware is contrary to the opinion prevalent among the fraternity and especially among those who have attempted it and failed. Nevertheless it is a fact. There is but one right way to do anything. The right leads to success, the wrong to failure. The beginner is no more liable to guess at the right way than he is to win a prize in a lottery. Whether he proceeds according to his own ideas and judgment or gathers fragments from the columns of advice and instructions that are published daily he is sure to omit or neglect one of the essentials and to suffer in a greater or less degree in consequence.

WHERE TO SELL.

The raising of Pekin Ducks for market is successfully and profitably conducted on many large farms in the eastern part of this country. There are many plants marketing every season from ten to forty thousand ducklings. They are scattered from Norfolk, Va., to Bangor, Me., and all are each year called upon to face an increasing demand. The largest consumers are found among the best hotels, the high priced restaurants, railroad dining cars, clubs and summer resort hotels. The wealthy classes in the large cities, the coastwise, and trans-Atlantic steamships, are all steady purchasers from the beginning to the end of the season, the general public indulging only at intervals as they do in the case of any luxury which this may be properly called owing to the comparatively high prices at which they are sold. The masses cannot afford to pay the retailer twenty cents per pound for ducklings, which was the lowest price they could be purchased for in New York or Boston at any time during the summer of 1899. The hotels, etc., are compelled to serve them to their guests as soon as obtainable regardless of price. The Boston dealers were so eager for early shipments in the spring of 1899, that they paid sixty cents per pound for three-pound ducklings from the first hatch of one of the largest New England growers, and while they were not in any condition for killing the importunity of the dealer prevailed and the grower supplied him. This is simply in evidence of the demand for, and popularity of the brooder house duckling. The farm-raised duckling is not to be compared with it in flavor and delicacy. We are what we eat. This applies to all animal creation. Take our wild ducks for example. The canvas back is the most highly prized, and those killed on the Chesapeake Bay sell at enormous prices, the same canvas backs are killed on our western lakes, but are no more desirable or valuable than a Red Head or Mallard. Some years ago the writer shipped numbers of them to eastern markets with this result: The reason was soon made plain. The Chesapeake bird feeds on a wild celery that grows in the shallows in the beds of the streams and in the various inlets and tributaries to the bay. This food flavors the meat and to a degree that makes it highly prized. Just as fish fed to ducks gives them an undesirable flavor and renders them almost unsaleable when known.

FARM VERSUS ARTIFICIAL PRODUCTION.

The farm raised duckling, as a rule, has to take his chances with the young chicks and live and grow on food that is suited to the chick, but not the duck. He has also unlimited range and in an endeavor to satisfy his natural desires for certain kinds of food he travels from daylight until dark. He may live and thrive so far as health and vigor are concerned by this enforced exercise, but his growth will be slow. In three months he may weigh three pounds, which will consist of frame work, internal organs, and well toughened muscles. When served at a table he is a delusion and a disappointment. One for each guest is not too liberal a portion if your guests carry appetites with them. The brooder house duckling has the very best of food, in the right proportions and quantity, and is restricted in his exercise, which enables him to accumulate flesh and fat, and of the finest flavor obtainable, as he receives the very best material for its production.

The business of raising Pekin ducklings on a large scale is one of considerable detail. Many little and apparently trifling things all unite in bringing about a successful result, and any of these trifles neglected or omitted is as sure to bring disastrous results as a leak is to sink a ship.

Always remember these facts: That we are trying to conduct a natural process artificially—not only this, but we are reversing the natural order of things—demanding summer results in mid-winter when everything that nature provides to encourage, stimulate and sustain, is locked under ice and snow. Now, if we expect to be successful in enforcing our demands we must duplicate the conditions that are

absolutely essential. The two essentials are TEMPERATURE and FOOD. I will add another—BRAINS in the man who is undertaking to supply the other two. It requires just as high an order of talent and brains to conduct a duck farm successfully as it does for any mercantile pursuit. And most of the failures in the business can be attributed to a lack of this essential in the man. In the first place he must be in love with his business and if he is he will become so well acquainted with his birds that he can interpret their wants at a glance. He will not only see quickly what is necessary, but will take hold and do it at once. The successful duckman of this country, no matter how large his scale of operation, is he who LEADS. Whether he has one or a dozen men working for him, when any thing is to be done he leads and orders his men to follow. Whatever help he has is help in the full sense of the word. They help him to do what he could not accomplish alone. As soon as he becomes the help and his men take the lead, it is an easy matter to predict the final outcome.

BRAINS ARE NECESSARY.

I have visited most of the large duck farms in this country and while an exception to this rule may be a possibility, I have found the successful men in this business are men who are systematic and orderly in everything pertaining to their business. They not only plan and direct every detail, but keep at the front themselves and see that their orders are obeyed to the letter in the routine work assigned to their men. They know the temperature of every heated building on the place at all hours of the day and recording thermometers, set each night, enable them to know whether the night watchman is attending to his duty. Breeders must furnish the brains to run the business. If they have no brains of their own and start out with the belief that they can always hire them, and make that their intention, the word failure is written on the front page of their book. If there is any poultry plant in existence that is an exception to this rule I should like to be advised of it. I want to see it in operation. Many good men have failed for another reason, that being—a lack of knowledge of the business to start with, which necessitated a continued series of losing experiments. They have been qualified otherwise, but have lacked capital to fall back on while they were losing money and gaining knowledge—and by the time the knowledge has been acquired the capital has been exhausted. They have gone to what they considered reliable sources of knowledge, and secured what they supposed they could rely on, only to be disappointed. A case in point: Several months ago I was visiting one of the large eastern duck growers. Our conversation drifted to this subject, and turning to his desk he handed me a letter just received, and asked me to read it. The printed heading showed the writer of it to be a large manufacturer of vehicles and harness in a neighboring state. He contemplated starting a large duck farm and propounded a series of questions, which, if addressed to any one in any other line of business, would be considered exceedingly impertinent. He said to me: "Do you know how I feel like answering this man?" and then went on to state: "I ought to write him and tell him that I have some intention of going into the vehicle and harness manufacturing business, and that I would like him to tell me what profits there were to be made in it, how much he paid his men, where he bought his material, what he paid for it, what profit he made on each vehicle, where he found sale for them, how to turn them out for the least money, etc. That would be just as proper as for him to ask me these same questions, and yet every man engaged in any agricultural pursuit or any branch of it is supposed to give just such information to the public in general, and every individual in particular who asks for it." The point was well taken, for in his position he feared the competition and the injury it would cause him if he were to give the other man a club to fight him with. Fortunately for the beginner we are not all placed in the same position, although some who are and have not the honor and consistency to decline to answer such pertinent questions rather mislead the enquirer which he eventually discovers to his sorrow.

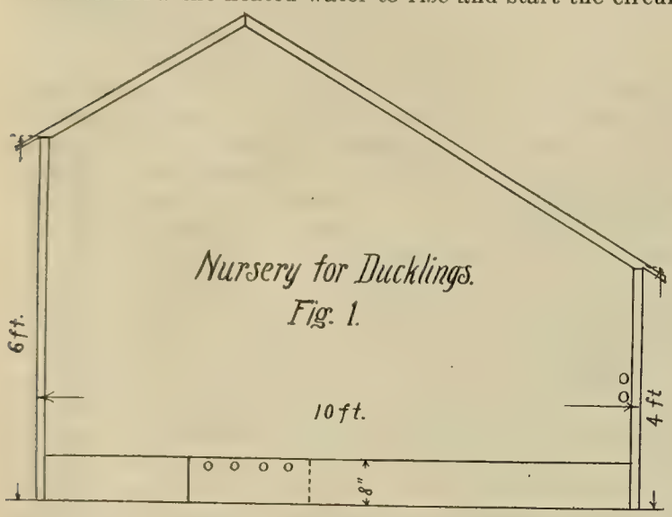
FEEL YOUR WAY.

I stated at the beginning that raising Pekin ducks is one of the simplest, easiest and surest operations in the poultry business, and in what follows I shall endeavor in as brief a manner and as concisely as possible to give such instructions and directions as will enable any one of average intelligence to comprehend, follow, and succeed. My advice to every beginner is to feel your way the first year, start on a small scale—one hundred, or one hundred and fifty stock ducks is all you should attempt to handle. After you have run one season you will have the confidence in yourself, which is absolutely necessary to operate successfully on a large scale. Of course, with a flock of this size the labor expended will figure up greater in proportion for each duckling marketed than it would on a larger scale, as the larger the output the less the cost per duckling for labor, provided you arrange the plant so as to minimize the labor by providing all possible conveniences for handling all materials that come to or leave the place and for feeding and watering the growing stock. Plan to save labor wherever possible, as this is the principal item of expense. The feed they consume is converted into flesh, but any surplus labor attending the distribution of it is simply wasted.

In the chapters which follow I wish to call the reader's attention to one thing, and that is where I advise a certain course and say it is necessary or must be done I mean just what I say and that to give all the reasons for the assertion, or why I arrived at this conclusion, or what it cost me to learn some of the lessons, I will not undertake to state or explain. They are facts and some of them were very costly to me. If you doubt them and wish to experiment on your own account there is no objection to your proving any theory you may have, but under no circumstances try it on the whole flock at once. Take a few in a pen by themselves and do your experimenting on them. If the results are unfavorable it will not be a serious matter. You will soon learn that it is best to be content with whatever method produces the highest attainable results and any effort to accomplish impossiblities is useless. When you can market ducklings that average over five pounds each at nine weeks you are doing all that is desirable or necessary, therefore hold on to that which you know to be good. The writer has proven these things many times over and knows what he is advising to be correct.

Before your ducklings begin to hatch you are supposed to have provided yourself with a suitable nursery as well as other necessary buildings, which become necessary as their growth progresses. This nursery is the most important building you operate. By most writers it is called a brooder house. This is rather misleading, for in it you are going to care for one of, if not the most, tender of all newly hatched fowl. The first ten days decides their fate; this is the critical period of their existence and if properly nursed and cared for during their stay in this building their future is practically assured—and it will take a sharp knife to kill them. I will try to describe this building so that any intelligent carpenter may construct it. The length can be modified to suit any capacity and it is well to arrange in the building of it so that you can extend it at any time. It should face south. Do not provide for any yards outside. Do not build on brick or stone foundation, but set the sill on posts or boulders that rise, say four inches above the ground, and let

their inside faces come flush with the sill. Sink a twelve-inch board on the inside and spike it to the sill. This makes a tight joint that no wind can enter. Fill inside with dirt to raise the floor up to the sill. Make the front or south side four feet high and the rear six feet high and the building ten feet wide. Use barn siding. Paper the sides with a good quality of paper that will stand the weather and make every lap tight by nailing a two-inch furring strip over it. Be particular to get it tight under the eaves. Shingle the roof. On the south side place a sash in each pen with six 9x12 lights up at least twelve inches from the sills and hinged at the bottom. Your ten feet of width divide up as follows: The rear three feet reserve for a walk; then two feet for the hover, and five feet for the pens. Locate your heater which, for economy, should be a water jacket stove in one end, in a walled pit dug to receive it. Run the flow pipe from the heater into a header with three 1½-inch openings; from two of these openings run 1½-inch pipes the full length of the building and ten inches above the floor, with gradual rise of 4 to 6 inches to the end opposite the heater, so as to allow the heated water to rise and start the circulation. Make the return, and place the two return pipes beside the flow pipes, where they will have the corresponding fall. Run them back to the base of the jacket or heater, where they enter a header and then the heater. This gives you a double loop in the hover. Now run a single loop along through the pens against the wall under the windows. The flow pipe being the uppermost. This loop can be given more pitch. At the extreme end of each loop and from the upper side there must be inserted a piece of gas pipe, which should rise perpendicularly almost to the roof and be open at all times to allow any accumulation of air to escape from the pipes. If this is not provided for, a trap will form and stop the circulation. Each of these headers should have an additional opening for half-inch pipe. From the one in the return run a pipe to the bottom of an expansion tank, to which it must be tightly connected and from the flow header run a similar pipe to the top of the expansion tank; bend it over to empty in it. This tank need be but two feet higher than the heater provided. The ends of the loop do not rise above the level of the water in the tank, for in that case the pipes would not be filled when the tank would be overflowing. The bottom of the tank should be higher than the loops.



Nursery for Ducklings.
Fig. 1.

SIZE AND TEMPERATURE. Suppose the nursery to be 100 feet long. Two feet west of the center build a cross partition with a door in it, as we wish to maintain a lower temperature in the eastern half. Divide this 48 feet into 12 pens 4x5 feet (which will accommodate 75 ducklings each), running the partitions under the pipes and letting the pipes rest on them. Close the rear of the hover next to the walk, as shown in the diagram, Fig. 1. Make a batten of common dressed boards two feet wide and the length of each pen; lay it directly on top of the pipes. This leaves the entire front of the hover open, which it should be, except during the most severe weather, when, if the full capacity of the heater should fail to hold the entire building quite up to the required temperature, the hover can still be kept up to the mark by hanging a curtain in front. The western end as now divided will leave room for eleven pens and eight feet of space for the heater. To hold this nursery at a uniform temperature is of the utmost importance, and in order to do so you must use the best appliances obtainable in addition to the usual watchfulness. In about the center of the west division select one of the hovers and on the partition fasten a small thermostat arranged to send an electric current through each point of contact, connect this with batteries and a clock-work damper regulator connected with the heater. At the side of this thermostat place a tall thermometer with the bulb on a level with the ducklings and the scale projecting above the cover of the hover, so it can be read in passing. Beside this, place a smaller maximum thermometer. This is a thermometer in which a small piece of steel is pushed in advance of the column of mercury, and it records the highest point reached. The steel is daily drawn down with a magnet. The damper regulator will control the heat fairly well but much depends on whether the fire is ashy or clean and it may need assistance to obtain quick work either up, or down. Adjust the device so as to hold the temperature under the hover in the western section at 80 to 85; this will give you about 75 degrees in the pens. Adjust ventilation so as to hold the eastern section at 75 to 80 under the hover, and 65 to 70 in the pens. These temperatures must be kept uniform within the limit specified, no matter how cold it is out of doors. This, of course, applies only to the season of the year when artificial heat is necessary. The high summer heat is not dangerous if all ventilation is open. Variable heat in the nursery has caused the death of more chicks and ducklings than all other causes combined, therefore watch closely. If the nursery could be lathed and given one heavy coat of rough plaster it would be all the better for it and require less fuel. Surround the thermometers under the hover with wire netting in such a way as to prevent a false reading, by the ducklings lying against the bulbs. Keep the ducklings down at least eight inches below the pipes. Bed the hover and pens with an inch of planer shavings, turner's chips, chaff, cut straw or dry sand, but never sawdust. Prepare a drinking fountain of the tomato can type for each pen. Have everything warm, even the drinking water must have the chill taken off in cold weather.

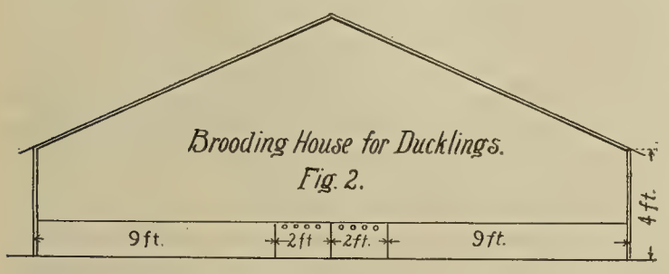
NEWLY HATCHED DUCKLINGS. You are now ready for the ducklings. If they have been out of the shell for thirty-six hours they are ready to transfer to the nursery. Do this in a box or basket, well covered with a blanket, to prevent chilling them. Turn them into the hover, set a board about a foot in front of the hover, so they can not stray far from the heat and bunch up on the outside. Do this for several days until they learn to seek the hover for warmth. Place feed and water within this space, and for forty-eight hours keep a supply before them day and night, after which feed regularly four times a day—at 6 and 10 a. m. and 2 and 6 p. m., but not not before daylight or after dark during the short days.

