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Jonathan J. Becker

*University of Florida, Gainesville, Florida*

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## FOSSIL BIRDS OF THE OREANA LOCAL FAUNA (BLANCAN), OWYHEE COUNTY, IDAHO

Jonathan J. Becker<sup>1</sup>

**ABSTRACT.**—The Oreana local fauna (Blancan) occurs in exposures of the Glens Ferry Formation in Owyhee County, Idaho. Fossil birds present include *Phalacrocorax* cf. *P. idahensis*, *Pelecanus* cf. *P. halicus*, an indeterminate anatic, an indeterminate falconid, two species of *Otus*, and a species of *Colaptes* larger than modern *C. auratus* that provides the earliest record of a colapline woodpecker.

The Oreana local fauna is a Blancan (= Pliocene) assemblage of vertebrate fossils from two localities in southwestern Idaho near the town of Oreana, Owyhee County (IMNH 74001 in Sec 25 and IMNH 74004 (≠ IMNH 78031) in Sec 1, T4S, R1W; 43 degrees 02' N Lat., 116 degrees 24' W Long., Oreana Quadrangle, U.S. Geologic Survey 7.5 minute series topographical map, 1949). Fossils from both localities come from exposures of the Glens Ferry Formation (Malde et al. 1963) (= Oreana Formation of Anderson 1965) and correlate with the Hagerman local fauna, approximately 75 miles to the east (Conrad 1980). Smith et al. (1982) discuss the biostratigraphy of fishes in this formation.

IMNH 74001 has produced many thousands of complete, disarticulated skeletal elements of fish, along with a few mammal and bird remains from thick lenses of fine sand interbedded with clays. This locality possibly represents a shoreline with swash accumulations (Schaeffer 1972). Vertebrate fossil remains are much more rare from IMNH 74004. More detailed information on each locality is available from IMNH upon request.

### MATERIALS AND METHODS

Comparative material of modern species examined is in collections of the American Museum of Natural History (AMNH), the Idaho Museum of Natural History (IMNH), Pierce Brodkorb (PB), and the National Museum of Natural History, Smithsonian Institution (USNM). All fossil specimens from the Oreana local fauna are in the vertebrate pale-

ontology collections of the IMNH.

Measurements were made with Kanon dial calipers, accurate to 0.05 mm and rounded to the nearest 0.1 mm. BMDP statistical software program BMDP1D was used to calculate simple descriptive statistics (Dixon 1981). Computations were made at the Northeast Regional Data Center (NERDC) at the University of Florida, Gainesville. Anatomical terminology follows Baumel et al. (1979).

### SYSTEMATIC PALEONTOLOGY

Order Pelecaniformes Sharpe, 1891

Family Phalacrocoracidae (Bonaparte, 1853)

Genus *Phalacrocorax* Brisson, 1760

*Phalacrocorax* cf. *P. idahensis* (Marsh, 1870)

**MATERIAL.**—IMNH 74001/26527, complete left carpometacarpus; IMNH 74004/30221, proximal end of left ulna; 74004/30223, proximal end of right ulna. Tentatively referred.—74004/30224, partial upper mandible; 74004/30222, proximal end of left ulna; 74001/30217, right scapula.

**REMARKS.**—Although originally described from the Hemphillian Chalk Hills Formation (Marsh 1870), this species is better known from the Blancan Hagerman local fauna (Wetmore 1933, Brodkorb 1958, Murray 1970).

The referred upper mandible is short and heavy, having a concave dorsal surface, characteristic of the subgenus *Phalacrocorax* (Howard 1946). The ulnae are within the range of *P. idahensis* or are slightly larger (Murray 1970).

The complete carpometacarpus is larger than any reported by Murray (1970), eliminat-

<sup>1</sup>Department of Zoology, University of Florida, Gainesville, Florida 32611. Present address: Division of Birds, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

TABLE 1. Measurements of humeri of *Otus asio*. Data are mean  $\pm$  standard deviation (number) and observed range. Measurements are TWSHAFT, transverse width humeral shaft; DSHAFT, depth of humeral shaft; TWDIST transverse width of distal end of humerus; DDIST, depth of distal end of humerus.

