

A NEW SPECIES OF ROAD-RUNNER FROM QUATERNARY CAVE DEPOSITS IN NEW MEXICO

WITH THREE ILLUSTRATIONS

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In the summer of 1929, Mr. J. W. Lytle, Mr. H. A. Wylde and Mr. W. L. Bliss excavated a cavern on the east slope of the Organ Mountains, in Dona Ana County, New Mexico. This cavern, which is now known as Conkling Cavern in honor of its discoverer, Mr. Roscoe P. Conkling, aroused no little interest at the time of its discovery, by reason of the occurrence there of remains of man apparently associated with bones of the extinct ground sloth. (See preliminary account of the cavern by Wm. Alanson Bryan, *Science*, 70, July 12, 1929, pp. 39-41.) The 1929 excavations yielded a large number of mammalian specimens (including not only the ground sloth, but extinct species of horse, camel, and wolf as well), and numerous bird bones.

Among the bird bones are seven which are undoubtedly of the genus *Geococcyx*, but whose large size immediately leads one to question their identity with *Geococcyx californianus*. These bones were taken at different levels and in different parts of the cave and undoubtedly represent several individuals.

With the aid of Miss Leigh Marian Larson's paper on the road-runner (*Univ. Calif. Publ. Zool.*, 32, 1930, pp. 409-428), together with her original measurements on each individual studied, which she has generously loaned, it has been possible to check the size of the fossil bones with measurements of twenty-five or more specimens of *californianus*. To Miss Larson's specimens, the present writer has added two skeletons of *californianus* from New Mexico (shot in the vicinity of the cavern), and specimens from Arizona and Mexico kindly loaned by the United States National Museum. Of all of these specimens, however, there is none which attains the size of the bones from the cave.

That the occurrence of bones of large road-runners in Conkling Cavern is not coincidence, but actually indicates the presence of a form distinct from *G. californianus*, is attested by the discovery, in 1930, of more specimens of large *Geococcyx* in another cave, Shelter Cave, two miles west of Conkling Cavern, on the west slope of the Organ Mountains. Specimens from Shelter Cave include a humerus and femur of even larger size than the corresponding elements found in Conkling Cavern, and tibiotarsi and ulnae which range both larger and smaller, the smaller specimens slightly overlapping the range in size of *californianus* (see fig. 48). In addition to these elements, there is a fragment of coracoid which appears larger, but cannot be measured satisfactorily, and several tarsometatarsi, which, like the tibiotarsi and ulnae, overlap the maximum specimens of *californianus* (fig. 48).

Seven other specimens of *Geococcyx* were found in Shelter Cave, two of which are definitely modern, the other five (including carpometacarpus, tarsometatarsus and tibiotarsi), by reason of their location in the cave and the matrix in which they were embedded, might be of more recent deposition than the typical specimens; none of these bones exceeds *G. californianus* in size.

Omitting the questionable specimens, from the two caves there are twenty-two bones representing seven elements of the skeleton. Of these, fifteen are larger than any available individual of *californianus*, and the others overlap only the largest specimens of that species.

From an even larger group of specimens (seventy) of the same skeletal elements of *Geococcyx*, from the Pleistocene of California (Larson, 1930, pp. 426-428), there is but one bone which exceeds the Recent *californianus* in size, and this but slightly.¹ Otherwise, the size range of the California Pleistocene form is similar to that of the Recent and, as Miss Larson has stated (1930, p. 424), "both should be designated *Geococcyx californianus* (Lesson)."

In view of the foregoing facts, it seems reasonable to conclude that the specimens of road-runner from the New Mexico caves, whose size range obviously does not accord with that of the Recent species, are not identical with the Recent or California Pleistocene *G. californianus*.

