not appear to. The flock immediately tightened up and resumed the avoidance type flight, looking much like a flock of "peeps" flying along the shore. They made no attempts to land on the edge of a nearby department store or on a silolike structure where flocks of doves frequently loaf. The hawk regained altitude above the flock and made a second pass into it. This time she came out below the flock with a dove hanging limp in one foot. The hawk's flight was noticeably labored. She descended and landed in a grassy spot within a fenced fairgrounds. She did not mantle the kill but immediately began plucking the bird and feeding. I passed by about 40 min later and she was just finishing her meal. Her distended crop was conspicuous even from a distance.

I find no record in the literature of Cooper's Hawk hunting in quite this manner. The more usual method appears to be for the hawk to attempt outflying a single prey individual, be it birds or bats (Brimley 1889, Oologists' Semi-annual 1: 32; Leopold 1944, Wilson Bull. 56: 116), in a short sprinting pursuit. Mead (1963, Condor 65: 167) saw a Cooper's Hawk twice strike a domestic pigeon in the air, after which the prey dropped to the ground. Although the hawk stooped on its prey, there was only a single individual being attacked, and the hawk did not bind to the prey but recovered it from the ground.

The habitat also seemed unusual for it is nearly totally commercial and residential developments well within the city. The open grassy fairground field is the only habitat in the vicinity that is anything like what one would expect to find a Cooper's Hawk hunting. The hawk appeared to be a migrant moving through and making an opportunistic kill (Haugh (1972, Search 2, Publ. Cornell Univ. Agr. Exp. Station) reports the earliest Cooper's Hawk migrants as 7 March at Debry Hill 235 air miles north of York).—RICHARD J. CLARK, *Department of Biology, York College of Pennsylvania, York, Pennsylvania 17405.*
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Sun compass utilization by pigeons wearing frosted contact lenses.—Previous experiments (Schmidt-Koenig and Schlichte 1972, Schlichte 1973, Schmidt-Koenig and Walcott 1973) have shown that pigeons wearing frosted contact lenses may home even though their image vision is so drastically reduced that they cannot recognize landmarks at 6 m distance (Schlichte 1973). The experimental results have suggested that the navigational component of the homing process is not affected by reduced vision, which would mean it is based largely, if not exclusively, on nonvisual information. The published results have not provided any indication whether one visual cue, the sun compass (which we regard as distinct from the navigational or "map" component), might still be used by pigeons wearing frosted lenses. It is this question that we have sought to answer in the experiments reported here.

The experimental birds for the first series of test releases were clock-shifted 6 h clockwise by being confined at least 4 days in light-tight rooms with timer-controlled artificial lights turned on 6 h before sunrise and off 6 h before sunset, as previously described in more detail (Schmidt-Koenig 1961, 1972; Keeton 1969). Control birds, drawn at random from the same flocks and thus having identical previous training and experience, were confined for the same period in similar rooms, except that the artificial lights were turned on and off in synchrony with sunrise-sunset. The test releases were conducted during the overlap period between the experimental birds' day and the true day.

Several hours prior to the release, both control and experimental birds were fitted with frosted contact lenses. These lenses, made of plastic, were manufactured as described by Schlichte (1973). Because such lenses have the disadvantage of usually remaining in the eyes of the pigeons until removed by the experimenter, we have more recently developed lenses made of gelatin that dissolves after several hours, thus enabling lost birds to regain their sight. We report the present results now, though they are still somewhat scant, because these will be our last such tests with the old type lenses.

Four experimental releases with clock-shifted birds are reported here; several releases conducted on very windy days—4 Beaufort or higher—are not included but will be mentioned in a paper dealing with the effects of high wind on pigeons wearing lenses. Three of the releases, involving 46 experimental birds and 34 controls, were conducted with Cornell pigeons: 19.3 km E (29 August 1972), 23 km W (30 August 1972), and 73.5 km N (5 September 1973) of the Cornell lofts. One release utilized pigeons (23 experimentals and 37 controls) from the loft in Frankfurt, Germany: 13.8 km N of the Frankfurt loft (15 August 1973). In each case, the pigeons were released individually, and were tracked with 10×50 binoculars until they vanished from sight; the vanishing bearings were recorded to the nearest 5 degrees.

The vanishing bearings from the four releases are shown in Fig. 1, pooled according to the format regularly used by Schmidt-Koenig (e.g. 1961); i.e. the mean bearings for each of the four groups of control birds have been set to 0° and the bearings of the clock-shifted birds have been plotted relative to the means of the controls.

Homing success was recorded in the usual manner. Experimental birds that homed with one or both lenses lost en route were excluded from the scoring of homing performance.

