ZOOLOGY.—*New pocket gophers from Arizona and Utah.*[1] E. A. GOLDMAN, U. S. Biological Survey.

During recent years many additional specimens of pocket gophers from typical regions and from localities tending to fill gaps in geographic ranges, as previously known, in Arizona and adjoining territory have been acquired. Study of this material has afforded a clearer concept of the status and relationships of the numerous forms inhabiting the highly diversified general area.

Leaving *Thomomys fossor*, a representative of a well marked group apart, out of consideration, the pocket gophers of Arizona are currently assigned to two groups. These are the "*perpallidus*" and "*fulvus*" groups respectively. In revising the genus *Thomomys* Bailey (North Amer. Fauna, No. 39, p. 33, Nov. 15, 1915) aligns these groups as follows: "The *perpallidus* group includes mainly pale desert forms with very small ears, but has no very distinctive group characters. . . . The *fulvus* group includes several mountain forms of rather bright tawny shades, and paler tawny valley forms in the surrounding country." He also says: "The *bottae* group is large, variable, and not sharply separated from the *perpallidus* and *fulvus* groups; all of them agree in number and arrangement of mammae, short ears, and many other characters."

Passing in review the material now available the writer is forced to the conclusion that not only are there no characters warranting the recognition of *T. perpallidus* and *T. fulvus* as separate groups, but they are united by forms so closely interrelated that even specific distinction disappears. Complete intergradation is evident in some cases and the kind and combination of characters presented indicate such close relationships that it can safely be assumed in others.

The ranges of a chain of forms connecting *perpallidus* and *fulvus* extend across the lower part of the Colorado River valley, interrupted by the river channel. The valley is inhabited on the two sides by forms that differ only slightly in average characters, some individuals being indistinguishable. This close alliance is readily understood when it is remembered that, from time to time, shifting channels along the lower Colorado transfer areas of considerable size from one side to the other.

[1] Received September 3, 1931.

The near relationship of *perpallidus* and *fulvus* is clear, but it seems best in the present faunal treatment of pocket gophers arbitrarily to draw a line between the two at the Colorado River rather than to invite the confusion that would result through an attempt to transfer all of the forms of *perpallidus* to *fulvus*, the older name. Incidentally, general comparisons strongly indicate that forms currently placed under *perpallidus* and *fulvus* may eventually have to be listed as subspecies of *bottae*, a still older name. In order to avoid confusion in describing new subspecies the following forms from east of the Colorado River currently assigned, except *cervinus*, to *perpallidus* are transferred to *fulvus:*

Thomomys fulvus chrysonotus Grinnell
Ehrenberg, Yuma County, Arizona.
Thomomys fulvus cervinus Allen
Phoenix, Maricopa County, Arizona.
Thomomys fulvus aureus Allen. . . Bluff City, San Juan County, Utah.
Thomomys fulvus apache Bailey
Lake La Jara, Jicarilla Indian Reservation, New Mexico.

Pocket gophers inhabit nearly every part of Arizona and adjoining territory, but the ranges even of subspecies are irregularly interrupted owing to rock formations, adverse soil, food, or other conditions. The multiplicity of forms appears to be the expression of environmental factors and the sedentary habits of the group. Some occupy extensive ranges and others are quite restricted. Habitats vary from alluvial river bottoms and sterile desert plains near sea level to high forested plateaus and rugged mountains, often rising abruptly to high elevations.

Descriptions of New Subspecies

Thomomys fulvus flavidus subsp. nov.

Golden Pocket Gopher

Type.—From Parker, Yuma County, Arizona (altitude 350 feet). No. 181065, ♂ adult, U. S. National Museum (Biological Survey collection), collected February 1, 1913, by E. A. Goldman. Original number 21810.

Distribution.—Known only from alluvial bottom lands along the Colorado River in the vicinity of the type locality.

