

# How the Little Brown Hen is Helped by the Self-Regulating Incubator



WEIGHING THE BIRDS—WEIGHMASTER E. E. SMITH IN CHARGE OF THE SCALES.



GENERAL VIEW OF THE INCUBATOR SECTION AT THE TRI-CITY POULTRY SHOW.



JUDGING THE EXHIBITS—G. D. MCCLOSKEY OF AVDCA, IA., NOTING THE POINTS FOR HIS CLERK.



GARD F. AND HER MAJESTY, A PAIR OF E. B. DAY'S IMPORTED ST. BERNARDS.



SINGLE COMB BUFF ORPINGTON SHOWN BY W. HAMILTON OF PLATTSBURGH, N.Y.



WHITE CHINESE GANDER SHOWN BY E. E. SMITH OF LINCOLN, NEB.



LIGHT BRAHMA COCKEREL SHOWN BY B. KEELINE OF COUNCIL BLUFFS.

chickens would have been extinct had not an inventor brought out the incubator and made the business profitable. The only kind of poultry we would have had today would be crows and mudhens. But the incubator saved the day. It started the farmers to producing chickens for big profits and gradually they have drifted and been driven by competitors to producing blooded stock. I believe I can safely say that half the farmers in Washington county are producing pure bred chickens. If their entire flock is not of pure blood they are buying nothing but thoroughbred cockerels and gradually working toward perfect purity of strain.

breeder of thoroughbred chickens. He secures a dozen good pullets and buys a cockerel from another reliable dealer, giving him a start in the pure bred poultry business at an expenditure of less than one-fourth the outlay for the flock of tramps which tore up the neighborhood and turned up poor at market time. Those who produce pure bred chickens declare they get a larger per cent of strong birds, with good habits and which will put on flesh on 60 per cent of the food required for a mixed lot of chickens.

Then there is a little gambling in the poultry business. Out of every hundred or more chickens the poultry farmer gets a "show bird." Sometimes the bird will be worth \$50 and again it may bring \$150. A very ordinary looking White Wyandotte hen at the Omaha show was worth \$50. Old Trusty, the rooster belonging to F. F. Devore of Valley, Neb., sold to a St. Joseph firm with his three sons for \$150. "I wanted a Barred Plymouth Rock hen

## Progressive Events in the Field of Electricity

**Development of Last Year.**  
EVENEMENTS in the science of electricity have become so common that the world no longer wonders. The expected inventions and applications of the current to manifold uses, which would be classed as sensational a score of years ago, now attract but momentary attention, so accustomed are we to the seemingly limitless possibilities of the science.

The last year records many notable strides in electrical development. At the head of the list is the completion of Marconi's transatlantic wireless telegraph system and its use for commercial purposes. Marconi's experimental work in transatlantic communication dates from the notable day in December, 1901, when he received in Newfoundland the letter S, the appointed signal, from Cornwall, England. Encouraged by this success, Marconi commenced the erection of a powerful station at Glace Bay, Nova Scotia, where four huge braced towers were built at the corners of a square, and an elaborate system of aerial wires strung from them and led down to the sending and receiving station below them in the center of the square.

the disruptive voltages between spherical electrodes at distances greater than normal conditions it is about 2,500 volts per millimetre. The dielectric strength of other gases can be found in a similar way experimentally. In the case of oils the dielectric strength can be ascertained by noting the disruptive voltages between spherical electrodes immersed in them, provided the distance apart is greater than 4.00 of a centimetre, but in finding the dielectric strength of solids it is advisable when possible to embed the spherical electrodes in the material under test. In the case of acetone the dielectric strength of the material is very difficult. Most insulating materials are composed of organic matter and are not quite isotropic, and the effect of applying an excessive pressure to a cable for a considerable time is often to carbonize part of the dielectric and to weaken it permanently. Many engineers connected with manufacturing companies are of the opinion that the testing pressures sometimes specified by consulting engineers are too high and applied for too long a time. The author states the formula for the construction of high-pressure concentric cables having an isotropic dielectric for a maximum working pressure. It is also pointed out that the effect of the temperature gradient in the dielectric of a concentric main is often to make the electric stress between the two conductors more uniform, and that the dielectric strength of many insulating materials in the solid form diminishes as the temperature rises. The effects of alternating and direct pressures in producing stresses are sometimes quite different. High pressure cables for alternating or direct current circuits should be graded so as to make the maximum electric stress on the dielectric as small as possible, and stranded conductors should be encased in thin lead tubes. In appendices to the paper are given the formulas for the construction of single core cables and the thermal conductivity of the dielectric.

