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BY

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Two New Gophers from Utah

By STEPHEN D. DURRANT

A study of mammals in the collection of the University of Utah, taken in western Utah during the summer of 1936 has brought out some interesting differences in the genus *Thomomys*. Series of gophers from Wah Wah Springs, Beaver County, and from Oak Creek Canyon, Millard County, differ sufficiently from named races of *Thomomys* and from each other to be given subspecific rank. The author is indebted to Dr. E. Raymond Hall of the Museum of Vertebrate Zoology, University of California, Berkeley, California, for aid in comparison of specimens, and to the afore-mentioned museum for the loan of comparative material. The diagnoses are as follows:

Thomomys bottæ wahwahensis, subsp. nov.

Type.—Male adult, skin and skull, No. 1750, Department of Zoology, University of Utah; Wah Wah Springs, 30 miles west of Milford, 6500 feet, Beaver County, Utah; July 22, 1936; collected by S. D. Durrant; original No. 989.

Range.—Western Utah, in Wah Wah Mountains, limits unknown.

Diagnosis.—Size: medium. Color: upper parts and sides, pinkish buff; underparts, paler with considerable gray; cheeks, pale pinkish buff; pectoral and inguinal regions, pale pinkish buff; post auricular patches, black; nose, grayish black. (Color terms according to Ridgeway, Color Standards and Nomenclature, 1912.) Skull; very flat dorso-ventrally; zygomatic arches wide spreading; dorsal surface of skull nearly flat, in lateral view; premaxillæ, broad and heavy; rostrum, blunt and heavy; nasals, short and straight, with no arch in lateral view; tympanic bullæ, small; interpterygoid space, broadly "V" shaped; origin of zygomatic process of temporal, very broad, causing the brain case to appear abruptly truncated in anterior region; alveolar length of upper molal series, short; molars, small.

Measurements.—Average and extreme measurements of 4 adult males from the type locality are as follows: Total length, 228 mm. (210-250); tail vertebræ, 66 (60-78); hind foot, 29 (26-30); ear from notch, 5. Skull: Basilar length of Hensel, 34.7 (33.0-37.6); greatest length of nasals, 13.5 (13.1-14.6); zygomatic breadth, 25.5 (24.6-27.0); mastoid breadth, 20.7 (20.1-21.4); least interorbital breadth, 6.6 (6.5-6.8); alveolar length of upper molar series, 7.3

(7.0-8.0); extension of premaxillæ posterior to nasals, 2.3 (2.2-2.5); length of rostrum, 15.7 (14.9-17.1); breadth of rostrum, 8.7 (8.5-9.0). The measurements of 8 adult females from the same locality are: Total length, 185 mm. (180-197); tail vertebrae, 56 (50-62); hind foot, 27 (26-29); ear from notch, 5. Skull: Basilar length of Hensel, 28.7 (26.3-30.7); greatest length of nasals, 11.3 (10.2-12.6); zygomatic breadth, 20.6 (19.0-22.0); mastoid breadth, 17.6 (16.5-19.0); least interorbital breadth, 6.3 (5.8-6.7); alveolar length of upper molar series, 7.1 (6.9-7.8); extension of premaxillæ posterior to nasals, 2.1 (1.1-2.9); length of rostrum, 12.6 (10.8-14.0); breadth of rostrum, 7.1 (6.4-7.6).

Comparisons.—The series of *Thomomys bottae wahwahensis* was compared to topotypes of *aureus*, *centralis*, *albicaudatus*, *aurieventris*, *nesophilus*, and *planirostris*. *Wahwahensis* differs from *aureus* in that the color of the upper parts is paler and does not grade to white on underside. The claws on the front feet are much more slender, it is much smaller in practically all measurements, smaller auditory bullæ, wider premaxillæ, shorter and heavier rostrum, shorter nasals, flat or concave top of skull rather than convex, smaller molars, palate not so arched. It differs from *centralis* in color, pinkish buff as compared to cinnamon buff, shorter tail, smaller in most all measurements, wider, and blunter rostrum, straight nasals as opposed to convex. Differs from *albicaudatus* in being much lighter in color, smaller in most all measurements, shorter nasals, blunter and wider rostrum, shorter alveolar length. Differs from *aurieventris* in lack of gold on under side, smaller in most all measurements, wider zygomatic arch at temporal region rather than jugal, no heavy thickening at junction of jugal and zygomatic process of maxillæ, shorter and blunter rostrum, wider premaxillæ, shorter alveolar length. Differs from *nesophilus* in paler color, in quadrangular as opposed to wedge shaped interparietal, shorter nasals, narrower occipital bone, shorter alveolar length, shorter and blunter rostrum, flatter dorsal surface of skull. Among named races of *Thomomys bottae*, *wahwahensis* most closely resembles *planirostris*, but differs in paler coloration and smaller measurements throughout, in still flatter dorsal surface of skull, shorter blunter rostrum, shorter nasals, shorter alveolar length, smaller size of molars, shorter extension of premaxillæ posterior to nasals.

