Breeding Biology and Population Dynamics

THE LIFE SPAN OF SWANS

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No difference has been discovered in the age of the adults of *Cygnus cygnus cygnus* and *Cygnus columbianus bewickii.* Their life spans can be estimated by matching recruitment to, and losses from, the population. In *C. c. bewickii* observed in the field, juveniles amount to between 25% and 43% (30.5% on average). Colour marking clearly shows that four juveniles (of 10 in two broods) survived till the migration season, ie the rate of elimination is 60%. Thus, in 43 swans, the number of adults will be 30 (69.9%) and that of juveniles 13 (30.2%) of all the swans in the first year. This result is roughly consistent with the average in the field.

Furthermore, we suppose that they come into breeding condition from the third year and that in this case the 13 juveniles are composed of two broods of five and a brood of three. On this assumption we add another, that the rate of elimination up to the second year is also 60%. Therefore, five juveniles survive as sub-adults.

If we compose an age pyramid style figure on the basis of these five sub-adults, we can get the result that in the second year the number of adults (including sub-adults) is 30, so the balance is kept. Therefore, in relation to the procreation coefficient of juveniles, if this cycle is maintained, the population of *C. c. bewickii* is kept constant.

In the 'Investigation Report on Hurt, Sick, and Dead Swans' (the Swan Society of Japan: 1977/78), the number of dead swans was 257. The dead adults and juveniles were in the ratio of 27 : 42 (= 39.4% : 60.6%).

While it is difficult to conclude that the actual condition of the whole population is directly reflected in this result, it may be helpful in examining the relation between breeding and selection.

Judging from these results, the average life span is ten years.

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