**Lighting Pines on a Cold Morning.**  
Ever since the principles of "bright living and right thinking" permeated into the brain of man the one obstacle to the attainment of the ideal has been the problem of lighting the morning fire in regions where Old Decca deposits himself. People possessed of sufficient means to dispense with stoves and line their homes with radiators warranted to radiate comfort in the early morning hours have solved the problem to their satisfaction. But the millions still starved to the electric stove, a sure thing winner, is leaping to the fore, mocking the Coal trust and searing its grip. It lacks only an automatic means of starting to work to make it the gem of winter homes. And the clockwork attachment is about to be supplied by Prof. Harmon W. Morse of

the chemical laboratory of Johns Hopkins university. The professor has invented an electric stove with a clockwork mechanism which the heat may be turned on at any hour without personal attention. The device also operates to turn the heat off at any time required. It is the professor's aim to do away with the necessity for early rising, so far as furnace tending is concerned. He believes that by installing one of his electric stoves in place of a furnace the head of the household may be as late as his business permits, secure in the knowledge the house is being kept at the proper temperature without any effort on his part.

**Electricity in Kitchens.**  
Housewives can make electricity serve them in many ways without installing an expensive equipment, says The Delinestor for January. The electric range, that must have special wiring, is costly. But other devices are within easier reach. They are operated simply by attaching the connection to the electric light socket, from which the ordinary bulb is temporarily removed for the purpose. Among these conveniences is the electric station maintained at the proper temperature while moving over the ironing board in action; the electric stinngroom set of basket chafing dish and coffee percolator which will merrily cook on the breakfast table the second course while you are eating the first; and the electric heating pad of sardines that takes the place of the hot water bottle. Any of these work at a cost of about 2 cents an hour. Beyond them there is so much that may be done by electricity that it sounds like a story of hot Indian magic.

Y EARS ago a famous rooster is said to have remarked: "Aw, what's the use? An egg yesterday, a feather duster and a chicken sandwich tomorrow." But since those days the lot of the rooster and his family has improved. His life story is more than simply a trip from some hidden hen's nest to the griddle. Like the lot of man, the chicken with good ancestry, a firm determination to become something in the world and win place among the millions, may become a pampered pet, a show bird worth \$1,000 and never see the griddle nor the chopping block. New and then a chicken with poor ancestry may "trample with his evil star" and be recognized by poultry breeders.

the long aisles at the annual disturbance. Hundreds of country visitors enjoyed the company of the chicken "60," and many went home determined to produce more and better chickens and get some ribbons at the Omaha poultry show in not more than two more years.

Some of the chickens boasted of being hatched by their "mothers," and came into the world to peep from beneath a feathered breast upon the interior of a modern poultry house, but most of the fine birds attested the success of artificial incubation, and boasted of pipping the shell in a steam-heated St. Louis flat, falling through the floor only to light on a piece of warm sheepskin with two inches of wool. Then they looked out on the domestic scenery of a neat kitchen or saw the large supply of canned fruit in a cemented cellar, instead of peeping at haymow rafters, and they heard the voices of children long before they ever heard a calf calling for help.

And so it goes. In days gone by the chicken which brought \$10 was a neighborhood wonder, but out over the prairie of Nebraska there are hundreds of poultrymen raising stock which will bring them prices almost beyond belief, some \$20 or \$25 and others will produce a bird or two during the year which will bring \$20 to \$25. "There is a fascination about breeding for perfection," said an exhibitor. "Beauty is a fine art now in everything, especially when experience proves it to be combined so well with utility." Years ago the farmer cared only for the useful, but he is independent now and has turned his eyes to the beautiful and seeks it alike on the interior of his home, in his stables where his horses show the same lines which make them beautiful as the cattle in his sheds. Instead of unsightly mongrel chickens, he has the best and gets more for them when he sells.