The nursery feed consists of one measure of cracker or stale bread crumbs, one measure of middlings, one-half measure of bran, five per cent of grit, wet with water or milk to a dry, crumbly state. Keep hands off of hard boiled eggs. I fail to see why any one should recommend them, unless they assume that because the yolk is the first food

supplied by nature to start them in life, with the entire egg boiled hard must be an ideal food. There is a vast difference between the digestibility of a raw yolk and the hard boiled albumen and yolk. The one can be safely eaten by an invalid where the other might kill him. Keep it away from ducklings. Some might survive it. They might also survive a moderate dose of poison, but that is no argument or reason why we should feed it to them. Be particular to keep the drinking vessels clean. Rinse them out at each feeding. Keep the pens dry. They will distribute much of their water over the pen. Fresh additions to the bedding and occasional cleaning and renewal are necessary. Feed just what they will clean up quickly at each regular feeding hour. It is better to underfeed a trifle and keep them looking for more than to overfeed. If they should be given more than they will clean up in short order, gather it up at once. Feed in flat troughs and keep them scraped clean. A grain sack answers the purpose as well as anything to feed on in the nursery, but should be lifted after each feeding and kept clean. There will be a rapid accumulation of filth around the fountain, scattered feed, droppings and water. This rapidly sours. Remove it daily, otherwise they will dig in it, eat portions of it sicken and die. At the end of five days move them into the east division and continue the nursery feed and keep the lower temperature uniform. The best plan would be to have separate smaller heaters for each half of the building, but by careful management one large one can be made to serve the purpose and at less expense. At the end of the second five days move them into a brooder house.

The Brooder House.

The brooder house should be a double one as shown in Fig. 2. In this the pens are longer and wider. The building should be 22 feet wide, which allows 2 feet for hover and 9 feet for pen on each side, the top of hovers being used for a walk. Sixty-five degrees is the temperature at which this hover should be held; two loops being run under each side and none in the pens. Feed and water out of doors whenever the weather will permit and use V troughs for feed and water as soon as the ducklings are large enough to eat out of them. The pens in this building should be 6 feet wide with yards 30 feet long divided by wire netting 18 inches wide, 1 inch mesh.



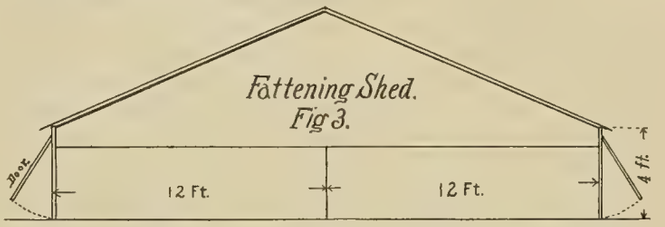
Brooding House for Ducklings.
Fig. 2.

If there is no natural shade provide artificial. Make it cheap but effective. On a large plant, in order to save labor, a windmill and pump with large tank from which a water supply can be piped to the various buildings is a necessity. A line of pipe should run under the yards with a branch rising in each to which a pet cock can be attached and adjusted to drip a regular supply of water in each trough. Clean these troughs daily and keep a supply of water constantly before them during the day and always feed before watering in the morning, if they have not had access to any during the night, otherwise they drink excessive quantities while the digestive organs are empty and colic and cramps ensue, which result in death in most cases. At the end of five weeks your ducklings can be moved into unheated buildings or sheds where they can be protected from storms. They must be kept dry until they are fairly well feathered, which will be at seven weeks.

After they leave the nursery they are fed the growing feed four times a day, composed as follows:

Four measures of bran.
Three measures of middlings.
One measure of corn meal.
Three measures of cut green rye or two of cut clover, scalded.
Five per cent sharp sand.
Five per cent scrap.

Wet this with water, but do not make it sloppy. You will notice the small percentage of corn meal. We have little use for it until we are ready to fatten. Thousands of ducklings die every year from its injudicious use. We are now feeding for a large frame.



Fattening Shed.
Fig 3.

At the end of seven weeks we move them into the fattening sheds and here corn meal is the principle element of diet. These sheds can be cheaply built. They must have a good roof and dry floor with good bedding. Cold is not injurious, but provide so as to prevent storms from blowing in, which can be done by keeping the eaves close to the ground, as shown in Fig. 3. Both sides should be a series of doors hung at the top which remain open except during severe cold or storms. As the ducklings grow very rapidly they need more room in the pens, which must be enlarged accordingly. The fattening feed consists of

Two measures corn meal.
Two measures middlings.
One measure bran.
One measure green stuff.
Ten per cent scrap.
Five per cent sand.
Wet with water to a dry, crumbly state.

This is a rich and concentrated ration and must be carefully fed or it will glut their appetites. Gather up at once any food left in the troughs leave nothing for them to nibble or lunch on between meals and they will come up to the troughs hungry and greedy at feeding time, which now is morning, noon and night. Keep up a strong appetite; this is important. At nine weeks they are ready for market and you will find them weighing from four and one-half to six pounds dressed. Don't hold them a day over ten weeks. In locating your buildings plan for extensions and additions. Your feed-mixing room should be placed where the mixing trough can be pushed out on a track and along an alley between the ends of the yards where a man with a shovel can feed both sides very rapidly, and by the arrangement suggested no water need be carried in pails. A further economy is an engine and a mill for grinding grain, cutting green stuff and pumping water. A great deal can be accomplished by working it one day in a week.

Water for swimming is not to be permitted growing ducklings under any circumstances. There is no objection to having a pool or tank of running water in the yard next the killing house and two days before killing drive the flock into it and let them wash themselves thoroughly. This renovates the feathers and makes them more saleable.

FOOD IN GENERAL.

In the foregoing feed formulas I have designated beef scrap to supply the requisite animal protein in the ration. I have done this because it has been so largely used and has been supposed to be the cheapest source of supply. For my own use I prefer and use dried blood altogether. I use

but one brand of it however, which I know to be absolutely pure and dried while perfectly fresh. The commercial dried blood purchased on the open market is indifferently made and intended for fertilizer only and is all right for this purpose, but contains putrid matter and would be fatal to ducks. Of the blood I have been using sixty pounds is the equivalent of one hundred pounds of scrap and as it contains but 2.5 per cent of fat as compared with 33.8 per cent in scrap, as the following table will show, it is easy to figure the advantage it possesses. It is also much richer in protein and contains practically no waste matter. The excess of fat in scrap is what causes looseness of the bowels. This danger is entirely avoided by using the blood. I also keep crushed dry bone, oyster shells and coarse sand in all the pens except the nursery, and they can consume it as they like. The natural food of the duck in its wild state, if analysed, will show that the bulk of the protein is contained in the animal food it secures and the carbo-hydrates or fats in the vegetable. This order must be maintained. It is useless for us to attempt to secure any degree of success by trying to improve upon nature's established laws. We can only stimulate the processes by supplying an abundance of such food and reducing the waste of energy made necessary in securing even a moderate supply in the wild state.

The following table shows the feeding value of the principal feed stuffs used for poultry, and will be valuable to those who figure their ration and have a working basis:

Composition of Feeding Stuffs.

FOODS.	Water. Per Cent.	Ash. Per Cent.	Protein Per Cent.	Fiber. Per Cent.	Carbo Hydrates. Per Ct.	Fat, Ether extract Per Ct.
Corn	10.6	1.5	10.3	2.2	70.4	5.0
Corn Meal	15.0	1.4	9.2	1.9	68.7	3.8
Corn Germ	10.7	4.0	9.8	4.1	64.0	7.4
Hominy Chops	11.1	2.5	9.8	3.8	64.5	8.3
Gluten Meal	8.2	0.9	29.3	3.3	46 5	11.8
Wheat	10.5	1.8	11.9	1.8	71.9	2.1
Middlings	12.1	3.3	15.6	4.6	60.4	4.0
Shorts	11.8	4.6	14.9	7.4	56.8	4.5
Oats	11.0	3.0	11.8	9.5	59.7	5.0
Oats—Rolled	6.3	3.2	16.0	.....	67.8	6.7
Oat Hulls	7.3	6.7	3.3	29.7	52.0	1.0
Buckwheat	12.6	2.0	10.0	8.7	64.5	2.2
Millet Seed	14.0	3.3	11.8	9.5	57.4	4.0
Kaffir Corn	9.3	1.5	9.9	1.4	74.9	3.0
Dried Blood	8.5	4.7	84.3	.....	.....	2.5
Meat Scraps	5.4	2.4	58.4	.....	.....	33.8
Animal Meal	5.1	28.6	40.0	.....	10.1	16.2
Cut Green Bone	29.7	24.0	20.2	.....	.....	26.1
Skim Milk	90.4	0.7	3.3	.....	4.7	0 9
Potatoes	78.9	1.0	2.1	0.6	17.3	0.1
Hens' Eggs	73.7	0.8	15.0	.....	.....	10.5

It is not a difficult matter to supply the essentials I have described. If one is equipped to carry out all these details all will run smoothly, but neglect any, and trouble, labor and anxiety begins. The labor is increased while the profits decrease.

DISEASES AND OTHER TROUBLES.

There are practically no diseases to which ducks are subject. They can be sickened and killed either through ignorance or carelessness by compelling them to submit to improper food or conditions, and when from any cause you have induced sickness don't waste time or feed on the affected ones; use a hatchet at once, it is the cheapest way out of it, for when once affected there is no profit to be made out of them as market birds, nor have you any time to fuss with and doctor them. Their development and growth would be checked and they would never fully recover.

During the early spring when the days begin to grow quite warm at noon and it is necessary to open the windows (but still cool enough at night to make it necessary to keep the fires going in the brooder house) close the front of the hovers to shut them out during the warm portion of the day, otherwise they will lie under the pipes and allow themselves to become half roasted. Their blood seems to dry up. The next day they lose the power of balancing and stagger around like drunken men. Their eyes and nose become watery and the down about the eyes gummed. It has induced distemper or catarrh which is contagious and is communicated by the discharges from the eyes and nose. Most of those affected will die and those that survive will be of little acount. They will never be able to walk steadily; some will have crooked necks or backs, and there is no profit in keeping them. Diarrhea is another source of trouble. In the brooder house it is often caused by an excess of scrap and can be promptly checked. In the nursery what is called, and to all appearances is, diarrhea, is really a clogging of the vent caused by feeding hard boiled egg or an excess of bran and is always fatal. The solids are retained and the liquids pass, and the appearance of the bird justifies the name. Remove the cause and you have the remedy.

FEATHER PULLING.

One of the most serious evils we have to occasionally contend with is feather pulling. It is claimed that crowding them too closely in the pens induces it. My experience does not justify this conclusion. I attribute it wholly to a desire of the birds to gratify its craving for the elements it can obtain in the quills it pulls from its neighbor and devours. It is hard to rid them of the habit when once begun. Catch the guilty ones, which is best done right after feeding, when they are playing at the water trough; take a sharp knife and shave the point of the bean on the bill off evenly so as to prevent them from taking a strong grip on a quill. Place them in a pen by themselves. Now correct your feed at once. There is a lack of scrap and green stuff in the feed; increase your proportions and you will see no new cases, but those who have acquired the habit never forget it until their companions are full feathered, when they can't practice it successfully. I have seen five thousand ducklings on a single farm almost denuded, causing serious loss to the owner as it takes many dollars worth of feed to grow a crop of feathers on that number of ducklings and at the same time to put flesh on them, and if forced to grow two crops of feathers the flesh must suffer and the scales will reveal the extent when you come to market them. The importance of keeping the ration properly proportioned for the specific purpose it is intended to accomplish is very evident.

NERVOUSNESS.

Another cause of much loss of flesh is their nervousness at night. On dark nights those half grown and over become exceedingly nervous and restless, and if one becomes frightened he soon starts the entire pen into a stampede. The adjoining pens follow and if left to chase up and down all night some will be trampled to death and many pounds of flesh be quacked away. This can be prevented by keeping lanterns burning in the yards and buildings at night. Light them at sunset and never move around among them after dark while carrying a lantern, as moving shadows set them wild.

Allow no dogs to run at large in the buildings or yards. Avoid all unnecessary passing among them yourself, although they soon learn to know their attendants and are not disturbed by them especially if carrying a feed pail; the less ten them to standard weight. Move slowly and deliberately; they are disturbed the better. I have known a sudden fright to so affect a pen of ducklings that it was impossible to fatten them to standard weight. Move slowly and deliberately; make no sudden turns or leaps. Visitors should be forbidden passing through the buildings or along the pens. If you intend converting grain into duck meat allow no nonsense of this kind to offset your feed. If you are running an exhibition it is another matter, and it is presumed that the audi-

ence are willing to remunerate you in some way for the loss they cause you.

There is practically nothing we have to contend with when proper feed and care is given. If any refuse to come to the troughs eagerly at feeding time, the probabilities are they will either be ready for the next feed or dead. There is no symptom whereby the ailment can be definitely diagnosed. When one simply refuses to eat it may be from one of a number of causes and it is impossible to offer any relief. Remove the affected bird to a pen by itself. Feed light and omit the beef scrap, add a little powdered charcoal and a few days will usually work recovery. Bowel trouble is the principal evil liable to affect large flocks. This is due to the excess of fat in the beef scrap. We should be able to feed the animal protein in such proportions as are needed without encroaching on the danger line on account of the fat associated with it. Until we are able to obtain scrap free from fat we can not expect to do this.

Watch your stock closely. Guess at nothing, but know to a certainty the daily condition of the flock and rest assured that if they do not come up at feeding time and act as if they were half starved there is something wrong and you must locate it quickly, or when laying has once begun it will not do to make any mistakes. If thrown off their feed at this time it means a serious loss in egg production and it may take some weeks to get them back. Never allow your supply of scraps to become exhausted; omitted for two days, and egg production will drop to one-fourth of what it was and it will take ten days to recover after it is again supplied.

Stock Ducks.

There is a wide difference of opinion among breeders as to which type of the Pekin duck is preferable or most desirable to encourage and develop. Some prefer the short bodied, deep keel—the deeper the better—type, others the long bodied type. The writer prefers the long body with an average depth of keel, believing it to be the most desirable from the market point of view. Too great depth of keel necessitates the flattening of the breast bone when packing for market. If this were not done its appearance would indicate a lean, underfed condition to the casual observer, and as appearances have much to do with prices, the utility question is primary.

The breast of a dressed duckling should be rounded and plump and it is preferable that it show a depression in the center instead of a ridge. The breast carries about all of the meat and an extra slice or two on each side is an important consideration to the buyer.

SELECTING AND FEEDING BREEDERS.

In the preceding chapters nothing has been said regarding the selecting of the breeding stock for the ensuing season. Right here is where the foundation is to be laid. The entire superstructure of the successful and profitable duck ranch rests on this foundation. Old overfed, neglected or degenerate stock can not profit the owner. The eggs are few and weak or infertile. The young are weak and sickly and few ever reach the market. It is therefore of the utmost importance that we lay the foundation in the best possible manner.

From the April and May hatches, when the growing ducks are six or seven weeks old and before they are placed on the fattening feed, select the breeding stock. Pick out the most promising and precocious birds as this means quick maturity and heavy weight for market purposes, and this should be the first consideration. Wide bodies and small heads are desirable, but weight above all other points is important on a market form. Instead of now placing your selection in small pens on rich food, they should be turned into a large pasture in which water and shade are abundant. They should then be fed morning and night:

Seven measures bran.
Three measures corn chop.
Five measures cut green stuff.
Wet as indicated for previous feeds.

If there is no grit available in the pasture, supply it. If they have access to a stream of water they will secure all the animal and insect food necessary. This ration is bulky and they may be fed liberally, but try and keep them hungry and active during a greater portion of the day. The more miles they travel the stronger their muscles become and the tougher, more hardy and vigorous they will be when transferred to the breeding pens. They should be kept down in feed sufficiently to make them ravenous at feeding time, not only for the reason just given but also to discourage laying during the fall months, as these early eggs are too far in advance of the season to be of any andvantage; are mostly infertile and tend to affect the vitality of those produced later on when eggs are desired. Exercise and plenty of it is of the greatest importance while on the summer range and judgment must be used in feeding, and it must be so regulated as to prevent lounging around the feed troughs, which they will do if their wants are all supplied there. The feed is bulky and ordinarily they can be given all they will eat of it. In two hours they will be hungry and then the exercise should begin. A stream of water is not a necessity, but it is a great advantage and the strongest point in its favor is the exercise it induces. This word Exercise should always be printed in capital letters in all poultry literature. Its importance can hardly be overestimated. It means appetite, digestion and assimilation. These wheels all fit into each other and work together. Remove one and the machine stops. About the first of November select the drakes you will need and place them twenty-five to a pen in the breeding pens and begin at once feeding them the ration given below. This gives them a necessary and desirable start. The ducks respond more quickly to the forcing feed than the drakes and if started together the early eggs will not exceed fifteen per cent fertilized. This plan will change the result very materially. On the 15th of November mate up all the pens, placing twenty-five ducks and five drakes in each. More than this should be avoided. Less may do better, but it is not practicable on large plants where from one to two thousand breeders are kept. The additional labor it would necessitate would be a serious objection and would offset what slight advantage might be gained.

FEEDING FOR EGGS.

