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NOTES ON A COLLECTION OF LIZARDS FROM NEW MEXICO.

By C. L. Herrick, John Terry and H. N. Herrick, Jr.

The following notes are based on the collections of lizards made by the voluntary geological and natural history survey of the University of New Mexico during the season of 1898, with such additions as were possible from the collections made by the senior writer during several years previous. The area covered is chiefly within the Rio Grande valley between Albuquerque and Socorro and the area of the field-work in geology reported elsewhere in this volume. For specimens from Gallup we are indebted to Mr. Wallace Bowie, and for a few specimens from Magdalena to Mr. James Pitch. The object in presenting these fragments is simply to facilitate the prosecution of this work during the coming seasons and to give to the residents of the territory who may be willing to assist in it the basis for the recognition of the commoner species. None of our lizards are venomous and they are mostly to be ranked with the harmless, if not actively helpful, inhabitants of the plains and mountains. In many cases they are marvelously abundant, especially in this the case with the Holbrookias and smaller honed toads. The latter pass below ground in October and do not reappear till spring, while the smaller lizards may appear during the warmer parts of the day throughout most of the winter. They are, for the most part, subject to a great deal of individual and seasonal variation and many are provided with a remarkable degree of color adaptability in adjustment to the environment, so that, for example, species from the open sands are entirely different in markings and color scheme from those of more pro-

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tected stations. They also have the camelion-like power of adapting themselves in a short time to the color of the background.

**LACERTILIA.**

The lizards may be distinguished from the recent families of reptiles by their scaly bodies, the presence of limbs, the absence of a carapace, the three-chambered heart, the fact that the jaw is not dislocatable from its cranial attachment as in snakes or, more technically, by the following characters: quadrate bone articulated with the skull, parts of the ali- and orbitosphenoid regions fibro-cartilaginous, rami of the mandible united by a suture, anal cleft transverse, copulatory organs paired.

**KEY TO THE FAMILIES DESCRIBED.**

**I. Eyes with movable lids.**

a. Pupil elliptical, vertical; head without large plates, its skin freely movable, *Eublepharidae.*

aa. Pupil round; top of head with immovable plates.

b. A series of femoral pores.

c. Lateral scales not abruptly smaller than the ventrals in numerous series; tongue not deeply divided, *Iguanidae.*

c. Lateral scales granular like the dorsals and smaller than the ventrals, which are in 8 longitudinal series, tongue ending in two slender points, *Teiidae.*

bb. No femoral pores.

d. Lateral scales very much smaller than the dorsal and ventral, usually hidden by a lateral fold; dorsal scales keeled, *Anguidae.*

dd. Lateral scales not much smaller than dorsals and ventrals; no lateral fold; scales smooth.

e. Scales on body flat, thin and imbricate, *Scincidae.*


II. Eyes without lids; pupil elliptical, *Xantusiidae.*

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**Herrick-Terry-Herrick, New Mexico Lizards.**

**Family. Eublepharidae.**

This family is admittedly nearly related to the geckos, from which its members differ in the procoelian vertebrae and single parietal bone. The limbs are slender and the claws are retractile. The rather few species are widely distributed, the family being represented in North and Central America and in Asia. The color patterns among those widely separated species is very similar.

*Coleonyx variegatus,* Bd., has been found in Texas and in California and so may be expected to occur in southern New Mexico. It may be recognized by the characters of the family and the five dark brown bands crossing the yellow of the back. The eyelids have a series of pointed scales. Males have six to eight preanal pores.

**Family. Iguanidae.**

A very large family restricted to America and the islands of the Pacific with the exception of two genera from Madagascar. The species are diurnal, the eyes having round pupils and strongly developed lids. The teeth are sub-equal in size and usually conical. Femoral pores are usually present in the North American forms while often absent in those of South America. The form of the head shields is various and affords good generic and specific characters. In this paper the shield formed by the confluence of a number of plates about the parietal eye is called the interparietal and not occipital, as is done in many cases. The tympanum is distinct, except in *Holbrookia.* The species are generally insectivorous but many are partial to a varied diet and some seem to be strongly vegetarian. Phrynosoma and some species of *Sceloporus* are oviparous. From the excellent report of John Van Denburgh on the reptiles of California we take the following key to the genera likely to occur within our limits.

**Synopsis of Genera of Iguanidae.**

I. A low dorsal crest composed of one longitudinal series of enlarged scales, *Dipsosaurus.*
II. No dorsal crest.
A. Head without spines.
   a. One or more transverse gular folds.
   b. Toes with a lateral fringe of movable spines, Uma.
   bb. Toes without spines.
   c. Supralabial plates strongly imbricated; symphyseal plate smaller than the largest infralabial.
   d. An ear opening, Callisaurus.
   dd. No ear opening, Holbrookia.
   cc. Supralabials not imbricated; symphyseal not smaller than the largest infralabial.
   e. No large interparietal plate; caudal scales small, not strongly keeled or pointed.
   f. Ear without strong denticulations and neck without spinose tubercles; supercilaries imbricate; tail long and tapering, Crotophysis.
   ff. Ear with strong denticulations and neck with numerous spinose tubercles on lateral folds; supercilaries not imbricate; tail scarcely longer than distance from snout to vent, Sauromalus.
   ee. A very large interparietal plate; caudal scales large, strongly keeled, and sharply pointed, Uta.
   aa. No complete transverse gular fold, Sceloporus.
   AA. Head with large spines posteriorly, Phrynosoma.

Genus. DIPSOSAURUS.

The single species of this genus, Dipsosaurus dorsalis, Bd. and Gd., has been found in the Colorado and Mojave Deserts and is abundant in the neighborhood of Yuma. It probably does not occur within our limits. It is entirely vegetarian in habit.

