Notes on fall-hatched Tricolored Blackbirds.—In October, 1959, at least two large colonies of Tricolored Blackbirds (*Agelaius tricolor*) bred in rice-growing districts in the Sacramento Valley of California (for details see Orians, *Auk*, 77: 379–398, 1960). This note reports the data on molt and gonadal cycles in 12 nestlings taken from nests during the first two weeks of November and hand-reared. The birds were kept in buildings, where they were subjected to some night-time disturbance until mid-December, when the 10 surviving individuals were transferred to an aviary in Strawberry Canyon on the campus of the University of California at Berkeley. Thereafter all birds experienced natural photoperiods.

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All birds began their postjuvenal molt in late December, completing it by early February. Thus, the postjuvenal molt followed fledging in the normal manner despite drastically altered temperatures and photoperiods. The second week in February several of the males began to sing abnormal songs, analysis of which will be given elsewhere. On 12 May 1960 laparotomies were performed on all birds. Three of the four males had greatly enlarged testes and five of the six females had enlarged ova, typical of the stage to be expected in wild females just prior to initiation of nest building (Table 1). The remaining female was extremely emaciated and died as a result of the operation. Inactive testes in male Tricolored Blackbirds are usually less than two mm in length, and the mean value of testis length in 41 adult males shot from the fall breeding population in October was 6.3 mm. Therefore, it is likely that the hand-reared males were in potential breeding condition at this time.

TABLE 1

MAXIMUM DIMENSIONS OF TESTES AND OVA OF FALL-HATCHED TRICOLORED BLACKBIRDS 12 MAY 1962

Males	*Longest dimension of larger testis*	*Females*	*Maximum dimensions of developing ova*
1	2.9 mm	1	0.5 mm (very thin, died)
2	7.0 ,,	2	1.4 ,,
3	6.5 ,,	3	1.5 ,,
4	6.0 ,,	4	2.0 ,,
		5	3.0 ,,
		6	1.3 ,,

None of the nine surviving birds molted prior to the time they escaped in mid-July and only one was recaptured. This lone male was taken by automobile to Seattle, Washington, 23–24 August, where he was housed indoors but with access to natural photoperiods. The transfer, although covering a considerable latitude, was accomplished at a time when changes in photoperiod were slight. This male sang vigorously throughout September and early October, and a laparotomy on 14 October revealed enlarged testes 8.5 mm in length. He died in early November without having molted since the previous January.

Discussion

Data from hand-reared birds throw some limited light upon several of the problems raised in my paper on autumnal breeding.

Age at first breeding of fall-hatched birds.—An important question, with respect to the evolution of autumnal breeding in this species, is the age at which fall-hatched individuals breed for the first time. Through the recent work of Miller (*Proc. Nat. Acad. Sci.*, 45: 1095–1100, 1959) it is now known that for passerines possessing two well-defined breeding seasons each year, the same individuals may be involved in both breeding efforts, undergoing two complete molt and gonadal cycles each year. It is also known that in some nomadic species, individuals are capable of breeding when they are six (Marshall and Serventy, *J. Exp. Biol.*, 35: 666–670, 1958; Vaugien, *Bull. Biol. France et Belgique*, 87: 274–286, 1953) or nine months old (Marshall and Disney, *Nature*, 180: 647–649, 1957). However, there has been no information as to the age at *first* breeding of species with a double breeding season at any latitude. Six-month-old birds were not found in breeding condition in the autumnal colonies in 1959, and whereas it cannot be definitely said that caged birds would have bred in the wild when they were six months old, most of them were physiologically prepared to do so. Since males do not normally breed in the wild until they are two years old, it is unlikely that any of the fall-hatched birds would breed in their first spring, but there is no reason to assume that they would not breed in their second spring when they were one and one-half years old. If females hatched in the autumn were to breed the following spring, as they are apparently capable of doing, this would support the argument developed in my previous paper (Orians, *op. cit.*) that only limited success need be expected from autumnal breeding in order for the habit to carry selective advantage.

Role of photoperiod in the gonadal cycle of the Tricolored Blackbird.—Since thousands of Tricolored Blackbirds came into breeding condition in September, 1959, it is clear that short day lengths are not essential to terminate a refractory period in this species, nor are increasing day lengths essential to bring birds into breeding condition. However, it is impossible to evaluate the influence of day length in the annual cycle of this species from such field data. The fact that fall-hatched birds came into breeding condition in May could mean that photoperiod was important since no birds six months of age were found in breeding condition in the fall colonies. Resolution of this problem must await results of detailed studies now under way on the molt and gonadal cycles in Red-winged Blackbirds, *A. phoeniceus*, and Tricolors (R. Payne). It is clear, however, that these two closely related species respond quite differently to environmental variables as there was no sign of gonadal activation of Red-wings in the fall of 1959.—Gordon H. Orians, *Museum of Vertebrate Zoology, Berkeley, California, and Department of Zoology, University of Washington, Seattle, Washington.*