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*** START OF THE PROJECT GUTENBERG EBOOK GEOGRAPHIC VARIATION IN THE POCKET GOPHER, CRATOGEOMYS CASTANOPS, IN COAHUILA, MÉXICO ***

Transcriber's Notes.

This file was derived from scanned images. With the exception of two typographical errors that were corrected, removal of an annotation to Figure 1, and rejoining the text which was split by the tables in the printed version, the original text and copies of the included illustrations are presented.

Typographical Errors Corrected:

Page 603, Paragraph 2: [subpecies](#) => [subspecies](#)

Page 607, Paragraph 2: [Aquanaval](#) => [Aguanaval](#)

[591]

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**Geographic Variation in the Pocket Gopher,
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By

Robert J. Russell and Rollin H. Baker

The plateau pocket gopher, *Cratogeomys castanops*, inhabits open lands from southeastern Colorado southward onto the Mexican Plateau as far south as southern San Luis Potosí and southeastern Zacatecas and southeastward to the Coastal Plain of northern Tamaulipas. This species occurs at elevations from as low as 26 feet at Matamoras in Tamaulipas to as high as 8700 feet in valleys of south-eastern Coahuila. In 1934, Nelson and Goldman (Proc. Biol. Soc.

Washington, 47:135-154, June 13, 1934) revised the genus *Cratogeomys* and decided that six subspecies of *C. castanops* occurred in Coahuila. In the present account, we describe four previously unknown subspecies from Coahuila, exclude from the state two others recorded from there by Nelson and Goldman, and show that three others named previously from adjacent Mexican states do occur in Coahuila. This makes eleven subspecies now known from that state. From Coahuila Nelson and Goldman had 35 study specimens of *C. castanops* from seven localities and we have had 234 specimens from 63 localities. Consequently we have been able to define with greater certainty, than formerly was possible, the geographic distribution of *C. castanops* in this Mexican state and similarly analyze more completely the geographic variation.

Coahuila is near the center of the geographic range of *C. castanops*. The occurrence of 11 subspecies within the state seems to be the result of partial or perhaps, in some cases, total isolation of populations of *C. castanops* because of the highly dissected topography and the variability of the soil. *Cratogeomys castanops* is a sedentary animal preferring open plains mantled by suitable soils, preferably sandy in texture, in which the animals can dig their elaborate underground systems of runways. Thin soils of hard texture and rocky soils do not offer optimum habitat for *C. castanops*, and the animals usually are absent or uncommon in such situations. Desert mountains with their thin rocky soils, elevated passes, perpendicular rocky cliffs, and stands of oaks and conifers at higher elevations present impassable barriers for pocket gophers of this species. The Río Grande, bordering Coahuila to the north, in many places flowing through steep-walled cañons, also seems to be a barrier that this fossorial rodent does not cross; distinct subspecies occur on the two sides of the river directly opposite each other (also see Nelson and Goldman, *op. cit.*: 143). Smaller streams, such as the Río Salado, Río Nazas and Río Salinas, seem to be unimportant barriers to the passage of these pocket gophers. The food supply of *C. castanops* seems adequate in most situations and consequently food is unimportant in governing the distribution of this species. Principal foods of *C. castanops* are fleshy tuberous roots of well-distributed desert shrubs, but in the valleys of the high mountains of southeastern Coahuila, where desert shrubs are absent, roots and leaves of low-growing forbs are eaten.

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Three distinct habitats for *C. castanops* occur in Coahuila. The state is crossed by a series of mostly impassable, mountainous ridges beginning at the northwestern boundary at the Cañon de Boquillas on the Río Grande and extending southeastward to the east-central border. This divides Coahuila into a more humid and less elevated northeastern area which is an inland extension westward of the Coastal Plain and a more arid and higher western and southern area which is a part of the "Mesa del Norte" of the Mexican Plateau. In the extreme southeast the still higher elevated plains and intermontane valleys within the Sierra Madre Oriental afford a third habitat for populations of this species. The subspecies of these pocket gophers found in any one of these three habitats show greater affinity to each other than they do to any subspecies found in the other habitats.

Generally speaking, populations of *C. castanops* from northeastern Coahuila are related, as a group, in color and cranial features. Partial isolation of subspecies in this area results chiefly from discontinuity of suitable soils rather than from topography. These pocket gophers occur most commonly in the deep, sandy soils which are found along streams, especially where farm lands are irrigated. In western and southern Coahuila, mountains extending in both north-south and east-west directions act as partial barriers to the passage of *C. castanops*. Within this large area, pocket gophers occur in desert basins many of which are enclosed on two or more sides by mountains. Even so, with the exception of the smaller *C. c. consitus* of northwestern Coahuila, all known subspecies occurring at lower elevations in the western and southern part of the state show close relationships in color and cranial features. Those subspecies in the higher parts of southeastern Coahuila by their small size and dark color reflect to a high degree their isolation in an elevated habitat.

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Males of *C. castanops* differ greatly from females of equal age; consequently animals of the same sex, as well as of the same age, are used herein for taxonomic comparisons. Since, of any given age-group, females show less individual variation than do males, we have relied more on the characteristics of the females in this taxonomic study. Only specimens taken at approximately the same times of the year have been compared for color of pelage. Capitalized color terms are those of Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912. Specimens made available through the courtesy of the authorities of the Biological Surveys Collection of the United States National Museum are indicated in the accounts of subspecies as BSC; other specimens listed are in the collection of the University of Kansas Museum of Natural History. Assistance with field work is acknowledged from the Kansas University Endowment Association and the National Science Foundation.