General characters.—A large ochraceous buff or golden yellowish subspecies with an angular, massive skull. Similar in color to *Thomomys fulvus chrysonotus* (somewhat paler than the type), but upper parts clearer ochraceous buff; under parts, especially inguinal region, and hind limbs all around irregularly marked by pure white areas, the white extending to roots of hairs (these parts in *chrysonotus* plumbeous basally); skull very similar but exhibiting a departure in detail. Allied to *Thomomys fulvus desertorum* but larger, much paler

and cranial characters distinctive. Very similar in general color and superficially resembling the geographically removed form, *Thomomys fulvus aureus;* upper parts more uniform rather pale ochraceous buff (varying to richer buffy tones, with dorsum moderately overlaid with black in *aureus*); under parts with irregular white markings (normally absent in *aureus*); skull more angular and massive and differing in important details.

Color.—Type (winter pelage): Upper parts near ochraceous buff or golden yellow, the back scarcely modified by dark-tipped hairs, becoming light ochraceous buff on sides; under parts in general overlaid with light ochraceous buff, the basal color plumbeous, irregularly and extensively invaded on inguinal region by pure white, the white extending to roots of hairs and including hind limbs all around; a pure white pectoral spot; black auricular spots small, not reaching anterior part of ear; feet and tail thinly clothed with whitish hairs. *Young* (in first pelage): Light ochraceous buff above, creamy white below.

Skull.—Very similar in general to that of *T. f. chrysonotus*, but larger; supraoccipital region indented mesially and more distinctly concave in transverse section over foramen magnum; auditory meatus opening more widely; mastoid process of squamosal less deflected forward; auditory and mastoid bullae large and fully inflated and dentition heavy as in *chrysonotus*. Similar to that of *T. f. desertorum* but larger, more angular and massive; auditory and mastoid bullae larger, more fully rounded; mastoid bullae more swollen and bulging posteriorly, and less broadly overlapped by exoccipitals; dentition similar but heavier. Compared with that of *T. f. aureus* the skull is similar in size, but more angular and massive; maxillary arm of zygoma heavier; nasals longer and broader posteriorly; ascending branches of premaxillae narrower, more tapering posteriorly; pterygoids broader; interpterygoid space more narrowly V-shaped (more or less distinctly U-shaped in *aureus*); auditory meatus opening more widely; paroccipital process in adult male more strongly overlapping auditory bulla; bullae large and swollen, and dentition much as in *aureus*.

Measurements.—Type: Total length, 249 mm.; tail vertebrae, 83; hind foot, 33. Average of three adult male topotypes: 238 (232–250); 75 (66–86); 33.5 (32.5–34.5). Average of nine adult female topotypes: 221 (210–236); 70 (57–78); 32 (31–32.5). *Skull* (type): Condylobasal length, 41.7; zygomatic breadth, 27.2; greatest breadth across squamosals (over mastoids), 21.8; interorbital constriction, 6.8; length of nasals, 15; alveolar length of upper molariform tooth row, 8.8.

Remarks.—The clear, nearly uniform golden yellowish general color and extensive pure white areas irregularly invading the under parts and usually involving both hind legs well up toward the hips all around distinguish this form externally from its near relatives. It bears a rather close superficial resemblance to *aureus*, but the ranges of the two are completely separated by those of interposed forms.

Specimens examined.—Sixteen, all from the type locality.

Thomomys fulvus modicus subsp. nov.

Type.—From La Osa (near Mexican Boundary), southern end of Altar Valley, Pima County, Arizona. No. 59203, ♂ adult, U. S. National Museum, collected by E. A. Mearns and F. X. Holzner, December 14, 1893. Original number 2681.

Distribution.—Desert plains and valleys of central southern Arizona, and probably adjoining parts of Sonora, Mexico.

General characters.—Closely allied to *Thomomys fulvus cervinus* of the Salt River Valley, but smaller, color darker, near wood brown instead of vinaceous buffy or fawn color in winter pelage; cranial characters distinctive. Related to *Thomomys fulvus chrysonotus* of the lower Colorado River Valley, but prevailing color wood brownish instead of pale ochraceous buffy; skull differing in detail. Similar in general to *Thomomys fulvus toltecus* of Chihuahua, but color duller, wood brownish instead of rich ochraceous buffy in winter pelage; skull more slender in form.

Color.—*Type* (winter pelage); Upper parts near wood brown, purest along sides, thinly overlaid with dusky on head and over back; under parts pale ochraceous buffy, the plumbeous basal color showing through; ears encircled by conspicuous deep black areas; forearms, feet, and tail whitish. Some specimens in worn summer pelage are rich ochraceous buffy above.

