GENERAL NOTES

Records of Swainson's Warbler in southern Illinois.— Swainson's Warbler (*Limnothylpis swainsonii*) is typically associated with extensive southern bottomlands and shallow swamplands, particularly where there are large cane brakes, *Arundinaria gigantea* (Walt.) Chapm. Although southern Illinois is at the northern limit of such habitat, there are a few places along the rivers and creeks that harbor fairly good growths of cane. In these areas Swainson's Warbler has been recorded occasionally, although the records are extremely few and irregular. The few published observations are as follows: Wabash County in April (Ridgway, 1878. *Bull. Nutt. Orn. Club*, 4:163); Perry County in June (Gross, 1908. *Auk*, 25:225); Alexander County in May and Johnson County in June (Howell, 1910. *Auk*, 27:216); near Cairo, Alexander County, in September (Ammann, 1939. *Wilson Bull.*, 51:185). These were the only published records of the warbler for southern Illinois until mention of some of the following observations appeared in *Audubon Field Notes* (1951. 5:292; 1952. 6:292). No published observations of Swainson's Warbler were made in southern Illinois over an extended period in summer prior to 1951.

On April 29, 1951, Richard Brewer and I discovered a singing male Swainson's Warbler in the extensive Cave Valley cane brake, two miles north of Pomona in Jackson County. With further searching during the following weeks, we found the male singing on May 15 and June 16, but otherwise were unable to discover any clue to its status. On July 1 we observed a Swainson's Warbler at close range in an upland forest adjacent to the swamp. The bird was excited by our presence, as if perhaps concerned for the safety of a nest or young birds. It carried insects in its bill and fluttered on the ground almost to our feet, but, although we searched carefully, we were unable to discover a nest. No further observations were made of the species in 1951. Observations of Swainson's Warbler in 1952 were made on May 4 and 20, and on July 4; all were of a singing bird or birds, obviously not excited by the observer's presence. Other duties prevented our searching for the possible nest during the remainder of 1952. In 1953, drought conditions caused the swamp to go nearly dry, so that repeated search for Swainson's Warbler yielded only one late May observation and no summer records. In 1954, moisture conditions returned to near normal, and with this condition Swainson's Warbler again appeared in the Cave Valley swamp in summer. Brewer and I heard a singing male on June 13, and I observed an individual on June 19. We both watched a singing male on July 3 as it fed or gathered food on the ground in the swamp. The preceding observations definitely establish Swainson's Warbler as a summer resident in Illinois. Furthermore, the actions of the bird or birds observed in suitable breeding habitat would seem to indicate nesting activities. It is hoped that these records will assist in ultimately clarifying the status of Swainson's Warbler in Illinois.—JOHN WILLIAM HARDY, *Department of Zoology, Southern Illinois University, Carbondale, Illinois, August 2, 1954.*

Tail winds and migration.— The *Wilson Bulletin*, vol. 66, no. 2, June, 1954, contains several articles dealing with the relationship of weather, particularly of wind direction, to bird migration; and there have been a number of other recent articles on this general subject in several journals. There seems to be general agreement among most authors that birds tend to drift with the wind, something like aerial plankton, but there seems also to be a general tendency to assume that the wind blows from the same direction at all levels. This is by no means the case; and a couple of observations on the Preston Laboratories' grounds in Western Pennsylvania seem to show that birds of many species can find and use a limited stratum of air that is moving in the direction in

which they want to go, even though at other levels there may be strong crosswinds or even headwinds. How the birds discover these critical levels is not obvious. It may be that they observe the drift of insects or clouds or true aerial plankton, or possibly they find the levels in some cases by accident or by observing other birds which have discovered the right level.

On September 27, 1953, at 10:15 a.m. I looked up and saw, at a height above ground of about 2,000 feet, an Osprey (*Pandion haliaetus*) headed south with the speed of an express train and without the slightest motion of its wings. At this I was very much surprised, because at the ground level the wind around my face was blowing strongly from the south, while at really high levels (say 10,000 feet), the few wispy clouds were scurrying east on a strong west wind. The bird had scarcely passed when I saw three Purple Martins (*Progne subis*) hawking where the Osprey had been and apparently migrating south too. A few moments later some wisps of cloud appeared at the same altitude, and, although they dissipated almost at once, they lasted long enough to show that at this level the wind was in fact blowing strongly from the north. The birds had discovered this condition and were making use of it. In the course of the next hour, the clouds thickened a great deal, and it was evident that at levels no higher than 5,000 feet above ground the wind was from the west. Thus the north wind was confined to a rather shallow stratum, and below this the wind would have opposed the birds, or at least would not have assisted them. The increasing cloudiness indicated that some change in the weather, and in the atmospheric circulation, was brewing and that the favorable stratum was not merely shallow in space but most likely fleeting in time.

On May 24, 1954, the early wind was from the north, but later in the day a dead calm prevailed. Around 3:00 a.m., May 25, a thunderstorm passed through, presumably a line-squall on a "front," and at 7:45 a.m., the ground wind was from the south, although at cloud level, several thousand feet up, the wind was from the west and was strong.