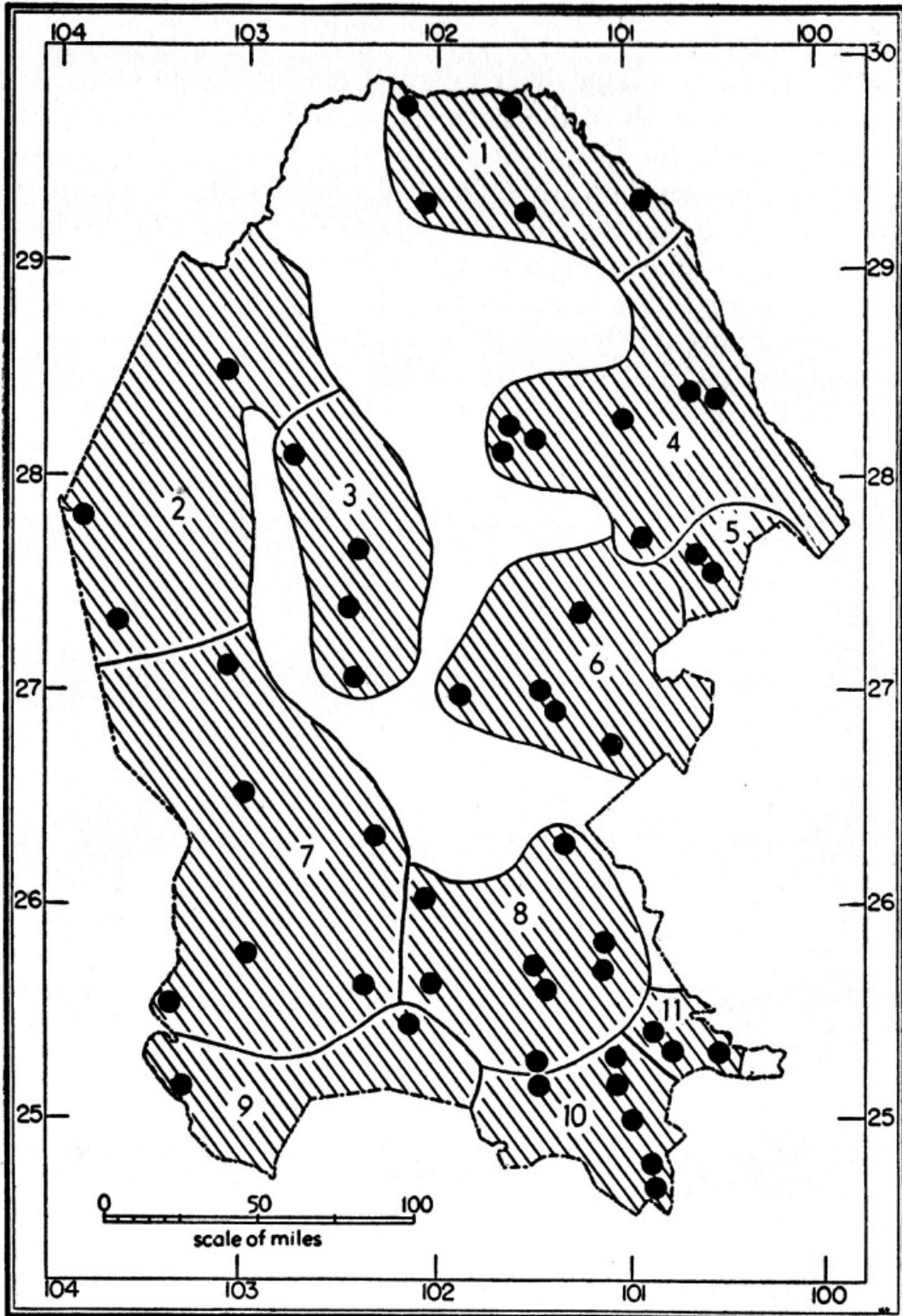
In any one of the lists of "Specimens examined" beyond, the order of arrangement of the localities is from north to south. Those localities listed in Roman type are represented on the distribution map (Figure 1) by blacked-in circles. Each of several circles covers two or more localities because the localities are close together. In any such instance the northernmost place is listed in Roman type and the names of the other places follow in Italic type. Measurements in millimeters are given in table 1 for females and in table 2 for males.

***Cratogeomys castanops convexus* Nelson and Goldman**

1934. *Cratogeomys castanops convexus* Nelson and Goldman, Proc. Biol. Soc. Washington, 47:142, June 13, type from 7 mi. E Las Vacas [= Villa Acuña], Río Grande Valley,

Distribution.--Extreme northern Coahuila, east and north of the Serranías del Burro (see [fig. 1](#)).

Diagnosis.--Previously known from only one specimen, a subadult female, this subspecies has not been well diagnosed. At hand we have five near topotypes of *convexus* (including two adult females and one adult male) and specimens assignable to this subspecies from several other localities. This subspecies may be characterized as follows: Size medium (see [tables 1 and 2](#)); dorsal profile of skull convex in females and flat, especially posteriorly, in males; zygomata weakly constructed and not widely flaring; mastoid and tympanic bullae inflated; nasals short; rostrum broad and short; maxillary teeth large.



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FIG. 1. Geographic ranges of the subspecies of *Cratogeomys castanops* found in Coahuila, México.

Click on ap to view larger sized.

- | | | |
|----------------------------|---------------------------|-----------------------------|
| 1. <i>C. c. convexus</i> | 5. <i>C. c. ustulatus</i> | 9. <i>C. c. goldmani</i> |
| 2. <i>C. c. consitus</i> | 6. <i>C. c. jucundus</i> | 10. <i>C. c. subnubilus</i> |
| 3. <i>C. c. sordidulus</i> | 7. <i>C. c. excelsus</i> | 11. <i>C. c. planifrons</i> |

Comparisons.--From topotypes of *Cratogeomys castanops angusticeps* Nelson and Goldman, found to the north and east across the Río Grande in Texas, *convexus* differs in: Body larger; upper parts more reddish, especially on sides; skull with zygomata less heavy, nasals broader, pterygoids smaller, maxillary teeth larger. For comparisons of *convexus* with the subspecies of *C. castanops* found to the west, south and southeast, see accounts of the subspecies to follow. [597]

Remarks.--The geographic range of *convexus* is restricted, being bounded on the west and southwest by mountains, especially the Serranías del Burro, and on the north and east by the Río Grande. The range of the subspecies found to the southeast may not be continuous with that of *convexus*. At least, in the area between Villa Acuña and Piedras Negras, along the Río Grande, no specimens were obtained and no sign was observed. We suspect that in this area the species occurs only locally if at all.