Skull.—Similar in general form to that of *T. f. cervinus* but smaller and of slenderer proportions; rostrum narrower, more constricted or compressed laterally in front of zygomata; nasals narrower; jugal shorter. Compared with those of *T. f. chrysonotus* and *T. f. toltecus* the skull is less massive than either; maxillary arm of zygoma sloping more strongly backward; jugal shorter, the result being a distinct shortening of the outer side of the zygoma, rostrum and nasals more slender; incisors narrower.

Measurements.—*Type:* Total length, 238; tail vertebrae, 79; hind foot, 30. Average of four adult male topotypes: 214 (204–222); 67 (55–75); 28 (25.5–30). Average of six adult female topotypes: 208 (198–224); 69 (60–74); 27.5 (26.5–28). *Skull* (type): Condylobasal length, 40.5; zygomatic breadth, 25; greatest breadth across squamosals (over mastoids), 20; interorbital constriction, 6.7; length of nasals, 13.7; alveolar length of upper molariform tooth row, 8.

Remarks.—While *modicus* is usually much larger than *intermedius* and differs widely in color, the skulls of some females, especially, are similar in size in the two forms, and in other respects indicate probable intergradation. This desert race tends to bridge the gap between *chrysonotus*, the pallid subspecies inhabiting the region east of the lower Colorado, and the darker forms occupying the higher country in southeastern Arizona. It partakes also of the characters of *cervinus*, the lighter colored, more robust animal of the Salt River Valley.

Specimens examined.—Total number, 20, all from Arizona as follows: Calabasas, 1; Fort Lowell, 2; Indian Oasis, Baboquivari Valley, 2; La Osa (type locality), 11; Tucson, 4.

Thomomys fulvus catalinae subsp. nov.

Santa Catalina Mountain Gopher

Type.—From Summerhaven, Santa Catalina Mountains, Pima County, Arizona (altitude 7,500 feet). No. 244081, ♂ adult, U. S. National Museum (Biological Survey collection), collected by E. A. Goldman, August 6, 1923. Original number 23517.

Distribution.—Known only from the upper slopes of the Santa Catalina Mountains, Arizona.

General characters.—A small, dark, richly colored subspecies. Allied to *Thomomys fulvus toltecus*, but smaller, much darker, with a narrower, less massive skull. Similar in general to *Thomomys fulvus intermedius* of the Huachuca Mountains, but larger; color of upper parts more uniform, without

the broad, blackish median dorsal area usually continuous from head to base of tail in *intermedius*, and sides brighter, more tawny; cranial characters distinctive.

Color.—Type (summer pelage): Upper parts between tawny and ochraceous tawny, clearest on lower part of sides, the top of head and back heavily mixed with black, the black predominating on middle of face; under parts over laid with light tawny, the under color everywhere dark plumbeous; ears completely within deep black spots; feet and tail thinly clothed with dull whitish hairs. Some specimens exhibit small median dorsal blackish areas.

Skull.—Narrower and less massive than that of *T. f. toltecus*; zygomata more slender and much less widely spreading; dentition similar. Compared with that of *T. f. intermedius* the skull is larger; rostrum less constricted in front of zygomata; nasals broader, less wedge-shaped posteriorly; auditory bullae larger, more smoothly and evenly rounded (more or less distinctly truncate anteriorly in *intermedius*).

Measurements.—Type: Total length, 218; tail vertebrae, 65; hind foot, 31. Average of four adult male topotypes: 211 (204–220); 64 (58–72); 28.5 (27.5–30). Average of four adult female topotypes: 202 (196–212); 59 (55–62); 25 (24–26). *Skull* (type): Condylobasal length, 38.6; zygomatic breadth, 23.8; greatest breadth across squamosals (over mastoids), 19.5; interorbital constriction, 6.5; length of nasals, 13; alveolar length of upper molariform tooth row, 8.1.

Remarks.—T. f. catalinae somewhat resembles its geographic neighbor *intermedius* but the upper parts are richer, more tawny instead of cinnamon brownish, and the general color is more uniform, without the broad blackish median dorsal area normally extending from top of head to base of tail in *intermedius*. It is probably restricted to the Santa Catalina Mountains which rise island-like from the desert plains.

