Further Evidence of Hybridization between Zonotrichia atricapilla and Zonotrichia leucophrys.—On March 11, 1960, in the foothills east of San Jose, California, we captured with mist nets 21 Golden-crowned Sparrows (*Zonotrichia atricapilla*). These were from a mixed winter flock which also included White-crowned Sparrows of two races, *Zonotrichia leucophrys gambelii* and *Z. l. pugetensis*. The birds were transported to San Jose State College to be used for investigations on the physiology of migration. At time of capture they were just beginning the pre-nuptial molt. By the last week of April the molt was completed except in birds that had been castrated on March 21. In early May we observed that one of the castrates (56–164252) completing its pre-nuptial molt had a white superciliary stripe. Closer examination made it apparent that this bird possessed characteristics of both the Golden-crowned and White-crowned sparrows. Our data show that at the time of capture we considered it a "sub-adult" Golden-crowned Sparrow with crown type 2 (max.) of Cogswell (News from the Bird Banders, 33, 1958:24–28). It progressed to 2–A by April 16 and to 5A-C by April 30. On May 28 this bird was found dead in its cage and was made into a study skin (SJSC Vertebrate Museum, no. 3031). There was no apparent regeneration of testicular tissue.

Miller (Condor, 42, 1940:45–48) described a hybrid between *Z. atricapilla* (then *coronata*) and *Z. leucophrys* taken in the spring of 1939 at Berkeley, California. Our bird appears to be the second such hybrid represented by a skin. Through the good offices of Dr. Miller, we were able to compare the specimens side by side in the preparation of this report.

The crown patterns of the two birds are strikingly similar. As in Miller's bird, comparison to *Z. l. gambelii* seems indicated because of the similarity of the head stripes to those of that subspecies. The distribution of the gold in the center of the crown and the gray area extending to the nape of both birds are characteristic of *atricapilla*. A yellow spot above the eye of our specimen is the same as that described by Miller for the bird of 1939. Again the absence of black (of *atricapilla*) apparently permits this yellow to be expressed in this otherwise white area (of *gambelii*). The yellow of our specimen is very pale, but this pale coloration is manifest in 49 of 51 Golden-crowns held in captivity through the pre-nuptial molt. We feel this is probably an artifact attributable to a diet which may have been low in carotinoids.

Whereas the dorsal and ventral surfaces of our bird are typical of *atricapilla*, the dorsal surface of Miller's bird resembles *atricapilla* while the ventral surface is lighter and more closely resembles *gambelii*. The bill color of our bird nearly matches *atricapilla*, but it may be slightly lighter. The bill of Miller's bird approached the pink of *gambelii*.

Table 1

Measurements of Hybrid *Zonotrichia atricapilla* x *Zonotrichia leucophrys* in Millimeters

	1939 hybrid	1960 hybrid
Wing length (chord)	75.5	80.0[1]
Tail length from emergence of central rectrices	72.5	76.1[2]
Bill length from nostril	8.5	8.3
Bill depth at nostril	7.0	7.3
Tarsus	23.6	24.8
Middle toe without claw from between second and third toes	14.1	14.5
Hind toe without claw	9.6	10.5
Claw of hind toe	6.9	8.1

[1] Taken April 30 before appreciable cage-wear to wing tips.
[2] From skin, tail slightly worn.

The more easily observed differences between the hybrids are in size (table 1). Our bird weighed 45.5 gm. on April 23, dropped to 40.0 gm. by April 30 and retained that weight for nearly a month thereafter. The weight on April 23 was 6.1 gm. above the mean for 33 castrates on the same day. After that date, however, and until its death, the hybrid's weekly weight did not deviate more than 0.8 gm. from the mean weight of the castrates. Twenty-nine to 31 unoperated males maintained a mean body weight approximately 2.0 gm. heavier than the castrates during this same period, indicating that castration did not cause this bird to be abnormally heavy. Miller's bird weighed 33.6 gm. on April 24, some 11.9 gm. less than our bird on April 23. The body measurements support the weight

differential. Our hybrid is consistently larger and its measurements appear to be more typical of *atricapilla*.