A specimen taken near the Río Grande in Coahuila, opposite Samuels, Texas, and assigned to *Cratogeomys castanops clarkii* by Nelson and Goldman (op. cit.:140), has been examined by us and is referable to *convexus*. This specimen is typical of *convexus* except for the lesser inflation of the mastoid bullae and tympanic bullae. Conspicuous differences between *convexus* and *angusticeps* indicate that the Río Grande is an effective barrier to passage by these rodents.

Specimens examined.--Total, 14, all from Coahuila: Río Grande, 17 mi. S Dryden, Terrell Co., Texas, 6; Río Grande, opposite Samuels, Val Verde Co., Texas, 1 (BSC); Villa Acuña, 5; Cañon del Cochino, 21 mi. E and 16 mi. N Piedra Blanca, 1; 11 mi. W Hda. San Miguel, 1.

***Cratogeomys castanops bullatus* new subspecies**

Type.--Female, adult, skin and skull, No. 48498, Univ. Kansas Mus. Nat. Hist., 2 mi. S and 6-1/2 mi. E Nava, 810 ft., Coahuila; 16 June 1952; obtained by Robert J. Russell, original number 276.

Distribution.--Desert lowlands of northeastern Coahuila, from the Río Grande to as far southwestward as the Río Sabinas (see [fig. 1](#)).

Diagnosis.--Body medium for the species (see [tables 1 and 2](#)); tail long; hind foot small; upper parts Light Ochraceous-Buff (in summer pelage) and Orange-Buff (in winter pelage), bases of hairs Plumbeous; underparts white to pale buffy; skull small, broad and slightly convex in dorsal outline; zygomata widely flaring; palate short; rostrum short; nasals short; mastoid and tympanic bullae inflated; basioccipital with lateral edges parallel; maxillary teeth small.

Comparisons.--From *Cratogeomys castanops convexus*, found to the north, *bullatus* differs in: Hind foot shorter; skull much broader in relation to length; rostrum narrower but, relative to length of skull, wider; tympanic bullae slightly more inflated; incisors and maxillary teeth smaller. From topotypes of *Cratogeomys castanops angusticeps*, found across the Río Grande and upstream from localities where *bullatus* is known to occur, *bullatus* differs in: Body slightly smaller; color paler, especially on sides; skull shorter and broader; rostrum shorter and broader; nasals shorter; mastoid and tympanic bullae more inflated; maxillary teeth smaller. For comparisons of *bullatus* with the subspecies of *C. castanops* found to the west and south, see accounts of the subspecies to follow.

Remarks.--*Cratogeomys castanops bullatus* in small size resembles *C. c. tamaulipensis* Nelson and Goldman of the lower Río Grande Valley in Tamaulipas, but the two differ markedly in cranial features. *Cratogeomys c. bullatus* is smaller than *convexus* but these two subspecies resemble each other in color and cranial characters. Both have an arched skull, inflated mastoid and tympanic bullae, short nasals, and a short rostrum. Comparison of *bullatus* with *angusticeps*, which occurs across the Río Grande but not directly opposite the range of *bullatus*, indicates that these two subspecies are less closely related than *bullatus* is to *tamaulipensis* and *convexus*. [598]

Cratogeomys castanops bullatus is especially common in sandy soils in the vicinity of Nava where the mounds were in fallow irrigated fields and other

open places between extensive live oak thickets. South and west of the Río Grande the animals were less abundant and lived in heavier soils usually as individuals or in small groups. Specimens were taken at elevations from as low as 800 feet to as high as 2,000 feet.

Specimens examined.--Total, 24, from: 2 mi. S and 6-1/2 mi. E Nava, 810 ft., 2; 2 mi. S and 12 mi. E Nava, 800 ft., 1; 3 mi. S and 12 mi. E Nava, 800 ft., 4; 29 mi. N and 6 mi. E Sabinas, 5; 10 mi. E Hacienda La Mariposa, 2000 ft., 1; La Gacha [= La Concha], 1600 ft., 8; 8 mi. S and 8 mi. E Hacienda La Mariposa, 1900 ft., 1; 9 mi. S and 11 mi. E Sabinas, 1050 ft., 2.

***Cratogeomys castanops ustulatus* new subspecies**

Type.--Female, adult, skin and skull, No. 34589, Univ. Kansas Mus. Nat. Hist., Don Martin, 800 ft., Coahuila; 19 August 1949; obtained by W. Kim Clark, original number 1034.

Distribution.--Extreme northeastern Coahuila from the vicinity of Presa Don Martin southward into northwestern Nuevo León in the valley of the Río Salado and its tributaries at least as far south as the vicinity of Vallecillo (see [fig. 1](#)).

Diagnosis.--Body large for species (see [tables 1 and 2](#)); hind foot short; upper parts Apricot Buff (in fresh summer pelage) and Salmon-Buff strongly mixed with black (in fresh winter pelage); underparts Light Ochraceous-Buff; skull large, especially in females, and broad; zygomatic arches widely flaring; palate long; rostrum broad; nasals long; mastoid and tympanic bullae not conspicuously inflated; incisors narrow; maxillary teeth large.

Comparisons.--From *Cratogeomys castanops bullatus* found to the north, *ustulatus* differs in: Body larger; tail shorter; upper parts darker, more rufous and less buffy; skull larger, especially in palate, nasals, and rostrum; zygomata more widely flaring; tympanic bullae less inflated; incisors slightly larger; maxillary teeth larger. From topotypes of *Cratogeomys castanops tamaulipensis* found to the southeast, *ustulatus* differs in: Body larger; upper parts, in winter pelage, darker, more rufous and less buffy; underparts paler; skull larger, especially in palate, rostrum and nasals; zygomata more widely flaring; tympanic bullae more inflated; pterygoids larger; basioccipital narrower, its sides parallel instead of convex; maxillary teeth smaller. From *Cratogeomys castanops subsimus*, found to the southwest, *ustulatus* differs in: Tail shorter; hind foot smaller; upper parts darker, more rufous and less pinkish-buff; skull shorter; zygomata less widely flaring; palate shorter; rostrum averaging slightly narrower; nasals shorter; incisors narrower; maxillary teeth slightly smaller. For comparison of *ustulatus* with the subspecies of *C. castanops* to the southwest, see account of that subspecies to follow.

