

INTRODUCTION AND LITERATURE REVIEW.

Artificial lighting has been used to increase the egg production of poultry since the beginning of the century. In particular it has been used in the temperate countries to aid the production of out-of-season eggs in autumn and winter. At this time of year wild birds do not reproduce and this is to some extent reflected in a falling egg production and a tendency to moult on the part of domestic poultry. It has been shown for many mammals and birds, and indeed for many other living things, that reproduction in the spring and early summer is brought about by lighting, or photoperiodic, effects. In most birds, for instance, reproduction in the spring and early summer is brought about by an increasing day length. Reasoning on these lines it would seem obvious that the falling egg yields in the autumn are the result of shortening days. Artificial lighting can be used to maintain a constant day length. This will prevent any effects the shortening days might have had. Alternatively it may be used to give an increasing day length thus reproducing the stimulating effect of spring. Standard practice has tended to do only the former. This is probably because the view was held that the beneficial effect of lighting was solely due to the additional time given to the hens to consume food. However the evidence seems to point towards the increasing day length being more effective and progressive poultry keepers are beginning to use it.

Research in the subject up to that time was reviewed by Whetham (1933) and she used a study of egg production records from different latitudes to show that increased production was due to increasing day length. This view is supported by

Larionov (1941) who showed that birds kept under artificial lighting which was varied to give a day length the same as natural day length at any season of the year behaved much as naturally, but that birds kept on a constant fourteen hour day, the day length commonly regarded as being optimum by those who advocate a constant day length, had more or less continuous courses of lessened activity, both of egg laying and of moulting.

As stated above there is some question whether the increased production is due to the stimulating effect of light or to the larger amount of food eaten by the hens in the longer day. The latter was the view held when lighting was first started but was questioned by Whetham (1933) who considered that any increase in food consumption was due to the increase in egg production rather than vice versa. Two series of experiments have been carried out to answer this question but have given contradictory results. Temperton and Dudley (1947) showed no increase in egg production if the hens were kept on a fourteen hour day but were only allowed food during the hours of natural daylight or were rationed to a food consumption similar to that of hens kept under natural lighting. This paper is not very convincing however. Callenbach et al. (1943) showed that availability of food had no effect on the increase in egg production caused by a fourteen hour day. Both these experiments were carried out using a constant day length.

It has been shown that light intensity is of no importance over the range studied. Nicholas et al. (1944) showed no difference in effect between illuminations of from 0.5 to 38.0 foot candles. Dobie et al. (1946) showed the same over the range from 1.0 to 31.3 foot candles.