Genus. UMA.

The two known species of Uma are not known to occur in our region, they being, like the last and the following, desert loving animals.

Genus. CALLISARUS.

Callisaurus ventralis, the only species, within the United States, was said to occur in Texas as well as in the desert region of southern California and Arizona. It may therefore occur in New Mexico. Stejniger, however, denies that it occurs in either Texas or New Mexico.

Genus. HOLBROOKIA.

Unlike the related genera, this genus is devoid of external ear discs, the tympanum being covered. The dorsal scales small, uniform; head scales small, interparietal enlarged. A long series of femoral pores; two transverse gular folds, the posterior with a denticulated edge; no abdominal ribs; males with enlarged postanal plates. The genus is limited to the southwestern part of North America.

Holbrookia Maculata, Girard.
Plate XIV, Fig. 1.

maculata approximans, Van Denburgh, Cal. Acad. Sci., V, 1897.

Description: Body depressed fusiform, head short, V-shaped in perpendicular section; nostrils on the upper surface; head plates mostly small and irregular, except the interparietal, which is large, as wide as long; one or more series of axial scales in front of the interparietal larger than the other head plates; supraocular regions covered with small granules; supercilaries strongly imbricated; middle subocular plate very large; eyelids well fringed; about six upper labials, strongly imbricated; lower labials smaller, not imbricate, separated from enlarged sublabials by a row of small scales; gulars flat, not imbricate, but becoming so on the last gular fold; ventral scales larger than the dorsals and laterals, which are granular; a lateral fold between the fore and hind limbs which are short;
femoral pores about 12; tail short, abruptly narrowed at about the proximal third.

Color: Upper parts gray yellow or light brown, with two or four longitudinal series of dark splotches and numerous lighter spots; top of head like back but without definite pattern; upper surfaces of legs marbled with brown; throat white or yellowish, sometimes marbled with darker; tail with a single series of spots; under parts white or yellowish, with two or three transverse of black laterally behind the fore legs, and which do not extend dorsally above the lateral fold and are sometimes edged with blue.

This little species is abundant everywhere in the Rio Grande valley and elsewhere in central New Mexico. It is extremely variable in color and adapts itself both temporarily and permanently to local color conditions. It feeds largely on plants and climbs readily.

Holbrookia Texana, (Troschel), Baird and Girard. (Plate XIV, Figs. 25-)


Description: Body slender, head as long or longer than head and body; head very small, V-shaped in vertical outline; nasal openings dorsal, prominent; head plates mostly small and irregular except the interparietal which is not large, and a series of rather large axial plates in front of the latter; superciliaries large and strongly imbricated; one of the suboculars very large; eyelids fringed; about seven large imbricated upper labials; lower labials smaller, not imbricated, bordered below by one or more series of enlarged sublabials; gular scales flat, not imbricated; posterior margin of the gular fold feebly denticulate; ventral scales larger than the dorsals and laterals; a lateral fold extending from the fore to the hind limb; femoral pores from twelve to fourteen; males with enlarged postanal plates; tail slender; hind foot very long.

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Color: Background above pale gray to yellow; upper surface of tail and caudal half of the back marked with transverse bands of brown; anterior part of back with circular spots especially laterally: sides in front of hind leg marked with two deep black crescentic lines extending from the lateral fold toward the median line on a bright yellow field; upper surfaces of limbs with irregular dark markings; under parts white or yellowish; under surface of tail with transverse bars of black; throat and lateral belly patches blue in the male; a dark streak along the caudal aspect of thighs.

This beautiful species has been collected no further north than Socorro where it is not rare. It ranges from northern Mexico into the adjacent states.

Genus. Sceloporus.

Head and body somewhat depressed, shorter than the tail; no dorsal crest; dorsal scales keeled imbricate, equal; head scales large, especially the interparietal, usually with a definite pattern; no gular fold; tympanum distinct protected by strong teeth; femoral pores present; superciliaries imbricate.

Sceloporus Poinsettii, Baird and Girard. (Plate XV, Figs. 6-8)


Description: Head and body somewhat depressed, very broad; nasal opening near the end of the snout, on the dorsal surface and within the canthus nasalis; upper head plates smooth, convex, not imbricated, irregular; interparietal largest; frontal divided transversely, caudal portion divided into four or more unequal parts, cephalic portion divided longitudinally; supra-oculars forming two irregular longitudinal rows, separated from the axial head plates by a continuous series of smaller scales; superciliaries large, strongly imbricated, keeled, separated from the supra-ocular by an irregular series of granules and small scales, middle sub-oculars as long as the remainder of
the series, keeled; rostral plate narrow, nearly rectangular; labials low, upper and lower subequal; symphysis plate large, pentagonal, followed by a series of plates larger than the gulars, not separated from the lower labials, the latter, however, in a double row; gular scales smooth, flat, bicuspid, strongly imbricated; those of a median portion of the belly not toothed, toward the sides first becoming bicuspid, then strongly denticulate; passing gradually into the dorsals; ear opening large, nearly vertical, protected by a small series of acuminate scales, only two of which are specially modified; scales of back broad, equal, slightly keeled, short-pointed and serrate, in longitudinal series but converging backward toward the median line; dorsals of the lumbar region, smaller than the caudal scales; scales of the sides pointing obliquely upward; no longitudinal dermal folds; a transverse gular fold behind the ear opening; upper surfaces of limbs covered with strongly keeled and long-pointed scales; scales on the posterior surfaces of the thighs similar; upper caudal scales not serrate, strongly spined, spines directed obliquely outward; femoral pores varying from eleven to thirteen or more; six to ten dorsal scales equal in length to shielded part of head; number of scales from the interparietal to a line drawn through the posterior surfaces of the thighs varying from 29 to 35; males with enlarged post-anal plates; tail as long as head and body.