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Remarks.--*Cratogeomys castanops ustulatus* is a large-sized pocket gopher with a relatively larger, skull. In size of skull, *ustulatus* is exceeded only by *C. c. subsimus* found beyond the mountains in the southern part of Coahuila. In size, *ustulatus* differs so markedly from *bullatus* that the two can be distinguished easily by this feature alone. The skull of *C. c. convexus* approaches that of *ustulatus* in size, but is smaller in all respects, save breadth of rostrum.

This pocket gopher is found commonly along the Río Salado and its watershed. Fallow cotton fields in the vicinity of Anahuac [= Rodríguez], Nuevo León, are preferred living places. This subspecies was found at elevations as high as 1000 feet and as low as 600 feet.

Specimens examined.--Total, 10, from: Don Martin, 800 ft., 5; base of Don Martin Dam, 2; 2 mi. SE Don Martin Dam, along Río Salado, 2; 5 mi. SE Don Martin, 1.

Records from Nuevo León.--Total, 14, from: 9 mi. N and 2 mi. W Anahuac [= Rodríguez], 1; 4 mi. N and 1 mi. W Anahuac [= Rodríguez], 5; 3 mi. N Lampazos, 4; 1 mi. N Vallecillo, 1000 ft., 1; Vallecillo, 20 mi. S Río Salado, 1000 ft., 3.

***Cratogeomys castanops jucundus* new subspecies**

Type.--Female, adult, skin and skull; No. 56603, Univ. Kansas Mus. Nat. Hist.; Hermanas, 1205 ft., Coahuila; 5 December 1953; obtained by Robert W. Dickerman, original number 2051.

Distribution.--Arid plains and broad intermontane valleys of east-central Coahuila (see [fig. 1](#)).

Diagnosis.--Body largest for the species (see [table 1](#)); tail long; hind foot large; upper parts in winter pelage Ochraceous-Buff, in summer pelage Antimony Yellow; underparts Pale Ochraceous-Buff; skull medium in size, broad; zygomata moderately flaring; palate medium in length; rostrum broad; nasals moderately long; maxillary teeth small.

Comparisons.--From *Cratogeomys castanops ustulatus*, found to the east, *jucundus* differs in: Body larger; tail longer; hind foot larger; upper parts paler, more ochraceous and less rufous;

skull averaging smaller; zygomata slightly less expanded laterally; palate and nasals shorter; squamosal breadth less; mastoid bullae less inflated, especially in females; rostrum slightly narrower; maxillary tooth-row shorter. From topotypes of *Cratogeomys castanops tamaulipensis*, found to the southeast, *jucundus* differs in: Body larger; tail longer; hind foot smaller; upper parts, in winter pelage, paler, more ochraceous and less rufous; skull larger; zygomata more widely flaring; palate longer; rostrum broader; tympanic bullae more inflated; basioccipital with sides parallel instead of convex; maxillary teeth smaller. From *Cratogeomys castanops excelsus*, found to the southwest, *jucundus* differs in: Body larger; hind foot averaging larger; upper parts darker, more ochraceous, and less buffy; underparts darker, more buffy and less whitish; skull slightly smaller; zygomata less widely flaring, especially in females; palate shorter; nasals shorter; squamosal breadth less; mastoid bullae more inflated; incisors narrower. From *Cratogeomys castanops subsimus*, found to the south, *jucundus* differs in: Body larger; tail shorter; hind foot shorter; upper parts paler, more ochraceous and less yellowish; skull smaller; zygomata less widely expanded laterally; palate and nasals shorter; rostrum narrower; squamosal breadth less; maxillary tooth-row shorter. From *Cratogeomys castanops bullatus*, found to the north, *jucundus* differs in: Body larger; tail averaging longer; hind foot larger; color of upper parts more ochraceous and less rufous; underparts darker, more buffy and less whitish; skull larger, especially in length, in width across zygomata, in lengths of palate, rostrum and nasals; mastoid and tympanic bullae less inflated; squamosal breadth greater.

Remarks.--*Cratogeomys castanops jucundus* is large, exceeding *subsimus* in dimensions of the body, but differing from *subsimus* in relatively smaller skull. Passage to the north and northeast by *jucundus* is at least partly blocked by inhospitable mountainous country; the resulting semi-isolation may be one reason for the distinctive characteristics of *jucundus* compared with those of *bullatus* and *ustulatus*. Two specimens from Monclova, assigned to *tamaulipensis* by Nelson and Goldman (op. cit.:142), are here referred to *jucundus* on the basis of cranial characters and size.

Specimens were trapped in fallow irrigated fields in the vicinity of Monclova. Others were taken in deep soils in desert flats.

Specimens examined.--Total, 19, from: Hermanas, 1205 ft., 9; 1 mi. S Hermanas, 2; 1 mi. N and 13 mi. E Cuatro Ciénegas, 2; 5 mi. N and 2 mi. W Monclova, 1; 2 mi. N and 1 mi. E Monclova, 1; Monclova, 2 (BSC); Hisachalo [= Huisachalo], 2.

***Cratogeomys castanops sordidulus* new subspecies**

Type.--Female, adult, skin and skull; No. 56614, Univ. Kansas Mus. Nat. Hist.; 1.5 mi. NW Ocampo, 3300 ft., Coahuila; 16 December 1953; obtained by Robert W. Dickerman, original number 2164.

Distribution.--Desert plains of north-central Coahuila, surrounded for the most part by higher mountainous country (see [fig. 1](#)).

Diagnosis.--Body large for species (see [tables 1 and 2](#)); tail short; hind foot large; upper parts Ochraceous-Buff (in summer pelage) and Orange-Buff (in fresh winter pelage); underparts Pale Ochraceous-Salmon; skull medium in size and narrow; zygomata narrow; rostrum narrow; palate short; nasals medium in length; basioccipital small and narrow; mastoid bullae not greatly inflated; tympanic bullae inflated; incisors small; maxillary teeth small.