| Measurement | <i>Otus asio</i>               |                                |            |
|-------------|--------------------------------|--------------------------------|------------|
|             | Males                          | Females                        | IMNH 28411 |
| TWSHAFT     | 3.19 $\pm$ 0.25 (7)<br>2.8-3.6 | 3.37 $\pm$ 0.25 (3)<br>3.1-3.6 | 3.3        |
| DSHAFT      | 2.76 $\pm$ 0.22 (7)<br>2.4-3.1 | 2.87 $\pm$ 0.25 (3)<br>2.6-3.1 | 2.9        |
| TWDIST      | 8.66 $\pm$ 0.59 (7)<br>7.9-9.6 | 9.17 $\pm$ 0.67 (3)<br>8.4-9.6 | 8.6        |
| DDIST       | 4.2 $\pm$ 0.22 (7)<br>3.9-4.5  | 4.90 $\pm$ 0.70 (3)<br>4.4-5.7 | 4.1        |

ing the possibility of its being referable to either of the other cormorants reported from the Glens Ferry Formation, *P. macer* and *P. auritus*, which are smaller. It differs from the carpometacarpus of *P. macropus* by the square shape of the process of metacarpal I (Murray 1970) and by the intermetacarpal tuberosity being in line with the proximal metacarpal symphysis whereas this is more distad in *P. macropus*.

Family Pelecanidae Vigors, 1825

*Pelecanus* Linnaeus, 1758

*Pelecanus* cf. *P. halieus* Wetmore, 1933

MATERIAL.—74001/26528, nearly complete left femur, lacking medial condyle and caudal portion of lateral condyle. 74004/30225, proximal end of left femur.

DESCRIPTION.—IMNH 26528 is from an immature individual and is abraded. Size intermediate between *P. erythrorhynchos* and *P. occidentalis*. Shaft more robust than in *P. occidentalis*. Neck more distinct, popliteal fossa deeper, undercutting internal condyle, and head angles more proximally than in either *P. occidentalis* or *P. erythrorhynchos*.

REMARKS.—This species was named by Wetmore (1933) from the proximal end of a radius. On the basis of this element it was said to be slightly smaller than *P. o. occidentalis* but probably closely related to *P. erythrorhynchos*. Even with the present material, the systematic position of this poorly known species cannot be clarified.

Order Anseriformes (Wagler, 1831)

Family Anatidae Vigors, 1825

Subfamily Anatinae (Vigors, 1825)

Genus and species indeterminate

MATERIAL.—74001/30504, complete left radius.

REMARKS.—This anatid specimen is similar to the radii in females of *Aythya collaris* but is slightly shorter and more robust. Because the radius is not a diagnostic element in the Anatidae (Woolfenden 1961:2), I have not identified this specimen beyond the level of subfamily.

Order Falconiformes

cf. Falconidae Vigors, 1824

Genus and species indeterminate

MATERIAL.—74001/30219, caudal portion of neurocranium.

REMARKS.—Neurocranium preserved from the caudal wall of the orbit caudally, basisphenoid plate missing. Brain case is somewhat bulbous and prominentia cerebellaris is well developed. This skull fragment shows the greatest similarity to the Falconiformes (absence of trabecular bone precludes assignment to the Strigiformes), specifically to the Falconidae. It is similar in size to that of *Falco peregrinus*.

Order Strigiformes (Wagler, 1830)

Family Strigidae Vigor, 1825

Subfamily Striginae (Vigors, 1825)

Genus *Otus* Pennant, 1769

*Otus* cf. *O. asio* (Linnaeus, 1758)

MATERIAL.—IMNH 74001/28411. Distal end of right humerus.

DESCRIPTION.—Similar in size to a male of *O. asio naevius*. Shape of fossa m. brachialis and the shape and development of the epicondylus dorsalis within the range of variation of modern populations of *O. asio*. IMNH 28411 differs from all modern specimens of *O. asio* examined in having a shallower fossa olecrani. See Table 1 for measurements.

REMARKS.—Ford and Murray (1967) reported an indeterminate owl the size of *Otus*

*asio* from the Hagerman local fauna. The above specimen may represent the same species.

*Otus* sp. (Kaup, 1852)

MATERIAL.—IMNH 74001/30216, nearly complete right tarsometatarsus with caudal portion of trochlea IV missing.

DESCRIPTION.—Similar in morphology to female *O. flammeolus* (USNM 554125) but much smaller (skeletons of males of *O. flammeolus* unavailable). Caudal projection of process on trochlea II more developed in fossil. Calcaneal ridge not as inclined laterally.