Color: upper parts olivaceous brown, head darker; black collar in front of shoulders; distinct, nearly complete rings of dark on tail; back with dark, broad, irregular inconspicuous bands; male much darker than female; under side of throat bluish grey, in the male darker and more highly colored; bluish longitudinal bands on either side of abdomen in both sexes, merging into a dark spot in front of the thighs; under parts yellowish white; spines of upper surfaces of limbs dark-tipped.

Measurements: Total length, 215 mm.; Length to anus, 105 mm.; Length of tail, 110 mm.; Snout to ear, 26 mm.; Width of head, 27 mm.; Fore leg, 42 mm.; Hind leg, 70 mm.; Base of fifth to end of fourth toe, 20 mm.

This species has been found living upon rocks at an elevation of about 6,500 feet in the western part of the Magdalena mountains and is reported also from Socorro though no specimens are available from that place. Our specimens were kindly secured for us by Mr. James Fitch, of Magdalena. This species seems to be shy and restricted to rocky places in our range.

Sceloporus Magister, Hallowell.

Plate XVI, Figs. 9-11.

Description: Head and body little depressed, sub-cylindrical; nasal opening nearer the end of the snout than the orbit; upper head plates smooth, often somewhat convex, usually slightly imbricated; interparietal largest; frontal divided transversely, two portions sub-equal or caudal part larger; parietals and fronto-parietals not separated from the enlarged supraoculares; latter very broad as are the strongly imbricated supraciliaries; middle sub-occular long, narrow and strongly keeled; rostral plate wider than high; labials long but very low, inferior longer than superior; symphysis plate large, followed by several plates larger than the gulars, separated from the lower labials by one to three rows of narrow sub-labials; gular scales smooth, flat, bi-cuspid, strongly imbricated, as are those of the belly; ear opening large and nearly vertical, protected by a series of very long acuminate scales, four of which are specially modified and not keeled projecting backward and slightly downward; back with equal, keeled, strongly pointed scales bearing a spine on either side of the point, arranged in nearly parallel longitudinal rows; 14 rows of keeled dorsals; scales of sides ranging obliquely upward, merging gradually into the smooth ventrals. No longitudinal dermal folds; upper surface of the limbs provided with strongly keeled and pointed scales; scales on the poster surface of thighs large, acuminate, strongly keeled, and long pointed; upper caudal scales similar to the dorsals but longer pointed; femoral pores varying from 11 to 15 on each side; five to ten dorsal scales equal in length to the shielded part of the head; number of scales from interparietal to line connecting posterior surfaces of the thighs varying from 29 to 35; males with enlarged post-anal scales.
Color: back grey, yellow or brown, with indistinct mottlings of brown anteriorly; a black bar or collar in front of each shoulder; head nearly uniform; faint brownish rings on the tail; central patch of blue on throat of adult males; lateral band of blue bordered with black; a dark area in front of thighs; under parts white or yellowish.

Measurements: Total length, 194 mm.; Length to anus, 85 mm.; Length of tail, 109 mm.; Snout to ear, 20 mm.; Width of head, 18 mm.; Fore leg, 39 mm.; Hind leg, 54 mm.; Base of fifth to end of fourth toe, 23 mm.


The relation between this species and Sceloporus magister, which is confessedly very close, has been discussed in extenso, in N. Am. Fauna, No. 7, by Stejniger, who claims that the two species are constantly distinguished by a difference in the spines guarding the ear openings; these modified spines being smaller and less acute in S. clarkii. There is said to be a difference in habit also and although the habitats overlap in southeastern Arizona, the stations affected by the two species are said to be different, S. magister affecting an arboreal life while S. clarkii is found upon the rocks. It is probably that this species will be found in the extreme south-western part of the territory.

The species extends into Mexico an unknown distance. Farther south, it is said to be replaced by S. boulengeri, which is similar to S. clarkii but has fewer femoral pores, short and broad ear spines and a very broad interparietal. S. acanthinus is said to be modification of the same type still further to the south.
median line; flanks blue, passing into black; black spot in front of shoulder.

Measurements: Length of anus, 57-55 mm.; Snout to ear, 15-13 mm.; Width of head, 12-11 mm.; Fore leg, 28-27 mm.; Hind leg, 34-32 mm.; Base of fifth to tip of fourth toe, 15-14 mm.

With the materials at hand it is impossible to discriminate S. occidentalis from S. biseriatus. The basis of separation offered by Van Denburgh in the coloration of throat, which in males of S. occidentalis said to have two dark lateral spots, while in S. biseriatus they may be confluent. He says "I have examined many hundreds of specimens of S. occidentalis and biseriatus and have not found a single male of the latter with two blue throat patches. Highly colored male of S. occidentalis are sometimes found in which the two blue patches have extended to end even merged on the median line, but by securing very young or less brilliantly colored males, there should be no difficulty in determining which species occurs in a given locality." Unfortunately he omits to say how he knew that he was dealing with a given species while determining the validity of the sole criterion. S. occidentalis is said to be the more northern species. It may be that the best plan is to accept Boulenger's suggestion and call these phases of this exceedingly variable group varieties of S. undulatus. This form, whatever it is, is extremely abundant in the Rio Grande valley and the range of individual variation is enormous.

Sceloporus Consobrinus, Baird and Girard.