Comparisons.--From *Cratogeomys castanops jucundus*, found beyond the mountains to the southeast, *sordidulus* differs in: Body smaller; tail shorter; hind foot slightly smaller; upper parts darker, more ochraceous and less yellowish, with plumbeous bases of hairs more conspicuous; underparts darker, more buffy and less whitish; skull slightly shorter, more nearly flat, and narrower; zygomata less widely flaring; rostrum narrower; mastoid bullae less inflated; incisors and maxillary teeth slightly smaller. From *Cratogeomys castanops excelsus*, found to the south and southwest, *sordidulus* differs in: Body slightly smaller; tail shorter; hind foot slightly larger; upper parts darker, more ochraceous and less pinkish-buff; underparts darker, more buffy and less whitish; skull smaller and narrower; zygomata less widely flaring; sides more nearly parallel and not expanded anteriorly; palate shorter; rostrum narrower and, in relation to greatest length of skull, longer; tympanic bullae slightly more inflated; incisors and maxillary teeth smaller. From *Cratogeomys castanops consitus*, found to the north and west, *sordidulus* differs in: Body larger; hind foot larger; upper parts paler, more ochraceous and less rufous; skull decidedly larger and wider; zygomata more widely flaring; palate and nasals longer; rostrum broader; mastoid bullae and tympanic bullae larger; maxillary teeth smaller. From topotypes of *Cratogeomys castanops clarkii* (Baird), found to the northwest, *sordidulus* differs in: Body larger; tail shorter; upper parts, in winter pelage, paler, more ochraceous and less dark-rufous; skull slightly smaller and narrower; rostrum narrower; nasals slightly shorter; sides of basioccipital more nearly parallel instead of wedge-shaped; mastoid bullae less inflated; incisor and maxillary teeth smaller. From *Cratogeomys castanops convexus*, found to the northeast, *sordidulus* differs in: Body larger; tail shorter; upper parts slightly darker, more ochraceous and less buffy; skull narrower; zygomata more nearly parallel and less expanded anteriorly; rostrum narrower and longer; nasals longer;

squamosal breadth greater; mastoid bullae less inflated; maxillary teeth smaller. From *Cratogeomys castanops bullatus*, found to the east, *sordidulus* differs in: Body larger; hind foot larger; upper parts darker, more ochraceous and less buffy; skull larger in all respects; zygomata more widely flaring; tympanic bullae less inflated; maxillary teeth larger.

Remarks.--*Cratogeomys castanops sordidulus* is limited to the Llano de Ocampo, an elevated, desert plain surrounded on three sides, west, south and east, by higher mountainous country which seems to bar the passage of this rodent. On the eastern side this barrier extends north to the very banks of the Río Grande in the Cañon de Boquillas. This subspecies, therefore, is in contact with other populations of *Cratogeomys* only to the north and northwest. This subspecies is well characterized by size, color and cranial characteristics.

Cratogeomys castanops sordidulus is not abundant; groups of mounds constructed by one or a few individuals were found in widely separated places. Mounds were often small, appeared old and, in other ways, were inconspicuous on arid flats. The animals were taken at elevations as low as 3250 feet and as high as 4150 feet.

Specimens examined.--Total, 13, from: 50 mi. N and 20 mi. W Ocampo, 4150 ft., 1; 18 mi. S and 14 mi. E Tanque Alvarez, 4000 ft., 4; 1-1/2 mi. NW Ocampo, 3300 ft., 6; *Ocampo*, 1; 5 mi. N and 19 mi. W Cuatro Ciénegas, 3250 ft., 1.

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***Cratogeomys castanops consitus* Nelson and Goldman**

1934. *Cratogeomys castanops consitus* Nelson and Goldman, Proc. Biol. Soc. Washington, 47:140, June 13, type from Gallego, 5500 ft., Chihuahua.

Distribution.--Arid high plains from central Chihuahua, east and southeast at least into northwestern Coahuila (see [fig. 1](#)).

Comparisons.--From *Cratogeomys castanops lacrimalis* Nelson and Goldman, specimens from Boquillas and Marathon north of the Río Grande in Texas, *consitus* differs in: Body smaller; tail and hind foot shorter; upper parts paler, more light buffy and less rufous; underparts paler, light buffy instead of dark buffy; skull decidedly smaller; zygomata slightly less widely flaring; palate especially shorter; rostrum narrower; squamosal breadth less; incisors smaller. From topotypes of *Cratogeomys castanops clarkii*, found to the north along the Río Grande, *consitus* differs in: Body smaller; tail and hind foot shorter; upper parts paler, more buffy and less rufous; skull markedly smaller, especially in palate and nasals; zygomata less widely flaring; tympanic bullae more inflated; mastoid bullae less inflated; basioccipital parallel-sided as opposed to wedge-shaped. From *Cratogeomys castanops convexus*, found to the east, *consitus* differs in: Body smaller; tail and hind foot shorter; upper parts paler, more buffy and less ochraceous; underparts paler, white or light buffy instead of pale ochraceous; skull smaller; zygomata less widely flaring; palate shorter; rostrum decidedly narrower and, relative to length of skull, longer; squamosal breadth less; incisors smaller. From *Cratogeomys castanops excelsus*, found to the south, *consitus* differs in: Size smaller; tail and hind foot shorter; upper parts darker, more rufous and less pinkish-buff; skull conspicuously smaller, especially in palate, rostrum, and nasals; zygomata less widely flaring; mastoid bullae and tympanic bullae more inflated; incisors smaller; maxillary teeth relatively larger. For comparison of *consitus* with *Cratogeomys castanops sordidulus*, see previous account.

Remarks.--*Cratogeomys castanops consitus* is a small pocket gopher (see [tables 1 and 2](#)); the largest adult available to us is much smaller than the smallest adult of any adjacent subspecies. Specimens from Coahuila assigned to *consitus* compare favorably with topotypes although those from the vicinity of Jaco are smaller, paler and have a narrower rostrum and smaller maxillary teeth. An immature male trapped three miles northeast of Sierra Mojada is tentatively assigned to *consitus*. This subspecies seems to be rare in northwestern Coahuila and small colonies are widely scattered.

Cratogeomys castanops clarkii (Baird) may occur along the Río Grande in extreme northwestern Coahuila. No specimens are known from Coahuila, and none was found in the vicinity of Boquillas, Coahuila, in 1952.

Specimens examined.--Total, 8, from: 3 mi. N and 9 mi. E El Pino, 1; 6 mi. E Jaco, Chihuahua, in Coahuila, 6; 3 mi. NE Sierra Mojada, 1.

