

can be supplied at 5s., 7s. 6d., and 10s. per head, according to selection, coops being extra—one, two, or three birds, 2s.; every additional bird, 6d. Early application for both birds and sittings is necessary, in order to avoid delay and possible disappointment. Owing to difficulty of collecting small accounts it has been decided that the cost must accompany all orders.

#### LINE BREEDING.

The value of inbreeding and the necessity of only doing this on definite principles suggests the necessity of providing for readers of these notes a definite method of procedure. I cannot do better than quote Lewer Wright's exposition of the method of line breeding devised by the American authority J. K. Felch. This is as follows:—

Suppose the strain to originate from two individuals only, though in the case of fowls, of course, several hens or pullets might be used as one of the units. In that case, however, all should be of the same breeding.\* The two original units must, of course, be perfectly vigorous and healthy, and either unrelated or only distantly related in blood. They should always be from different yards, for it is found that even change of ground has some effect in producing that "different blood" which has so much to do with avoiding constitutional disease. Taking our two original units, then, Mr. Felch's chart shows how they may be bred so as to maintain health and vigour.

In reading this chart every dotted line means a female—*i.e.*, a hen or pullet—and every unbroken line a male. Wherever two such lines meet at a point, the circle at that point denotes the produce of the mating, bearing a number distinguishing it as a group or product; while the fraction outside the circle denotes the mixture or proportion in that product of the blood of the two original units from which is bred the strain. The first year, for instance, the original pair produce group 2, whose blood is half-and-half of each. The second year the original female, or one of them, is bred to a cockerel from group 2, and the original male to a pullet from group 2. Thus are produced groups 3 and 4, each of which possesses three-fourths of the blood of the unit on its own side of the diagram. Here begins the real work of the breeder, since these mates now taken from group 2 must be most carefully selected to type, according to that "course of selection" which we have already discussed. From the very first all depends upon this, and, of course, the two original units have been chosen with equal care, so far as money and opportunity allowed. The third year a cockerel from group 3 is mated with the original hen to produce group 5, and pullets from group 4 to the original male to produce group 7, all of which possess seven-eighths of the blood on their own side, and are to be rigorously selected true to type as before.

But the most noteworthy mating this year, to which we would call special attention, is that of a pullet or pullets from group 3, with a cockerel from group 4, producing group 6. It will be seen that all the members of group 6 possess equal or half-and-half blood from the original parents, as much so as group 2. We also mate a pullet from group 5 and a cockerel from group 7, each of these owning seven-eighths of the blood of one ancestor, and we again produce in group 10 a progeny whose blood is half-and-half. Now, suppose we had mated brothers and sisters from group 2 to produce the half-and-half blood and age of group 6, and brothers and sisters from these to produce similar equality of blood at the age of group 10, the result of such incestuous inbreeding would have been swift degeneracy. As it is, we have made our matings from lines characterized mainly by the original male and female, and yet preserved the same mathematically exact equality of blood in our group 10. A generation further on we can produce group 15 as shown, from groups 9 and 11; or we might have mated groups 8 and 12; or the produce of the former may be mated with that of the latter. We have thus seen how it is possible to keep up the half-and-half blood of a cross intact and exact without any loss of size, fertility, or vigour.

\*It need hardly be pointed out that in this case the scheme may be carried out with less inbreeding at the first stages, as a cockerel might be bred back to an aunt instead of to the mother. But unless the hens or pullets are full sisters the result will not be the same or have the same certainty.