We now begin feeding for eggs. This should be approached gradually, that is work up to the given ration in four or five days and particularly as regards the beef scrap, or bowel trouble may ensue. The following feed has proven the very best combination and the best balanced egg ration the writer has ever used. It is compounded with the intention of forcing the duck to lay a reasonably large number of eggs even at the expense of her vitality, for after she has served me for one season I have no further use for her and she goes to market as soon as laying is over.

Every morning and evening feed the following:
Five measures corn chop.
Five measures bran.
Two measures middlings.
One and one-half measures beef scrap.
Three measures boiled vegetables.
Three measures cut green stuff.
Five per cent sand.

Wet this, as all the other composition feeds, to a crumbly state. Keep a box of sand and one of oyster shells in each pen and an abundance of fresh water. In exactly three

weeks you should begin to gather eggs, a few at first, but rapidly increasing in number. When they have fairly started add one measure of corn chop and cut down one measure of bran. Notice particularly I say corn chop, not corn meal. The reason for this is easily understood. Ducks in common with other fowls have a gizzard which is equipped with strong muscles, and it is intended to perform certain duties. In order for the fowl to enjoy perfect health and to perfectly employ all of its natural functions, all its organs must be employed for the purpose and in the manner intended by nature. The creator gave the gizzard the power to do certain work. The instinct of the bird furnishes it with this work in its selection of food, and its physical powers are maintained at a high standard when left to its own instincts or thrown on its own resources. Give the gizzard nothing but mush to grind and, like Othello, its "occupation is gone" and debility must result. For feeding purposes we prefer the long slatted trough which is really a coop without a top. It enables the ducks to reach in and get the feed and yet not trample upon and scatter or waste feed, or crowd each other. Many hundred pounds of feed are wasted every year through feeding ducks in flat or V open troughs, especially in wet weather when it is tramped into the mud and lost. A careless feeder enters the pen with a pail of feed; he finds the ducks all on the trough waiting for it; scatters it over their backs and as he turns to leave they flap a third of it into the mud. This means a serious loss on a large farm.

DUCK HOUSES ON RELIABLE POULTRY FARM, QUINCY, ILL.

THE LAYING HOUSES. The laying houses must now be considered. These can be very cheaply constructed and at the same time answer every requirement. Not a dollar need be spent on ornament. What is absolutely essential is a dry, well bedded floor, a tight roof and barn siding with battens on the outside. A 3x3-foot glazed sliding sash, a 2x3-foot drop door and a door to enter and clean out at. The pen should be about 12x12 feet, and need be no higher than necessary to permit cleaning out. Nests are unnecessary and only in the way. They prefer to scoop out a nest in the litter. It does not matter which way these houses face as they are occupied only at night. We object decidedly to feeding and watering in the house. When it is all done on the outside, which it can be in most localities, the bedding can be kept dry and by frequent light additions the necessity of cleaning out can be reduced to two or three times during the laying season. This saves labor, which is a very important item, and causes no inconvenience whatever. If once the bedding becomes wet it should be removed immediately. We prefer to build these houses in pairs, thus giving the yards more width and less length. A large yard for breeding ducks is of no advantage unless it is so extremely large that they can't keep down the growth of grass, and this is unnecessary as it is preferable to supply the green food in the mash. Breeding ducks unfortunately lose all desire for exercise. The liberality with which they must be fed induces laziness and they will be very indifferent to exercise until about two hours before feeding time, when they begin to make their wants known.

Feed at regular hours. Sunrise and sunset are the best hours until the days grow too long, then six o'clock night and morning.

If your ducks are all young, as they should be, there will be no danger of this feed making them overfat, but if there are any old ones among them there is danger that it might. This does not apply to drakes. We insist on young ducks, but have no objection to yearling drakes, and maintain the theory which we have also proven in practice that after a duck has been driven to the enforced production of from one hundred to one hundred and twenty eggs in one season her vitality is impaired and her second season will be a disap-

pointment. There should, if possible, be a swimming pool in each yard. This is not absolutely necessary, and as good results are attained without as with it, only with more difficulty, but as they enjoy it and their appearance is greatly improved their natural desires should be gratified if possible.

If the birds have been given the summer care as suggested they must not be expected to develop into extra large, heavy specimens suitable for the show room, but should be rather under the standard in weight and in no case over it for the best results. If the right selection has been made the qualities and tendencies of the parent will be transmitted to the progeny, and it is not necessary or desirable that the parent shall have been developed to its fullest extent in weight in order to transmit the tendency. The larger the duck the larger the egg and the poorer its hatching qualities. There is an excess of albumen—too much watery element to be elaborated, more than the average embryo can successfully dispose of.

Those who in starting a duck farm purchase their stock ducks, should select the medium sized, never the largest specimens, and yet nine out of ten make this mistake and pick the largest. They also are compelled to buy stock that has passed through the fattening process, as most growers throw out the breeding stock at killing time. If compelled to buy such stock, do so as early as possible in the summer and then care for them as I have described and they will go into the breeding pens in fairly good condition.

Before closing this subject I wish to emphasize the principle of economy not only in labor but in feeding. It would surprise many readers to see the quantity of feed wasted on the large duck farms. Careless feeders scatter large quantities in the mud and filth. They often, when distributing with a shovel from a car, place more in some pens than will be consumed; this is trampled under foot and wasted. There should be a hog pen on every duck farm to which all waste feed scraped up and all discarded eggs can be carried. There are many pails full of scrapings accumulate in the brooding house and breeding pens and sweepings of the feed room that can be converted into pork. Stop the leaks.

H. E. MOSS.

HOW TO FEED AND CARE FOR DUCKLINGS.

BY GEORGE H. POLLARD, POLLARD'S POULTRY FARM, SOUTH ATTLEBORO, MASS.

IN RESPONSE to your request that we give you a few ideas concerning our methods of feeding and raising Pekin ducks, we feel it is right we should first explain that we do not raise so many thousands yearly; that there are others who raise as good, and if we should stop they would doubtless continue to successfully raise them. With these facts clearly understood, we can proceed without being charged with seeking free advertising.

We find in raising ducks there are five essentials—muscle, water, food, shade and grit—and the greatest of these is muscle. Any one who has tried it will cheerfully testify to this truth. In feeding and raising young ducks, begin with the breeding stock. Strong, vigorous breeders mean healthy, wide-awake ducklings, needing a minimum of attention and easily raised. This being the case, we give the breeders a large grass range, with plenty of shade and running water —believing nature webbed their feet for a purpose—though they can be successfully raised without water. To each five ducks allow one drake and mate about thirty in a pen. Later in the season, about the middle of May, remove one drake from each pen. Feed night and morning what they will eat of a mixture of three parts each of Indian meal and wheat bran, one part each low grade flour and beef scraps, making sure it is beef scraps and not a poor quality of fertilizer, the whole salted slightly and thoroughly mixed, not too wet, with cold water. Never cook the food, except in winter, when it may be mixed with hot water. Do not feed at noon, as ducks on good grass range do not need it. If without grass range, feed all the green food they will eat each day—fodder corn, rye, grass, clover, or anything they will eat. Have water in pails or troughs convenient to feeding places at all times of the day and night, also oyster shell and grit, and do not forget the shade, they must have it.

In winter vary the fare by a liberal allowance of boiled turnips, mashed in with grain, say one-third turnips, every other morning, and with cabbage chopped fine or any other green food that can be obtained, fed at noon.

After hatching, which we do altogether with incubators, leave the ducklings quiet from twenty-four to thirty-six hours, according to the season when hatched, after which they may be put in a brooder heated from ninety to ninety-five degrees in the center of the hover—ninety-five degrees in winter—placing each carefully under the hover.

The food is prepared of two-thirds wheat bran and one-third Indian meal, wet to a crumbly mass with milk, either skimmed or whole, but not cooked. Cover floor under hover with chaff, or fine shavings, and in front of the hover, for two or three feet, with fine gravel or sand. Six or eight inches from front of hover place small troughs or dishes containing food—slightly sprinkled with sand the first time —and a fountain of luke warm water. The fountains are galvanized iron cans, eight inches in diameter and twelve inches deep, inverted in tin pans ten inches in diameter and two inches deep, and the water is kept near the top of the pan. After all this, simply keep the ducklings warm and let nature work. If they are worth raising they will gradually get out from under the hover, and it is astonishing how quickly they will begin to stow away the food and water. Beyond watching for the first few hours that none get away from the hover and become chilled do not fuss with them and do not try to fill them up with boiled eggs and bread crumbs.

Keep food and water before them all the time for the first three days—and water all night, sure—after which they may be fed every three hours till seven or eight days old, when four or five feeds a day will be enough. After the fifth day they are generally alive to stay, or are dead, and they may be fed five per cent beef scraps instead of milk, or both. At two weeks old make their feed of one-half meal, one-half bran and ten per cent beef scraps, which may be increased to fifteen per cent scraps, with three parts each of bran and meal and one part flour at three weeks.

Carry them on this food till killing time—ten to eleven weeks—not changing for any heavier or more fattening food, as advised by many. After the fifth week feed only three times a day. Feed green food or not, as is most convenient. If intended for breeding, it will be good for them, but is unnecessary for market ducks.

For best results, yard in flocks of from fifty to seventy-five and give plenty of yard room, never less than thirty by fifty feet for fifty birds of five weeks old or over. In short, keep only healthy, vigorous breeding stock. Have shade and an unfailing supply of water and grit. Feed all they can be made to eat, at regular intervals, and do not skimp the meat scraps. Kill at ten or eleven weeks old and receive the reward promised for work well done.

GEORGE H. POLLARD.

INDIAN RUNNER DUCKS.

Very Prolific Layers, with Remarkably Hardy Constitutions—A Variety That Thrives Under Conditions Suited to Broilers.

BY R. B. DAYTON, REMSENBURG, N. Y.

PREVIOUS to 1895 wonderful stories reached this side of the Atlantic about a species of duck that would lay the year 'round, grow rapidly and when dressed for market have a most attractive appearance. In fact, from the vague reports reaching us from their English home, one would judge that the ideal duck had been found. In 1895 the writer secured a number of these wonderful In-

INDIAN RUNNER DRAKE AND DUCK.

dian Runner ducks. Just here let me say a word as to their home. Although grown extensively in England, their original home was in India; hence, the Indian Runner. They earned the term "Runner," as they literally are runners. Their strong legs, set well back, with their erect carriage, make it possible for them to move with great rapidity, there being no trace of the awkward "waddle" of the common duck.

There are two distinct strains, one black and white and the other fawn and white. The black and white, while possessing many of the good qualities of the breed, are not as distinct in shape and marking as the fawn and white; the black pin feathers seriously detract from their market value, hence we confine ourselves to the fawn and white, of which the accompanying cut, a photograph, represents a typical pair, the drake, very erect, strong and alert in every motion, with firmly set head and bill, as they delight to forage for stray grubs and worms in the tangled grass and weeds. A cap of steel blue gives them a most attractive appearance. The ducks are not quite as large, often showing more white, which, in fact, is a variable quantity in both the drakes and ducks.

The English breeders claim 225 eggs per duck each year. One hundred and ninety-two eggs per duck was the average, however, for the past two years of the flock in question, which is certainly a most phenomenal record, being not the record of one or two picked birds, but that of a large flock.

By careful experiments it has been proved that they mature very rapidly, but it does not seem possible to grow them successfully in crowded quarters, as is so often attempted with Pekins.

The Indian Runners, when grown, are easy keepers. The flock, a photograph of a portion of which is here reproduced, the past two months has consumed two-thirds the amount of food required to keep a flock of Pekins of the same number in good condition, the Runners laying continuously throughout the time, while the Pekins did not. Experience seems to prove that the size of the flock makes little difference in the number or fertility of the eggs produced, provided only that plenty of room be given. In mating up the flock about ten ducks to one drake has been found the most satisfactory. The Runners seem to care little for a large body of water, but when kept for eggs alone find no small part of their food foraging over their range.

Another, and by no means the least of the Indian Runner's good qualities, is the remarkable way in which they stand shipment. As an example of one of the many instances coming under our notice we cite this: A trio shipped to us from England last April, after a long and stormy passage, commenced to lay six days after reaching our yards. This speaks well for the care with which they were shipped, but it is also a striking example of the Indian Runner duck's hardy character.

PAIR OF YOUNG INDIAN RUNNER DUCKS DRESSED FOR MARKET. WEIGHT, 10½ POUNDS.

It has become a well recognized fact that the best results can not be obtained when ducks are grown in a brooder regulated to insure the best results with broilers, and on the large plants a separate house with an expensive heating apparatus is provided for both chicks and ducks. This, however, is not practical for the small breeder, who is compelled to abandon the culture of ducks and thus be deprived of a substantial source of income. After a close study of

the Indian Runner Ducks it seemed feasible to us to grow them with broilers, and a trial was made. The brooder used was one in constant use in a broiler house with a capacity of 1,700, the heating apparatus being of the regulation type of hot-water heater, regulated to a temperature of about eighty-five degrees. One hover was used for the experiment and the temperature was regulated solely with regard to the broilers, of which the house at the time contained about seven hundred. The temperature of the room outside of the hovers varied from seventy degrees on clear, warm days to as low as forty degrees on others.

The results obtained were far above our expectations. The same food was given the little Runners as was fed to the chicks next door, and a fountain, such as was in use with the chicks, served them for drinking. In fact, as far as it was possible the same conditions were observed in all parts of the house. It was soon an evident fact that the chicks were beaten on their own ground, for the little ducks demonstrated that whatever might be the requirements of ordinary ducks these Runners had just what they wanted and they proceeded to grow. It is too early as yet to say what the market price will be, but they are now much heavier than chicks of their age and they are still growing. So far as we have been able to observe they eat no more than chickens of an equal age, and from present indications they will weigh several times as much when dressed for market.

This experiment is of special value, for it opens a new field to the fancier who has one or more brooders that he uses in the early spring and summer, and for nine months of the year have been lying idle, bringing him no returns. The Runners are particularly adapted to the market poultryman's needs, as their wonderful laying qualities insure an almost constant supply of eggs. Their small size when first introduced into this country was much against them. This, however, by careful selection has been almost entirely removed. The accompanying cut taken from a photograph of a pair weighing ten and one-half pounds gives but a very inadequate idea of the rich yellow flesh, very firm in texture, and the full, deep breast.

The past summer experiments were made with the Runner eggs hatched by hens, the ducklings being allowed to run with the hens, or rather we should have said the hens being allowed to run with the ducklings, for the poor hens had a sorry time. Aside from a little hovering at night and on stormy days, the ducks had no use for their foster mother and she was left to cluck to an imaginary brood while they foraged over the field for flies and worms only to return at feeding time. If a wire pen can be arranged to confine them we can see no reason why they could not successfully be grown in this manner in warm weather, or in localities where the climate is uniformly mild. We, however, lost a number from their wandering too far away from the hen and becoming chilled before they could find their way home, but a number were successfully grown in this manner.

R. B. DAYTON.

A FLOCK OF R. B. DAYTON'S INDIAN RUNNER DUCKS.

FEEDING DUCKS FOR MARKET.

The Manager of the Poultry Department of the Agricultural College at Guelph, Ontario, Describes His Method.

"We purchased a few sittings of duck eggs in the spring for the purpose of having ducks for experimental feeding. The Pekin and Rouen varieties were selected. We hatched seventeen—eight Pekins and nine Rouens. One of the Pekins got killed when young. For the first two weeks we fed equal parts by measure, cornmeal, wheat bran and middlings, having added enough scalding water to make it crumbly, but not porridgy, and fed five times a day, but no more at a time than they would eat up clean. For the next four weeks, two parts wheat bran and five parts middlings constituted their ration, and after that the same mixture was used without scalding. Grit and sharp sand were placed in a vessel containing water, so that they could have access to it at any time. No water except for drinking purposes was supplied to them.

"We weighed the entire flock when six weeks old, with the following result: The seven Pekins weighed thirty-nine pounds, being an average of five pounds and nine and one-seventh ounces each, and the nine Rouens weighed thirty-six pounds, or an average of four pounds each. When they were ten weeks old, we again weighed the entire flock and found that seven Pekins weighed fifty-nine and one-half pounds, or an average of eight and one-half pounds each, and the nine Rouens sixty-three pounds, or an average of seven pounds each.

"This experiment in feeding ducks teaches us that by selecting the right varieties and feeding them on the right kinds of food, you can get them on the market when six weeks old. We also find that water is not needed except for drinking purposes, but is a hindrance to the growth and fattening of ducks. We selected two of the best varieties of ducks for market purposes, and while they have the same standard weight when fully matured, the experiment plainly shows that the Pekins can be made to take on flesh faster than the Rouens. We find on our markets ducks that are fully matured and six months old not weighing over four or five pounds, and we venture to say that such birds do not pay for the food they consume, let alone the trouble for caring for them. No ducks should be kept longer than ten weeks, as they can be placed on the market at that age and sold at a good profit. Ducks that are intended for breeding purposes should not be fed on a fattening ration, so as to weaken them by too much forcing. They should be selected when about six or seven weeks old, when their sex can readily be seen and the most perfect specimen selected."