1934. *Cratogeomys castanops excelsus* Nelson and Goldman, Proc. Biol. Soc. Washington, 47:143, June 13, type from San Pedro, 10 mi. W Laguna de Mayrán, Coahuila.

Distribution.--Desert plains of southwestern Coahuila and northeastern Durango (see [fig. 1](#)).

Comparisons.--*Cratogeomys castanops excelsus* is characterized by large size and pale color; it is the palest subspecies of *C. castanops*. Of adjacent subspecies, *excelsus* most closely resembles *C. c. subsimus* which occurs to the east and resembles least *C. c. consitus*, which occurs to the northwest.

From *Cratogeomys castanops subsimus*, found to the east, *excelsus* differs in: Body averaging slightly larger; tail and hind foot shorter; upper parts paler, more light buffy and less yellowish; skull smaller; palate especially shorter; rostrum narrower; nasals shorter; incisors slightly smaller; maxillary tooth-row shorter. Compared with topotypes of *C. c. goldmani*, found to the south, *excelsus* differs in: Body larger; hind foot smaller; upper parts in winter pelage paler, more buffy and less rufous; skull larger; zygomata more widely flaring; rostrum broader; nasals shorter; tympanic bullae larger and more inflated; maxillary teeth larger.

Specimens of *excelsus* from the vicinity of Torreón, in southwestern Coahuila, are slightly smaller in cranial dimensions than more typical examples of the subspecies. In small size, at least, these specimens show some resemblance to *goldmani* to the south. The range of *excelsus* approaches that of *C. c. consitus* in west-central Coahuila (see [fig. 1](#)), but no evidence of intergradation between these two subspecies could be ascertained. For comparison of *excelsus* with *consitus*, see account of the latter.

Remarks.--*Cratogeomys castanops excelsus* lives in the deep soils of the arid interior basin of southwestern Coahuila and adjacent parts of Durango. This animal is common in the cultivated areas in, and in the vicinity of, the formerly extensive Laguna de Mayrán. East of this laguna the land becomes progressively higher, and *C. c. subsimus* occurs in the higher, more dissected part of this area.

Specimens examined.--Total, 33, from: 8 mi. E and 2 mi. S Americanos, 3500 ft., 3; 4 mi. N Acatita, 3600 ft., 9; 20 mi. S El Hundido, 1; San Pedro, 2 (BSC); 1 mi. SW San Pedro de las Colonias, 3700 ft., 4; 10 mi. N and 11 mi. W San Lorenzo, 2; 2 mi. E Torreón, 12.

Cratogeomys castanops subsimus Nelson and Goldman

1934. *Cratogeomys castanops subsimus* Nelson and Goldman, Proc. Biol. Soc. Washington, 47:144, June 13, type from Jaral, Coahuila.

Distribution.--Desert plains and lower foothills of mountains in south-central Coahuila (see [fig. 1](#)).

Comparisons.--From *Cratogeomys castanops goldmani*, found to the southwest, *subsimus* differs in: Body larger; hind foot larger; upper parts paler, more yellowish and less rufous; skull larger and rougher, having more prominent ridges and crests and deeper fossae for attachment of muscles; zygomata more widely flaring; palate longer; rostrum broader; nasals longer; squamosal breadth greater; maxillary teeth larger. From *C. c. subnubilus*, found to the south, *subsimus* differs in: Body larger; tail and hind foot shorter; upper parts paler, more yellowish-buff and less blackish; skull decidedly larger in all respects. From *C. c. planifrons*, found at higher elevations to the southeast, *subsimus* differs in the same respects as *subsimus* differs from *subnubilus*. For comparisons between *subsimus* and [subspecies](#) to the west, north and northeast, see accounts above.

TABLE 1. MEASUREMENTS OF ADULT FEMALE CRATOGEOMYS FROM COAHUILA, MÉXICO

[604]

Table legend:

- Column A: No. av. or cat. no.
- Column B: Total length
- Column C: Length of tail
- Column D: Length of hind foot
- Column E: Condylbasal breadth

Column F: Zygomatic breadth
 Column G: Length of palate
 Column H: Breadth of rostrum
 Column I: Length of nasals
 Column J: Squamosal breadth
 Column K: Alveolar length of maxillary tooth-row

A	B	C	D	E	F	G	H	I	J	K
<i>C. c. convexus</i> , Villa Acuña										
52259	260	86	37	50.6	31.7	33.8	11.7	16.7	29.1	9.3
52261	265	83	38	49.3	31.6	32.9	11.8	15.8	28.9	10.6
<i>C. c. bullatus</i> , vicinity of Nava										
5 Av.	256	80	36	47.4	30.6	32.6	10.7	17.1	27.9	9.5
Min.	242	72	35	47.0	30.6	32.3	10.0	16.5	27.5	9.2
Max.	263	85	37	47.7	31.1	32.9	11.6	17.8	28.2	9.8
<i>C. c. ustulatus</i> , vicinity of Don Martin										
8 Av.	273	74	36	51.4	33.5	35.4	11.8	18.8	30.1	10.0
Min.	261	64	35	50.7	32.6	34.8	11.0	17.8	29.1	9.3
Max.	280	83	38	52.1	34.1	36.5	12.5	19.2	30.8	10.6
<i>C. c. jucundus</i> , Hermanas										
4 Av.	296	85	39	50.9	33.0	34.6	11.5	18.0	29.6	9.4
Min.	294	83	38	49.8	32.1	33.8	11.0	17.0	29.0	9.1
Max.	298	86	39	51.8	33.8	35.0	11.6	18.6	30.1	9.6
<i>C. c. sordidulus</i> , 1.5 mi. NW Ocampo										
3 Av.	276	79	37	50.4	31.7	34.6	10.9	18.2	30.0	9.1
Min.	270	75	36	49.5	30.6	33.8	10.3	17.7	29.8	8.9
Max.	288	85	39	51.4	32.4	35.2	11.4	18.5	30.1	9.2
<i>C. c. consitus</i> , 6 mi. E Jaco, Chihuahua, in Coahuila										
4 Av.	229	74	32	43.8	28.1	29.6	9.7	16.0	26.2	8.9
Min.	226	68	31	42.6	27.3	29.4	9.4	15.5	25.7	8.1
Max.	232	78	32	45.8	28.8	29.9	9.9	16.2	26.9	9.2
<i>C. c. excelsus</i> , 4 mi. N Acatita										
4 Av.	284	82	37	51.4	34.1	35.4	11.6	18.9	31.2	9.5
Min.	274	77	35	51.1	33.6	34.7	10.4	18.4	30.5	9.2
Max.	291	86	38	51.6	34.9	36.1	12.1	20.1	31.7	9.9
<i>C. c. subsimus</i> , 12 mi. N and 10 mi. E Parras										
34937	287	87	39	53.1	34.9	36.9	11.5	19.4	31.7	10.5
Jaral (BSC)										
51049	295	104	40	53.2	34.1	36.9	12.6	18.7	29.7	10.0
<i>C. c. goldmani</i> , 1 mi. S Jimulco										
55611	250	85	35	46.0	32.6	31.4	10.7	16.3	27.8	9.8
<i>C. c. subnubilus</i> , 1 mi. S Carneros										
33128	220	65	29	40.8	27.9	27.2	8.7	12.7	24.7	8.1
2 mi. W San Miguel										
33132	222	65	30	40.4	26.3	26.6	8.1	13.2	24.5	8.4
1 mi. N Agua Nueva										

