

**Record of the Knot in Texas.**—On March 24, 1957, I shot a male and a female Knot (*Calidris canutus*) from a flock of approximately 30 individuals on Mustang Island, four miles southwest of Port Aransas, Nueces County, Texas. The male weighed 114.3 grams and possessed little fat; the female, 126.8 grams, was moderately fat. The birds were changing from winter to summer plumage. Wolfe (1956. "Check-list of the Birds of Texas," p. 29), lists this bird as "probably a rare migrant all along the coast." The fifth edition of the American Ornithologists' Union Check-list states that they are casual winter visitants along the Gulf coast of Texas, migrating in the spring chiefly along the Atlantic coast and through the lower Great Lakes region.

I left the island on March 29, 1957, without seeing the Knot again. The specimens are now in the collection of Southwestern College, Winfield, Kansas (SC201-202).—MAX THOMPSON, *Museum of Natural History, University of Kansas, Lawrence, Kansas, December 6, 1957.*

**Bird fossils from the Late Pleistocene of Kansas.**—In the summers of 1952, 1955, and 1956, Claude W. Hibbard and his associates collected numerous fossil bird remains in Meade County, Kansas. I am grateful to Dr. Hibbard for the opportunity to study some of this material, and for information about the locality where it was found. Thanks are also due Drs. Harrison B. Tordoff and Robert W. Storer for their advice and assistance in studying the fossils and preparing the manuscript. The specimens are in the collection of the Museum of Paleontology, University of Michigan, Ann Arbor.

All the bones were found in the bank of Shorts Creek, SW  $\frac{1}{4}$  sec. 36, T. 33 S., R. 28 W. The basin or lake deposit is composed of silt, silty clay, and sandy silt. Fresh-water snails, a piece of an *Equus* skull, and a muskrat (*Ondatra zibethica*) tooth were associated with the bird remains. On the basis of the stratigraphic position of the deposit and the species of the muskrat, these fossils date from the late Pleistocene and are younger than the Berends fauna (Starrett, 1956. *Jour. Paleo.*, 30:1187-1192).

*Pelecanus erythrorhynchos*. White Pelican.—A fourth and a sixth cervical vertebra (UMMP no. 30049), both lacking parts of their zygapophyses; brownish white. The fossils are larger than corresponding elements of the Brown Pelican, *P. occidentalis*, and are within the size range of modern White Pelicans. This is interesting in view of the somewhat larger specimen from the late middle Pleistocene of Oklahoma reported by Mengel (1952: *Auk*, 69:81-82).

*Chen* sp. Goose.—Proximal third of a right carpometacarpus (UMMP no. 34830); the distal end of the basal process and the edges of the carpal trochlea have been worn off; brownish white. *Chen* differs from *Anser albifrons* (White-fronted Goose) in the shape of a transverse ligamental scar at the proximal end of the anconal side of the bone, in the shape of the dorsal margin of the carpal trochlea, and in its deeper anterior carpal fossa. *Branta canadensis* (Canada Goose) resembles *Chen* spp. very closely but examination of the basal process in a series of specimens reveals that it is consistently thicker in *Branta*. The fossil is larger than the comparable element in *C. rossii* (Ross's Goose) but is within the size ranges of *C. hyperborea* (Snow Goose) and *C. caerulescens* (Blue Goose). I am unable to separate the two latter forms by any characters which can be discerned in the fossil. This is the first fossil record of this genus from the High Plains.

*Anas* sp. Duck.—Proximal third of a left ulna (UMMP no. 34833), slightly abraded; brownish white. The fragment resembles the ulna of *Anas* and differs from those of *Spatula* and *Aythya* in its blunter olecranon, fainter scar for M. brachialis, and larger external cotyla. It closely resembles that of *Mareca* but has a relatively broader shaft

immediately distal to the external cotyla. On the basis of size the fossil may represent *Anas acuta* (Pintail), *A. rubripes* (Black Duck), *A. strepera* (Gadwall), or *A. platyrhynchos* (Mallard).

*Anas* sp. Duck.—Piece of the right half of a furcula (UMMP no. 34834), slightly abraded; brownish white. The robustness and curvature of this fragment suffice to identify it as either *A. rubripes* or *A. platyrhynchos*.

*Aix sponsa*. Wood Duck.—Right carpometacarpus (UMMP no. 30053), lacking metacarpal III and lightly abraded on all protuberances; whitish. The fossil closely resembles the comparable element in *Aix* and in *Aythya marila* (Greater Scaup). Careful examination of a series of specimens from both species reveals the following differences and permits identification of the fossil: the anterior carpal fossa is clearly defined in *Aythya* but only suggested in *Aix*; in end view the dorsal condyle of the carpal trochlea is dihedral in *Aythya* and slightly curved in *Aix*; the sides of the external ligamental attachment converge sharply at a point or along a line, forming a pit in *Aythya* whereas they form a rounded depression in *Aix*. This is the first fossil record of the Wood Duck.