L. G. JARVIS.

INCUBATORS AND BROODERS.

Selected from the "Incubators and Brooders" Department of the Reliable Poultry Journal—A Department Set Apart for the Use of Its Readers.

Feed and Care of Ducklings.

Hagerstown, Ind.

Editor Reliable Poultry Journal.

Kindly tell us what you think is the matter with our ducklings. They get weak and can not walk, but stagger about. Some of them die in a short time, while others live for ten days or two weeks, but most always die. We feed them three times a day on coarse cornmeal and bran, and give plenty of drinking water, but none to swim in. We have them in lots thirty feet square, about sixty in a flock. Some die when a week old, others live to be five or six weeks old before taking the disease. Have lost over one hunderd, and would like to have a cure as soon as possible.

F. A. HARTER.

We wrote Mr. Harter direct and trust that what we told him has been of some benefit. In stating what he feeds and how he cares for his ducklings, he says nothing about shade. Extreme hot weather will kill young ducks. Chicks and ducklings should be placed in the shade, and, if possible in an open space where they can get any breeze that is stirring. Under a tree or in an orchard is a good place.

Little ducks should not be raised on cornmeal or bran exclusively. Corn, especially, is a strong food, and must be fed rather sparingly. Half at least of their food should be green food, like cabbage, lettuce, kale, beet tops, etc. Little ducks and chicks are fond of boiled potatoes. On the Reliable Poultry Farm we use hundreds of bushels of cull potatoes each year, buying them from market gardeners and farmers at twelve and one-half and fifteen cents per bushel. We boil them and feed them whole or partly mashed, allowing the chicks and ducklings to pick them to pieces. We salt these potatoes to taste.

Ducklings, like little chicks, must have a supply of good grit. It is best to buy the manufactured article, for growing ducks have to be kept in narrow limits in order to do well, and they very soon exhaust nature's grit supply on the small piece of ground they range over. They eat grit readily when first given them, showing that they need it—in fact, must have it.

Hatching Duck and Hen Eggs Together.

Southold, L. I., N. Y.

Editor Reliable Poultry Journal.

I notice in the May number of your valuable journal a subscriber asks if it will do to hatch hen and duck eggs at the same time in an incubator. I also note your comments, with request for reports from parties who have had experience in the matter. I wish to say for the benefit of your subscribers that I have done it right along for years and never experienced any difficulty in securing a good hatch, having brought off 90½ per cent from a tray of hen's eggs in same machine with a tray of duck eggs. I have hatched thousands of duck and hen eggs together and have found that they require the same conditions as to moisture and ventilation.

I generally start three or four machines at once and when testing out keep as many of the machines full as possible (a full tray will hatch better than a tray partly full). After the test one of the machines will lack one or two trays of being full, so on the seventh day I fill the empty trays with hen eggs and lay a quarter of an inch strip of wood on each of the tray slides or cleats. This raises the tray so that the top of the hen eggs are on a level with the top of the duck eggs, consequently they both get an even amount of heat, and being in a tray by themselves do not interfere with the turning and airing of the duck eggs.

If the hen eggs are placed in the same tray with the duck eggs, they not only run through the hatch with a degree too little heat, causing a deferred hatch, but interfere with the proper airing or cooling and turning of both.

If your subscriber will work on these lines, he will have no difficulty in securing a good hatch, other conditions being favorable, from hen and duck eggs in the same machine. In regard to the amount of moisture and when to apply it, everything depends on the location. Here on Long Island I never add moisture until after the eggs begin to pip.

A. H. TOPPING,
Manager Southold Poultry Farm.

More About Duck and Hen Eggs.

Editor Reliable Poultry Journal.

In the May issue of the R. P. J. a correspondent asks if hens' eggs and ducks' eggs can be successfully hatched at the same time in an incubator. I have just been experimenting in that line, and as you invite your readers to relate any experience, I will give results. On April 14 I put in my incubator, a VonCulin, twenty-eight Pekin duck eggs and exactly one week later 162 White Leghorn eggs. On the seventh day after setting the duck eggs I tested out four that were perfectly clear, and on the thirteenth day I took out three more. The hatch is completed and I have thirteen ducks, seven eggs that did not pip, and one duck died after the egg was pipped.

That I might know how the eggs hatched in the incubator as compared with setting them under hens I also set two hens at the same time, one with seven duck eggs and the other with five. These forty eggs were all from the same flock of ducks. One hen hatched three and the other two. Thus you will see that the eggs hatched at about the same ratio, and I consider them as not running very fertile.

Now as the hens' eggs, I made the usual two tests and took out thirty-four eggs. Out of the remaining 128 I have 119 sprightly little chicks and one that came out a cripple, which I destroyed. I consider it an unusually good hatch of hens' eggs.

Taking this experiment as a basis upon which to judge, I do not hesitate to say that hens' eggs and ducks' eggs can be successfully hatched in an incubator at the same time, but I would always recommend putting in the duck eggs one week before the hens' eggs, and if the machine has two trays, put the eggs in separate trays. If only one tray I would put a partition between the eggs. It will keep the ducks from floundering around on the chicks while hatching. I would very much like to know the experience of others in this line.

FRANK C. JONES.

A WATER-FOWL ARTICLE.

By a "Water-Fowl Crank"—One of Illinois' Best and Most Successful Breeders Tells What He Thinks of Geese and Ducks.

BY M. W. SUMMERS, CURRAN, ILL.

SOME of the poultry fraternity call me a "water-fowl crank," but, crank or no crank, I have tested for years the breeding of almost every variety of the web-footed tribe with both pleasure and success, and am free to profess my partiality for them. I find that water-fowl are not heir to so many afflictions and diseases as are other members of the feathered tribe; neither are there so many enemies lying in wait for these birds as for others. For these reasons, I feel more enthusiastic and more determined than ever each year to press on with the "waddlers." They are so easily confined and managed, it seems to me that every fancier should have at least a few varieties along with the chickens he breeds.

White and Brown China Geese—Take for instance, the White Chinese Geese. What could be more gracefully beautiful than these swan-like birds playing and diving in the water? They are more symmetrically graceful than the swan, are of medium size, have large, orange-colored webs, pure white plumage, and always attract much attention. Their peculiar trumpet-like call is quite unique, and sounds much like a challenge. In my breeding of the birds, I have mated my flocks to produce webs as large and smooth as possible, and have some specimens that are a curiosity in this respect.

The Brown Chinese variety is identically the same as the White in habits. They are somewhat larger, their plumage being of several soft shades of brown, and their webs black, with dark-colored feet. They do not possess so much grace as their fair sisters, but we have found them somewhat easier to raise. Both varieties are great layers, commencing early in the season. We have had them lay as early as Christmas. Their feathers are not surpassed, even by those of the wild goose.

The African Goose—This variety is rare. They are very similar to the Brown Chinese, are larger and have a dewlap under the throat. Their habits are much the same as the Chinese.

The Embden Goose—This mammoth variety is pure white in plumage, and excelled by none in size. They are fairly good layers and are much sought for by the trade. Until recent yards the Embden have been comparatively scarce, but have been in such demand that fanciers have taken special pains to produce them until now they are quite common.

The Toulouse Goose—The Toulouse is rivaled in size only by the Embden. They grow to immense size, are of very docile disposition and are, as every one knows, good layers and are easy to raise.

VARIETIES OF DUCKS.

The great trade on ducks has been in the Pekin. Their plumage being of creamy white, with bright orange-colored bills, a flock of these fowls are very beautiful. They are great layers, and while not so good as some other varieties for table use, are the leaders as feather-producers. Good specimens of this breed, when fat, weigh as much as nine to ten pounds for female, while adult males sometimes weigh as high as twelve or thirteen pounds.

The Rouen Duck—The Rouen is a close rival of the Pekin. They grow to great size. The drake of this variety has a lustrous green head, with body of ashy-grey color. The female is brown, her plumage resembling very much that of the Partridge Cochin hen. I find them excellent layers and hardy.

The Muscovy Duck—The Muscovy is one of the oldest varieties, and yet many visitors to my farm do not know what they are. I have a soft spot in my heart for this queer bird. It is an oddity. In habits they are entirely different from all other ducks. The Standard calls for them to be black and white in color, the dark feathers to have a deep, lustrous sheen in the sun. In the finest specimens the dark color prevails. They have a peculiar head, being red on the sides of the face and with a crest on top, which can be raised or lowered at pleasure. The male bird grows to immense size, while the female is medium. These ducks are the best table fowl of any of the water-fowl fraternity. They are not so good for feathers as some other varieties. They make for themselves beautiful nests in curious places. An old hollow log or stump, or frequently the hay-loft, are the places they seem to favor most. Last year we had one nest in the hollow of a living tree, about five feet from the ground. The nest is daintily and cunningly lined with the softest, fluffiest down, from the breast of the female, and then they proceed to business in dead earnest. They stand without a rival as layers, often continuing as late in the season as October.

Another peculiarity of the Muscovy is that its eggs take five weeks to hatch, but when a duckling does come forth he is fully determined to live, and usually does so. They are unquestionably the easiest fowl to raise that lives, in fact, we do not try to raise them, but let the old ones attend to that part of the business themselves. We have had an old mother duck hatch as high as sixteen young ducklings and raise every one of them. They will not mix with other ducks, and as stated above, are fine for table use. They raise themselves, so why not have some Muscovys on the farm? They will pay their way. They do not eat as much grain as other ducks do. Long live the Muscovy.

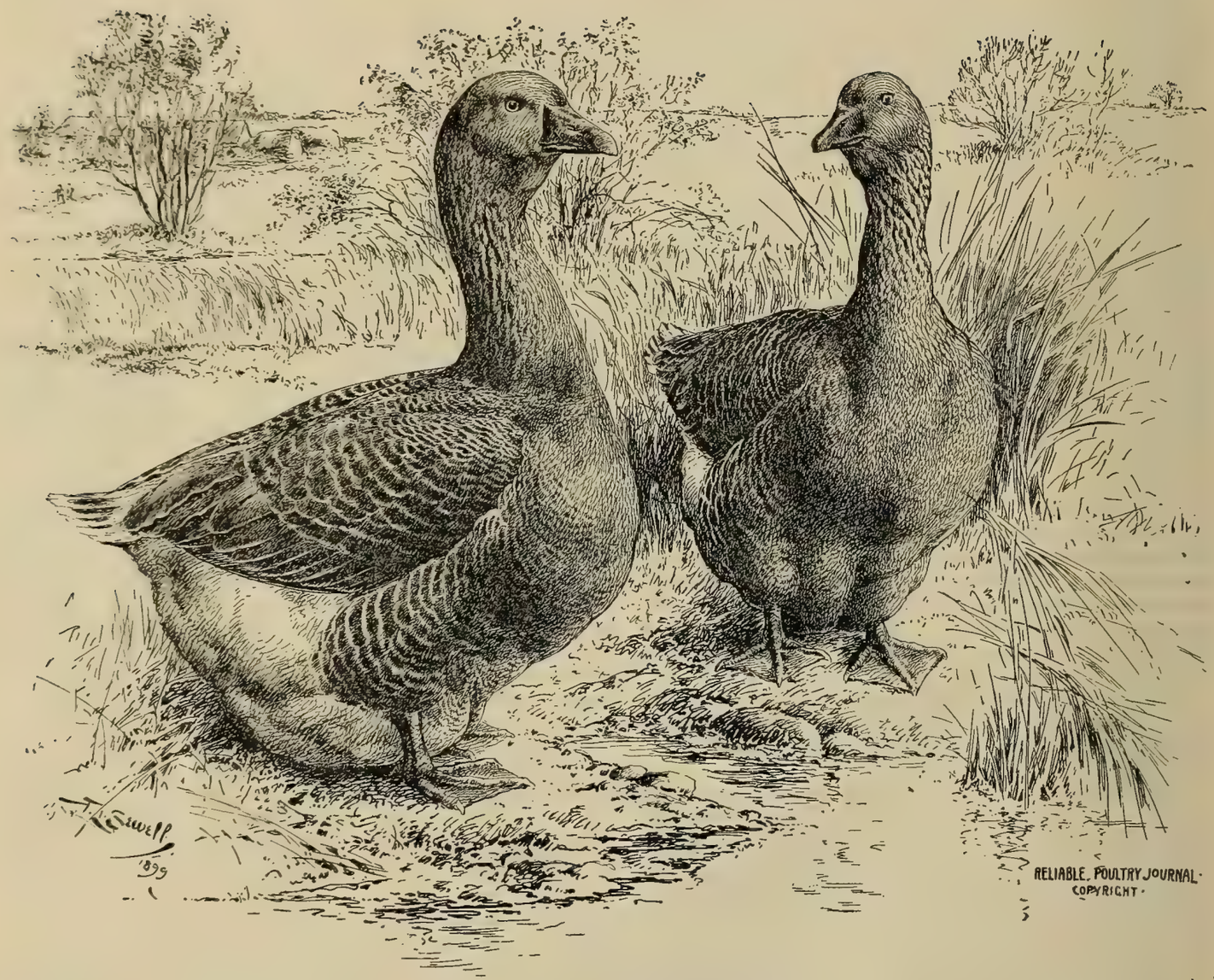
The Aylesbury Duck—This variety is much like the Pekin, only that their plumage is pure white, instead of having a creamy tinge. The beak is also flesh-colored. They are large and in every way equal to the Pekin.

The Call Duck—There are two varieties, the white, and colored or gray, the latter being the most handsome and popular. They are the bantam duck and should be bred as small as possible. The colored are precisely of the same colors as the wild Mallard duck. They are good feeders, quick movers and certainy a thing of beauty, if of no vast profit.

The Cayuga Duck—I must not overlook Cayuga ducks. They are quite odd in two respects, their plumage is black as midnight, except that the male bird has a greenish tinge on head and neck. Their eggs are also of a dark color and frequently black as the duck itself. The bird is of good medium size, with a broad and very plump body. Their feathers are of a fine quality and they are also excellent table fowls. They were originally a wild duck, but have been domesticated, and I believe they are fast growing in favor and will some day be one of the leading varieties.

Friends, don't be afraid of the water-fowls, they will doubly repay you for all you do for them.

M. W. SUMMERS.



TOULOUSE GEESE—MALE AND FEMALE.

BREEDING TOULOUSE GEESE.

How to Manage Geese With Success and Profit—Care of the Breeders—Feeding the Goslings—Diseases of Geese —Full Description of the Toulouse Goose and Gander—Geese Breasts and Livers.

BY CHARLES F. NEWMAN, HUGUENOT, STATEN ISLAND, N. Y.

THE Toulouse goose is in my estimation the most profitable goose to raise. I have made many trials with others, but I now prefer the Toulouse. It grows the largest, matures the quickest, is not so much of a rambler and flyer as other kinds and as it does not take so readily to water as other varieties, it grows more rapidly and accumulates flesh faster. They are not so noisy, and you need not be afraid to let your horse stand in the yard for fear the flock might rise and fly away and scare the horse and wagon into flying, too.

I allow two geese to one gander, though generally they will pair off and you will notice that a gander will stay with his actual mate nearly all the time. The gander is the protector of the goose, especially in breeding time will he defend her and her nest—fearless and vicious. It is not an easy matter to distinguish the sex. When six or seven months old, or at maturity, you can usually, by observation, tell the ganders from the geese. The male, in most cases, grows some larger than the female. The goose is deeper in the body, a trifle slimmer in neck and smaller in head. The call of the gander is loud, long and shrill, while that of the goose is merely an answer to it. Separate a flock by driving part on each side of a fence or building and you can distinguish most of the ganders by their calls. Never look for a curled feather in the tail or any outside marks, such as I have seen in somecuts, for there are none. Early in the spring it is easier to tell them, for instance, by tasting, but it must be understood and done with care.

Geese live to a great age. The females are profitable up to ten or twelve years of age, and the males up to six or seven years. It is not profitable to raise geese in confinement. They must have a pasture where from early spring they will live almost exclusively on green rye, clover or grass, needing little grain and thriving well. Do not feed too much corn in winter, as it is apt to get them too fat for breeders. Oats and barley are better. The way I feed is this: I take some boxes about eight inches deep and put in the oats or whatever grain I want them to have. These I place in the pasture, away from other fowls, and invite them to help themselves. One need not be so careful in feeding them as in feeding ducks and other poultry. You can not spoil their appetites, and by putting the boxes of grain in the runs they get a good run and a light feed, and are in no danger of overfeeding. I should not advise you to feed corn in this way. Give them corn only in the hardest weather, when it is storming or there is so much snow they can not go foraging. Toulouse geese need only enough water to drink, none to swim in.