33127	220	74	29	41.8	24.6	28.4	8.3	14.2	23.9	8.4
8 mi. N La Ventura										
34934	235	76	30	42.2	27.9	28.5	9.0	14.3	26.3	7.8
<i>C. c. planifrons</i> , 12 mi. W San Antonio de las Alazanas										
5 Av.	244	66	32	43.7	28.0	29.1	9.4	14.5	26.2	8.6
Min.	239	62	31	43.3	27.5	28.7	8.9	13.6	25.3	8.3
Max.	247	69	33	44.3	28.5	9.4	9.7	15.3	26.8	8.9

TABLE 2. MEASUREMENTS OF ADULT MALE CRATOGEOMYS FROM
COAHUILA, MÉXICO

[605]

Table legend:

Column A: No. av. or cat. no.
 Column B: Total length
 Column C: Length of tail
 Column D: Length of hind foot
 Column E: Condylbasal breadth
 Column F: Zygomatic breadth
 Column G: Length of palate
 Column H: Breadth of rostrum
 Column I: Length of nasals
 Column J: Squamosal breadth
 Column K: Alveolar length of maxillary tooth-row

A	B	C	D	E	F	G	H	I	J	K
<i>C. c. convexus</i> , Villa Acuña										
52260	275	89	39	55.0	34.4	37.0	12.6	20.0	30.9	10.4
<i>C. c. bullatus</i> , 3 mi. S and 12 mi. E Nava										
48500	261	80	36	49.7	35.3	34.4	12.4	17.1	29.2	9.5
La Gacha										
57028	250	76	34	49.9	34.0	34.4	11.5	16.6	28.4	9.3
<i>C. c. ustulatus</i> , Don Martin										
34587	280	75	37	54.6	37.3	38.2	13.7	20.6	31.8	10.3
<i>C. c. jucundus</i> , Hermanas										
56605	311	80	42	56.9	38.7	40.1	13.3	21.0	32.3	9.9
<i>C. c. sordidulus</i> , 1.5 mi. NW Ocampo										
56733	307	88	37	57.5	49.6	40.3	13.6	22.1	33.1	10.3
<i>C. c. consistus</i> , 3 mi. N and 9 mi. E El Pino										
54547	289	94	36	53.8	32.6	37.1	12.7	18.8	29.5	9.6
<i>C. c. excelsus</i> , 2 mi. E Torreón										
40224	315	97	41	54.7	37.8	37.6	12.1	19.5	31.4	9.8
<i>C. c. subsimus</i> , Hda. El Tulillo, 5 km. S Hipolito										
35772	315	105	40	56.4	35.3	39.5	12.5	20.8	33.8	10.6

				2 mi. N Santa Cruz							
48517	316	89	40	58.2	37.9	40.3	14.1	21.7	34.8	10.3	
				<i>C. c. goldmani</i> , W foot Pico de Jimulco							
55610	255	82	36	48.9	33.4	33.4	11.7	17.7	29.6	9.3	
				<i>C. c. subnubilus</i> , Carneros (BSC)							
79484	247	86	34	45.3	30.9	30.8	9.6	15.7	28.4	8.5	
				8 mi. N La Ventura							
34932	250	79	34	46.3	31.8	31.0	9.6	16.4	28.7	8.4	
				<i>C. c. planifrons</i> , 4 mi. S and 6 mi. E Saltillo							
35779	254	76	34	48.0	32.2	32.6	9.8	16.6	28.0	8.6	
35780	272	85	35	48.8	33.2	34.1	10.5	17.5	29.9	9.5	
				12 mi. S and 2 mi. E Arteaga							
33122	255	72	35	47.0	32.3	31.2	10.5	15.5	28.7	9.0	

Remarks.--*Cratogeomys castanops subsimus* is the largest known subspecies of the species in cranial dimensions, but is exceeded in size of body by *C. c. jucundus* to the north. Of adjacent subspecies, *subsimus* is the most closely related to *excelsus* and shows little or no relationship to the smaller and darker *C. c. subnubilus* and *C. c. planifrons*, which are found at higher elevations to the south and southeast, respectively. Movements by *subsimus* to the north, east, and south are barred by inhospitable mountains. Specimens of *subsimus* from the northeastern part of its range are larger and darker than other specimens assigned to this subspecies. An adult female, assigned to *subsimus*, from the vicinity of Santa Rosa is noticeably smaller and paler than typical specimens of this subspecies. [606]

Cratogeomys castanops subsimus occurs in scattered colonies in sandy soils principally in the upper drainage of the Río Salinas. Specimens have also been taken from the foothills of the Sierra Madre Oriental and westward on the elevated desert plains.