Description: Head and body little depressed, fusiform; nasal opening nearer the end of the snout than the orbit; upper head plates smooth, somewhat convex, not obviously imbricated; interparietal largest; frontal divided transversely, cephalic portion much larger than the caudal; parietals and frontoparietals separated by small granules from the enlarged suprarupernasals; latter broad (but not so broad as in S. magister) and separated by a number of scales from the narrow, imbricated superciliaries; sub-ocular keeled; rostral plate wider than high; internasals large labials long but narrow, the inferior larger than the superior; symphysal plate larger than the rostral, followed by several plates larger than the gulars, separated by one row (or two incomplete rows) of sub-labials from the lower labials; gular region with scales smooth, flat, bicuspid, and strongly imbricated like those of the belly; ear opening large and nearly vertical, protected by three or four small, acute, modified scales; back with moderate-sized, keeled, simply-pointed scales in parallel rows; scales of sides ranging obliquely upward; about 45 scales in a dorsal series from cephalic plates to a line drawn through the posterior border of the thighs; transition from the lateral to ventral scales gradual; no longitudinal dermal folds; upper surfaces of the limbs with keeled and pointed scales, like those of the back; scales of the posterior surfaces of the thighs not enlarged; upper caudal scales similar to the dorsals; about 14 femoral pores; about 8 to 12 dorsal scales equal in length to the shielded part of the head.

Color: Pale olivaceous brown; head darker and uniform; back with narrow whitish bands one on either side and separated by a broad area in which is a double row of dark, irregular blotches which may be edged with lighter; sides passing gradually into the white of the lower aspects; a dark line from the posterior canthus of the eye to upper angle of ear opening and thence bordering the lateral light line laterally to the tail; upper and lower labials darker than adjacent parts; limbs marbled with dark brown; tail with obscure dark rings. (The above description refers to the female, the male being more highly colored.)

Measurements: Total length, 145 mm.; Length to anus, 71 mm.; Length of tail, 74 mm.; Snout to ear, 15 mm.; Width of head, 14 mm.; Fore leg, 27 mm.; Hind leg, 41 mm.; Base of fifth to end of fourth toe, 18 mm.

This species seems not to be uncommon in the Rio Grande valley near Socorro. Collected by John Terry and Harry N. Herrick.
Sceloporus Gratiosus, Baird and Girard.

Description: Head and body somewhat depressed; nostrils opening much nearer to the end of the snout than to the orbits; upper head shields smooth, moderately large, and slightly convex, interparietal largest; frontal usually divided transversely; parietal, frontoparietal and frontal plates separated from the supra-oculars by a series of small plates of granules; superciliaries long, wide, and strongly imbricated; middle subocular very long, narrow strongly keeled; rostral plate very wide and rather high; labials long, low, and almost rectangular; below lower labials series of large sublabial plates; symphysal large, pentagonal; gulars small, smooth, imbricate, frequently emarginate posteriorly, about the size of the ventrals; ear opening large, slightly oblique, with an anterior armature of from four to seven acuminate scales; dorsal scales equal, keeled, pointed, and arranged in longitudinal parallel rows; scales on sides similar to those of the back, but directed obliquely upward; no longitudinal dermal folds; superior surfaces of the limbs with keeled scales; posterior surfaces of thighs with small smooth scales; ventrals smooth but usually bicuspid; caudal scales very much larger than the dorsals, keeled and strongly pointed; femoral pores varying in number from twelve to twenty; eleven to seventeen dorsal scales equal in number to the shielded portion of the head; scales in the longitudinal row from parietal plate to a line connecting the posterior aspects of the thighs varying from 45 to 66; males with enlarged postanal plates.

Color: above, brown, olive or bluish or greenish gray; with one dorsal and two lateral series of closely set brown spots on each side, spots sometimes more or less confluent, forming longitudinal bands separated by narrower bands of the lighter ground color; tail usually with trace of dark rings; males with a blue spot, sometimes bordered with black, on each side of the belly; throat more or less washed with blue which has a tendency to form narrow oblique lines.

This species is closely related to S. consobrinus, but is smaller. It occurs in the mountains of California, Utah and Nevada and will doubtless be encountered in the northwestern parts of New Mexico.

After careful comparison of descriptions by various authors we incline to believe that this but a smaller mountain-loving race of S. consobrinus. One of our specimens of the latter species is but 130 mm. but otherwise resembles the types.

Genus. Phrynosoma.

The horned toads are among the most characteristic of lizards and form a rather compact American group which are not to be confused with any other. Their bizarre spiny, disc-like bodies and short horned heads which they know well how to use in the defensive and even in offensive struggles are eminently characteristic. The plates of the head and body are heterogeneous and tend to assume the spinous form while the existence of strong bony spines from the back of the head is a universal character. The tympanum is distinct and may or may not be covered with scales. There is a transverse gular fold and usually a series of peripheral spines along the lateral margins of the body. Femoral pores are present. The tail is short as are the legs. The digits have keeled lamellae below. Lateral teeth subcoincial or indistinctly tricuspid; no pterygoid teeth. No abdominal ribs. A large sternal fontanelle. Other osteological characters may be gathered from the figures.

In our region (eastern New Mexico) we have been able to distinguish but three species though there is a considerable range of variation which may serve to invalidate some so-called species. These animals are essentially insectivorous and sluggish and rely upon their spinous armature for protection as well as upon their very considerable power of modifying the color of the skin to conform to the color of the station. This power is due to the capacity of the chromatophores to alter their form in obedience to nervous stimuli of varying kinds.

They protect themselves from the extremes of heat and cold by burying themselves in the earth. We have never been able to observe that they construct burrows but they sink into the sand in such a way as to completely cover the body and
may be seen after a cold night emerging from the sauce-like depression so made.