Trusty, the barred Plymouth rooster sold by F. F. Devore of Valley, Neb., for \$150. Trusty's sons went along for \$50. A perfect Barred Rock should have such a beak I raised over two hundred hens before I got one which was perfect, but I have one now which money would scarcely buy. Yes, she's worth a hundred to anyone, but it is worth more than that to me." And so it goes. In days gone by the chicken which brought \$10 was a neighborhood wonder, but out over the prairie of Nebraska there are hundreds of poultrymen raising stock which will bring them prices almost beyond belief, some \$20 or \$25 and others will produce a bird or two during the year which will bring \$20 to \$25. "There is a fascination about breeding for perfection," said an exhibitor. "Beauty is a fine art now in everything, especially when experience proves it to be combined so well with utility." Years ago the farmer cared only for the useful, but he is independent now and has turned his eyes to the beautiful and seeks it alike on the interior of his home, in his stables where his horses show the same lines which make them beautiful as the cattle in his sheds. Instead of unsightly mongrel chickens, he has the best and gets more for them when he sells.

Just twenty-three years ago artificial incubation proved successful and practical. Before the mechanical device for hatching eggs the capabilities of poultry husbandry were limited. Had the demand for poultry products increased as it has in the last twenty-three years, and the hens been compelled to hatch all the eggs and run with all the chickens, it is likely that "springing" would be quoted at \$9 cents per pound instead of 8 cents during the poultry show in Omaha. But incubation by means of a machine has only been perfected within the last fifteen years. The first incubators were useless in the hands of 25 per cent of those who bought them, and even until 1896 the machines were retired by many farmers.

In the small pine and glass boxes shown hatching chicks at the poultry show were seen the simplified results of years of labor by such eminent scientists as Huxley, Agassiz, Foster, Haffour, Biehoff, Dollinger and Karl Ernst von Haer, who studied eggs and gave the first workers with the incubator their knowledge of embryology. Then came the army of inventors, some of them not so successful as others. Mastering at least a part of the knowledge of the physiological life of the chick given by the scientists, they experimented with first electricity for heat, and then went back to the coal oil lamp. They learned that the temperature under a hen at its highest is never over 105 degrees. If the temperature runs up a single degree there is a corresponding mortality. Should it go higher, it was found that chicks might be hatched, but would invariably die.

Enough eggs were spoiled in experimenting with incubators to run the hotels of Omaha for almost a whole season, and poultry men believe most of the bad luck was due to a desire to reach too great a perfection in self-regulating machines. Statistics presented at a Massachusetts convention of poultry fanciers in 1886 recorded an experiment of James Rankin, and took out 183 ducks. During the spring of 1886 he produced over 3,000 ducks, and Massachusetts avowed to the fact that coffee and beans were far less profitable than ducks. Those green ducks of one James Rankin are still talked about by poultry men. Before he had hatched the last duckling the first ones he hatched in the spring were being marketed along about June 19 for \$2 per pair and sold for \$2 per pair until July 15. The literature market went down in Boston when the papers printed the "story" of the famous green backs and the incubator business became an established fact.

Before the days of the incubator the hope of the poultry farmer was to produce eggs. The profit from the business was almost wholly dependent on the egg product. The roosters were kept for this purpose and the roosters slung for the market. In this connection it is interesting to note the reports of the Middlesex South society, which held a meeting in Boston in 1901, and one Mansfield gave a report of his experiment. He had started in the poultry business on an extensive scale with 199 hens and during the first season consumed ninety-three bushels of corn and produced 117 eggs each (no chicks being raised) and these gave Mansfield a profit of \$125 per head for his hens. But a growing demand for chicken as a meat food has led farmers in constant uneasiness in fear that the hens would not get to setting early enough in the spring. The desire to have a hen which would set at any season was one of the first reasons advanced for artificial incubation. The "fried chicken" market offered opportunity for handsome profits if the springs could be placed on the market early enough, and when the machine succeeded the poultry farmers swamped the market with fried chicken early in May and springs were well along in age by June 1.

That Omaha is destined to be the poultry show town of the west was the prediction of the exhibitors at the Omaha show. It is the market for the commercial chicken and the show place for the fancy and perfect birds of three or four great states, which produce more poultry than any other states in the union. During the coming year the energy of the Omaha, South Omaha and Council Bluffs poultry men will be put into next year's show and hundreds of members will plan to bring birds to Omaha next year. It is predicted that the next show will present to visitors not less than \$200 of the barnyard art-tocracy.