REMARKS.—The paucity of skeletons of modern species of small owls makes it impossible to determine the exact systematic relationships of this fossil specimen.

Order Piciformes (Meyer and Wolf, 1810)

Suborder Pici Meyer and Wolf, 1810

Family Picidae Vigors, 1825

Subfamily Picinae (Vigors, 1825)

Tribe Colaptini

Genus *Colaptes* Vigors, 1826

GENERIC DIAGNOSIS.—The skull of *Colaptes* may be distinguished from other genera of New World Picinae by the following combination of characters: (1) Interorbital septum completely ossified (similar to *Sphyrapicus*, *Campethera*, *Piculus*, *Celeus*, and *Dinopium*; incompletely ossified or perforate in *Xiphidiopicus*, *Dendrocopos*, *Picoides*, *Veniliornis*, *Dryocopus*, *Campephilus*, *Picus*, and *Chrysocolaptes*; variable in species of *Melanerpes*); (2) dorsal surface of brain case slightly dimpled (heavily dimpled in *Dryocopus*, *Campephilus*, *Picus*, and *Chrysocolaptes*; smooth in *Melanerpes*, *Sphyrapicus*, and *Xiphidiopicus*, slightly dimpled in other genera examined); (3) supraorbital ridge present (absent to slightly developed in *Melanerpes*, *Campethera*, *Dendrocopos*, *Picus*, and *Dinopium*; present in other genera examined); (4) groove for hyoids present (similar to *Campethera*, *Piculus*, *Dryocopus*, *Campephilus*, *Picus*, and *Dinopium*; absent to slightly developed in other genera examined); (5) frontals flat to concave (similar to *Melanerpes*, *Piculus*, *Celeus*, *Dryocopus*, *Campephilus*, and *Chrysocolaptes*; inflated and expanded to varying degrees in other genera examined, producing a distinct, midsagittal crest in *Xiphidiopicus*, *Campethera*, *Picus*,

*Dinopium*, and some species of *Picoides*); (6) interorbital constriction narrow (similar to *Celeus* and *Veniliornis*; wide in *Campephilus*, *Dendrocopos*, and *Sphyrapicus*; intermediate in other genera examined); (7) narrow width between nares (similar to *Melanerpes* and *Dinopium*, wide in *Sphyrapicus*, *Dendrocopos*, *Picoides*, *Veniliornis*, *Campephilus*, and *Chrysocolaptes*; intermediate in other genera examined); (8) basisphenoid region inflated (not inflated in *Veniliornis*, *Dryocopus*, *Campephilus*, or *Chrysocolaptes*, inflated in other genera examined); and (9) otic region inflated (not inflated in *Veniliornis*, *Campephilus* or *Chrysocolaptes*); inflated to slightly inflated in other genera.

*Colaptes* sp.

MATERIAL.—IMNH 74001/30218, cranium lacking entire upper jaw, pterygoids, and quadrates.

DESCRIPTION.—IMNH 30218 is distinguished from *Colaptes auratus* and *C. melanochloros* by larger size; from *C. campestris* by having a more developed postorbital process and a deeper, well-defined temporal fossa; from *C. pitius* by having a more bulbous prominentia cerebellaris and a more caudo-rostrally oriented temporal fossa; and from *C. rupicola* by being smaller and having more distinct hyoid grooves. *Colaptes* (= *Nesocelus*) *fernandinae* is very distinct from all other species of *Colaptes*. In this species the dorsum of the skull is dimpled, hyoid grooves deep, prominentia cerebellaris poorly developed, and the nuchal crest is well developed. See Table 2 for measurements.

REMARKS.—North American Neogene woodpeckers include *Palaeonerpes shorti* Cracraft and Morony 1969, based on a single distal end of a tibiotarsus from deposits equivalent to the upper part of the Valentine Formation (early Clarendonian). Cracraft and Morony (1969) suggest that the affinities of *Palaeonerpes* are likely to be with the melanerpine woodpeckers rather than with genera such as *Dendrocopos*, *Dryocopus*, or *Colaptes*.