Like many others we long regarded the statement that these animals sometimes discharge a quantity of blood from their eyes when disturbed as a fable. Upon a single occasion however we have had an opportunity to verify this statement. So far as we could discover the animal was not injured and we have handled others much more roughly without such a result but in this case (P. cornutum) a large drop of a red fluid was thrown out from the eye and moistened its head as well as the hands of the intruder.

Although the most peaceful of animals, the horned toads defend themselves with energy. The writer once witnessed a contest between two large lizards (Crotophytus) and a very large specimen of P. douglassii. The toad threw himself into the most amusing posture of defense by kneeling down with the legs of one side while standing on tip toe with the opposite set and thus presenting the shield-like dorsal surface to the enemy. With a single opponent these tactics succeed well and the lizard received some shrewed thrusts with the powerful horns, but when there were two foes it was easy for one to take advantage of the weaker side and seize the toad in the soft region under the neck where he hung with a grip not to be shaken off.

**KEY TO THE GENUS PHRYNOSOMA.**

The following key is largely a compilation from various sources and we suspect that there may be synonyms or at most geographical races among the species enumerated. It is hoped that the table such as it is may nevertheless be serviceable.

**A.** Nostrils opening on or near the lines connecting the supraorbital ridges with the end of the snout (canthi rostrales).

a. Gular scales small, nearly equal in size; a series of enlarged scales below, but not larger than, the lower labials.

b. Head spines short (variable); occipitals shorter than the transverse diameter of the eye ball. *P. douglassii.*

bb. Head spines moderately large, occipitals as long as the transverse diameter of the eye; gular scales perfectly smooth, *P. orbiculare.*

aa. Several longitudinal series of enlarged pointed gular scales; a series of large spinose plates below the lower labials; head spines long.

b. Gular scales spinose.

c. Head shields convex and almost smooth. *P. blainvillii.*

c. Head shields flat, with numerous ridges and granulations, *P. frontale.*

bb. Gular scales feebly keeled.

c. Occipital spines extend upward and outward. *P. boucardii.*

AAA. Nostrils opening in the line of the canthi rostrale or slightly above; several longitudinal series of enlarged gular scales; a series of very large bony shields below the lower labials.

a. Occipital spines directed obliquely upward, like the temporals; ventral scales smooth, *P. coronatum.*

aa. Occipital spines vertical, erect; ventral scales keeled. *P. ario.*

AAA. Nostrils pierced within the canthi rostrale; gular scales small, equal or with one series of enlarged ones on either side.

a. Tail longer than the head.

b. Head bordered posteriorly by a series of contiguous large spines, of which four are occipital. *P. regale.*

bb. Two occipital spines larger than the other head spines, with an interval between their bases and those of the temporal.

c. Enlarged dorsal tubercles spinose, erect; tympanum naked, *P. cornutum.*

cc. Enlarged dorsal tubercles flat, or feebly raised; tympanum covered with scales; occipital spines as long as the horizontal diameter of the orbit; two or three series of peripheral spines; 18–20 femoral pores, *P. platyrhynus.*
*Plate XIX, Fig. 16.*

This seems to be the commoner form in the valley of the Rio Grande.

Description: Head as broad or broader than long; nostrils opening the canthi rostrales; tympanum naked; gular scales, of which form a series of enlarged pointed scales on either side of neck; gular folds several, irregular, a series of very large projecting sublabial scales; infralabials head spines large, the occipital being much larger than the three temporals and directed obliquely, upward and outward; interoccipital and postorbital present.

Back with very large erect spinose tubercles, the longest of which form a series of three or four on either side the vertebral line; two lateral series of spines of which the upper are longest; pectoral and ventral scales more or less distinctly keeled; femoral pores twelve on a side not extending upon the preanal region; no enlarged postanal scales. The body is one and a half times as long as the tail. Scales of head pustulose or longitudinally striate, spines ribbed.

Dorsal surface of head isabelline brown, mottled with white with two black cross bands between the canthi rostrales, a band from the eye to the angle of mouth, another black band from eye to temporals, about the mouth and cheeks ochraceous brown; under parts of head mottled with black as also the lateral margins of body below; dorsal surface with 4 longitudinal...
rows of dark spots edged with lemon yellow, bright yellow patch on shoulder; narrow white median dorsal line; 66 rows of scales on belly; long series of femoral pores nearly meeting in front of anus; two groups of slender spines behind the tympanum.

There are four rows of black spots on the back; each spot bordered by strips of white and yellow; space between the spots ochreaceous; tail with six double rows of black spots; underneath white often mottled with numerous black splotches.

Measurements of large individuals.

<table>
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<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
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<td>Length to anus</td>
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<td>80 mm.</td>
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<td>Length of tail</td>
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<td>Snout to ear</td>
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<td>18–35 &quot;</td>
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<td>Length of hind leg</td>
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<td>43 &quot;</td>
<td>23–45 &quot;</td>
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<td>Base of fifth to end of fourth toe</td>
<td>14 &quot;</td>
<td>12 &quot;</td>
<td>7–15 &quot;</td>
</tr>
</tbody>
</table>

Coloration of specimen from San Pedro mountain at 7000 feet. Upper surface of head mottled with brown and white; six pairs of vandyke to umber brown blotches on neck and body, the two middle pairs double as by confluence of two, spots bordered behind by a dark band shading into brown, this still bounded posteriorly by a narrow band of brilliant orange; intervals between spots irregularly shaded with orange, yellow and brown; numerous white spots on the side; irregular gray bands on either side the median line; tail with seven dark bands, belly burnt sienna with numerous small dark spots, whitish on sides with brown bands and spots.

Sp. 3. Phrynosoma Platyrhynus, Girard.
Plate XX, Fig. 18.