When in proper condition young geese will lay from eighteen to twenty-four eggs the first season, and old geese will lay from thirty to thirty-six and even forty eggs in a season. Early in the spring I place some boxes and barrels in out-of-the-way places and cover them with rubbish, having straw or litter of some kind inside of them. Some of the geese will begin laying in February, and they will find the places provided for them. We gather the eggs every day, but avoid disturbing a goose when she is on the nest, and we always arrange the nest as nearly as possible the same as we found it. Always leave a nest egg—any kind will do. A goose will cover her egg with the nest material, and in winter instinct teaches her to bury it deep.

Young geese seldom get broody the first year. We seldom let our geese sit, but break them up as soon as they become broody. We put an extra gander in a yard by himself away from the other geese. Into this yard goes the broody goose or geese. Her nest is destroyed, or if it is in a barrel or box it is moved to a new position. In four or five days turn the goose out and in most cases she has forgotten she wanted to sit and goes to work again. In this way we keep the geese busy laying eggs and a large common hen attends to the hatching for them.

We put the goose eggs under a hen, setting as many as we can at the same time. On the fifth or sixth day we test the eggs and divide the fertile eggs among the hens, giving each four eggs, which are as many as a hen can well cover. It takes thirty days to hatch them. Then you want to be on the lookout. The hen will sit all right, but when the young ones break the shell and the hen sees a queer, green little creature with a long, wide bill saluting her, she takes it for a freak of nature and off comes its head! Not many hens will claim the young geese, so take the goslings away as they hatch and try the hens, giving them to a good, slow, gentle hen. As soon as she takes them without any fuss there is no further danger.

FEEDING THE GOSLINGS.

The first two or three days keep them in a warm place and give them a little soaked bread and water. When the weather is nice turn them out in a small inclosure which can be changed every day or so. Use boards six feet long and twelve inches wide. After a week let them go and then their foster mother's trouble begins, for the little goslings do not care a snap for her calling. They are off hustling for every spear of grass, and she has to go after them. Her business is to keep them warm at night and warm them in the day time if they get chilled.

The first four or five weeks give them nothing but stale bread occasionally, but always leave them at liberty to get all the grass or clover they want. Do not soak the bread, as they do not like it so well. After five weeks give them a mash of two-thirds bran and one-third corn meal. If you wish to fatten them, after six weeks feed one-half bran and one-half cracked corn, but do not let it be sloppy. Never allow goslings to go to water to swim until fully feathered, and then only let those go that you wish to keep for breeders. Many of them will do as well if they never go swimming. During this period you must keep the old geese away, as they will fight the hen and molest the young.

It will sometimes happen that you will hatch and raise a gosling with a broken wing. It is no serious fault at all, only a malformation in the egg. If it is a nice, large, promising bird do not kill it nor be apprehensive that it will breed broken-winged birds, for it will not. If the looks of it be unpleasant to you take a sharp knife and sever the crooked part at the joint. Bandage it and it will soon heal and you will never note the difference afterward. You will generally find such to be the largest birds.

Goslings, when nine and ten weeks old, weigh from twelve to fifteen pounds. That is the best time to market them, as they will bring more money then than in the fall

and winter, and you have no trouble fattening them. The first green geese in the New York and Boston markets this year brought from eighteen to twenty-five cents a pound and now, when nine months and not weighing much more, they bring from fourteen to eighteen cents. Will you not agree with me that they are profitable to raise? I do not generally paint things in the brightest colors, and do not advocate everybody going into goose culture. You can not raise geese as you do chickens and ducks—on an acre lot. They must have pasture. It is a wrong belief that geese or their droppings will kill grass or destroy a pasture. I will explain this as follows: If you have a large flock of geese and a small pasture they will clean it up, that is they will eat the grass as fast as it sprouts and give it no chance to grow, just as a cow on a city lot will soon have only bare ground and you will have to tie her out in the road. If you could do the same with geese you would find the grass coming again and growing as before.

To provide a good pasture for geese for the late fall, winter and early spring, plow a piece of ground in September and sow it to rye. It will make good picking for them in the winter and provide them with a good living in the early spring before the grass comes in the pasture.

Geese are more profitable than either ducks or chickens, but you can not raise them in such quantities. I have tried, but can not hatch them successfully in incubators. It would be too much work to raise them in brooders. But you can raise quite a flock in a season and make it pay. Have no fear of glutting the market. Green geese always find a ready sale, and there is a good demand in the fall and winter. Their feathers are an item worth considering, but do not pluck your geese twice a year and expect them to be good breeders. A goose so treated will not lay as early, nor lay as many, nor as fertile eggs as one that is left alone to go through the changes naturally. Always send your fowls to market properly dressed. Never send them alive. The difference in the price of the carcass and the feathers will pay you three-fold for the extra work.

DISEASES OF GEESE.

Geese are easier to raise than any other fowl. There is no mortality among the young stock from disease. Lameness is the only ailment with which I have had to contend. It is caused by too close confinement, unwholesome food, too warm housing, and close quarters in the fall. Let your geese stay out under a shed with some litter under them in the hardest winter weather and they will be more vigorous than those closely housed.

To treat lameness, proceed as follows: If you notice one that is rather bad, put it by itself in a dry place and give light food (stale bread) and water. If it shows signs of fever and diarrhea, give a tablespoonful of castor oil by holding its beak open and working it down its throat. Repeat the second day if it is no better.

Do not mistake the common crown goose for the Toulouse. The following is a short description of the Toulouse:

Head, large and short, especially in the gander; color, dark-gray; beak, reddish-flesh, not pink; eyes, dark brown, or hazel; neck on gander, long and carried erect—by long I do not mean extremely long; neck of goose, medium in length; plumage, dark gray, shading a trifle lighter toward the beak; back slightly curved, long and broad, color dark gray; breast, full and deep, plumage, light gray, not white; body, round and deep, in old birds in good condition it almost touches the ground; plumage down to the keel is light gray; the lower and fluffy parts are pure white.

The tail ought to be short, in color black and white, the ends of the feathers being white. Wings, strong and large, with smoothly folded, dark gray primaries, brown secondaries and dark gray coverts. Thighs, short and stout, covered by light gray plumage, distinctly laced. Shanks and web of feet, dark orange color, not pink. White feathers in wings, or any other part of body other than above mentioned, show impure breeding.

The weight differs in various seasons. In winter they should be kept in good condition. The old geese should average about twenty pounds, the young about eighteen pounds. I have some weighing from twenty-six to twenty-eight pounds.

There is still much to be said about this variety of geese, and a wide field open for discussion. Who has not heard of "Hanover Ganze Biuste," Hanover smoked geese breasts, which sell in Europe in the finest delicatessan stores at 80 cents and $1 a pound? And have you ever heard of goose livers selling at $2 to $3 per dozen? That is for the livers only. You can sell lots of them every day in New York and other large cities—if you only have them.

CHARLES F. NEWMAN.

BILL OF A GOOSE, SHOWING THE SERRATED EDGES OF UPPER AND LOWER MANDIBLES AND TONGUE, WHICH ENABLE IT TO GRAZE.

TOULOUSE GEESE.

Full Directions for Raising Them as Practiced on the Orrocco Poultry Farm, at South Natick, Mass.—Hatching with Hens—Yards for Fattening—Variation of Prices in the Boston Market.

BY W. H. RUDD, SOUTH NATICK, MASS.

NEW ENGLAND is quite a goose growing section of our country. In fact, the New York market depends upon her for its supply of green geese in summer. Rhode Island is particularly devoted to this industry, and perhaps more geese are raised there on the same area than anywhere else. The Rhode Island breeders, or at least the majority of them, have wonderful success in producing the largest and best specimens of green geese we receive from any source; and yet we should not say wonderful, because it is simply the result of their being willing to take the necessary pains and perform the necessary labor to give their goslings the necessary conditions, and without these three necessary things it is in vain to expect success, for it will never come.

The price of green goslings, or "green geese," as they are termed, in the Boston market to-day (June 10th) is 35 cents per pound. This top price is short lived, however, and ten days hence they may bring only 25 cents, and rapidly decline until through July and August they average about 15 cents per pound. But Rhode Island goslings then weigh fourteen or fifteen pounds each, so that they amount to quite a respectable figure, even at the lowest price, and New Jersey geese by Christmas frequently weigh from sixteen to twenty pounds. Our hotels, as a rule, use geese mostly from June 1st to March 1st. At present goslings will range from nine to twelve pounds each, and ten pounds is a very good average weight for them. The cost per pound of raising them to this size is variously estimated by different breeders. Some careful figures result in placing it at 5 cents per pound; others equally careful give 6 cents. Through the summer they will, on the average farm, pick up their entire living.

Adult geese can be turned out to pasture precisely the same as cattle, and in this latitude wil obtain their own living more than six months of the year, during which time the cost of keeping them is simply the value of the grass they consume. Throughout the laying and breeding season, however, in addition to grass they should be fed twice a day with shorts and Indian meal, equal parts, thoroughly moistened with cold water, but not too wet, lest it produce diarrhea, and the mass should be dry enough to crumble. If stale bread from hotels or elsewhere can be had at a reasonable price, soak it and use it instead of the shorts. Add ten per cent of ground scraps, or its equivalent, and feed all they will immediately eat up clean. Supply them liberally with ground or crushed shells and all the water they will drink. Where they can not roam at liberty a substitute for grass must be furnished. Cabbages answer very well, but quite a variety of green food, such as corn fodder, green oats or rye, barley, etc., can be provided without much labor by using a little forethought. For adult or breeding geese, access to a pond or stream is desirable and much enjoyed by them, but is not essential. For growing goslings, however, where the most rapid growth is desired, all swimming exercise is objectionable and should be avoided, as it does more harm than good.

In winter geese should have protected and comfortable quarters, but not be compelled to occupy them against their will. When the breeding flock is small they had better employ their energies in laying eggs to be hatched by hens, whose time is less valuable. A good-sized hen, like a Plymouth Rock for instance, will cover five or six geese eggs, but their being so much larger than her own she does not always take kindly to them, and for the first day or two may "sit standing up." Goslings are often twenty-four hours and sometimes longer in emerging from the shell, and should never be hurried nor assisted except in rare cases, where it is obvious they will die without timely aid.

Hens should average hatching not less than four goslings each in the very early spring, when geese eggs (like duck eggs) are least fertile, but as the per cent of fertility increases (again resembling duck eggs) there is no good reason why the second, and in fact all the subsequent hatchings, should not produce a gosling from almost every egg. When well hatched the mortality among goslings is almost nothing, and, except in case of accident, we usually raise them all, and should no more think of losing one by disease than of losing a calf or a colt. We have lost only one well-hatched gosling this year, and that was killed by its clumsy and stupid mother goose in attempting to care for it; but of those we raised artificially we have lost none that were well-hatched—not one. Two per cent loss would be a fair figure for a calculation, and five per cent unnecessarily liberal.

WHEN BREEDING A FEW.

Where only a few goslings are hatched, say twenty or thirty, they can, until two or three weeks old, be kept in any convenient boxes or baskets (common soap boxes will do) by the kitchen stove at night. The goslings can be kept by the kitchen stove at night and placed in the sun during the day, or, if a warm, sheltered spot in the yard is at hand, they can be put there when a week old, in a bottomless box, if no snow is on the ground, otherwise the bottom is indispensible, and, if the air is chilly or too cold ,cover the box with a window sash. Put them out thus on sunny days about the middle of the forenoon and take them in about the middle of the afternoon, guarding against their getting chilled. They can be fed at first on one-third Indian mead and two-thirds shorts, wet cold and squeezed almost entirely dry. They should be fed as often as they manifest a desire for food, which will be at least every two hours—perhaps more frequently—and we offer them water almost as often as we feed them, but in such manner that they can not wet their bodies. The principal points to be observed at this early stage are to keep them warm and dry, as well as fully supplied with food.

As they grow older they very rapidly become able to endure more out-of-door air and exercise. Indeed, both of these are then absolutely necessary for best results. As spring advances and grass begins to grow, they may be put in a pen, which can be quickly made by nailing four boards together. Ten inches is wide nough to keep young goslings within bounds, and any length will do, two or three feet square, or three feet by six, according to what boards may

be at hand. In chilly, windy weather it is a good plan to have the pen to fit a window sash, as the goslings can thus be easily protected and kept warm, but the smaller the pen the more frequently must it be moved, both to secure cleanliness and to furnish fresh grass. We have portable yards thus made, of all shapes and sizes, up to sixteen feet square. These larger ones are designed more particularly for advanced goslings, and are made of 1x3-inch strips on which we put 12-inch poultry netting, and as the netting laps onto the strips only an inch, it gives a height which is certainly sufficient for any well-bred gosling. These yards are fastened at the corners with hooks and eyes and can readily be moved by two persons (even boys) to a new spot, which should be done three or four times a day, or as often as the grass is devoured. But when the goslings are three or four weeks old (depending upon the weather, condition of grass, etc.,) they should, if possible, be given a wide range—turned out to pasture as it were; but the inclosure, whether an acre or more, or less, should, if practicable, be fenced gosling-proof, that we may always know where to find them. They should also be fed twice a day with three-quarters shorts and one-quarter Indian meal, thoroughly wet, but pressed or squeezed dry, and they should be fed all they will immediately eat up clean, whether it be a peck or a cartload, and they must have a supply of drinking water continually by them. The drinking vessels should never be empty.

When the earliest hatched goslings are about eight weeks old, if then having unlimited range, they should be confined to narrower quarters and fed expressly for fattening and prepared for market. The aforesaid 16-foot-square yards would answer the purpose very well, and about eight goslings, or at the most not over ten, would be enough to occupy one of them. The yards must be moved as often as necessary to secure a constant supply of grass,, and being so frequently in motion the shade must be provided artificially and must be sufficiently ample to protect every gosling. Exercise is now a secondary consideration with them; in fact, much of it is objectionable and interferes with their main business, which is not exactly to "eat, drink and be merry," but to eat, drink and grow fat. We would then feed less shorts and more Indian meal, and add some ground scraps, increasing the last two as rapidly as possible and diminishing the shorts until we discontinued them entirely and fed ten per cent scraps and ninety per cent meal. If stale bread is obtainable it can be used to advantage, as already stated. But where later goslings, intended only for breeding stock, are at pasture, this fattening process is of course unnecessary. W. H. RUDD.

RAISING TOULOUSE GEESE.

Selecting the Breeders—Hints on Hatching and Care of Young—Plan for Simple and Convenient Brooder—Food and Quarters—Feather Picking Time and Curing of Feathers—Fattening for Market—Preparing the Carcass.

BY MRS. JENNIE E. WOLCOTT, NAPOLEON, OHIO.

I HAVE bred poultry for fourteen years, my first attempt at going into the matter in a business-like way being when I was fifteen years old, when my father told me I might have all the money I could make from our flock of Bronze Turkeys to pay for my lessons at a musical college. I made a great success of my work, raising over one hundred turkeys, and from that time to this I have not felt content without my flock of fancy feathered pets. After I was married the male member of the firm objected to my keeping Toulouse Geese, but I argued and won (as most women do), by purchasing a trio of this variety. When he said to me one day, "I wonder what those geese live on? I never see them eating anything but grass," I knew they were working their way into his good graces, and in time he declared that he preferred the Toulouse Goose to any other bird I raised.

Truly there seems to be an awakening to the fact so long known by a few, that there is money in geese. Among the various breeds raised there seems to be a steady demand for the beautiful, large gray Toulouse variety, and well do they deserve every word of praise given them. They are known to have lived one hundred years and even at that age to produce eggs that were as good and fertile as those from a young generation. Much care should be taken in selecting the breeders. Use large, vigorous birds, one male to every two or three females. During the breeding season, if the male birds disagree, place only one in the yard at a time. Some breeders change them every day, but I have better success by placing them alternately, one a half a day at a time.

I make large warm nests for them early in February. If they are comfortable in their quarters and are not disturbed they will lay in the same nest every year. Great care should be taken in gathering the eggs early, as they are very easily chilled. They lay two clutches, and occasionally three. If they want to sit, after the first laying, I keep them away from the nest for a few days and then they begin laying again. I incubate their first laying with chicken hens, and frequently let "old mother goose" care for her second hatch.

Be sure to have your sitting hens free from lice. Treat them with Lee's Lice Killer or any good insect powder every week. Sprinkle the eggs with warm water twice during the last week they are hatching, and oftener in dry hot weather will do no harm. Remove each gosling from the nest as it hatches, for they are easily mashed. Keep them in a flannel cloth in a basket in a good warm place until all have finished hatching. Then remove the little goslings to a brooder, as I think this quite an improvement over the old way. The goslings grow very rapidly, while the wings of a hen do not.