Specimens examined.—Ten, all from the type locality.

Thomomys fulvus grahamensis subsp. nov.

Graham Mountain Pocket Gopher

Type.—From Graham Mountains (Pinaleno Mountains on some maps) Graham County, Arizona (altitude 9,200 feet). No. 204313, ♂ adult, U. S. National Museum (Biological Survey collection), collected by E. G. Holt, June 7, 1914. Original number 269.

Distribution.—Known only from the upper slopes (6,100–9,200 feet altitude) of the Graham Mountains, Arizona.

General characters.—Closely allied to *Thomomys fulvus toltecus*, but color darker; skull narrower. Resembling *Thomomys fulvus fulvus* of the high plateau region in color, but duller, less ochraceous tawny; skull differing in detail. Similar in size to *Thomomys fulvus catalinae* but lighter, the sides of body ochraceous buffy instead of ochraceous tawny; combination of cranial features distinctive. Differing from *Thomomys fulvus intermedius* in decidedly larger size, lighter color and well-marked skull characters.

Color.—Type (summer pelage): Upper parts dark ochraceous buff, purest along sides, rather heavily mixed with black on top and sides of head and over dorsum, the dark hairs becoming somewhat thinner on rump; face blackish; ears encircled by deep black; under parts overlaid with light ochraceous buff, the basal color plumbeous everywhere; feet dull whitish; tail whitish, interrupted by irregular dusky sections above.

Skull.—Similar to that of *T. f. toltecus*, but narrower; braincase narrower; zygomata much less widely spreading; maxillary arm of zygoma more slender, the external angle narrower and less prominent; jugal less expanded anteriorly and more strongly inclined upward to point of union with maxilla; auditory bullae smaller; dentition very similar. Similar to that of *T. f. fulvus*, but narrower and flatter; zygomata much less widely spreading; auditory bullae rather small, much as in *fulvus*. Not very unlike that of *T. f. catalinae* in size and general form, but rostrum deeper; jugal slanting more strongly upward from squamosal to point of union with maxilla (jugal more nearly horizontal in *catalinae*) bullae slightly smaller. Compared with that of *T. f. intermedius* the skull is larger and heavier; nasals broader posteriorly; rostrum less constricted or compressed laterally in front of zygomata; ascending branches of premaxillae broader posteriorly; auditory bullae larger, more smoothly rounded.

Measurements.—Type: Total length, 231; tail vertebrae, 71; hind foot, 29. Two adult male topotypes: 217, 225; 68, 68; 27, 28. Two adult female topotypes: 215, 228; 69, 76; 27, 28. *Skull* (type): Condylobasal length, 38.3; zygomatic breadth, 23.3; greatest breadth, across squamosals (over mastoids), 19.2; interorbital constriction, 7.5 length of nasals, 13.8; alveolar length of upper molariform tooth row, 8.5.

Remarks.—The present form appears to be restricted to the upper slopes of the Graham Mountains, doubtless intergrading lower down with *toltecus* which inhabits the Gila Valley and neighboring areas. In general color it somewhat resembles typical *fulvus* but the ranges of the two are separated by an arm of that of *toltecus* along the Gila River valley, and distinctive characters have been pointed out.

Specimens examined.—Ten, all from the Graham Mountains, Arizona.

Thomomys fulvus collinus subsp. nov.

Chiricahua Mountain Pocket Gopher

Type.—From Fly Park, Chiricahua Mountains, Cochise County, Arizona (altitude 9,000 feet). No. 66053, ♂ adult, U. S. National Museum (Biological Survey collection), collected by A. K. Fisher, June 10, 1894. Original number 1527.

Distribution.—Known only from the upper slopes of the Chiricahua Mountains, Arizona.

General characters.—Closely allied to *Thomomys fulvus toltecus*, but smaller and darker; skull of lighter proportions. Similar in size and color to *Thomomys fulvus grahamensis*, but skull more slender. About like *T. f. catalinae* in size, but color much lighter, the sides ochraceous buffy instead of rich tawny, and skull differing in detail.

Color.—Type (summer pelage): Upper parts dark ochraceous buff, purest along sides, rather heavily mixed with black on top of head and over back; under parts overlaid with rich ochraceous buff, the hairs plumbeous at base; feet and tail whitish. In one specimen from 7,500 feet altitude the under parts are creamy white.