This species is excessively abundant in the valley of the Rio Grande and elsewhere at lower levels in the eastern part of the territory. It is rarely seen of a large size and is greatly exposed to the attacks of its enemies though it possesses the power of changing color to a greater extent than the others.
KEY TO THE AMERICAN SPECIES.

I. Dorsal scales uniform, larger than those of the flanks.
   a. Dorsal scales not imbricate; smooth, a narrow black band from shoulder to shoulder above.
      *Uta neansii*.
   aa. Dorsals imbricate, keeled, no black band, from shoulder to shoulder, a round blue spot behind the axilla.
      *Uta stanisburiana*.

II. A band of six or eight longitudinal series of equal enlarged scales along the middle of back.
   b. A lateral line of special scales.
      *Uta ornata*.

III. Dorsal scales heterogeneous.
   c. Slender, tail more than twice as long as head and body, enlarged dorsals sub-equal.
      *Uta gratiosa*.
   cc. Stout, tail less than twice as long as head and body, largest dorsals in four series.
      *Uta symmetica*.

*Uta Ornata*, Baird and Girard.


"This species may be distinguished from *U. stanisburiana*, of which it has the general appearance, by a dorsal space covered with five or six rows of scales larger than those on the sides of the body. Along the middle of the sides there exists one row of small scutellae imitating the lateral lines of fishes. The ground color is reddish brown, with transversely elongated black patches all along the upper part of body and tail. The belly is unicolor in the female while it is blue in the male." The range is said to be from Texas to California. It has not been encountered by our collectors.

*Uta Stanisburiana*, Baird and Girard.

Plate XXI, Fig. 19.


**Herrick-Terry-Herrick, New Mexico Lizards.**

Description: Head and body depressed; head truncately pointed in front; head plates flat smooth; interparietal largest; frontal plate divided transversely, followed in a cephalic direction by an irregular series of enlarged plates; three to five supraoculars enlarged and separated from the, frontals by small granules; supraciliaries imbricate, few, projecting; central subocular large keeled; rostral and supralabials long and low; the other plates of the upper surface small or granular; symphyseal plate rather small, followed on either side by larger smooth plates, which are separated from the infralabials by one to three series of sublabials; gular region covered with small, smooth, nonimbricating scales; gular fold with a series of projecting spines; tympanic opening with an armature of three enlarged spines; lateral dermal folds present; back with keeled scales nearly uniform in size but graduating into those of the side, on the neck and sides granular scales; scales of tail large, keeled and pointed; femoral pores from twelve to seventeen.

Color: Upper parts with a ground color of brownish or yellowish gray densely spotted with darker and lighter; a more or less distinct light band on either side of the back, most distinct anteriorly; the small spots of the upper surface tend to be blue or green and often give to the animal a prevailing tone of that color; tail often with dark rings; upper surfaces of limbs spotted like the back; toes of hind feet with dark bands; under parts light, variously marbled with dark; throat blue; light spots; an irregular blue spot behind the fore leg which is surrounded by a light band; usually a brown spot in front of the shoulder; sides marked with large light spots.

This graceful species is abundant in the Rio Grande valley at Socorro and further north. It is active and restricted to the ground.

**Genus. Crotophytus.**

Head and body depressed or sub-cylindrical, much shorter than the very slender tail; no dorsal crest; a gular fold; tympanum present; all the head plates small; labials not imbricate; dorsal scales small and nearly uniform; a long series of femoral
poles; males with enlarged preanal plates; lateral teeth tricuspid; pterygoid teeth; no sternal ribs; no sternal fontanelle. These large and very active lizards occur in the southwest states and northern Mexico. They are predaceous and even cannibal in their habits. Two species are known to occur in New Mexico.

*Crotaphytus* Wissensii, Baird and Girard.


*Crotaphytus* gambelii, *Baird* and *Girard*, l. cit.

**Description**: Body slender and strong; head large, depressed and broad behind; head plates small, larger toward the snout; orbit convex; three to five longitudinal rows of shields between the supraocular regions; nostrils nearer the end of head than the orbit; superciliaries small, imbricate; a long subocular plate; rostral plate very low; supralabials of nearly equal size; lower labials somewhat larger than the upper, bordered below by several series of small plates larger than the gulars; symphysisal plate large; tympanic opening large oblique; one strong gular fold with sometimes two additional ones; back and sides covered with small granules merging into the larger scales of the belly; latter imbricate and sometimes keeled; irregular lateral dermal folds; tail cylindrico-conical, more than twice as long as the head and body; males with enlarged postanal plates.

**Color**: Upper parts browish gray, the head darker, with creamy white lines surrounding the orbits and in the supraocular regions and the snout; back crossed with alternating light lines; between each pair of which a round spot of brown; the proximal part of tail like the back, the distal part ringed with dark; upper surface of limbs marbled or spotted. With age the spots on the back break up, the bands disappear or become more marked and the whole color fades. No two specimens are exactly alike. There is a change during the breeding season, especially in the females.

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Herrick-Terry Herrick, *New Mexico Lizards.*

This species seems to occupy the entire territory at suitable stations but does not ascend into the mountain canons, where its place is taken by *C.* Collaris. So far from being sluggish, we have found it the most active and wary of our lizards. It will fight viciously and devours other species of lizards and upon occasion, young of its own species.

*Crotaphytus Collaris*, Say.

Plate XXII, Fig. 20. Plate XXIII, Fig. 21.


*Description*: Head large, depressed, much swollen posteriorly, especially in the males; body fusiform; tail long and terete; legs very long and strong; plates of head all small, two or more series between the granules of the supraocular regions; nostrils large and opening laterally; superciliaries small and imbricate; supralabials of about equal size; a large subocular plate; ear opening large, oblique, without prominent armature; symphysial plate large, followed by two short rows of somewhat enlarged plates; one or two well-developed gular folds; back and sides covered with small granules; ventral region with larger scales; femoral pores from sixteen to twenty-two.