BROODER FOR GOSLINGS.

As I have other young birds beside goslings to raise by brooder, I simply use a store box, making it rat and water-proof. In this box I make two large ventilators, one at each end near the top, and with a piece of tin or thin board make a slide to work back and forth, so that I can ventilate as desired. With a square board (about six inches) I make a frame for this brooder and cover it with screen wire. A lighted lantern set into the center of the box furnishes the heat. This makes a very simple and convenient brooder. I have used it with success in very cold weather. Use large boxes.

Heat and ventilation must be used with judgment, the

former can be abandoned entirely as the goslings grow older and the weather becomes warmer. It is very essential to keep them warm and dry while young, especially at night, as dampness often proves fatal. Protect them from rain and storm during the day until after they don their new coat of feathers, the down that is on their little bodies being no protection whatever. I consider the care of young geese as little trouble compared with that required by other fowls. I have never had disease or lice among my birds, in fact, I have never lost one except through accident.

Place a little sand and straw in the bottom of the brooder, and clean it out every other day. Put ten to twelve goslings in one coop, and reduce the number to six as they become larger.

Begin the business moderately, and acquire experience.

FLOCK OF TOULOUSE GEESE ON THE FARM OF CHARLES M'CLAVE, NEW LONDON, OHIO.

There are some things about raising geese which can be learned only by experience, and a little practice is worth a world of theory. Intelligent and systematic breeding is sure to bring both pleasure and profit to the breeder.

The first problem with young goslings is what is best to feed them to produce fine, large, healthy birds. True, there are about as many bills of fare as there are poultrymen and women. However, I believe in the most simple and effective way. When the goslings are twenty-four hours old I give them a light food of rolled oats, dry, and some water to drink, being careful not to let them get damp or to tread in the water. I use the galvanized drinking fountains, which prove very satisfactory. I prepare food by using one-third cornmeal and two-thirds bran, dampened (not wet), mixed and baked. It is not necessary to bake very long, just so it is thoroughly heated. If prepared properly it is very crumbly when done. After it is cool, add one tablespoonful of bone meal to every gallon of the food. I find it best to prepare the food fresh every day.

Feed this food alternately with rolled oats for nearly one week, after which the oats can be abandoned, and the prepared food used only. Soda, very little salt, and good grit added to the food every few days prevent indigestion and bowel trouble. Bran is quite indispensable as a bone forming element, and grit should be provided at all times. Feed often while they are young, four times a day until they are three weeks old, and three times thereafter will be sufficient. As soon as they can eat cracked corn and wheat, I feed the prepared food in the morning only, and keep plenty of fresh water at their disposal. When they don their new coat of feathers they can be given water to bathe in. Before that time it may injure their growth. A neighbor of ours lost nearly forty goslings in this way last summer. The overflow from a windmill tank furnished them a splendid bathing place, too tempting to resist, but the results were fatal.

GRASS AN ESSENTIAL FOOD.

Grass is the most important of all foods for young goslings. I keep a box sown thickly with oats, and when it is too cold for the goslings out of doors I let them devour this, which furnishes an abundance of green food that is much enjoyed by them. They eat very daintily, preferring grass to all other foods. With their "musical" chatter they are ready to meet you, take a few mouthfuls of food and then with the same old tune they lazily saunter away in search of more grass and more rest.

Early in the spring I turn them into a yard set with tender June grass, later I place them in a clover field. If your range is limited and grass is scarce, a yard sown with oats will do splendidly. I did this one year when my clover field was too distant for the young birds. They kept the green blades of oats quite close along the edge, while the interior grew and ripened. This served as food for a long time and was excellent, and my birds never weighed more than they did that season.

Be sure to have plenty of shade, as they suffer greatly from heat. Do not give them crowded quarters, the more

range the better. In the fall select only the best birds for breeders, and dispose of the remaining ones. Feed wheat and oats at morning and noon, and corn at night, with free access to clover hay during the winter, wheat and oats being best for them during the laying season. If you wish to turn grass into greenbacks, I say decidedly, raise geese.

One of the best items of profit to be derived from a flock of Toulouse Geese are the feathers, which are clear gain, costing nothing but the trouble to pick. Do not pick your breeders when they are laying. When one has donned the oldest garment she can find, and starts out for the delightful task of picking her geese, it is best to let one of the "old man's socks" accompany her, as she will most likely need it. After you have caught a goose, turn back the feathers, and if there are little pin-feathers just peeping through the fowl is ready for picking. Do not pluck a large handful at once, as it is apt to tear the flesh and old mother goose is liable to return "pinch for pinch." If she insists on doing this, put the "old man's sock" over her head, but do not do it as long as you can handle her without it, as you are not quite as apt to forget what you are doing, and it is lots of company, you know. I usually try to find as comfortable a seat as possible in some shady corner, with a box beside me over the top of which a cloth is tacked, except a corner to poke the feathers into. I put the feathers away in this box for a short time, so that any that are not real ripe and are a little bloody will dry.

I make cheese cloth sacks that will hold two pounds of feathers. I make them quite large, as the feathers will cure quicker if they are not packed together. Put the feathers in the sacks, and after a few days sprinkle some good sachet powder through them. I hang the sacks on the clothes line every sunny day for about two weeks, if I want to cure the feathers quickly, and then put them in a well-aired room. They should be ready for customers in three months' time. Be careful to keep the sacks clean, as the feathers will sell much better. Ladies living in the cities and towns will be your best customers, providing you let them know you have good feathers for sale.

PREPARING FOR MARKET.

The market demands large, heavy weight specimens, with a round, plump carcass, and those requirements the Toulouse Geese are most able to fill. Those intended for market I place in a small lot, so that they cannot exercise very much. I use a V-shaped trough for food and water. I make a mash for the morning food consisting of equal parts of ground corn, oats, wheat and barley. To each gallon of this, I add one tablespoonful of oil meal. Mix these ingredients thoroughly, scald, and feed while warm (not hot) all they will eat. During the forenoon give green food, cabbage ,potatoes, beets, etc. The noon and night food should consist of shelled corn, all they will clean up. Keep plenty of grit and charcoal where they can have free access to it.

Hang each bird up separately that you wish to kill, so they will not get blood on one another. Insert a sharp knife into the roof of the mouth, well back, so they will bleed properly. If you wish to dry pick them it is best to do so while they are bleeding. I have no success in that way, as when they are fat they tear easily. I take a wash-boiler, put in it a little water, and then make a rack out of laths to fit inside, so that it will be about three inches above the water. Lay your bird on this rack, being careful not to let any part of the body touch the water. Cover tightly and steam from three to five minutes. Have twine strings, doubled, fastened up in the building to rafters, about long enough to bring the birds at a height that it will make it unnecessary for those who are picking to reach up or to stoop over. Loop the end of the string and hang the fowl in the loop, head down, so that the blood will not soil the feathers.

Have a clean barrel beside you to put the feathers in. Do not hold the bird over this barrel, as the blood may drop on the feathers and soil them. You will find this very convenient, and not so tiresome as the old way of picking. If any down should remain on the body of the bird, take some powdered resin and rub over it. Place the fowl in your steamer a few seconds, remove it and rub the downy parts with your hands, and the down will disappear as if by magic. Steaming those few seconds will also plump the bird. Dip afterward in cold water and wash all the blood off the mouth and head.

Have boards laid upon trestles and covered with cloth or paper if not smooth, and lay your birds upon this. Do not place one bird upon another. It ruins their shape and may spoil the sale. We have no sale for drawn birds here. The manner of dressing fowls in different localities depends on the requirements of the market, hence it is best to consult a good commission man and ask him how he wants birds dressed. There are some who do not care to have them dressed at all, and in a great many instances do not pay only about half what they should. If the commission men find that you mean business, they will send you a circular, quoting prices, twice a week and will also inform you as to the best time and way for shipping. Our prices here range from 8 to 11 cents per pound, between Thanksgiving and Christmas, the best prices being obtained about Christmas. Do not be timid about making inquiry.

MRS. J. E. WOLCOTT.

YOUNG AFRICAN GEESE ON THE FARM OF SAMUEL CUSHMAN, PAWTUCKET, RHODE ISLAND.

GEESE FOR PROFIT.

Hatching Goslings and Breeding Geese—When to Hatch—How to Fatten for Market and How to Pick Them.

BY C. L. DARLINGTON, LOYD, N. Y.

THERE are a number of varieties of geese, but the most profitable are the Toulouse, Embden and the China, of which latter there are two kinds, the Brown and the White. The color of the Toulouse is gray and white, of the Embden white. The Toulouse and Embden are the larger. I have now at my place a pair of Toulouse that weigh 59½ pounds and a pair of Embden that tip the beam at 57 pounds. They are great layers of large eggs, of which they will lay from thirty to forty in a year. They lay about fifteen or eighteen eggs and then want to incubate, but if they are not allowed to sit they will start to lay again in about six days, and will then lay until they stop for the season. My geese always lay at night or before five o'clock in the morning, and they lay every other day, or rather night. After they have deposited their eggs they cover them up with straw or litter. To hatch geese take large hens and put from four to six eggs under one hen. The eggs should be sprinkled every fourth day after the twelfth day, the length of time required to hatch being from twenty-eight to thirty-one days. Often the goslings have to be helped out of the shell.

When first hatched the goslings should be fed four or five times daily on cornmeal, in which is mixed chopped boiled eggs, a pinch of black pepper and a handful of sand. Feed this for three days, then discontinue the eggs and give bread soaked in skimmed or sweet milk, oatmeal or broken rice boiled until soft, outer leaves of cabbage, onion tops and all the grass they can eat. I have always found it better to keep the young away from water until nearly feathered, only giving them enough to drink, which must be a liberal quantity, as they want to drink with almost every mouthful of food.

For use as breeders geese should be hatched very early, as they do not mature until they are twelve or fourteen months old. The number of geese with one gander should never be more than three, and if the gander is vicious or ill-tempered he ought to be disposed of after five or six years, for they are dangerous and will not hesitate to attack man, woman or child ,and they strike a heavy blow with their wings.

Old geese do not need any feed except a little at night, so as to keep them in the habit of coming home when they have unlimited range in summer, but in winter cut hay (clover is the best), grain boiled, grit, cabbage leaves, turnips, wheat screenings and cracked corn, but never whole corn unless it has been soaked in warm water for three or four hours. To fatten geese give them a liberal supply of barley meal and cornmeal soaked in buttermilk. When fed this food they fatten rapidly and are soon ready for market. Geese should not be picked before the twentieth of May. Catch one, draw a stocking over its head and then pick it, leaving the feathers on its back, shoulders and wings to protest it from the rain and sun.

Some writers claim that the Toulouse cannot fly, but I have a gander ten years old that I have seen fly a distance of three hundred yards so high that he cleared the peak of the corn house thirteen feet from the ground; but generally speaking a three-foot wire fence will keep them in.

In writing the above I refer to the Toulouse breed only.

C. L. DARLINGTON.

PROFITABLE GEESE BREEDING.

FROM THE NEW ENGLAND DEPARTMENT OF THE RELIABLE POULTRY JOURNAL.

THE value of investigations by experiment stations can be best understood when one learns to what extent goose breeding and fattening are carried on in New England. In Little Compton, R. I., there are numerous large flocks of geese, and, indeed, throughout the state the rearing of geese is an important industry. The fattening establishment of Mr. G. M. Austin alone requires from 10,000 to 25,000 in a year, and some years as many as 10,000 to 12,000 are to be found there at one time. The conductor of this department has eaten a roast goose—that is, part of one fattened by Mr. Austin, and he can vouch for the fact that it was the fattest creature he ever put a knife into. And more than that, the lean meat was juicy, tender, and delicately flavored.

In a conversation with Mr. Austin it was learned that he buys his grain by the car load and has it ground for his own use. Cornmeal that is purchased as such, so he says, has removed a portion of the most fattening material, which is sold for a high price. He desires all that lies inside the kernel for his use and can obtain it by having it ground where he knows he will get the whole.

The fattening process consumes on an average twenty days. Not every goose will be well fattened at the end of that time, but not more than one or two out of a hundred will fail to reach the desired degree of fatness. The geese are put into fattening pens of about 100 to 150 feet in length, and perhaps 25 feet in width, and about 150 of them in a pen. They are fed three times a day in summer and twice a day in winter on grain rations, consisting of about two-thirds ground corn and one-third whole corn, with an abundance of freshly ground beef scraps. When killed the inside of the goose is a solid mass of fat and the exterior is handsomely overlaid with fatty tissue. Expert pickers are employed, and about 200 geese are slaughtered daily. This number, it will be seen, requires about 4,000 to be fattening at once in order to keep a supply ready each day. The killing is done on fair days only, for on a wet, nasty day it is

impossible to make the dressed geese look clean and inviting.

The above facts will show, to some extent, the importance of the experiments referred to. If it can be demonstrated that any particular breed or cross will produce the heaviest and most saleable carcass for the least expense, all things considered, that breed or cross will be the one that practical men, men who are "in the business not for their health," but for the money there is in it, will adopt. Even a slight difference in favor of a breed or cross will make a large amount when it is multiplied by thousands, and that is what must be done to understand the effect which will be produced.

Incidentally other facts of great value are continually being ascertained. It sometimes happens that these incidental facts, facts which an investigator at the start may regard as minor, prove even of greater value than the one or ones for which the investigation was started.

By the way, it will not do, in this connection, to forget the Mongrel Goose. The name is unfortunate, for mongrel has a fixed meaning and this goose is, and ought to be called, a hybrid. It is the result of a cross between the Canada goose—the goose which the Standard makers, evidently forgetting that there are many species of wild geese, have called wild—and some one of the domesticated varieties. It is usual to employ a Canada gander with the tame geese. The resulting hybrid is sterile being the product of two species and externally bears a strong resemblance to its male parent, the Canada goose. It has, however, greater size. But it is the flesh beneath the feathers which makes it specially prized. This is considered much superior to that of any of our domesticated breeds and the geese are sought after by those who live to eat as well as eat to live. Quite a little business is being worked up in this so-called mongrel goose.

BREEDING EMBDEN GEESE.

Breeding Season and Best Age for Breeders—Mating—Feeding to Insure Fertile Eggs—Hatching With Hens—Food and Quarters for Young—Marketing.

BY GEORGE H. POLLARD, SOUTH ATTLEBORO, MASS.

A FEW generations ago the breeding and raising of geese was one of the commonest branches of poultry culture in this country. What causes have led to its comparative decay would make an interesting and attractive theme, but one which will not be attempted here. Neither shall we devote lengthy space to the origin and development of the goose family, tracing its growth from the remote past down through the dark ages, till the era of Roman civilization is reached when they compelled this noble bird to emerge from the clouds which enveloped him and to take his appointed place in the domestic economy of men as a savior of a nation. For these most interesting suggestions of goose history we refer the reader to any good encyclopedia where the facts may be readily learned.

We take up the goose where we find him to-day—the wisest and most cunning, as well as the hardiest and most profitable member of the whole poultry world. In their purity the grower has practically to do with three breeds only, namely, the African, Toulouse and Embden. The other breeds stand in relation to these as do frescoes to the wall which sustains them. They are ornamental and pleasing to the eye, but add nothing of strength or intrinsic value. Of the three breeds, we have chosen the Embden as being the most valuable market bird and the most beautiful to the eye. No other breed can compare with the Embden in graceful shape and carriage, and the snowy purity of their plumage is unequalled by any other variety. While tastes differ as to the relative beauty of the live birds, there can be no question of the superiority in appearance of the dressed carcass of the Embden over that of either the African or Toulouse. When dressed as green geese, that is, from twelve to sixteen weeks old, the African is the poorest appearing of the three, showing as it does, traces of dark down and pinfeathers, giving the carcass an unsightly and unclean look which detracts from its value in high-class family markets. This is less of a failing when consumed in hotels and public houses, as the professional cook is less careful of the external appearances of the carcass than is the dainty, fastidious housewife, and the pin-feathers do not enter into his calculations. The Toulouse is better than the African on these grounds and is easier to pick. The feathers of the African have the proverbial chinch—and in the hands of other than expert pickers are apt to rend both the skin of the bird and the temper of the picker.

The Toulouse, while a better market bird than the African, shows a tendency to coarseness of flesh, and its great size, if allowed to reach its best market point, makes it undesirable for markets where the call is almost wholly (as in the east) for birds weighing from ten to twelve pounds each. At Christmas the larger birds sell readily, but at other seasons the demand is for lighter weights.

