

and at the end of incubation there were 50 per cent. of chicks, in spite of the shaking to which the eggs had been subjected.

"No one will think of recommending fowl-keepers to send their incubators across continents, but these remarks seemed worth mentioning. Failures ascribed to shaking are generally due to other causes, and there are many other injurious circumstances, in fact, which intervene."

Ostrich Farming

More than ordinary interest has been aroused in this wonderful bird from the fact that an ostrich farm is to be located in the vicinity of Toronto. A number of birds for this purpose have already arrived and are for the present located at Munro Park, one of the many pleasure resorts for which this good city is known, where they form the chief attraction. Whether the promoters will be successful in their venture to breed and raise ostriches in this climate time will tell. We can only hope that abundant success will crown their efforts.

In the meantime the following account of a visit to a California ostrich farm by Miss Louise E. Drew gives some idea of how such a farm is managed:

California has many things of which to boast besides "the land of sunshine," charming climate and luscious fruit. For instance, the only ostrich farms of any importance in the United States are located here. The one at San Diego is the original farm which was at the World's Fair, but the one at Pasadena is the largest in this country. The day of our visit to the latter we were somewhat startled at the announcement that President McKinley had "thrashed his wife shamefully," and we were told that the pugilistic Bob Fitzsimmons had joined in the fracas—but then they were only ostriches.

We were so fortunate as to witness a plucking bee, and it was a most interesting sight. The young birds were six months old and it was funny, indeed, to watch them balk like untamed colts. A long stocking-shaped hood was drawn over the head and down the neck, thus blinding the bird, a small opening being left at the toe of the hood through which the beak could project to admit of breathing. When blinded, the bird became passive and was shoved into a stall to prevent his moving forward, while the operators prevented him from backing.

The plumes of the six months' chick are not of much commercial value, and they are called spadonias. From this age on, however, the bird is plucked every ten months, the feathers attaining perfection at the maturity of the bird. Twenty-six plumes in each wing are protected by less feathers underneath, and by three rows of feathers above overlapping one another. Besides the wing feathers the tails are also taken. Body feathers are not taken, but are picked up during the moulting season, and used for cloak trimmings, collarettes, etc.

An average bird yields one and one fourth pounds of feathers at a plucking, those of the male being of a heavier quality and of more value than those of the hen. The time when the plumes are at their best is just before they are ripe. The quill is then cut with a pair of sharp clippers—small pruning shears are best—about two inches from the socket. The stubs are left two or three months to ripen and can then be easily pulled without injury to the socket in the wing.

The kicking qualities of an ostrich are great, but he exercises the prerogative only when in the breeding season. They do not back up to one for that purpose as has been often stated, but are thoroughly progressive in whatever they do. The kick is delivered either standing or running, and has a distinct up and down stroke. When in the immediate vicinity of an infuriated ostrich a high board fence is comforting; lacking this, one should be provided with a ten-foot pole with a forked end. In plucking a breeding bird it sometimes becomes necessary to pick a fight with him before he can be caught.

The average weight of an ostrich egg is 3½ pounds, and

it will measure 15½ by 17½ inches in circumference. For eating it is delicate and nutritious, equalling 2½ dozen hens' eggs. For a soft boil 30 minutes' time is required. The flesh of a young bird compares favorably with the choice cuts of good venison. Dried beef ("biltory" in Africa, "jerky" in California) is made of the flesh of the older birds, and is used by African boers (farmers).

It takes just 42 days in Africa for eggs to incubate, in California two days' less time. After mating, the ostriches prepare for housekeeping by scooping a nest in the sand or loose soil, pushing with their breast bone, and pushing out behind with their toes. The nest, when completed, is 4 feet in diameter, and slanting to a depth of 10 inches in the centre, saucer-shaped. One egg is deposited every other day for three or four weeks. These are faithfully turned every day in order that the germ, which is held in place by a delicate spiral cord, and always near the upside of the egg, may not become inactive, and thus cause an imperfect embryo.

The birds take regular turns at sitting on the nest—the hen occupying it from 8 a.m. until 4 p.m., while the gallant male takes the 16 hour watch. The care of chicks hatched in the natural way devolves upon the cock. Chicks artificially hatched must be cared for much in the same way as young turkeys. Too soon out in the morning dew, too late out in the evening damp, is good cause for sickness and death.

The feeding process is an interesting sight. The birds push one another aside, exhibiting all the selfishness of human nature—greediness is no name for it. The long neck is craned to receive an armful of alfalfa, a dozen oranges, as many potatoes, a measure of grain, etc. It takes enough rations for a good-sized regiment to appease their hunger. The oranges and potatoes are swallowed whole, and each one can be distinctly seen as it passes down. The birds are also fed shells and gravel in order to aid their digestive apparatuses to perform their work.

Just at the sunset hour as we were ready to turn away Madam Ostrich deposited an egg in her nest, evidently for our benefit. The keeper "stole" it right away, and placed it in the incubator. Thus the birds are "fooled" and they will lay many more eggs than if left to their own devices.

Orchard Cultivation

The following, taken from a press bulletin issued by the Kansas Experiment Station, will be of interest to fruit growers here:

Bare soil soon loses its humus and becomes infertile. This must be prevented. Here is one way of preventing it. Plow the orchard in the spring, cultivate both ways and keep all weeds down till September 1, at which time the soil will be in fine condition for a seed bed. Sow rye at the rate of two bushels per acre. This will cover the ground well before winter, and therefore protect the ground from blowing or hard freezing during the winter. Let the rye stand till knee high in the spring, then turn under and proceed with clean cultivation through the summer.

Deep cultivation is not essential nor advisable, but the cultivation should be frequent. Go over the ground after every rain, if possible, with the disk or the harrow to break the crust. This will give a mulch of loose earth two inches deep, which will greatly retard evaporation and therefore conserve the moisture for the use of the trees. This system of management has the following advantages:

1. It provides the soil with a good supply of organic matter (humus), which will keep it in good physical condition, as well as prevent washing and blowing.
2. It provides a cover for the ground during winter, thus preventing the soil from blowing; it catches the snow, thereby moderating the temperature of the soil.
3. It provides for clean cultivation during the summer, the time when all the moisture that falls should be conserved for the use of the trees.
4. By ceasing cultivation and introducing a crop Septem-