**Color**: Upper surfaces olive or browish gray, quite variable and variously spotted and barred with lighter color; two intensely black transverse shoulder bands which do not meet above, the anterior one being interrupted by a V-shaped sepia band on the nape; under parts white, the throat and sides mottled with dark; tail near the end with dark rings. The form living in the mountain canons seems to be darker than that occurring on the upland mesas and the spots are larger and interrupted by transverse bars. The following description of a living specimen illustrates a common type of coloration:

Head above light brownish gray irregularly bloomed with sepia; about seven blotches of orange red back of ear; band of
Genus. Gerrhonotus.

Limbs well-developed, pentadactyl; lateral fold present; scales squarish or rhomboidal, forming transverse series; eye large with a round pupil; no femoral pores or enlarged postanal plates; ear opening distinct; no gular fold. A group of closely allied species of this genus occupies the entire western coast of North America, G. Coeruleus (G. sciincicaudata) being the type.

Herrick-Terry-Herrick, New Mexico Lizards. 143

Boulenger says this species extends as far east as Texas and also describes G. kingii from Deming in southern New Mexico. The latter is regarded by Dr. Gunther as a variety of G. coerules. The following description is taken from Van Denburgh in part.

Gerrhonotus Sciincicaudata, Skilton.

Description: Body long and rather slender, with short limbs and very long tail; head pointed, with flattened top and nearly vertical side, temporal region often swollen in old specimens; rostral plate rounded in upper outline, preceded by a pair of small internasals, a pair of small frontonasals, very large azygous prefrontal, a pair of large prefrontals, a long frontal, a pair of frontoparietals, two parietals separated by an interparietal, a pair of occipitals, and (usually) a single interoccipital; two series (of 5 and 3) supraocculars and a series of small supercillaries. Upper labials much range than lower, below the latter two series of large sublabial plates, lower larger; gular scales smooth and imbricate; scales on the upper surfaces large rhomboidal, strongly keeled, arranged in longitudinal and transverse series; about 14 longitudinal series of dorsals and number of transverse series back of thighs from forty-one to fifty-two. A band of granules under the lateral folds; ventral plates about the size of dorsals, imbricate, smooth, the grayish or brownish color of the back crossed by from nine to sixteen continuous irregular dark bands; lower parts white or yellowish with brownish or grayish suffusions.

G. knightii is said to differ in having only six or eight of the dorsal series of scales keeled. It will require further study to determine the value of this distinction.

(Family. Anniellidae.)

The student should be alert for the discovery of subterranean species of this family which, so far as now known, is confined to California. The body is cylindrical and snake-like and the external limbs are absent.
Family. **HELODERMATIDAE.**

The Gila monsters are the only lizards with venom-secreting glands but they are fortunately so sluggish as to rarely strike even when disturbed. They may be recognized by their large size, tubercular skin and snake-like dentition.

**Genus. HELODERMA.**

Characters of the family.

**Heloderma Suspectum**, Cope.

Description: Large, heavily set, clumsy in form, with short legs and tail; nostrils large, opening laterally between three plates; eye small; ear opening large oblique; rostral and symphysal plates large; a pair of internasals; three pairs of plates behind the symphysal; gular region with the small tubercles passing into the plates of the belly; upper parts covered with smooth convex tubercles, separated by granules, lateral tubercles passing into the squarish plates of the belly; a pair of enlarged preanal plates.

Color: Upper parts variously and irregularly marked with dark brown and salmon color; tail sometimes ringed; belly orange or salmon, with tessalted markings of brown.

The Gila monster probably occurs in this territory only in the southwestern portion.

Family. **TEIIDAE.**

New world lizards related to the true lizards of Europe (Lacertidae). Head shields free from the cranial ossifications; ná śals' double, frontal are parietal single; tongue slender and ending in two smooth points; head covered with large, regular plates; ear opening and eyelids usually present; femoral pores may be present. A very large family represented within our limits by a single genus.

**Genus. Cnemidophorus.**

Four pentadactyl limbs; head plates large; two frontoparietal plates; back and sides covered with small uniform granules; ventral plates large and serially arranged; eye lids and ear openings present, pupil round; two or more gular folds; femoral pores numerous.

**Cnemidophorus Sexillieatus**, Gray.

Plate XXIV, Figs. 23, 24.

Description: Slender, agile; head nearly flat above, with nearly vertical sides; snout slender; rostral plate large, high, triangular; nostrils opening within the large nasal plates which are partly enveloped by the rostral; posterior nasal nearly quadrangular, articulating with the anterior nasal, first, second, and third labials, loreal, frontal, and prefrontal plates; four enlarged supraoculars, the two in the middle largest, all of them separated from the superciliaries by a row of granules; superciliaries not imbricated, the anterior two large; supraoculars separated from parietals and frontoparietals by granules; occipitals in two or more irregular transverse bands; about five superior and six inferior labials to middle of eye; inferior labials larger than the upper; sublabials very large, connected with the symphysal by a large azygous plate, separated from the lower labials by three or four large plates and a short series of granules in front of them; intermandibular region of throat with larger scales than the throat behind the ears to the first gular fold, behind the latter larger scales merging into those of the throat; ventral scales large, in eight longitudinal rows; upper surface with small equal granules; ear opening large, semicircular; external aspect of upper arm and cephalic aspect of fore arm with enlarged scutes; ventral aspect of fore arm with a patch of enlarged scales below the elbow; scales of ventral aspect of hind legs very large; femoral pores from 16 to 18; scales of tail strongly keeled; about three enlarged preanal scales.