IDEAL MARKET FOWL.

The Embden, being a pure white bird, dresses well at all times, yielding a carcass as white as marble and free from any unsightly down or pin-feathers. They will command from 2 to 4 cents per pound more in any high-class family market on the strength of apearance alone. When we add to these qualities the fact that their size is the most desirable, dressing from nine to fourteen pounds at their best age, picking easily and clean and giving feathers worth nearly double those of the colored breeds, we have abundant reasons why, other things being equal, the Embdens should be the chosen breed.

We know of no complete test of the relative value of the different breeds other than we have indicated. Probably the average breeds will continue to choose more from appreciation of color and style, than from any exact knowledge of the different values inherent in the breeds. Embden geese are of pure white plumage, (not the creamy white of the Pekin duck) with pinkish, or flesh colored legs and bill. Their eyes are a light blue and are very expressive. We are aware that some of the experts who made the recent Standard of Perfection decided that the Creator was wrong in his preferences, and that the Embdens should have orange legs and bills like the Pekin duck. In this case, as in some others, we prefer to be on the Lord's side and allow the flesh colored legs and bills to stand, leaving it for the ex-

perts to produce a pure-bred water-fowl having a pure white, not creamy-white plumage, white skin, light blue eyes and orange legs and bills. In our experience they do not grow that way. The purer the breeding, the stronger the tendency to the pinkish colors, and where an Embden is found with even a clear yellow bill and legs we believe it can be traced back to some mixup with other blood. The common weight of Embden males is from thirteen to seventeen pounds when in good condition; females, eleven to fourteen pounds. These are not standard, but actual weights, and while often specimens may be found much heavier, they are exceptions and from a practical standpoint are not so valuable.

The breeding season varies with the section and climate. Here in New England it naturally lasts from about the middle of February to the middle of May. The breeders are best at from two years old up to seven or eight. Many claim no age limit to their value as breeding birds. They naturally breed the first year and sometimes with good results, but in common practice the older birds are found to lay better and more fertile eggs, and the germs being stronger the goslings are better able to break the shell and live. Breeding birds can be forced to lay in January and February by full feeding. This is a practice which weakens the vitality of the germs, and leads to ultimate failure. Many of the eggs come infertile and a large proportion of the young can not break from the shell, while such as do seldom or never attain the size and quality of birds from unforced and properly fed breeding stock.

Ganders may be mated with from one to four geese. We think as a rule two geese will be the best number. Where many are kept the birds should be separated into the desired matings just before the breeding season and shut away from the sight and company of the other birds. Ten days or two weeks will generally be long enough to separate them, when they may again be allowed to run together. Once thoroughly mated they sometimes continue for years without further trouble. The breeding geese need little shelter. Cold and storms do not seem to bother them much. Indeed, an open shed with a little straw on the floor is all they will generally use of their own volition, and that only in the severest weather. It is, however, a good plan to have a cheap shelter of some sort where they may be shut in from the roughest of the weather and the hard storms of winter.

They should not be heavily fed on grain, as they lay on fat readily, and over-feeding results in weak or infertile eggs and general failure to hatch. Feed a variety of vegetables, such as turnips, beets, cabbage, etc., and a light, bulky mash of two-thirds bran and one-third meal, with one-half of the whole mass cut clover, wet up with hot water in winter. In the laying season add ten per cent beef scraps. After grass comes in the spring they should have a large range, nothing being better for their purpose than an old wet pasture, abundant water and swimming pools being desirable breeding spots. The lot should be sufficiently fenced to keep them in place. An unfenced flock of geese on a farm where other young birds are kept puts the caretaker in a plight of troubles, besides which Job had a pleasureable existence.

A VIEW ON THE DUCK RANCH OF G. H. POLLARD, SOUTH ATTLEBORO, MASS.

HATCHING AND RAISING.

One prominent writer claims the Africans and Toulouse to be more prolific layers than the Embden. There is so much difference in the laying proclivities of the different families of the same breeds that we have not felt that there is any reliable data to prove the matter either way. Conclusions deduced from the performances of a few geese of each breed and the specimens of each breed from the same family, are of little real value in determining

questions of this kind. The same faulty methods are often used to determine the laying value of different breeds of hens, and the results are just as valueless. Certain it is that some Embdens are very satisfactory layers of large white eggs, which they produce at very regular intervals in such places as they shall choose to set up their home building. Where few breeders are kept the better way, all things considered, is to set the eggs under hens. In setting geese we have found the birds too cross and hard to manage to get the best results. The eggs may be successfully tested about the eighth day of incubation, the length of which varies from thirty to thirty-five days, and is generally about thirty-one days. Sometimes there is virtue in a little help for the gosling to free himself from the shell. As a rule, however, the better way is to let him fight his own battles. Then if he does get out the chances are very good for his reaching maturity.

No other young in the whole tribe of domestic poultry is so up-to-date and helpful as a young gosling, and given a tender grass plat and a bit of warmth he goes serenely on his way, nipping a living and asking favors of no one. When few in number they do as well if left with the mother hen, enclosing her for the first week, so she can not roam too much, and after that time letting them form a roving, happy family of wilful, pushing little peepers. Their food needs no frills and no fussing. From twenty-four hours after hatching they may have a mash of two-thirds bran and one-third meal, three times daily, all they will eat, adding a small proportion of beef scraps after the third day and increasing to ten per cent at two weeks old. They can and will live on grass alone, but will not grow so quickly nor so large. Fresh water should be within reach at all times. They grow as by magic and the old hen soon finds herself the dwarf of the family. They may be very successfully and easily raised in brooders, as they need little heat and that only for a short time. Twenty to twenty-five are enough to be together until some weeks old, when they may be kept in large flocks if care is given in feeding so all may have enough. They may be raised without the grass run and with little green food, but it is a most unnatural way, and the cost per pound for raising is considerably higher.

Neither young nor old are troubled with lice or vermin of any kind, and sickness is almost unknown. They need and must have plenty of shade, and the very young must be protected from very heavy showers and rains. In the olden days here in New England, as in foreign countries, the old birds were picked alive several times each season for the feathers which were in strong demand for beds and cushions. It was a most cruel practice and in the civilized parts of this country, at least, has become a thing of the past. The "live geese" feathers of the present day are mostly supplied by the ducks from the large market ranches. Not knowing the difference, the buyer is equally happy, while the poor goose is saved many a cruel pain.

The goslings should reach market proportions at from twelve to sixteen weeks old. Previous to the day of killing they should have had from ten to two weeks of heavy feeding. Coax them to eat every possible quantity, three-fourths meal and one-fourth bran, and fifteen per cent in bulk of the best beef scraps, with an occasional feed of whole corn. If to be sold alive the weight counts, but the fattening will have to be done over, as a change of quarters worries the birds, quickly removing the fat and compelling the second fattening, which is always more difficult than the first. They are killed by bleeding in the roof of the mouth and a blow on the head, and are picked substantially the same as a duckling. About half the neck next to the head, also the wings above the first joint, are left unpicked, though the long flight feathers are pulled from the wing. They are marketed with heads on and undrawn, except in mid-winter, when many of the western geese are headed, while some are drawn and some are not. When dry picked in summer they should be cooled in cold water and much care taken that all the animal heat is expelled before packing for market. In winter a douse in cold water helps the looks and adds to the style of the carcass, but they should be thoroughly dried before packing.

GEORGE H. POLLARD.

EMBDEN GEESE.

A Great Improvement Over the Common Gray Goose.

BY MRS. W. N. MARSHALL, LISBON, MO.

THERE has been greater improvement in the goose family than in all the fowl kingdom. Perhaps there was more room for this improvement, from the commonest grey goose to the standard-bred Embden. There is no fowl more dreaded or detested by the farmer than the old-fashioned goose, and it is hard to overcome this feeling, for the very word "goose" carries with it an association of bad pastures, bad water and the ceaseless clatter so annoying to the tired farmer. If the Embden could have appeared before the farmer without the surname "geese," they would no doubt have at once become a bird of great popularity, but on account of their being a part of that dreaded family, many of their virtues have been overlooked. Their name is like a blot on a family record. It follows them through generations, no matter how much the later generations have improved.

The Embden goose is certainly a bird of more than average grace and profit. It teaches a lesson of evolution, the survival of the fittest. They are pure white, both the goose and the gander, and like all standard-bred fowls, show their good breeding in their appearance. They are very much like the swan, and in the goose family are next in size to the Toulouse, their average weight being from twelve to twenty pounds. The feathers of the Embden goose are very fine, being more than one-half down, and make a valuable source of income. They average a half pound of feathers every six weeks, while a common goose does not produce more than a fifth of a pound during the same time.

If properly treated the Embden goose is a gentle fowl. Several years ago I purchased a pair of standard-bred Embden geese at $10, which was then considered an enormous price. There were some in the family who thought our finances were going to ruin at this rate, but the first thing I did was to make pillows of the purest down, which luxury very soon came to be appreciated by the household. My flock of fifty geese is now an object of beauty and profit. I only wish the Embden goose were better known and I am sure it would be better appreciated.

MRS. W. N. MARSHALL.

EXPERIMENTS WITH GEESE.

Mongrels — Cross-breds — Thoroughbreds — Experiments Conducted by the Rhode Island Experiment Station Afford Valuable Information Upon the Breeding, Laying, Fattening and Marketing of Geese.

THE production of geese for market is one of the most important branches of the poultry industry, and the outcome of the experiments described below will be useful in determining the comparative value of different breeds in the flock bred at the Experiment Station:

"The Canada goose, mated with the domestic goose, produces goslings commonly called mongrels, and sometimes termed "mules," because of the fact that they are sterile. It is occasionally true that a mongrel goose when kept for two or more years will lay a few eggs, but we have no knowledge that goslings have ever been hatched from eggs laid by a mongrel goose. The progeny of the cross mating is usually sold the same season it is produced, and because of its delicacy, brings a much higher price in the market than other domestic waterfowl. As the Canada females lay but few eggs, it it is not customary to raise mongrels from them. They are more often used for breeding pure Canada geese. The mongrel is generally the product of the Canada gander mated with some dark colored domestic goose, usually an African or Toulouse. The gander will mate equally well with a white or light colored goose, but the progeny would be very liable to be marked with more or less light colored feathers, which might cause doubt upon the part of the dealer as to the genuineness of the breeding, and thus injure the sale when the bird came to be marketed. The gander has usually to be kept until two or three years old before he will mate, and probably for this reason the ganders bring a comparatively high price, good breeding birds ranging from ten to fifty dollars or more each. When a gander has reached the proper age for mating, a good sized, well-bred African or Toulouse goose is usually selected for his mate. A goose two or three years old, which has already proven to be a satisfactory egg producer and good mother, is preferred, and the two should be confined together in some roomy yard provided with water and grass. It is better to get them mated during the autumn months, and to confine them in the field or yard which is to be their future home."

BROWN AND WHITE CHINA AND CANADA WILD GEESE ON THE FARM OF CHARLES M'CLAVE, NEW LONDON, OHIO.

PRODUCTION OF CROSS-BREDS.

Several experiments were made in the production of cross-breds. It should be understood that cross-breds are the result of mating two thoroughbreds of different breeds. If the crossing is continued in subsequent years, by mating cross-bred to cross-bred, the results will be unsatisfactory and the stock will dwindle in size. Breeders should be careful to distinguish between cross-breds and what are ordinarily termed mongrels. Good results are obtained from the first cross of thoroughbred stock, but every subsequent cross must also be made with thoroughbreds to secure satisfactory results.

The geese used in producing the following crosses were thoroughbreds.

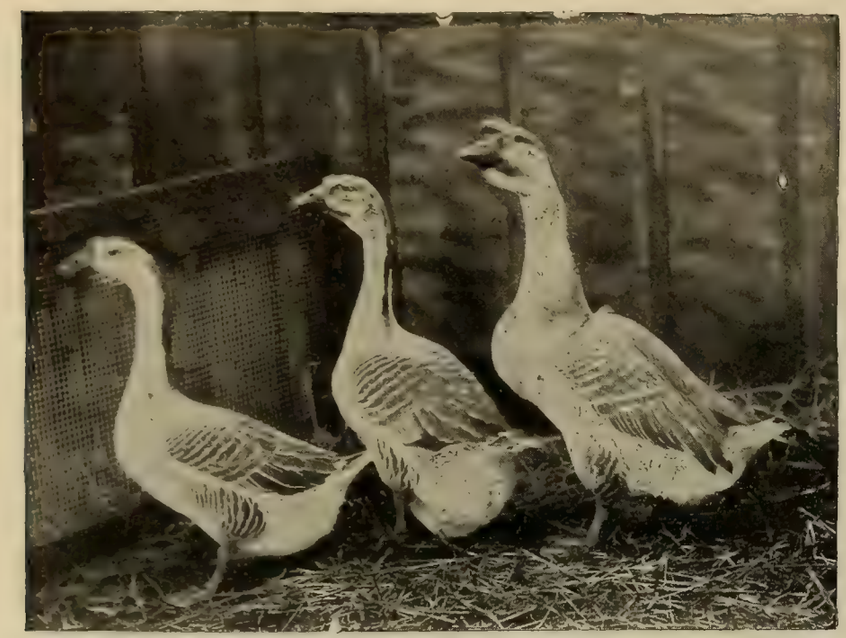
Hatches were made on April 2, April 29 and May 28. The growth of goslings of the second hatch is described in the following table, which covers both cross-breds and thoroughbreds:

SHOWING WEIGHTS OF GOSLINGS HATCHED APRIL 29th, 1897.—SECOND HATCH.

MATING.	WEIGHED JUNE 5, 37 DAYS OLD.		WEIGHED JUNE 25, 57 DAYS OLD.		WEIGHED JULY 10, 72 DAYS OLD.	
	No. of goslings.	Average pounds.	No. of goslings.	Average pounds.	No. of goslings.	Average pounds.
Embden—African.....	6	3.24	6	7.11	6	9.03
Embden—Brown China.	7	3.46	7	7.03	7	8.87
Embden—Toulouse.....	1	4.13	1	7.88	1	9.31
Toulouse—Embden.....	2	3.22	2	7.40	2	10.03
African—Embden.....	4	3.53	3	7.75	3	10.16
Brown China—Embden.	1	3.38	1	6.88	1	8.44
African—White China..	3	4.04	3	7.43	3	8.52
White China—Embden.	1	3.31	1	6.88	1	8.25
Brown China—Toulouse	4	3.09	4	6.90	4	8.98
African—African.	2	4.00	2	8.94	2	11.40
Toulouse—Toulouse	9	3.41	8	6.86	8	8.66
Embden—Embden.....	6	3.32	6	7.24	6	9.38
Toulouse—White China.	1	3.44	1	7.63	1	9.69

Taking the average of growths of goslings hatched upon the three dates mentioned above, "The pure bred Africans

reached the greatest average weight five times, held third place once, and made the greatest daily gain four times. Pure bred Toulouse held the first place three times, and made the greatest daily gain once. The Embden-Toulouse cross, pen 3, were the heaviest birds once, second heaviest once, and made the greatest daily gain once. The pure bred Embdens did not once reach the first place, but ranked second five times, and third once. The Toulouse-Embden cross, pen 7, ranked second and third, once each, and twice made the greatest daily gain. The African-Embden cross, pen 8, ranked second once, and third once." * * * "The lowest average weights were recorded for the Brown China-Toulouse twice, and the following matings once each: African-White China, White China-Brown China, pure Toulouse, and White China-Embden." * * *



AFRICAN GEESE.

"It will be seen that the pure bred birds, of which, excepting Africans, there were very few specimens in 1896, have this season made an excellent showing as compared with the crosses. A slightly greater average weight was reached by the Africans, in each of the second and third periods of growth in 1897, than was attained by the progeny of any mating in 1896 during a similar period."

COMPARATIVE LAYING QUALITIES OF GEESE.

In the test of laying qualities for the years 1896 and 1897 the results "give the first place for egg production, taking the results of the two years together, to the White Chinas, with an average of 31.9 eggs; then Brown Chinas, 31.6 eggs; Toulouse, 26.0 eggs; Embdens, 18.6 eggs, and Africans, 16.5 eggs. The largest individual egg yields in 1897 were as follows: One White China goose, in pen 20, laid 40 eggs; a Brown China goose, in pen 2, laid 35 eggs; two Toulouse females, in pen 3, averaged 31 eggs each; an African, in pen 15, laid 30 eggs, and four Embden females, in pens 6 and 19, averaged 23 eggs each. A careful weeding out of poor layers for a series of years would make a material change in the average egg production of the flock."