Skull.—Not very unlike that of *T. f. toltecus* but smaller, relatively narrower, less massive. Similar in size to that of *T. f. grahamensis*, but more slender in form; rostrum, braincase, and interorbital constriction usually narrower; nasals narrower; jugal nearly horizontal (not distinctly inclined upward anteriorly as usual in *grahamensis*); auditory bullae larger; incisors

usually narrower. Compared with that of *T. f. catalinae* the skull is similar in size and form but is usually narrower; rostrum more slender; bullae usually smaller; dentition about the same.

Measurements.—Type: Total length, 225; tail vertebrae, 68; hind foot, 29. Two adult males from Pinery Canyon (altitude 7,500 feet), Chiricahua Mountains: 210, 190; 74, 60; 27, 26. Two adult females from same locality: 200, 190; 74, 62; 27, 27. *Skull* (type): Condylobasal length, 39; zygomatic breadth, 24; greatest breadth across squamosals (over mastoids), 19.8; interorbital constriction, 6.6; length of nasals, 12.4; alveolar length of upper molariform tooth row, 8.3.

Remarks.—T. f. collinus is a small dark high mountain subspecies readily distinguished from the larger lighter ochraceous *toltecus* of the neighboring plains. Specimens from the mouth of Turkey Creek at 5,000 feet altitude are dark in color, but the skulls are heavier than in typical *collinus* and indicate gradation toward *toltecus*. The present form resembles *grahamensis* externally but differs in combination of cranial characters, and the ranges of the two are separated by an arm of that of *toltecus*.

Specimens examined.—Total number, 24, all from the Chiricahua Mountains, Arizona, as follows: Fly Park, 1 (type); Pinery Canyon (7,500 feet), 6; Rucker Canyon, 6; Turkey Creek (mouth, 5,000 feet), 11.

Thomomys fulvus pusillus subsp. nov.

Coyote Mountain Pocket Gopher

Type.—From Coyote Mountains, Pima County, Arizona (altitude 3,000 feet). No. 209290, ♀ adult, U. S. National Museum (Biological Survey collection), collected by E. A. Goldman, September 4, 1915. Original number 22722.

Distribution.—Known only from the Coyote Mountains; probably inhabiting other desert mountain ranges of central southern Arizona.

General characters.—A small, rich ochraceous tawny form with a slender, delicate skull and large, fully distended bullae. Similar in size to *Thomomys fulvus intermedius*, but general color above rich ochraceous tawny (without a broad blackish median dorsal line) instead of cinnamon brown, and cranial characters, especially form of zygomata and large bullae, quite distinctive. Much smaller than *Thomomys fulvus modicus*, color richer, more tawny, and skull differing in detail.

Color.—Type: Upper parts between tawny and ochraceous tawny, purest along sides, the top of head and back somewhat darkened by black-tipped hairs; muzzle blackish; black auricular spots small, encircling entire ears; under parts ochraceous buffy; feet white; tail grayish dusky above, whitish below.

Skull.—Similar in size and general form to that of *T. f. intermedius*, but flatter; zygomata diverging and widest anteriorly (instead of posteriorly as in *intermedius*); nasals broader posteriorly, the ends emarginate as usual in *intermedius;* premaxillae narrower posteriorly; basioccipital narrower; auditory and mastoid bullae much larger, more swollen and smoothly rounded; molariform toothrows shorter. Compared with that of *T. f. modicus* the skull is very much smaller and flatter; zygomata widest anteriorly instead of posteriorly; auditory and mastoid bullae similarly inflated.

Measurements.—Type: Total length, 201; tail vertebrae, 65; hind foot, 27.5. *Skull* (type): Condylobasal length, 32.6; zygomatic breadth, 19.7; greatest breadth across squamosals (over mastoids), 17.1; interorbital con-

striction, 6.2; length of nasals, 11; alveolar length of upper molariform tooth row, 6.8.

Remarks.—This small desert-mountain form approaches *intermedius* in size, but in the sum of its characters is more nearly related to the much larger lowland subspecies *modicus*. It may be expected to occur in other desert mountain ranges in the region of the type locality. It is based on a single specimen which presents cranial characters that appear to be quite distinctive.