Color: Above dark olive brown, passing into clear olive on the head and greenish olive on the tail; back marked with three narrow, distinct yellowish white lines on either side and sometimes a faint median stripe on the median line, the latter more distinct anteriorly; upper surfaces of limbs faintly marbled; sides of head and under parts immaculate.

Only a few specimens of this species, which is referred to
C. sexlineatus only doubtfully have been found among the numerous individuals of the next and nothing can be said of its range or habits. It is true that it seems to vary in the direction of C. undulatus but the forms seen are easily distinguished from that species.

*Cnemidophorus Undulatus*, Hallowell.

This is perhaps the commonest lizard in the Rio Grande valley and is everywhere in evidence. It differs from the preceding species in the absence of the patch of enlarged scales on the under aspect of the fore arm and in the colors. The back is marked by from seven to nine wavy dark bands which, in the older individuals, break up into irregular blotches to the almost entire suppression of the longitudinal arrangement; the sides of the head are distinctly marked with dark spots but the spots on the throat are small and scattering; head and tail olive. We have not seen typical specimens of C. tigris but they no doubt occur and will be recognized by the almost entire absence of the black markings on the sides of the head and a suffusion of gray on the throat. The color of the back is more minutely broken up.

**Family. Scincidae.**

Tongue slightly notched at the tip; head covered with large regular plate scales on body and tail of moderate size, imbricate, supported by bony plates; eyelids present; pupils round; dentition pleurodont; no femoral pores.

**Genus. Eumeces.**

All the scales are thin, smooth and imbricate. There is a distinct ear opening and the gular and lateral folds are absent, limbs pentadactyl; nostril penetrating the nasal plate; digits not denticulated laterally. The skinks are of world-wide distribution and three species at least have been reported from New Mexico but as we have but once encountered a representative and have no authentic material it seems best to reserve the mention of these till material shall have been collected. It is to be sought in moist places as under stones near springs and in deep woods.

**Definition of Terms.**

**Azygous.**—Not paired.

*Canthus rostralis.*—The ridge from above the eyes to the extremity of the snout.

**Femoral pores.**—Gland openings along the lower surface of the thighs.

**Frontal plates.**—One or more plates on top of the head between the supra oculars.

*Frontoparietals.*—Plates on top of head between the parietals and the frontal.

**Gular fold.**—Fold of skin crossing the throat.

**Gular scales.**—The scales of throat.

**Infraciliaries.**—Scales of lower lip.

**Internasals.**—Plates of snout behind the rostral.

**Interparietals.**—The plate on top of head in which is the pineal or parietal eye.

**Labials.**—Scales of the edge of lip.

**Occipitals.**—Plates behind the parietals and interparietal.

**Parietals.**—Plates on either side of the interparietal.

**Rostral.**—Plate on end of snout.

**Sublabials.**—Plates below the lower labials.

**Superciliaries.**—Plates on upper aspect of orbit of eye.

**Supraoculars.**—Scales over the eye mesally of the superciliaries.

**Symphyseal.**—Scale at tip of lower jaw.
EXPLANATION OF FIGURES TO ARTICLE VI, VOL. I.

Fig. 1. Holbrookia maculata.
Fig. 2. Holbrookia texana.
Fig. 3. Holbrookia texana, top of head.
Fig. 4. Holbrookia texana, side of head.
Fig. 5. Holbrookia texana, anal armature of male.
Fig. 6. Sceloporus poinsetii.
Fig. 7. Sceloporus poinsetii, ear armature.
Fig. 8. Sceloporus poinsetii, top of head.
Fig. 9. Sceloporus magister.
Fig. 10. Sceloporus magister, top of head.
Fig. 11. Sceloporus magister, ear armature.
Fig. 12. Sceloporus occidentalis.
Fig. 13. Sceloporus occidentalis, top of head.
Fig. 14. Sceloporus occidentalis, anal armature of male.
Fig. 15. Phrynosoma douglassii.
Fig. 16. Phrynosoma cornutum.
Fig. 17. Phrynosoma position of nasal opening.
Fig. 18. Phrynosoma platyrhynchos.
Fig. 19. Uta stansburiana.
Fig. 20. Crotaphytus collaris.
Fig. 21. Crotaphytus collaris.
Fig. 22. Cnemidophorus sexilineatus, genital plates of male.
Fig. 23. Cnemidophorus sexilineatus.
Fig. 24. Cnemidophorus sexilineatus, ventral aspect of forearm.

ERRATA.

The authors of the article on Lizards of New Mexico do not wish to be held responsible for the fact that the specific names in the titles are capitalized but confess to the comma separating the specific name from the authority. In explanation of the latter, in spite of various usage and authority for the omission of the point, we preferred to obey the unambiguous dictates of rhetoric rather than the divided and arbitrary authority of zoologists.

On page 126, line 2, instead of Scelopus, read Sceloporus.
On page 145, line 3, instead of Sexilieatus, read sexilineatus.
On page 146, line 1, instead of sexilineatus, read sexilineatus.
'Plate XVI, instead of MAJISTER read MAGISTER.
HERRICK—Lizards of New Mexico.

SCELOPORUS OCCIDENTALIS.
Fig. 15.

HARRIE—Lizards of New Mexico.

PHRYNOSOMA DOUGLASSII.
PHRYNOSOMA CORNUTUM.
HERRICK—Lizards of New Mexico.

PHRYNOSOMA PLATYRHYNUS.
HERRICK—Lizards of New Mexico.

UTA STANISBURIANA.
HERRICK - Lizards of New Mexico.

CNEMIDOPHORUS SEXILINEATUS.