

your incubation is conducted upon theoretically perfect lines, none; for the egg when it is laid contains within itself as much moisture as if properly conserved would suffice for the hatching of the chick, but as we are rarely able to supply, as does the hen, air to the germ without causing undue evaporation of the liquid contents of the egg, it follows that we must repair our clumsiness by supplying moisture to take the place of that of which we rob the egg, and this is the only possible answer to the question "How much moisture to supply." We have an excellent means of judging at any given stage of the hatch, as to the conservation of moisture within the egg, being able to see through the shell the rate of growth of the air space, remembering that the contents of the newly laid egg fill the whole of the shell and that just before the eggs are ready to hatch, say on the 18th day of incubation, they fill only about four-fifths of it, and this diminution by evaporation should go on regularly from the beginning to the end of incubation. Usually and preferably the evaporation of the contents of the egg is controlled by the operator through the manipulation of the ventilating holes made in the machine which are mostly adjustable by means of small shutters. In our own case we provided in a 162 egg machine twenty-four half inch holes, all in the bottom of the machine, of which we open at putting in of eggs always one hole to fifty eggs; on the 7th day another hole to every fifty eggs; on the 12th day ditto; while on the 18th day we open more, not by rule, but we are guided every time by our own judgment as to the relative size of the air space. It usually happens that on the 18th day we have about 15 of these half-inch holes open, we however always use some moisture supplied in galvanized iron pans four-inches square, 16 square inches each. Usually about four of these are in by hatching time, having been put in at various times throughout the hatch, beginning with one between the 7th and 10th days. When the chicks are coming down into the nursery where the pans are we cover them with a piece of fly screen gauze tacked on a light wooden frame. I am aware that this ventilation is in excess of that usually recommended and that added moisture is in many machines not used at all, but it appears to me that the air in the incubator cannot be any the worse for constant renewal, and supplying so much air we have to

counterbalance its drying effects by the addition of moisture; and so far we have observed no results which would cause us either to condemn our practice or to depart from it.

There is another thing also that calls for careful watching, viz., the quantity of moisture in the air we supply. In our own case our hatching is done in a spare bedroom of our dwelling house in which room we have at the present time three machines—one of 50 eggs, a bought one, and two others of our own design and construction, one of which is 135 and the other of 162 egg capacity. Now in the summer, not only is the air in general dryer, but the household cooking and washing is done in the summer kitchen while in winter these operations are performed in the kitchen proper, which is part of the house. It is then perfectly clear that any rule that might be formulated to meet the winter campaign when the air of the house is somewhat heavily charged with steam from the cooking and washing would be totally unfit for summer when the air is relatively dry and contrariwise. What is wanted is common sense, diligent watching and comparison and an inclination and capacity for absorbing lessons from other people's experience. Of course when one buys an incubator there comes with the machine the maker's instructions for running it which should, for at least the first hatch, be followed implicitly, and from one's experience in that hatch and the results thereof may be deduced many other rules which will help the operator in aftertimes.

It is curious to observe how narrow is the margin of safety between having the eggs too dry and not dry enough. If too dry the chicks, although perfectly formed, will be found stuck to the inner skin of the egg and so unable to turn in the shell, while if not dry enough the chick will be so large that when it breaks the shell it will thrust the point of its beak right through and so from that cause also will be unable to turn and complete its liberation. Although I think there is no doubt that the general experience is in favor of putting in an excess of moisture rather than not enough, for while it is difficult for an abnormally large chick to free itself from the shell, it is impossible for one to do so that is dried to the skin enveloping it.

So that the whole question may be summed up in this: Watch your air space not one or two eggs only