*Aythya affinis*. Lesser Scaup.—Fragment of the distal end of a right humerus (UMMP no. 30050), abraded on the ectepicondyle and on the proximal end of the external condyle; brownish white. In size and general shape the fossil most resembles the corresponding element in the following species: *Aythya collaris* (Ring-necked Duck), *Aythya affinis*, *Clangula hyemalis* (Oldsquaw), *Spatula clypeata* (Shoveler), and *Lophodytes cucullatus* (Hooded Merganser). The fossil agrees with *Aythya* spp. and differs from the other species listed in its well-marked scar for M. brachialis. It further agrees with *Aythya* and differs from *Clangula* and *Spatula* in the shape of the olecranal fossa and in its fairly straight, flattened shaft. The most reliable difference between *Aythya affinis* and *A. collaris* which I can find in this bone is the shape of the brachial scar. The apex of the scar is elliptical in *A. affinis* and pointed in *collaris*; its ventral margin is less oblique to the long axis of the shaft in *affinis* than in *collaris*. Using these criteria the fossil can be assigned to the former species. Fossil coracoids and humeri which possibly represented the Lesser Scaup were reported by Downs (1954. *Condor*, 56:211) as part of the Jones fauna, late Pleistocene, Wisconsin age, of Kansas. The present specimen is older than those and constitutes a definite record of the species from the High Plains.

Owing to the similarity of these bones among genera, individual variation within species, and the fragmentary or worn condition of the fossils, the following specimens could only be identified as duck remains: cervical vertebra (UMMP no. 34832), ventral half of left coracoid (UMMP no. 34831), proximal third of right scapula (UMMP no. 30054), left carpometacarpus (UMMP no. 30052), proximal third of right carpometacarpus (UMMP no. 34836), and proximal third of left tibiotarsus (UMMP no. 34835).

*Asio flammeus*. Short-eared Owl.—Distal end of left humerus (UMMP no. 30051), with summits of the ectepicondyle and the entepicondyle abraded; whitish. The humerus of *A. flammeus* differs from that of *A. otus* (Long-eared Owl) in its wider distal end, greater distance from ectepicondyle to ectepicondylar prominence, and in having a well-defined pit on the entepicondyle. The fossil agrees with *A. flammeus* in all these characters. This is the first fossil record of this species from the High Plains.

According to Tordoff (1956. *Univ. Kans. Publ., Mus. Nat. Hist.*, 8:307-359) all the above-named species are common in at least some parts of Kansas at certain times of the year. Most of the waterfowl now occur only as transients and there is no indication that they did or did not nest in the region during the late Pleistocene. Since the ecologic requirements and tolerances of birds may not be the same when migrating as when

nesting, the fossil evidence of these species tells little about contemporary conditions. There is nothing in this avifauna to contradict the nature of the landscape, vegetation, and climate as postulated by Hibbard (1955. *Univ. Mich., Contrib. Mus. Paleo.*, 12: 203-204). The abundance of duck remains is further indication of marshes and marsh-edged streams and pools. Even as a migrant the presence of a Wood Duck suggests that there were probably at least patches of woods along the lowland streams. The records of pelican and goose point to the existence of fairly large, shallow lakes. Hibbard's suggestion of mixed grasses on some valley walls and on some uplands is supported by the owl remains.—PETER STETTENHEIM, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan, December 3, 1957.*

**New records of the Nashville Warbler in Colorado.**—The Nashville Warbler (*Vermivora ruficapilla*) is comparatively rare in Colorado. According to Dr. Alfred M. Bailey (pers. comm., November 7, 1957), "There are three specimens taken in the state, including one from Mesa Verde, and several sight records, the most recent being from Colorado Springs, May 19, this year."

To these records we wish to add the following: In August, 1954 (exact date not available), a single bird was observed by a biology class under the direction of Daniel, in a shrubby area near the mouth of the Conejos River Canyon, Conejos County, about 20 miles north of the New Mexico border. On November 1, 1957, an individual flew into the window at the home of Mr. and Mrs. Robert Armagast of Alamosa, Alamosa County, Colorado. It was released on November 2, apparently unharmed.

Both of these locations are in the San Luis Valley which is a high (7500 feet), large, flat, intermontane basin on the eastern slope of the Rocky Mountains.—JOSEPH C. DANIEL, JR., ROBERT M. ARMAGAST, AND JULIA W. ARMAGAST, *Adams State College, Alamosa, Colorado, January 21, 1958.*

**Notes on pre-copulatory display in the Starling.**—In a recent paper on the breeding biology of the Starling (*Sturnus vulgaris*), Kessel (1957. *Amer. Midl. Nat.*, 58:257-331) brings together some of the European literature on the sexual displays concerned with pair formation and copulation. The following two observations from the field, however, are presented to point out elements of pre-copulatory display which are not included in Kessel's paper. The first observation was made on April 22, 1956, on the grounds of Harvard University, Cambridge, Massachusetts. A Starling, hereafter called "A," was perched in a tree when first seen, but immediately flew down to Starling "B," perched on a lower limb in the same tree. Bird A alighted on the right side of B, and mutual bill rubbing took place. Both birds assumed a sitting position with the axes of their bodies at about a 45° angle with the limb, and rubbed their bills together in a motion resembling bill wiping on a limb, with the exception that it was slightly slower. Then A mounted B for a brief interval, flying up to a higher limb immediately afterwards. Shortly after, B flew to a limb about six feet lower, and both birds began to preen vigorously. Bill wiping against the limb was prominent in the comfort movements. Then A flew down to the side of B again, and mutual billing took place. A mounted B in the same manner as before, after which both birds sat quietly side by side. The entire sequence lasted about two minutes, and was performed in complete silence, as far as I was able to detect.

This observation points to two exceptions and an addition to Kessel's descriptions. She notes that the female "always" pecks the male in the neck just prior to his mounting, and that a second mating never follows the original one (although she acknowledges that it may happen rarely). Moreover, "courtship-billing" as described here is not mentioned