Specimens examined.--Total, 22, from: 3 mi. S and 3 mi. E Muralla, 3800 ft., 3; 2 mi. N Santa Cruz, 2; 21 mi. S and 11 mi. E Australia, 4400 ft., 6; Jaral, 3860 ft., 4 (BSC); *Hacienda El Tulillo*, 5 km. S *Hipolito*, 2; 17 mi. N and 8 mi. W Saltillo, 5200 ft., 1; 3 mi. N and 5 mi. W La Rosa, 3600 ft., 1; 12 mi. N and 10 mi. E Parras, 5000 ft., 1; N foot Sierra Guadalupe, 9 mi. S and 5 mi. W General Cepeda, 6200 ft., 1; N foot *Sierra Guadalupe*, 10 mi. S and 5 mi. W General Cepeda, 6500 ft., 1.

***Cratogeomys castanops goldmani* Merriam**

1895. *Cratogeomys castanops goldmani* Merriam, N. Amer. Fauna 8:160, January 31, type from Cañitas, Zacatecas.

Distribution.--Plains of northeastern Zacatecas, northward into extreme southwestern Coahuila (see [fig. 1](#)).

Comparisons.--Compared with *Cratogeomys castanops subnubilus*, found to the east, *goldmani* differs in: Body larger, tail and hind foot longer; color paler, more rufous and less blackish; skull larger; zygomata more widely flaring; palate larger; rostrum broader; nasals longer; maxillary teeth larger. Compared with *Cratogeomys castanops rubellus* Nelson and Goldman, found to the southeast, *goldmani* differs in: Body and skull smaller; zygomata less widely flaring; palate shorter; rostrum narrower; maxillary teeth smaller.

Remarks.--Records of *goldmani* given here extend the known range of this subspecies northward into southwestern Coahuila. Specimens assigned to this subspecies from Coahuila compare favorably with topotypes of *goldmani* (see [607])

[tables 1 and 2](#)) but are slightly paler, and in this respect show some relationship to *excelsus*. The ranges of these two subspecies however, are partly isolated by mountainous country in southern Coahuila.

Specimens examined.--Total, 6, from: W foot Pico de Jimulco, 4600 ft., 1; Valley Río [Aguanaval](#), 1 mi. S Jimulco, 4; 1-1/2 mi. N Parras, 1.

***Cratogeomys castanops subnubilus* Nelson and Goldman**

1934. *Cratogeomys castanops subnubilus* Nelson and Goldman, Proc. Biol. Soc. Washington, 47:145, June 13, type from Carneros, 6800 ft., Coahuila.

Distribution.--Intermontane valleys and plains of southeastern Coahuila and probably adjacent parts of Zacatecas, San Luis Potosí and Nuevo León (see fig. 1).

Comparisons.--*Cratogeomys castanops subnubilus* needs close comparison only with *Cratogeomys castanops planifrons*, found to the east and from which *subnubilus* differs in: Body, hind foot and skull smaller; upper parts, in summer pelage, paler, more rufous-buff and less dark russet; underparts paler, more whitish and less blackish; hairs of hind foot reddish rather than blackish; zygomata more widely flaring; palate shorter, especially in females; rostrum broader, especially in females; nasals slightly smaller; squamosal breadth greater; incisors narrower, especially in males; maxillary teeth smaller. From *Cratogeomys castanops rubellus* Nelson and Goldman, found to the south in San Luis Potosí, *subnubilus* differs in: Body, hind foot and all parts of skull smaller; upper parts and underparts darker, more blackish and less rufous.

Remarks.--*Cratogeomys castanops subnubilus* is the smallest subspecies of *C. castanops* (see [tables 1 and 2](#)). This subspecies is dark and lives at high elevations (5500 ft. to 6800 ft.) in deep valley soils in relatively isolated intermontane valleys and elevated plains. It is differentiated to a much higher degree from adjacent subspecies of *C. castanops* than is usual in this species, and no intergrades between *subnubilus* and other subspecies have been taken. In the Sierra Guadalupe, *subnubilus* was trapped at 6700 feet within two miles of a place where *subsimus* was taken at 6500 feet.

Specimens examined.--Total, 31, from: 1 mi. N Agua Nueva, 5500 ft., 1; Domingo Cañon, Sierra Guadalupe, 6700 ft., 11 mi. S and 4 mi. W General Cepeda, 1; Carneros, 6800 ft., 6 (BSC); 1 mi. S Carneros, 6000 ft., 4; 2 mi. W San Miguel, 5500 ft., 3; 8 mi. N La Ventura, 6000 ft., 10; La Ventura, 5600 ft., 6 (BSC).

***Cratogeomys castanops planifrons* Nelson and Goldman**

1934. *Cratogeomys castanops planifrons* Nelson and Goldman, Proc. Biol. Soc. Washington, 47:146, June 13, type from Miquihuana, 5000 ft., Tamaulipas (listed, by mistake, as southern Nuevo León).

Distribution.--Elevated montane valleys of Sierra Madre Oriental of extreme southeastern Coahuila, south and east into southwestern Nuevo León and Western Tamaulipas (see [fig. 1](#)).

Remarks.--Specimens from Coahuila assigned to *planifrons* compare favorably with topotypes of this subspecies although they are slightly larger in cranial dimensions (see [tables 1 and 2](#)). This small subspecies is darker and slightly larger than *subnubilus* but in other ways is most closely related to *subnubilus*. *Cratogeomys c. planifrons* shows little relation to other adjacent subspecies, including *tamaulipensis*, *subsimus* and *rubellus*, all of which are considerably larger and paler.

[608]

Cratogeomys castanops planifrons is found in both deep and shallow soils of the high, open valleys of the Sierra Madre Oriental; in Coahuila it was taken at elevations as low as 7200 feet and as high as 8700 feet.

Specimens examined.--Total, 50, from: 4 mi. S and 6 mi. E Saltillo, 7500 ft., 7; 7 mi. S and 4 mi. E Bella Union, 7200 ft., 14; 12 mi. W San Antonio de las Alazanas, 16; 12 mi. S and 2 mi. E Artega, 7500 ft., 11; 2 mi. E and 2 mi. N San Antonio de las Alazanas, 8700 ft., 2.

Transmitted August 23, 1954.

[End]

*** END OF THE PROJECT GUTENBERG EBOOK GEOGRAPHIC VARIATION IN THE POCKET GOPHER, CRATOGEOMYS CASTANOPS, IN COAHUILA, MÉXICO ***

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