Thomomys fulvus peramplus subsp. nov.

Tunicha Mountain Pocket Gopher

Type.—From Wheatfield Creek, west slope of Tunicha Mountains, Apache County, northwestern Arizona (altitude 7,000 feet). No. 247632, ♂ adult, U. S. National Museum (Biological Survey collection), collected by Paul Trapier, June 23, 1927. Original number 720.

Distribution.—Mountains of northeastern Arizona and northwestern New Mexico (altitude 7,000–8,800 feet).

General characters.—A large dark-colored subspecies closely resembling *Thomomys fulvus apache*, of northern New Mexico, but upper parts still duller, the sides vinaceous instead of dull ochraceous buffy; skull more elongated and presenting a departure in detail. Contrasting strongly with *Thomomys fulvus aureus* of southeastern Utah in dark, dull coloration, but cranial characters indicate close relationship and the two doubtless intergrade along the basal slopes of the mountains. Color much duller than *Thomomys fulvus fulvus* of the high plateau region of Arizona, and skull quite distinctive.

Color.—Upper and under parts near vinaceous buff, clearest along sides, the top of head and posterior part of back blackish; dark plumbeous basal color tending to show through nearly everywhere and accentuating the dull general tone; black auricular spots inconspicuous, nearly confluent with general color of dorsum; ankles dusky; fore feet grayish or light brownish; hind feet white; tail above clothed with brownish hairs on proximal half, becoming white beyond to tip and whitish below.

Skull.—Closely aproaching that of *T. f. aureus* but rostrum longer; nasals broader posteriorly and premaxillae correspondingly reduced. Similar to that of *T. f. apache*, but more elongated; rostrum decidedly longer; nasals longer and broader posteriorly, less wedge-shaped; premaxillae narrower posteriorly; interorbital constriction narrower; bullae large and rounded, about as in *apache*. Compared with that of *T. f. fulvus* the skull is similar in general form, but larger, more angular and massive; nasals less wedge-shaped, broader posteriorly, the ends irregularly truncate instead of emarginate; auditory bullae much larger, bulging farther below basioccipital; dentition heavier.

Measurements.—*Type:* Total length, 260; tail vertebrae, 80; hind foot, 35. Average of four adult male topotypes: 246 (240–255); 80 (60–90); 35 (34–37). Average of six adult female topotypes: 230 (225–240); 75 (65–88); 32 (31–33). *Skull* (type): Condylobasal length, 45.6; zygomatic breadth, 28; greatest breadth across squamosals (over mastoids), 23; interorbital constriction, 6.7; length of nasals, 16.8; alveolar length of upper molariform tooth row, 8.8.

Remarks.—In dark, dull coloration this high-mountain form resembles *apache*, but in cranial characters reveals closer relationship to the vividly tinted subspecies *aureus* of the surrounding deserts. Its known vertical range is from 7,000 to 8,000 feet. At the type locality it occurs in close proximity to

the distinct species, *Thomomys fossor*, which seems to replace it at about 9,000 feet altitude along the crest of the Tunicha Mountains.

Specimens examined.—Total number, 33, as follows:
Arizona: Canyon de Chelly (7 miles above mouth), 1; Fort Defiance (12 miles northwest), 1; Saint Michaels, 2; Tunicha Mountains (type locality), 16. New Mexico: Chusca Mountains, 13.

Thomomys perpallidus osgoodi subsp. nov.

Type.—From Hanksville, Wayne County, Utah. No. 158530, ♂ adult, U. S. National Museum (Biological Survey collection), collected by W. H. Osgood, October 20, 1908. Original number 3701.

Distribution.—Fremont River Valley near Hanksville, Utah; limits of range unknown.

General characters.—A very light ochraceous buffy or light yellowish form with a rather massive skull. Somewhat resembling *Thomomys fulvus aureus* from Bluff, San Juan County, Utah, but upper parts contrasting in decidedly lighter ochraceous buffy tones, and cranial characters distinctive. Related to *Thomomys perpallidus planirostris* from Zion National Park, but much paler, and skull differing in important features, especially the arched instead of flattened or depressed upper surface near anterior roots of zygomata.

