

INTRODUCTION.

In the poultry industry and particularly in the tropics, improvement in methods of rearing, feeding and management could do much towards increasing the efficiency of production, but beyond a certain point further improvement will depend on an improvement in the breeding quality of the stock. "The purpose in poultry improvement is to produce the best genotype for a given environment and at the same time to establish the optimum environment for the genotype created." (Lerner, 1954). The Imperial College as well as concerning itself with devising systems of poultry management suitable for the tropics inaugurated a progeny testing scheme in 1952. The progeny test is the evaluation of the breeding animal upon the qualities of its offspring.

The first two years of the test have been reported by Hoole (1953), Pitman (1953), Wheeler (1954). In this, the third year, the males used in the first two years have been evaluated on the records of their progeny. Those males shown to be superior have been used, or will be used, in the foundation of an Elite flock. A further group of males have been tested this year.

A great deal of literature is available on the subject of progeny testing, (Edwards 1932, Goodale 1938, Hays 1947, Lush 1949, Kelley 1949, Hutt 1949, Lerner 1950, Hagedoorn 1950, and Mann 1953). Poultry provide good material for carrying out a progeny test because they produce a relatively large number of offspring from a mating and have a short period from initial mating to the productive period of the progeny. The test is best used as a supplement to earlier selection when it improves the accuracy of selection for quantitative characters (those influenced by many genes), but it involves the lengthening of the generation interval. The circumstances most favouring its use

are when the heritability of a character is low, when a character is measured in only one sex, and when the size of the breeding unit is large.

From the standpoint of rate of genetic progress factors other than the accuracy of progeny testing compared to other methods must also be considered. The additional genetic gains from the progeny test obtained from increasing the precision of selection, may be, at least in part offset, by a reduction of selection intensity and increases in the interval between generations. In overcoming this Lerner and Cruden (1948) have shown that the loss in accuracy in selection consequent upon the use of partial records is more than compensated for by the speed-up in generation turn-out. The correlation between the phenotypic partial record for egg production and the genotype for full production is good. Cooper and Maddison (1954) agree, and state that the partial record is 50 per cent more efficient than the full record. In the progeny test at the Imperial College records are taken to 500 days. A preliminary evaluation after 300 days resulted in similar conclusions being reached on which sires were superior.

The progeny test will increase in accuracy as the number of progeny increases but there will be an optimum beyond which numbers will do little to increase accuracy. The minimum number of progeny required for the evaluation of a sire will vary with the nature of the character being tested and the environmental conditions existing. For quantitative characters Midtland (1953) calculated that the significance of progeny tests increases only slightly when the number of daughters exceeds 15 for egg number or 10 for egg size. For characters of a qualitative nature not less than 30 progeny may be required (Mueller and Hutt, 1946).