*Pliopicus brodkorbi* Feduccia and Wilson 1967, based on a single distal tarsometatarsus, is from the mid- to late Clarendonian Wakeney local fauna (late Miocene) from the Ogallala Formation, Kansas. Feduccia and Wilson (1967) consider *Pliopicus* to be allied

TABLE 2. Measurements of the crania of species of *Colaptes*. Data are mean, standard deviation, number measured, and observed range. LENGTH, greatest length from the caudal portion of the supraoccipital (*Prominentia cerebellaris*) to the nasofrontal suture, measured on the midsagittal plane (*Planum medianum*); DEPTH, depth of skull from dorsal groove for the hyoid to the slight, anteroposteriorly oriented groove in the basitemporal, measured on the midsagittal plane; WIDTH, greatest transverse width brain case; W-TEMPORAL, transverse width of brain case, measured in the temporal fossa immediately caudal to the postorbital process; W-POSTORB, transverse width between postorbital processes; IORB-CONST, narrowest interorbital constriction; W-IORBSEPT, transverse width interorbital septum; L-FMAG, anteroposterior diameter of *foramen magnum*, measured from the caudal projection of the occipital condyle to the rostral surface with the caudal border of the foramen; W-FMAG, greatest transverse width of *foramen magnum*; W-BULLAE, distance between bullae (i.e., between medial surfaces of *O. exoccipitale ala tympanica*); COND-SR, occipital condyle to sphenoidal rostrum, measured from caudal portion of occipital condyle to the rostralmost extension of the sphenoidal rostrum; EUSTACIAN, distance between openings of the eustacian tubes; W-BASITEMP, greatest transverse width of basitemporal plate; SR-FO, sphenoidal rostrum to ventral border of foramen opticum; FO-PC, foramen opticum to prominentia cerebellaris. ( ) = specimen damaged.

| Measurement | <i>auratus</i>                   | <i>campestris</i> | <i>pitius</i> | <i>melanochloros</i> | <i>rupicola</i> | <i>fernandinae</i> | IMNH 30218 |
|-------------|----------------------------------|-------------------|---------------|----------------------|-----------------|--------------------|------------|
| LENGTH      | 29.33 ± 0.93 (28)<br>27.5-31.1   | 31.0              | 31.7          | 29.0                 | 32.5; 29.7      | 31.2               | 34.1       |
| DEPTH       | 17.89 ± 0.42 (28)<br>17.15-19.15 | 19.2              | 19.1          | 17.2                 | 19.1; 19.2      | 18.3               | 19.6       |
| WIDTH       | 22.39 ± 0.63 (28)<br>21.3-23.7   | 22.8              | 23.9          | 21.1                 | 24.3; 24.0      | —                  | 23.6       |
| W-TEMPORAL  | 20.75 ± 0.76 (20)<br>18.9-22.2   | 20.2              | 21.4          | 18.6                 | 21.6; 21.1      | (20.6)             | 21.4       |
| W-POSTORB   | 21.86 ± 0.79 (28)<br>20.4-22.95  | 22.9              | 23.4          | 21.0                 | 23.4; 22.9      | 21.8               | 22.7       |
| IORB-CONST  | 8.71 ± 0.61 (30)<br>7.25-9.8     | 7.7               | 9.2           | 9.2                  | 7.8; (7.4)      | 11.1               | (6.7)      |
| W-IORBSEPT  | 1.12 ± 0.13 (19)<br>0.95-1.55    | (1.5)             | (1.7)         | (1.6)                | 1.8; 1.7        | 1.4                | 1.45       |
| L-FMAG      | 3.94 ± 0.16 (28)<br>3.6-4.3      | 4.1               | 4.4           | 3.8                  | 4.2; 3.7        | 3.7                | 3.9        |
| W-FMAG      | 5.76 ± 0.28 (29)<br>5.35-6.3     | 5.9               | 5.4           | 5.5                  | 6.5; 6.4        | 6.0                | 5.65       |
| W-BULLAE    | 10.77 ± 0.44 (29)<br>10.2-12.0   | 12.1              | 11.4          | 10.5                 | 11.3; 11.0      | 11.5               | 11.35      |
| COND-SR     | 11.93 ± 0.66 (26)<br>10.55-13.3  | 11.4              | 12.4          | 10.45                | 11.9; 12.1      | 11.6               | 12.95      |
| EUSTACIAN   | 3.94 ± 0.30 (27)<br>3.25-4.75    | 4.5               | 4.4           | 4.8                  | 4.6; 3.2        | 4.5                | 4.0        |
| W-BASITEMP  | 13.91 ± 0.51 (27)<br>13.2-14.95  | (13.0)            | (11.9)        | (11.5)               | (11.0); (10.6)  | (11.7)             | (14.85)    |
| SR-FO       | 3.84 ± 0.27 (27)<br>3.25-4.55    | 4.5               | 4.2           | 4.3                  | 3.9; 3.9        | 4.0                | 4.55       |
| FO-PC       | 16.16 ± 0.53 (27)<br>15.3-17.3   | 16.5              | 17.1          | 15.7                 | 18.0; 17.3      | 12.4               | 17.6       |