A mass migration of warblers and other birds rode the south wind and our woods were full of them, but by 8:15 a.m. the warblers had passed through, leaving behind numbers of Red-eyed Vireos (*Vireo olivaceus*) and Wood Pewees (*Contopus virens*) (the first of the season in each case). Several other species of summer residents seemed to increase in numbers suddenly at the same time. At 9:15 a.m. the ground wind was no longer from the south, but from the west, and was strong. The migration was confined to the south wind, and this wind was confined in space to a shallow stratum near the ground, and in time (at the laboratory) to a few hours, certainly not extending longer than from about 3:00 a.m. (time of the thunderstorm) to 8:00 or 9:00 a.m., and perhaps much less.

The following comments, from a private letter from Mr. Henry Rockwood, Meteorologist-in-Charge, U.S. Weather Bureau, Pittsburgh, have been condensed slightly without changing their sense.

"Wind direction is chiefly a function of the pressure patterns in the atmosphere, which at the surface (neighborhood of ground level) tend to be rather complex. As we go aloft, the pressure patterns tend to become increasingly simpler. This means that wind direction is not the same throughout the atmosphere, but varies with altitude. One of the simpler variations is a clockwise shift with height, which indicates the advection of a warmer airmass into the area. At other times the shift is counterclockwise with height, which means the advection of a cooler air mass.

"Because of the complexity of pressure patterns mentioned above, it is possible for a rather strong low pressure center moving eastward across the Great Lakes to induce a

surface flow at Pittsburgh from south to southwest. At intermediate levels though, the low center may be slightly farther west and more V shaped so that winds will be more northerly or northwesterly. At much higher levels low pressure may not be apparent at all and winds at those levels could well be from the west.

"The duration of a particular pattern is chiefly a matter of a rate of movement of the pressure systems and may last for a few hours at the least to a day or more. It might well be that migrating birds, consciously or unconsciously, seek out the optimum level for their direction of flight."

Although only two occasions are reported above when a particularly striking set of circumstances was obvious, it seems likely that many more would be observed if they were carefully watched for.—F. W. PRESTON, *Preston Laboratories, Butler, Pennsylvania, August 13, 1954.*

An avifauna from the Pleistocene of central Kansas.—The avifauna described here is the result of ten years of intermittent collecting of vertebrate remains from a Pleistocene deposit in the NE¼ sec. 14, T.18S., R.3 W. (Kentuck locality of Hibbard, 1952. *Univ. Kansas Paleont. Contr., Vert., Art.* 2:6), McPherson County, Kansas, by members of the Kansas Geological Survey, Museum of Natural History, and Department of Anatomy, University of Kansas. I wish to acknowledge the critical advice of Dr. H. B. Tordoff, University of Kansas, and the use of comparative material in the University of Kansas Museum of Natural History and the National Museum, Washington.

The specimens, all in the University of Kansas Museum of Natural History, represent the following species:

FAMILY ANATIDAE

Anas carolinensis Gmelin, Green-winged Teal. Nos. 9908 and 9909, distal ends of right humerus.

Lophodytes cucullatus (Linnaeus), Hooded Merganser. No. 9910, proximal end of left carpometacarpus. No. 9911, shaft and distal end of left carpometacarpus.

FAMILY SCOLOPACIDAE

Bartramia longicauda (Bechstein), Upland Plover. No. 9912, left coracoid.

Numenius borealis (Forster), Eskimo Curlew. No. 7428, humeral end of right coracoid.

FAMILY ICTERIDAE

Euphagus cyanocephalus (Wagler), Brewer Blackbird. No. 7354, humeral end of left coracoid. This specimen and no. 7428, listed above, were reported (as unidentified birds) by Hibbard (*loc. cit.*).

To my knowledge, this is the first record of *Numenius borealis* as a fossil. The remaining four species are known from late Pleistocene deposits, to wit: *Anas carolinensis,* Florida (Wetmore, 1931. *Smithsonian Misc. Coll.,* 85:21), Oregon (Howard, 1946. *Carnegie Inst. Wash. Publ.,* 551:191), California (Howard, 1949. *Condor,* 51:21 — a tentative identification), and Nevada (Howard, 1952. *Bull. So. Calif. Acad. Sci.,* 51:54); *Lophodytes cucullatus,* Florida (Wetmore, 1931. *op. cit.*:23) and Oklahoma (Lunk, 1952. *Condor,* 54:317); *Bartramia longicauda,* Kansas (Downs, 1954. *Condor,* 56:211); and *Euphagus cyanocephalus,* Oregon (Howard, 1946. *op. cit.*:192). Fragments, closely resembling parts of *Anas carolinensis,* have been reported from the lower Pliocene of Texas (Compton, 1934. *Condor,* 36:41) and lower Pliocene of Nevada (Miller, in Merriam, 1916. *Univ. Calif. Publ., Bull. Dept. Geol. Sci.,* 9:173). Judging by the result of Wetmore's (1944. *Univ. Kansas Sci. Bull.,* 30:92–94) study of *Anas bunkeri* from the Blancan of Kansas, it