Color.—*Type* (winter pelage): Upper parts very light ochraceous buff, richest on posterior part of back, unmodified by dark-tipped hairs present in most related forms; middle of face, nose, and area near mouth indistinctly dusky; under parts and well up on flanks and outer sides of limbs creamy white; black auricular spots small, but conspicuous and completely encircling ears; feet and tail white. Five other specimens are practically identical in color.

Skull.—Similar in general form to that of *T. f. aureus*, but smaller; occipital region more smoothly rounded above, tending to bulge posteriorly below slightly developed lambdoid crest; premaxillae narrower posteriorly and tapering to a more acute point; sides of zygomata more or less distinctly bowed inward near middle (sides more nearly straight in *aureus*); interpterygoid fossa more narrowly V-shaped (usually more nearly U-shaped in *aureus*); basioccipital shorter; bullae slightly smaller, but fully inflated; dentition about the same. Compared with that of *T. p. planirostris* the skull is arched, instead of flattened or depressed, and more or less distinctly concave in cross section along the median line near anterior roots of zygomata; occipital region more projecting posteriorly below lambdoid crest; auditory bullae larger, more distended below level of basioccipital.

Measurements.—*Type:* Total length, 233; tail vertebrae, 72; hind foot, 30.5. Two adult male topotypes: 215, 225; 68, 70; 29, 29. Average of three adult female topotypes: 197 (184–203); 58 (51–63); 27 (27–27.5). *Skull* (type): Condylobasal length, 39; zygomatic breadth, 24.2; greatest breadth across squamosals (over mastoids), 20.3; interorbital constriction, 6.9; length of nasals, 13.8; alveolar length of upper molariform tooth row, 8.

Remarks.—*T. p. osgoodi* superficially resembles *aureus*, but is lighter yellowish and in cranial characters presents a marked departure. Moreover, it is separated from *aureus* by the effective barrier of the Colorado River. It is a well marked subspecies more closely allied to *planirostris* and other forms inhabiting the territory north and west of the Colorado River.

Specimens examined.—Six skins and skulls and two skulls without skins, all from the type locality.

Thomomys perpallidus dissimilis subsp. nov.

Henry Mountain Pocket Gopher

Type.—From east slope of Mount Ellen, Henry Mountains, Garfield County, Utah (altitude 8,000 feet). No. 158526, ♀ adult, U. S. National Museum (Biological Survey collection), collected by W. H. Osgood, October 15, 1908. Original number 3677.

Distribution.—Known only from the type locality; probably generally distributed over the upper slopes of the Henry Mountains.

General characters.—Closely allied to *Thomomys perpallidus osgoodi* but upper parts near light buff, instead of light ochraceous buff, and skull differing in detail. Similar in general to *Thomomys fulvus aureus* but smaller, light buffy color contrasting strongly with rich ochraceous buff of *aureus*, and cranial characters distinctive. Differing from *Thomomys perpallidus planirostris* in pallid coloration, and important cranial features.

Color.—*Type* (winter pelage): Upper parts near light buff, faintly darkened along the median dorsal area by dusky-tipped hairs; muzzle dusky; black auricular spots small, but including entire ears; under parts, forearms and hind legs creamy white; feet and tail whitish. *Young* (in first pelage): Similar to type but inclining toward light ochraceous buff on top of head, neck, and shoulders.

Skull.—Most closely resembling that of *Thomomys perpallidus osgoodi*, but more elongated; rostrum longer; zygomata more slender, more strongly converging anteriorly; bullae less rounded, more compressed laterally; incisors pale, the ends less recurved. Compared with that of *T. p. planirostris* the skull is arched, instead of flattened or depressed and more or less distinctly concave in cross section along the median line near anterior roots of zygomata; occipital region more projecting posteriorly below lambdoid crest; zygomata narrower, more slender, more strongly converging anteriorly; auditory bullae more elongated, more compressed laterally and projecting below level of basioccipital. Similar in general to that of *T. f. aureus*, but smaller, more slender, and differing in important details as follows: Occipital region more smoothly rounded above, tending to bulge posteriorly below lambdoid crest; zygomata narrower, more slender and converging anteriorly; interpterygoid fossa more narrowly V-shaped; auditory bullae narrower, less fully inflated; teeth smaller, the incisors less recurved.