to *Melanerpes*. Whereas Cracraft and Morony (1969) reject this suggestion, they could not ally *Pliopicus* with any other particular group of woodpeckers. Brodkorb (1970) described a fossil species of ivory-billed woodpecker, *Campephilus dalquesti*, based on a single distal tarsometatarsus, from the Blancan (Pliocene) Beck Ranch local fauna, Texas, and Feduccia (1975) mentioned the occurrence of *Colaptes* sp. from the Rexroad local faunas, Kansas.

With only a single specimen known, the exact systematic relationships of *Colaptes* sp. from the Oreana local fauna remain uncertain.

This specimen may represent either a distinct species or merely a Blancan population of the living *Colaptes auratus* lineage that was larger. Additional specimens of this species are needed to choose between these alternatives. In either case, this record is the earliest known occurrence of a colapline woodpecker.

#### DISCUSSION

The Blancan North American Land Mammal Age (= Pliocene) has a diverse fossil avifauna, with approximately 90 avian species reported from 16 localities. Localities in the

Glenns Ferry Formation have produced some 30 of these species (Feduccia 1975 and references therein, Miller 1944, this study). There are also several unstudied collections of fossil birds from this formation (Becker in preparation).

The systematics of many of these species are still poorly known. New species, often only known from fragmentary material, were proposed more on the basis of a presumed difference in geologic time than on quantifiable differences in morphology. Sexual and geographic variation in the osteology of living species was rarely quantified. Many Blancan species of birds should be critically reexamined before being accepted as valid, extinct taxa.

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#### APPENDIX

Skulls of the following recent woodpeckers were examined to develop the generic diagnosis. *Melanerpes lewis* (1), *M. erythrocephalus* (8), *M. formicivorus* (10), *M. cruenatus* (2), *M. pucherani* (1), *M. chrysogenes* (2), *M. (Chryserpes) striatus* (1), *M. (Centurus) hypopoli* (1), *M. radiolatus* (3), *M. rubricapillus* (6), *M. uropygialis* (4), *M. aurifrons* (12), *M. carolinus* (12), *M. caymanensis* (= *super-cilliaris*, 3); *Sphyrapicus varius* (9), *S. nuchalis* (2), *S. thyroideus* (2); *Xiphidopicus percussus* (1); *Campothera bennettii* (1), *C. abingoni* (2), *C. taeniolaema* (1); *Dendropicus fuscescens* (3); *Picoides arizonae* (1), *P. minor* (1), *P. major* (1), *P. scalaris* (4), *P. nuttallii* (1), *P. pubescens* (11), *P. borealis* (9), *P. villosus* (8), *P. trydactylus* (1), *P. arcticus* (2); *Veniliornis fumigatus* (2), *V. sanguineus* (2), *V. cassini* (2); *Piculus flavigula* (2), *P. rubiginosus* (2), *P. auricularis* (1); *Colaptes auratus* (31); *auratus* group—14, *chrysocaulosus* group—3, *cafer* group—12, *chrysoides* group—1; species groups after Short, 1965), *C. campestris* (1), *C. pitius* (1), *C. rupicola* (2), *C. melanochloros* (1), *C. fernandinae* (1), *C. (Chrysoptilus) punctigula* (1); *Celeus undulatus* (2), *C.*

*castaneus* (1), *C. elegans* (1), *C. flavus* (1); *C. rubricollis* (1), *Picus canus* (1), *P. viridis*  
*Dryocopus lineatus* (3), *D. pileatus* (10), *D.* (2); *Dinopium javanense* (2), *D. benghalense*  
*martius* (1); *Campephilus guate-malensis* (1), (2); *Chrysocolaptes lucidus* (1).