

progressive of modern zoos have attempted to show these birds by leashing them to lawn-blocks in the same way that falconers have traditionally kept their birds. Such an arrangement does permit the exhibit of these species, but of course gives them no opportunity to reproduce.

Prior Attempts at Captivity Breeding

There are verbal reports of some attempts to breed Peregrines in Hungary between the two world wars but the first documented account is the series of experiments by Renz Waller in Germany during the Second World War, and no report of similar experiments with Peregrines can proceed without reference to his work. The account has been published in the book "The Wild Falcon Is My Companion" and that portion relating to the breeding experiments has been translated into English by Erling Sundve and Ronald Stevens.

The reported experiment extended over a period of some eight years and concerned both Peregrines and Goshawks, but it is only to the former that I shall refer here. The entire sequence with the Peregrines involved only three individuals, one female and two males. The year the first nesting attempt was made is not definitely stated, but it would appear to be in 1938 or 1939. The female was about five years of age. The pair was confined in an aviary 15 feet long, 9 feet broad, and 6 feet high. Two eggs were produced, the first on the 21st of March. Both sexes took part in incubation but the eggs failed to hatch. No information is given as to whether the eggs were fertile or not, nor is there any information on the background of the two birds, but there is an unstated implication that they were both eyasses. After full-term incubation, two large downy Buzzards were placed in the nest and the eggs were removed. The young Buzzards were ignored but not molested by the female, were fed by the male for fourteen days, then abandoned.

The same pair made a second nesting attempt the following year in the same aviary. Again the eggs failed to hatch. This time one of the eggs was opened and a well-developed, dead embryo was found. No information on the treatment of the two adults in the time interval between these two attempts is given, nor are the dates of egg production.

The third attempt occurred in 1941. The female was the same bird that attempted the two previous nestings, but she had been moved to a different place and a different setting. The quarters this time are described simply as "a room," the dimensions not given, but the pair seems to have been quite closely confined. The new male was an injured, wild-caught adult of unknown age. Three eggs were laid between the 10th and 15th of March and were brooded by both sexes until the 20th of April but failed to hatch. The eggs were removed, checked, and found to be infertile.

In the spring of 1942 the fourth reproductive attempt was made by this falcon in company with the same wild-caught male. Four eggs were laid between the 5th and 13th of March when temperatures were as low as 20 degrees below zero. Both sexes again took part

in incubation. One egg was accidentally broken on the 19th of March, but two of the three remaining eggs subsequently hatched on the 12th of April. The third egg failed to hatch but on examination proved to contain a full-term chick that had died in the egg. One of the two successfully hatched young died on the 27th of April, but the one remaining young bird was brooded, fed, and normally attended by both adults until the 8th of May at which date it was taken from the adults and reared to flying age by the falconer.

One more successful nesting was made by the same pair in the spring of 1943. Eggs were produced unusually early--the first on the 25th of February, the third and last on the 3rd of March. Incubation proceeded normally as before, but only one egg hatched. One egg contained a large dead embryo; the third egg was infertile. The young falcon was left with the adults and was attended normally until the 7th of May, then removed. This bird too was raised to flying age successfully.

Waller's experiments terminated at this point, his entire property being destroyed by air-raids although he notes that the hawk-shed escaped damage. Waller's conclusions: (1) work only with birds held for a long time in captive situation; (2) feed a rich diet; (3) absolute seclusion to copulation.

Following Renz Waller's experiments, there seems to be no further recorded attempt to raise Peregrines until 1959 when Ronald Stevens began a similar program in Ireland extending over a period of four years. Stevens has published a full account of the two nesting attempts by his pair in the Journal of the North American Falconers Association of 1963. In this case both birds are clearly stated to have been eyasses, and, in 1959 when they were first confined together, the female was seven years old. The male was of doubtful maturity, being only two years of age. Stevens' pair was given considerable space, being confined in a building measuring 40 feet by 18 feet by 16 feet. There was no attempt at nesting in 1959, yet both sexes brooded and fed a young Merlin that was placed on the nest ledge. Again, in 1960 no eggs were laid and yet again the adult Peregrines brooded and attended two young Merlins that were placed on the nest ledge. In 1961 three eggs were produced, apparently early in April. Both sexes took part in incubation for a time, then one egg was found broken, and shortly after that the other two eggs "disappeared," apparently without trace. In 1962 three eggs were again produced, the dates not listed. These eggs were abandoned by the adult birds after the eggs had rolled into a deep crack in the dried turf on the nest-ledge. Finally, in 1963 two eggs were laid and were incubated by both sexes for four weeks. These eggs proved to be infertile.

Concurrent with Stevens' experiments, there have been several other unpublished attempts to attain domestic reproduction of Peregrines but apparently no eggs have been produced. It seems that the birds involved in most, if not all of these are wild-caught.