The average weights of eggs laid during 1896 and 1897 were as follows:

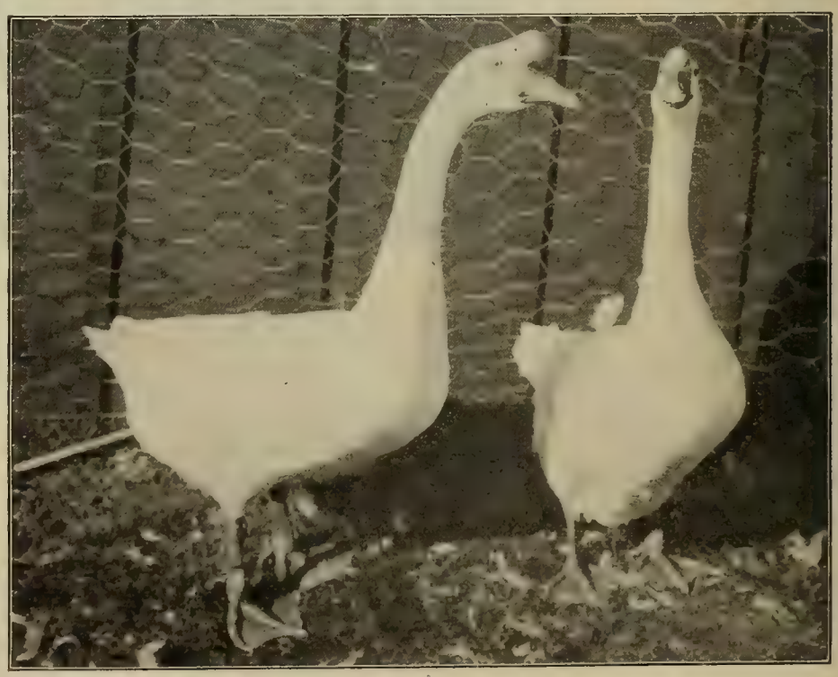
"Africans laid the largest eggs, averaging practically 6.7 ounces each. Embdens rank next in order, averaging 6.567 ounces each. The eggs of Toulouse geese averaged 6.3 ounces each; those from White Chinas 5.522 ounces, and those from Brown Chinas were smallest in size, averaging but 5.445 ounces each. These averages are the result of weighing from 155 to 250 eggs in each instance, and fairly represent the difference in size in the eggs from the different breeds. Eggs from African geese would average to weigh 5.025 pounds per dozen, which is 3.1 times the average weight of Rhode Island Red and Plymouth Rock hens' eggs, as determined by weighing ten dozens selected for hatching. (Average weight 1.62 pounds. In 1897 only the cross-breds were fattened. A comparison of them follows: "The goslings shipped August 11 brought 15 cents per pound, although had the whole lot corresponded with the poorer grades the price would have been less. There was some criticism on account of pin-feathers, which were especially injurious to the appearance of the dark-feathered birds, and which could only be removed by using a sharp knife, and picking them out individually. The influence of Embden blood in the crosses, as illustrated by the production of white or pied birds with yellow bills, is a point of value to the practical breeder, as such birds are more easily dressed and sell better in the market.

COMPARATIVE WEIGHTS AFTER FATTENING.

"The Embden-African, Embden-Brown China, and Toulouse-Embden crosses were considered about equal in quality, and classed as the best goslings.

"The third hatch, dressed the 6th and 7th of September, sold for 14 cents per pound, and was commended as the best looking lot sent, taking all the crosses together. Especial pains were taken by the pickers to remove all pin-feathers. The Embden-White China cross received the highest commendation for both form and appearance, and the Embden-African cross was the next choice. The African-White China cross was selected as third in point of quality and appearance. In this hatch this cross was all white birds with yellow bills, while in the second hatch this same cross was all colored like the pure African or Brown-China geese, and the three goslings in the shipment were considered 'especially rough' in appearance. This serves to show the advantage that white feathers and yellow bills have over dark feathers and black bills." * * *

"The heaviest goslings were the Toulouse-Embden cross, pen 7, in the second hatch, which averaged 13.15 pounds dressed weight. The same cross in the third hatch averaged 11.16 pounds. The African-Embden cross, in the second hatch, averaged 11.53 pounds dressed, which was next to the heaviest average. The gains during the fattening period were much less than those secured in 1896. The greatest average daily gain was 1.96 ounces, for pen 4, White



WHITE CHINA GEESE.

China-Brown China cross, and Toulouse-Embden, pen 7, was only a little less, 1.92 ounces per day. In 1896 the Embden-African cross gained 2.48 ounces per day, and the Embden-Toulouse and African-Toulouse crosses both exceeded 2 ounces gain per day." * * *

MARKET QUOTATIONS IN 1897.

"Messrs. Knapp & Van Nostrand, Nos. 241 and 243 Washington Street, New York, kindly furnished the following quotation of prices paid for Rhode Island geese during the season of 1897:

The first lot of green geese was received May 20, and the price paid was 25 cents per pound

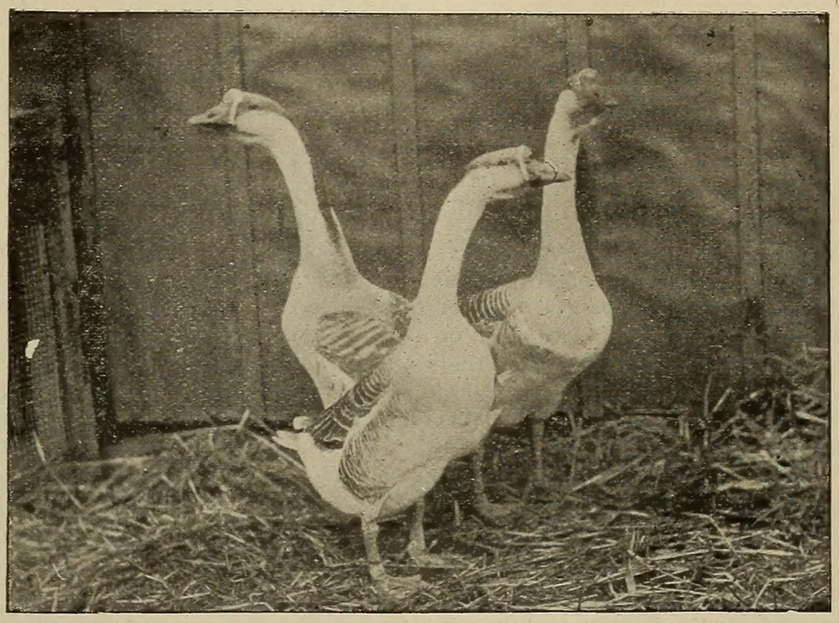
Prices change as follows:

June 4, paid	24	cents per pound
June 9, paid	22	cents per pound
June 12, paid	21	cents per pound
June 16, paid	20	cents per pound
June 22-29, paid	18	cents per pound
July 9-14, paid	16	cents per pound
July 16 to Aug. 24, paid	15	cents per pound
Aug. 31 to Oct. 22, paid	14	cents per pound

Fancy stock to freeze:

Oct. 23 to Dec. 3, paid	14½	cents per pound

Messrs. W. H. Rudd, Son & Co., No. 40 North Street, Boston, Mass., under date of February 16, 1898, say: "Green geese began to arrive last season the early part of June, and we paid 25 cents per pound for the first lots. Later shipments, the latter part of June, were 20 cents, and in July the prices eased off to 16 cents, ranging from 13 to 15 cents the balance of the season, according to quality of stock. We paid 14 cents for Canadian geese, fattened in Rhode Island, during the fall months. We froze up quite a large stock for use through the winter at that figure. The supply of these is about exhausted at the present time, and little stock arriving now except ordinary western geese, which range from 8 to 11 cents per pound, according to quality, the majority being rather poor stock. The better class of hotels running upon the European plan take geese from the bill of fare after this time, and do not put them on again until the middle of June."



BROWN CHINA GEESE.

GEESE AND DUCKS FOR MARKET.

Suitable Breeds—Manner of Killing, Dressing and Packing for the Chicago Market—Large Fat Geese Always in Demand—Prices Obtainable.

BY H. P. SPRAGUE, PRESIDENT SPRAGUE COMMISSION COMPANY, CHICAGO.

THE breeding and growing of geese and ducks for market purposes can undoubtedly be made profitable if conducted in a practical manner. It is not necessary to have a large farm and running water or even a lake for geese and ducks to swim in, as they will do well if they have plenty of water to drink, which can be given them from a well, but they should have it before them all the time.

Geese, as a rule, do not require much grain, as they will feed almost entirely on pasture, while ducks should have plenty of food in addition to grass. There is no excuse for anyone raising small ducks or geese, as it costs no more to raise large birds than small ones. The leading varieties of geese for marketing are the Toulouse, Embden and African. For general purposes the Toulouse, in my opinion, leads all other varieties. The Embden are about the same size as the Toulouse, but are poorer layers. Young Toulouse geese at six months weigh on an average 12 to 15 pounds each, while common geese with the same care and feed weigh 5 to 6 pounds each.

The larger breeds of ducks are also best for the market; either Pekins, Aylesburys, or Rouens. The White ducks are much the best, as they command better prices and look better after they are dressed; their feathers, too, are worth more than colored. To obtain the best results, hatching should be done by incubators or common hens, and the young ducks and goslings should be taken care of in brooders or by hens. After goslings are eight weeks old they may safely be turned into the fields with the old geese and should have free access to plenty of fresh green grass. Very little other food is required. Young goslings are very rapid growers and at eight weeks will be over half grown if properly taken care of. Young ducks also grow very fast. Pekin ducks if properly taken care of will weigh 4 to 6 pounds each at ten weeks of age. If they are raised for market purposes they will bring as much when they are ten to twelve weeks old as at any other time. Considerable revenue may be obtained from feathers by picking the maturer specimens four or five times during the spring and summer months, and the goslings during the latter part of August and in October, providing they are not being fattened for market. Goslings, as well as ducks, sell readily when young, as there is always a good demand for large young goslings during the spring and summer months.

Ducks and geese should be killed by bleeding in the mouth or opening the veins of the neck. Hang by the feet until properly bled. Never pick just before killing in order to save the feathers. Never pick just before killing in order they are killed, before they get cold, in other words, while they are bleeding, as at that time they come out very easily, but if they are picked before they are killed it leaves the skin so inflamed that the stock will not bring a good price. After the feathers which are to be saved are taken off, the geese and ducks should be scalded in water as near the boiling point as possible without boiling.

OCT 6 - 1902

Pick the legs dry before scalding; hold the fowl by the head and legs and immerse; then lift up and down three times; if the head is immersed it turns the color of the comb and gives the eyes a shrunken appearance, which leads buyers to think the fowl has been sick. The feathers and pinfeathers should be removed immediately, very cleanly and without breaking the skin. If the feathers do not come off readily after the birds are scalded, wrap the bodies in blankets for the purpose of steaming them, but they must not be left in this condition long enough to cook the flesh. Another good way to remove the down is to rub the feathers with powdered resin before the bird is scalded, and then the down comes off with the resin, which makes a very good way of dressing ducks and geese, especially geese. Do not pick the feathers off the head, and it is well to leave them on the neck, close to the head, for a space of two or three inches. The feet should not be skinned, nor the bodies singed for the purpose of removing the down or hair, as the heat from the flame will cause them to look oily and bad. After they are picked clean they should be held in scalding water about ten seconds for the purpose of plumping them, and then rinsed in clean cold water.

The process of plumping and cooling is the same as with turkeys and chickens. There is no kind of poultry harder to sell in this market at satisfactory prices than poor, slovenly dressed geese and ducks, and those who send in such must not be disappointed at low prices. No poultry of any kind sent to this market should be drawn.

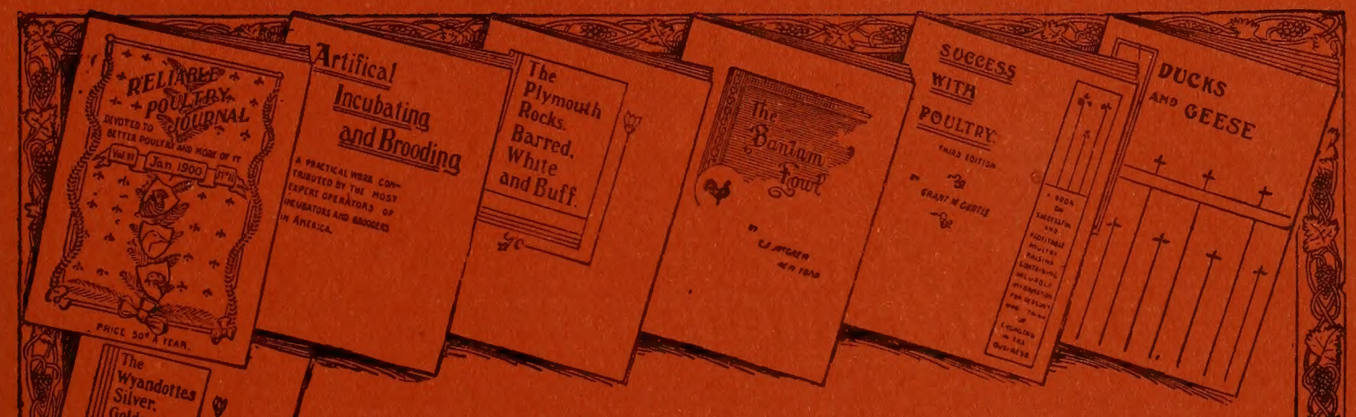
Pack in boxes or barrels, boxes holding 100 or 200 pounds are preferable, and pack snugly; straighten out the body and legs so that they will not arrive very much bent and twisted out of shape; fill the package as full as possible, to prevent shuffling about on the way. Mark kind and weight and shipping directions neatly and plainly on the cover. Barrels answer better for chickens and ducks than for turkeys and geese. When convenient, avoid putting more than one kind in a package. Endeavor to market all old and heavy cocks before January 1, as after the holidays the demand is for small, round, fat hen turkeys only, old toms being sold at a discount, to canners.

The best time to sell ducks and geese is when they are young if they are raised early. Most of the live geese are marketed during September, October and November. There is a good market for live ducks all summer or, in fact, the year around, but after the weather has turned cold it is better to ship both ducks and geese dressed. The larger they are the better prices they will bring per pound. While the market sometimes gets over stocked on ducks, it never has and never will be overstocked on large fat geese at anytime of the year, as we have a Jewish trade that is always looking for large fat geese and as a rule they are always scarce. The duck market has been much higher for the last six or eight months than it was a year ago at the same time and there is no reason why there will not be a good market the coming season. We want to impress on the minds of breeders that they must raise large geese. Do not forget that it costs no more to raise large geese than small ones and when they come to the market they will bring from two to three times as much either by the pound or by the dozen. Live geese sell by the dozen, dressed geese, and alive and dressed ducks sell by the pound. For the last few months live ducks have been selling for about 10c per pound; dressed ducks, 11 to 11½c per pound, while geese have been selling at from $6 to $18 per dozen, alive, according to size, and from 8 to 11c per pound dressed. Remember, the larger the geese the more they will bring per pound. P. H. SPRAGUE.

CHICAGO AND PHILADELPHIA MARKETS.

As reported monthly in the Reliable Poultry Journal by Messrs. P. H. Sprague, Chicago, and Philip Quigley, Philadelphia:

	DRESSED.			ALIVE.			
	DUCKS.		GEESE.	DUCKS.		GEESE.	
1899.	Chicago.	Philadelphia	Chicago.	Chicago.	Philadelphia.	Chicago.	Philadelphia
Feb.....	8c. to 9c.	.....	8c to 9c	7½c to 8c	.....	$4-$6 doz.	.....
March...	8½ to 9½	.....	8½-9½	9c	.....	$3-$6 doz.	.....
April	.....	10c.	.....	9 to 10	11c	$3-$6 doz	9c
May	.....	.....	.....	8 to 9	.....	$3-$6 doz.	.....
June...	(old) 8 to 9 (young) 10 to 14	12-13	.....	.....	.....	.....	.....
July ...	(old) 7½ to 8 (young) 10 to 11	9 10-11	.....	.....	.....	.....	.....
August ..	.....	.....	.....	(old) 7½ young 8½	.....	$5-$7 doz.	.....
Sept	.....	.....	.....	8 to 8½	10 to 11	$5-$7 doz.	.....
October..	.....	.....	.....	8 to 8½	.....	$6-$9 doz.	.....
Dec.....	7 to 9	9 to 10	7 to 9	7 to 7½	9 to 10	$4-$8 doz.	9 to 10
1900							
Feb.....	10 to 11	.....	8 to 10	9 to 10	.....	$6-$9 doz.	.....
March....	10 to 11	10 to 13	.....	9 to 10	12c	.....	10 to 11



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