

conditions, but, other things being equal, those machines which are most nearly automatic are to be preferred. In addition to the foregoing requisites, a convenient appliance for turning the eggs, positive in its action, should accompany each incubator. This may be an extra tray that is to be placed bottom side up over the tray of eggs and held firmly in this position while both trays are turned, thus completely transferring the eggs from one tray to the other without jar. The different machines have very different appliances for accomplishing this result. Excellent results are obtained by the use of many machines now on the market when the operator of these various machines is thoroughly interested. Poultrymen have, for a term of years, hatched in incubators over 80 per cent of all eggs put in the machine. It must not be interred that this is an easy thing to do. A record of this kind is attained only by close observation and good judgment, not only in running the machine, but also in the breeding and care of the fowls to produce fertile eggs.

DISEASE AND LICE.

Disease and lice are the great obstacles to be overcome in poultry raising. The houses may be kept free from lice by a liberal use of kerosene emulsion and by whitewashing. Whitewash serves a double purpose, that of ridding the house of lice and making the interior much lighter. A small window, with the interior of the house whitewashed, will make the building as light as a much larger window without the whitewash. If the poultry houses are kept free from lice, the fowls can usually be depended upon to keep themselves free by a liberal use of the dust bath. If, however, body lice are found, they may be successfully treated by dusting insect powder under the feathers in the evening and allowing the fowls to be undisturbed on the perches after the treatment.

Gapes in chickens frequently destroy large numbers, and are caused by trematode worms in the windpipe. The number of worms is sometimes so great as to completely choke the fowl. A feather moistened with turpentine or kerosene oil and inserted into the windpipe and turned until the worms are removed is a practice quite largely recommended. Others recommend removing the worms with a fine wire or horsehair, doubled so as to form a loop; this is to be inserted into the windpipe and turned until the worms are detached, and then withdrawn, bringing the worms with it. Another remedy practised by some poultrymen is to cause the chicks to breathe air in a confined space into which fine, slaked lime is occasionally dusted.

Preventive measures are far more satisfactory than the

treatment of infected fowls. The pens and yards should be kept clean and dry and the chickens kept in as thrifty condition as possible by supplying proper food and exercise. While these conditions may not insure absolute freedom from the disease in every instance, yet to moisture and filth can be attributed nearly all cases of gapes, particularly if the yards or pens were previously occupied by infected birds. Yards that have been allowed to become damp, filthy, and infected with the gape-worm may be improved by draining and thorough cultivation. Heavy applications of lime just before cultivating or saturation of the soil with strong salt solution (provided no crop is to be grown) are recommended by experienced poultrymen.

Chicken cholera.—This is an exceedingly fatal contagious disease, which is widely distributed over this country, and causes enormous annual losses, especially in the central and southern sections.

The first symptom of the disease is, in the majority of cases, a yellow coloration of that part of the excrement which is usually white, quickly followed by diarrhoea and rise of temperature. Other common accompanying symptoms are the drooping of the wings, stupor, lessened appetite, and excessive thirst. Since the disease is due to a specific germ, it can only be introduced into a flock by direct importation of this germ, generally by fowls from infected premises. As soon as the symptoms of the disease are observed "the fowls should be separated as much as possible and given restricted quarters, where they may be observed and where disinfectants can be freely used. As soon as the peculiar diarrhoea is noticed with any of the fowls, the birds of that lot should be changed to fresh ground and the sick ones killed. The infected excrement should be carefully scraped up and burned, and the inclosure in which it has been thoroughly disinfected with a one-half per cent solution of sulphuric acid or a one per cent solution of carbolic acid, which may be applied with an ordinary watering pot. Dead birds should be burned or deeply buried at a distance from the grounds frequented by the fowls.

"The germs of the disease are taken into the system only by the mouth, and for this reason the watering troughs and feeding places must be kept thoroughly free from them by frequent disinfection with one of the solutions mentioned.

* * Treatment of sick birds is not to be recommended under any circumstances. The malady runs its course, as a rule, in one, two, or three days, and it can only be checked with great difficulty."—(D. E. Salmon, U.S. Dept. Agr. Rpt. 1880, p. 444)

Roup is one of the most dreaded of diseases. It is some-