

The presence of four birds around the nest early in the nesting cycle suggests that this nesting was initiated by two pairs of adults occupying the same site; polygyny, therefore, appears unlikely. Of approximately 180 nests of the Tree Swallow I have examined, only one other contained an unusually large number of eggs (also 11). That one was destroyed by a predator before I could determine the number and sex of adults in attendance.—BENEDICT C. PINKOWSKI, 60510 Campground, Washington, MI 48094. Accepted 27 Aug. 1974.

Some unusual nest sites of the House Sparrow.—The sites of 28 nests of House Sparrows (*Passer domesticus*) occupying barns and sheds on a farm in western Illinois were recorded during April and May, 1973. Half of the nests were in typical sites, such as under the eaves of buildings, but the other half were in more unusual sites. Twelve were in holes in the once-baled hay in a barn loft. The hay in the barn had been undisturbed for at least 5 years. Entrances to the nest cavities were spaces between boards in the floor of the loft (the ceiling of the main floor), so that the birds had to fly upward to enter. From there a narrow opening extended from 5 to 20 cm horizontally into the hay until it opened into a 10 cm diameter nest chamber. The chambers were lined with feathers and dry grass other than the original hay, but the added material was scanty in comparison with normal nests. The digging of the nest holes in the hay may have been done by rats (*Rattus norvegicus*) or by the sparrows. Sparrows have been reported excavating a nest hole in a rotting tree branch (Philipson, Br. Birds 32:17, 1938). No previous reference to House Sparrows nesting in hay bales has been found.

House Sparrows had also modified and occupied a nest of a Barn Swallow (*Hirundo rustica*) and a nest of an American Robin (*Turdus migratorius*). Similar instances have been previously noted (Bent, U.S. Natl. Mus. Bull. 211, 1958). The Barn Swallow nest we observed was on a joist and was at least a year old and unoccupied when the House Sparrows began modifying it. Large amounts of grasses, feathers, and other materials were added inside and outside until the original diameter was trebled. A dome was constructed over the top, leaving a small entrance at one side.

The robin nest was on a purlin about 20 cm beneath the roof of the barn. Robins had been incubating for 6 days. On the 7th day, grasses and one House Sparrow egg had been added to the robin nest; we never saw the robins at that nest after the first sparrow egg appeared. An additional House Sparrow egg was laid in the nest on each of the next four days, after which the nest was deserted. No dome was constructed over the nest and no lining materials were added to the inside. The sparrows may have been attracted to the open nest due to the roof boards forming a ceiling about 13 cm above the nest rim.—ERICA WERLER AND EDWIN C. FRANKS, Dept. of Biological Sciences, Western Illinois Univ., Macomb, IL 61455. Accepted 23 Sept. 1974.

Soaring vultures use a dust devil to gain altitude.—An observation during the afternoon of Sunday, 18 July 1965 suggests that large birds are aided by visual perception of thermal air columns. I was driving north of Oklahoma City in a search for dust devils as objects of motion picture photography. The whirls are clearly visible when

dust is lifted to considerable altitudes by the associated rising current of relatively warm air (Sinclair, J. Atmos. Sci., 30:1599-1619, 1973). There were scattered cumulus clouds with bases at about 2500 m; the temperature near the ground was about 38°C; wind from the south was blowing 5 to 10 m/sec (meteorological data correspond to the record of the U.S. National Weather Service at Oklahoma City).

Near Hennessey at about 14:00 I saw a large dust devil about 0.8 km to the east in a field. I sped north to pass it; then to intercept it I turned east and stopped as the whirlwind approached. It had become invisible after entering a woodlot where dust previously marking the column was less available. Suddenly, about 150 m away, the whirlwind appeared again, well marked by dust lifted from plowed land bordering the woodlot. Almost at the same moment as my renewed sighting, about six vultures, probably *Cathartes aura*, appeared above the woodlot and flew with rapid strong flapping of wings directly toward and into the whirlwind. They gained altitude rapidly; I guessed they were about 150 m high as they passed nearly overhead. Their position related to the whirlwind at the surface showed that the axis of the whirlwind sloped about 20° from the vertical toward the direction of its horizontal motion. While spiraling in the thermal column and drifting northward at a forward speed of about 10 m/sec, the birds passed rapidly out of sight as they continued to rise together.

It seems likely that soaring birds use both tactile and visual sensing as well as random flight to locate regions of rising air. Thus both Hankin (Animal Flight, Iliffe & Sons Ltd. London, 1913) and Cone (Am. Sci. 50:180-209, 1962) refer to the start of circling by a flock of vultures or condors initially on the ground, coincident with a gust of wind. Hankin seems to imply visual sensing where he states that Cheels (*Milvus govinda*) often amuse themselves by gliding in and out of dust devils at Rajputana, where sometimes half a dozen, like a row of factory chimneys, are visible at once. Pennycuik (Sci. Am. 229(5):102-109) states that vultures and eagles appear to use visible signs as a glider pilot does. Cone suggests, however, that birds find thermal shells (bubbles) by accident, or by sensing air temperature gradients associated with the buoyancy structure of their thermal core and body, or by monitoring aerodynamic forces.

In the present case it remains inconclusive whether the primary stimulus to avian flight was tactile or visual or both. My perception of events suggests, however, that the vultures rose from the ground because they saw a dusty column and recognized it as the strong updraft they required for low-energy ascent to a great altitude.—EDWIN KESSLER, *National Severe Storms Laboratory NOAA, 1313 Halley Circle, Norman, OK 73069. Accepted 23 Sept. 1974.*

Blue Geese wintering with Sandhill Cranes.—Between 14 January and 26 February 1974 two immature Blue Geese (*Chen caerulescens*) were seen on 14 occasions with a wintering sub-flock of approximately 200 Greater Sandhill Cranes (*Grus canadensis tabida*) on Paynes Prairie, Alachua Co., Florida. Times of observations varied from dawn to dusk. The geese flew to and from roosting sites and fed with the cranes and were usually associated with a group of five cranes. The geese were never seen individually and as far as could be determined, did not leave the company of the cranes. On 19 February the geese and 33 cranes were captured with oral tranquilizers, banded and released (William and Phillips, J. Wildl. Manage. 37:94-97, 1973). When observed one week later, 26 February, the geese were still with the flock. This association is particularly interesting since Harvey et al. (Wilson Bull. 80:421-425, 1968) described Sandhill Cranes as a predator of eggs and young Blue Geese. The fact that the geese were