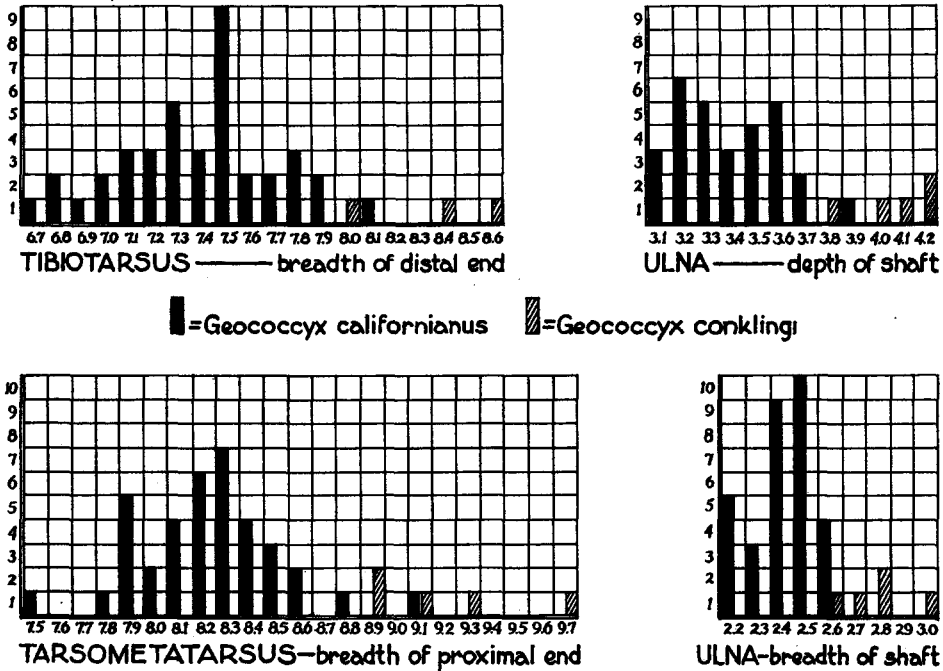


Fig. 48. CHARTS SHOWING INTERGRADATION OF *Geococcyx conklingi* WITH *Geococcyx californianus* IN MEASUREMENTS OF TARSOMETATARSUS, TIBIOTARSUS AND ULNA. HORIZONTAL FIGURES INDICATE MEASUREMENTS IN MILLIMETERS; VERTICAL FIGURES, NUMBER OF INDIVIDUALS.

Some thought has been given to the degree of distinction which should be drawn between these forms, whether specific or subspecific. Though there is an intergradation in the ulnae, tibiotarsi, and tarsometatarsi, the humeri and femora do not intergrade. Possibly, if more specimens of these elements were available, intergradation would be evident in these elements as well. On the other hand, the femur and humerus may have been proportionately larger in the earlier form. Since we must base our deductions on the characters of the bones at hand and not on the possible

¹ Miss Larson lists one femur (L. A. Mus. no. F1716 from Rancho La Brea) as exceeding the Recent in breadth of proximal and distal ends. I have not been able to duplicate Miss Larson's measurements of this specimen.

intergrading of hypothetical specimens, it seems wiser to regard the New Mexico bird as specifically distinct.

It is therefore proposed that the road-runner of Conkling and Shelter caves, New Mexico, be designated as *Geococcyx conklingi*. The specific name is chosen in honor of Mr. Roscoe P. Conkling who discovered both caves.

The drawing and charts illustrating this paper were made by Mr. H. A. Wylde, the photographs by Mr. H. Wm. Menke.

Geococcyx conklingi, new species

The choice of type material for this species has been a matter of some consideration. Since a single element is scarcely indicative of the bird as a whole, it has been deemed advisable to use the alternative of several cotypes or syntypes as outlined by B. F. Howell (Bull. Geol. Soc. Amer., 40, 1929, pp. 215-220). Conkling Cavern has been selected as the type locality since it was in this cave that bones of the species were first discovered; furthermore the selection of Conkling Cavern facilitates the association of the type specimens with the type locality by reason of similarity in name.

Cotypic material.—Distal end of humerus, Los Angeles Museum number 118, collected by H. A. Wylde and W. L. Bliss in Conkling Cavern at the 32-35 foot level. Generally larger bone than any specimen of *Geococcyx californianus* examined by the writer or listed by Larson. Breadth of distal end

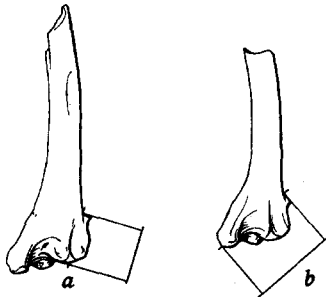


Fig. 49. HUMERI OF *Geococcyx conklingi* AND *Geococcyx californianus*, SHOWING DIFFERENCE IN ANGLE OF ECTEPICONDYLAR PROMINENCE AS REVEALED BY POSITION OF PARALLEL BARS OF CALIPERS; NATURAL SIZE; a, *G. conklingi*; b, *G. californianus*.