Material.—Twelve skins and skulls from type locality.

Remarks.—The author has had occasion in this study to see nine gophers from Beaver, Beaver County, Utah, and two from Cedar City, Iron County, Utah. The nine specimens from Beaver, Beaver

County, Utah, were studied by Dr. E. Raymond Hall and referred to the group of *Thomomys b. albicaudatus* (Hall, 1931). He also stated that while they were referable in most characters to *albicaudatus* still they showed some characters towards *centralis*. A recheck of these specimens further bears out the diagnosis of Dr. Hall. This is very interesting in view of the fact that the type locality of *wahwahensis* is about midway between Beaver and the type locality of *centralis*. Future work will undoubtedly elucidate this point. The two specimens from Cedar City, Iron County, Utah, are not typical. In color they seem to intergrade between *planirostris* and *wahwahensis*. In skull characters they seem to be more like *wahwahensis*. This is to be expected because of the large break in both topography and climate between Cedar City and Zion National Park. The fact that the specimens from Cedar City resemble *wahwahensis*, while those from Beaver, even though closer geographically, do not, brings out some interesting studies on the effect of Old Lake Bonneville on the distribution of these gophers.

Thomomys bottæ tivius susp. nov.

Type.—Female adult, skin and skull, No. 1827, Department of Zoology, University of Utah; Oak Creek Canyon, 6 miles east Oak City, 6000 feet, Millard County, Utah; September 14, 1936; collected by S. D. Durrant; original No. 1100.

Range.—Canon mountains, Millard County, Utah, limits unknown.

Diagnosis.—Size: small. Color: upper parts, mummy brown; sides, cinnamon; underparts, pale cinnamon; pectoral and inguinal regions, cinnamon; cheeks, cinnamon; post auricular patches, black; caudal half of tail, white. (Color terms according to Ridgeway, Color Standards and Nomenclature, 1912.) Skull: small, weak; zygomatic arch, widest in temporal region; zygomatic arch, weak; tympanic bullæ, large; interpterygoid space, "V" shaped; incisors, narrow; molars, small; paraoccipital processes, small; nasals, relatively simple with some slight denticulations; palate, narrow; palatal pits, deep.

Measurements.—Average and extreme measurements of seven adult males from type locality are as follows: Total length, 208 mm. (227-199); tail vertebrae, 68.9 (70-67); hind foot, 27.3 (30-25); ear from notch, 6 (6-6). Skull: Basilar length of Hensel, 31.5 (34.1-29.3); greatest length of nasals, 12.2 (12.8-11.9); zygomatic breadth, 22.4 (25.0-20.6); mastoid breadth, 18.4 (19.8-17.1); least interorbital breadth, 6.4 (6.6-6.0); alveolar length of upper molar series, 7.2

(7.6-7.0); extension of premaxillæ posterior to nasals, 2.4 (3.0-2.1); length of rostrum, 14.0 (15.0-13.2); breadth of rostrum, 7.1 (7.9-6.5). The measurements of five adult females from the same locality are as follows: Total length, 203 (215-192); tail vertebræ, 68.3 (74.0-63.0); hind foot, 27.3 (30.0-26.0); ear from notch, 5.5 (6.0-5.0). Skull: Basilar length of Hensel, 29.5 (31.3-28.0); greatest length of nasals, 11.1 (11.4-10.5); zygomatic breadth, 21.1 (22.9-20.1); mastoid breadth, 17.8 (19.0-17.3); least interorbital breadth, 6.5 (6.7-6.3); alveolar length of upper molar series, 7.2 (7.5-7.1); extension of premaxillæ posterior to nasals, 2.4 (3.0-2.0); length of rostrum, 13.5 (14.2-12.7); breadth of rostrum, 6.8 (7.2-6.4).

Comparisons.—Among named races of *Thomomys bottae*, *tivius* most closely resembles *albicaudatus*. It has the white caudal half of tail as found in *albicaudatus*. The coloration is very similar. The main differential characters are largely those of size. It is remarkably smaller in all measurements. There are characteristic differences, however, in the smaller incisors, weaker zygomatic arch, smaller molars.

Material.—Twelve skins and skulls from type locality.

Remarks.—Gophers were taken on both sides of the Canon Mountain, and they were remarkably different from *tivius* as to size, coloration, and skull characters. Further work by the author is being done on these other forms. The topography of the country is quite varied, and the gophers show many variations, which may ultimately be correlated with topography, climate, and soil. At present the unanswered question is whether these gophers on the mountains of the same species as those from the valleys merit splitting off into subspecies, or present merely growth differences due to environment and not heredity.

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