Despite the size differential, these two specimens are quite similar, lending support to Miller's speculation that his hybrid may be of the first filial generation. The fact that they were captured 21 years apart in time but only about 30 air miles apart in distance makes one wonder if they may have come from the same breeding population.—MARTIN L. MORTON and L. RICHARD MEWALDT, *Department of Biological Sciences, San Jose State College, San Jose, California, July 20, 1960.*

Changes in Food Habits of Short-eared Owls Feeding in a Salt Marsh.—Predation by Short-eared Owls (*Asio flammeus*) on the inhabitants of a salt marsh was reported for a four-year period (1952–1955) by Johnston (Wilson Bull., 68, 1956:91–102), who randomly collected and examined owl pellets from San Pablo salt marsh, near Richmond, Contra Costa County, California. The present author collected and examined owl pellets on this same marsh during 1959 with a view to demonstrating suspected changes in the predator-prey relationships there. A total of 170 food items was recorded and percentages of the prey species computed for comparison with the figures available for this marsh. A description of the habitat involved is given in Johnston's paper (*op. cit.*: 91). As in Johnston's report, all owls involved here are migrants or winter visitants. One owl, however, remained through June, 1959, although departure for the breeding grounds usually occurs in early May. The total number of owls feeding on the marsh was probably six to eight, a figure comparable to the estimate made by Johnston (*op. cit.*: 93).

The data in table 1 were assembled in the manner followed by Johnston with the exception that counts of humeri (left or right, whichever was higher) instead of skulls only were made for mammals. This resulted in a slightly higher number than if skulls alone had been counted. In the column of the table headed "change from 1952–1955," a percentage is considered different if it is outside the range of Johnston's figures (*op. cit.*: 95). A few species listed by him were not recorded in 1959, but these form only a very small part of the diet of the Short-eared Owl on San Pablo salt marsh.

Examination of the present table and that of Johnston (*loc. cit.*) shows that most prey items have been taken at a constant rate over the five years for which data are available. However, notable fluctuations did occur in the numbers of the Norway rat (*Rattus norvegicus*) and the Water Pipit (*Anthus spinoletta*).

Johnston (*op. cit.*: 96) noted that there was apparently some relationship between the numbers of the California vole (*Microtus californicus*) and *Rattus* in the pellet samples. From 1952 through 1955 the numbers bore an inverse relationship as the rats increased in number in the sample. However, my data for 1959 show the situation is more comparable to 1952 when the rat population was apparently low and *Microtus* apparently high. The probable reason for this was that during the period from 1952 to 1955 rats inhabiting the nearby dump had direct access to the marsh. The Richmond city dump then in operation was located on the southeast side of the marsh and dumping was directly onto the marsh. A suggestion by Davis (Quart. Rev. Biol., 28, 1953:397) indicates that it is probable that competition resulting from high rat populations forces subordinate individuals to move out in search of more favorable conditions. Emigrating individuals forced out by an increase in the dump population here could easily move out into the marsh. In January, 1956, this dump was closed and a new dump on the north side of the marsh was placed in full operation. The new dump is connected to the marsh study area only by a secondary road, and rats do not have the free access to the marsh that they had previously. In addition, burning of refuse, practiced in the old dump, may have driven some rats into the marsh. Burning is prohibited in the present dump. The policy now in use of burying refuse continually changes the dumping area, a factor which presumably helps check the population of rats at the dump.

Johnston (*loc. cit.*) pointed out that the population of *Rattus* at the dump supplied animals to the marsh but that the rats also lived successfully there. However, it is probable that the rats actually do not live permanently in this marsh in large numbers without regular emigration into it. When the first dump was closed, rats no longer invaded the marsh and so the population dwindled. I have seen only a few rats and trapped just one in 20 months of mammal studies on San Pablo salt marsh. Furthermore, during the winter high tides which flood the marsh and force mammals into the open,