Measurements.—*Type:* Total length, 211; tail vertebrae, 60; hind foot, 27· *Skull* (type): Condylobasal length, 37; zygomatic breadth, 21.6; greatest breadth across squamosals (over mastoids), 18.8; interorbital constriction, 6.8; length of nasals, 12.2; alveolar length of upper molariform tooth row, 7.6.

Remarks.—Pocket gophers from high mountains are usually dark, but *T. p. dissimilis* is remarkable for its pallid coloration. Near relationship to *osgoodi* of the adjoining Fremont River Valley is evident but the unusual color and the combination of cranial characters are distinguishing features.

Specimens examined.—Three, from the type locality.

Thomomys perpallidus absonus subsp. nov.

Houserock Valley Pocket Gopher

Type.—From Jacob's Pools, Houserock Valley, Coconino County, northern Arizona (altitude 4,000 feet). No. 250016, ♂ adult, U. S. National Museum

(Biological Survey collection), collected by E. A. Goldman, June 7, 1931. Original number 23569.

Distribution.—Known only from the type locality.

General characters.—A dull grayish buffy subspecies of medium size, with a narrow, slenderly formed skull. Closely allied to *Thomomys perpallidus planirostris* but paler, with differential cranial characters, especially the higher midline of the fronto-nasal region. Similar in general to *Thomomys perpallidus osgoodi* and *Thomomys perpallidus dissimilis*, but much darker, and skull presenting a different combination of characters.

Color.—*Type* (acquiring summer pelage): Upper parts near light ochraceous buff, purest along sides, thinly mixed over top of head and back with pale dusky hairs producing a dull rather grayish buffy combined effect; muzzle dusky; black postauricular spots rather large, extending forward to include anterior margins of ears; under parts overlaid with pale ochraceous buff; forearms, ankles, and feet whitish; tail whitish, becoming pale buffy above near base. In some specimens the under parts vary to light ochraceous buff.

Skull.—Similar in general structure to that of *Thomomys perpallidus planirostris*, but of slenderer proportions, the zygomata very weak, and the lambdoid crest and temporal ridges slightly developed even in adult males; frontal region and posterior part of rostrum less flattened or depressed along the median line, and lacking the concavity in cross section characterizing *planirostris*; ascending branches of premaxillae narrower, less extended posteriorly beyond nasals; palate usually narrower; teeth smaller. Compared with that of *T. p. osgoodi* the skull is more slender in form; rostrum longer and relatively narrower; zygomata more slender, the jugal, especially, more attenuate; palate narrower; auditory bullae less inflated, less bulging below basioccipital; dentition similar. Differing from that of *T. p. dissimilis* in more squarely spreading zygomata; auditory bullae broader, more rounded, less laterally compressed and less projecting below basioccipital; incisors slightly more recurved.

Measurements.—*Type:* Total length, 230; tail vertebrae, 79; hind foot, 30. Average of three adult male topotypes: 231 (228–234); 77 (74–82); 31 (30–32.5). Two adult female topotypes: 210, 217; 69, 70; 30, 29. *Skull* (type): Condylobasal length, 40; zygomatic breadth, 24.4; greatest breadth across squamosals (over mastoids), 19.5; interorbital constriction, 6.6; length of nasals, 13.7; alveolar length of upper molariform tooth row, 7.3.

Remarks.—*T. p. absonus* is a fairly well marked form probably restricted to Houserock Valley which occupies a broad depression with a generally level bottom lying along the northern side of the Marble Canyon of the Colorado River. This reach of the river bisects the interior basin of which Houserock Valley is the northern half, at the upper entrance to the Grand Canyon, and forms a barrier limiting the distribution of most of the smaller mammals. The species or subspecies usually differ on the opposing sides of the stream. The bottom of Houserock Valley is gashed by side canyons of the Colorado and the dispersal of this pocket gopher is much restricted even here. It has been found inhabiting soft sand extending for about two miles out over the floor of the valley from near Jacob's Pools, a spring at the western base of the escarpment marking the great fault line known as the Vermilion Cliffs.

Specimens examined.—Twelve, from the type locality.

Goldman, Edward Alphonso. 1931. "New pocket gophers from Arizona and Utah." *Journal of the Washington Academy of Sciences* 21, 416–426.

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