5.6% greater than maximum obtained by Larson. Ectepicondylar prominence forming a more acute angle with the shaft than in *californianus*. This character can best be tested by applying the equal length parallel bars of a pair of calipers to the bone; with one bar resting along the proximal surface of the prominence, the other bar reaches no farther than the external condyle in *conklingi*, while in *californianus* it reaches beyond the internal condyle, and in nine out of seventeen individuals examined, touches the tip of the entepicondyle (fig. 49). Measurements: breadth and depth of distal end, 11.2 mm. and 5.8 mm., respectively; breadth and depth of shaft immediately proximal to ectepicondylar prominence, 7.1 mm. and 3.7 mm., respectively.

Femur, Los Angeles Museum no. 113, collected by J. W. Lytle in Conkling Cavern at the 29-32 foot level. Trochanteric region broken away. In general similar to *californianus* but larger; length 1% greater than longest of twenty-six specimens of *californianus*, breadth and depth of distal end

6% and 9% greater respectively than the maximum of these measurements in 26 specimens of *californianus*. Breadth and depth of distal end relative to length tending to be greater than in *californianus*. Measurements: length from head to internal condyle, 57.5 mm.; least breadth of shaft, 5.0 mm.; depth of shaft at same place, 4.7 mm.; breadth and depth of distal end, 11.4 mm. and 10.7 mm., respectively.

Shaft of ulna, Los Angeles Museum no. 119, collected by H. A. Wylde and W. L. Bliss in Conkling Cavern at the 35-38 foot level. Depth of shaft 5% greater than maximum of thirty specimens of *californianus*. Breadth of shaft equal to maximum breadth obtained for *californianus*. Measurements: breadth and depth of shaft measured between third and fourth papillae from distal end, 4.1 mm. and 2.6 mm., respectively.

Referred material.—Two shafts of femur, Los Angeles Museum nos. 114 and 115, collected by J. W. Lytle in Conkling Cavern at the 35-38 foot and 23-26 foot

levels, respectively. Breadth and depth of shaft larger than cotypic specimen no. 113 (no. 114, breadth 5.1 mm., depth 5.2 mm.; no. 115, breadth 5.1 mm., depth 5.0 mm.).

One shaft of humerus, Los Angeles Museum no. 117, collected by J. W. Lytle in Conkling Cavern at the 35 foot level. Breadth of shaft at point of maximum curvature, 4.5 mm.; approximate breadth of shaft of specimen no. 118 at this point, 4.3 mm.

One fragment of distal end of tibiotarsus, Los Angeles Museum no. 116, collected by J. W. Lytle in Conkling Cavern at the 23-26 foot level; larger in breadth of shaft (5.2 mm.) than the largest specimen of *californianus*.

Remarks.—The humerus from Shelter Cave resembles the type from Conkling Cavern in the angle of the ectepicondylar prominence, and is of even larger size (breadth and depth of distal end, 11.7 mm. and 6.5 mm., respectively; breadth and depth of shaft above ectepicondylar prominence, 7.3 mm. and 4.2 mm., respectively). Of the other elements from Shelter Cave, the proximal end of femur measures 13.2



Fig. 50. COTYPIC SPECIMENS OF *Geococcyx conklingi*, NATURAL SIZE: *a* and *a'*, ANTERIOR AND EXTERNAL VIEWS OF FEMUR, L.A.M. NO. 116; *b*, INTERNAL VIEW OF ULNA, L.A.M. NO. 113; *c* AND *c'* ANCONAL AND PALMAR VIEWS OF HUMERUS, L.A.M. NO. 118. MILLIMETER SCALE INSERTED.

mm. in breadth and 11.0 mm. in depth, exceeding the maximum of *californianus* by 1.4 mm. in the former and 2.0 mm. in the latter; the two specimens of ulna in which the size of the proximal end can be determined, measure 6.1 mm. and 6.6 mm. in breadth and 5.5 mm. and 6.1 mm. in depth, respectively; other measurements indicating the size of the ulnae, tibiotarsi and tarsometatarsi are included in the charts shown in figure 48; the coracoid cannot be measured but appears larger than *californianus*.

The differences in the mean measurements of *conklingi* (based on bones from both caves) and *californianus* (based on Recent and California Pleistocene bones) are as follows: humerus, breadth of distal end, 1.85 mm.; femur, breadth of proximal end, 2.22 mm., breadth of distal end, 1.46 mm., breadth of shaft, .66 mm.; tibiotarsus, breadth of distal end, 1.11 mm., breadth of shaft, .67 mm.; ulna, depth of shaft, .70 mm., breadth of shaft, .30 mm.; tarsometatarsus, breadth of proximal end, .92 mm.

Los Angeles Museum, June 12, 1931.