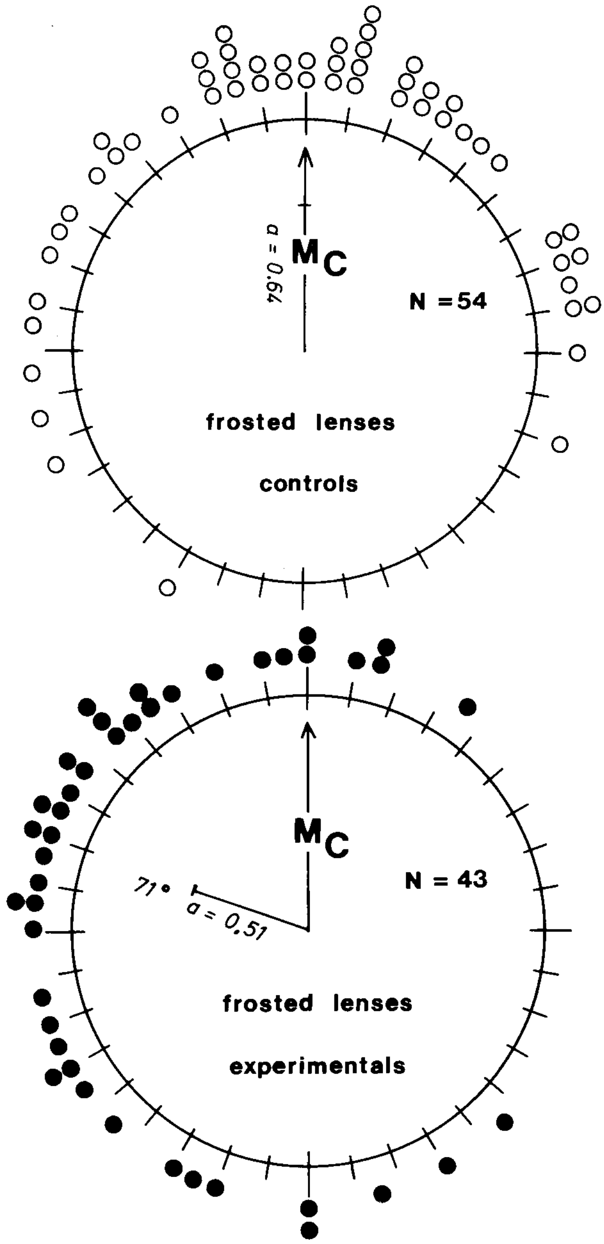

Fig. 1. Pooled vanishing bearings of control (top) and clock-shifted (bottom) pigeons wearing frosted contact lenses. The mean bearing of the clock-shifted birds (a = length of resultant vector) is deflected significantly counterclockwise from the mean bearing, M_c, of the controls, which indicates that the birds were using the sun compass.

The number of vanishing bearings recorded is considerably smaller than the number of pigeons released because some birds perched soon after release and thus yielded no bearings; the tendency to perch is considerably higher in birds wearing lenses than in normal birds. In addition, some birds yielded no bearings because they joined other birds or were lost from sight before the binoculars could be focused on them.

The pooled bearings of both treatments were significantly oriented ($P << 0.0001$) under the Rayleigh test (Batschelet 1965). As can be seen from Fig. 1, the vanishing bearings of the clock-shifted pigeons were definitely deflected counterclockwise relative to those of the controls. Indeed the mean of the pooled clock-shifted bearings is 71 degrees to the left of the mean of the controls. The Watson and Williams F test (Batschelet 1965) for difference between experimentals and controls yields $P << 0.001$.

Homing success was very poor in both groups. Of 71 control birds and 69 experimentals, only 14 controls and 17 experimentals returned, none the day of release. We can offer no explanation for the unusually poor homing performance of the controls; poor homing was, of course, expected in the clock-shifted birds.

We may safely conclude from these data that the sun compass is still used in homing by pigeons wearing frosted contact lenses. They can certainly see the sun as a bright area in their blurred, milky white visual field, and this is apparently sufficient to provide compass information. These results are in agreement with Schlichte (1973), who demonstrated that pigeons immobilized in a stationary apparatus could be trained to use the sun compass while wearing frosted lenses.

A second series of releases, designed to test the ability of pigeons wearing frosted lenses to orient under total overcast, was also initiated, but only two such releases (involving 35 experimentals wearing frosted lenses and 33 controls wearing clear lenses) were carried out, both with Cornell birds: 14 km S (27 August 1971), 91 km E (29 August 1971). Most of the birds perched (only four vanishing bearings of experimental pigeons were obtained), probably because the combination of lenses and overcast resulted in very low light intensity. We mention these releases here because we plan no more such tests with the present style lenses, and wish to put these two on record.

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Ejection of pellets by captive Ovenbirds.—As summarized by Rea (1973, Auk 90: 209), the regurgitation of pellets containing indigestible material is known to occur in several avian families. Among the Passeriformes these include: Corvidae, Cinclidae, Turdidae, Sylviidae, Meliphagidae, Dicaeidae and Sittidae (Pellow 1971, Brit. Birds 64: 80) and Laniidae (Storer 1961, Auk 78: 90). To our knowledge the phenomenon has never been reported in Parulidae or other members of the New World nine-primaried assemblage.

In our laboratory, captive Ovenbirds (*Seiurus aurocapillus*) regularly regurgitate pellets. These birds are maintained on a mash based on dog food, supplemented by Hykro insectivorous bird food along with