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THE REPTILES AND AMPHIBIANS COLLECTED IN NORTHEASTERN NEVADA BY THE WALKER-NEWCOMB EXPEDITION OF THE UNIVERSITY OF MICHIGAN.

BY ALEXANDER G. RUTHVEN AND HELEN THOMPSON GAIGE.

In the summer of 1912, the Museum was enabled, through the generosity of two of the honorary curators, Dr. Bryant Walker and Dr. W. W. Newcomb, to send an expedition to northeastern Nevada for zoological material needed in the study series. The party consisted of Frederick M. Gaige, Helen Thompson Gaige and Crystal Thompson, scientific assistants in the Museum, and the Director, in charge. All of July and the greater part of August was spent in the field, and the groups given the most attention were reptiles, amphibians, molluscs, crustaceans and ants. The study of the rep-

tiles and amphibians was the principal work of the writers, but considerable assistance was received from the other members of the party.

General Location of the Region.

The area studied is about the town of Carlin, Nevada, in the western part of Elko County and northern part of Eureka County. It includes the basin of Maggie Creek south of Maggie Canyon, the valley of the Humboldt River between Moleen Canyon and the Cortez Range, the east side of the Cortez Range, and the parts of the Seetoya, River and Pinyon Ranges which border on the basin. About all of the major habitats characteristic of the general region are probably represented in this area, with the exception of those above 8,000 feet.

The boundaries of the region chosen for study were so drawn that many habitats were included in an area which could be examined carefully in the time available. An effort was then made to discover every locality where representatives of the groups which were to receive careful study were living, and these were visited many times, so that an exhaustive collection of species and detailed data on habits, habitats and local distribution might be obtained.

Climate.

The region is arid. The mean annual precipitation is about 7.22 inches; there may be as little as 2 inches in one year, and much of it is in the form of snow. As a rule more than half of the precipitation occurs between December and March and over 80% occurs between November and May inclusive. There is a high percentage of clear skies. During the summer months high temperatures are frequent, but there are large diurnal variations so that the nights are generally decidedly cool and

frosts occur in every month. During July and August, 1912, temperatures of 100°-106°F. were recorded on sixteen days, and on five days the diurnal variation was between 60°-64°F. The winters are rather mild, but low temperatures occur.

The climatic conditions at Carlin, as recorded in the reports of the United States Weather Service, are summarized in the following tables.

Maximum and Minimum Temperatures for July and August, 1912

July						August					
Day	Maximum	Minimum	Day	Maximum	Minimum	Day	Maximum	Minimum	Day	Maximum	Minimum
1	98	44	17	100	58	1	84	45	17	82	32
2	90	38	18	82	75	2	85	41	18	85	46
3	94	41	19	90	65	3	84	40	19	90	40
4	....	....	20	93	38	4	92	41	20	90	40
5	....	....	21	95	41	5	95	42	21	95	40
6	....	....	22	106	48	6	95	43	22	97	36
7	93	30	23	94	36	7	95	40	23	100	37
8	100	51	24	93	38	8	100	42	24	100	41
9	98	40	25	95	57	9	93	40	25	98	40
10	103	43	26	94	39	10	91	39	26	94	48
11	106	48	27	99	44	11	96	41	27	85	35
12	106	53	28	102	47	12	98	53	28	87	38
13	102	42	29	101	54	13	100	50	29	78	33
14	104	42	30	93	54	14	92	40	30	80	28
15	106	42	31	88	56	15	95	44	31	82	55
16	106	48	....	....	....	16	87	48	....	....	....

Monthly and Annual Mean Temperatures and Precipitation with Departures from the Normal for the Years 1909-1912

Month	1909				1910				1911				1912			
	Temperature	Departure	Precipitation	Departure	Temperature	Departure	Precipitation	Departure	Temperature	Departure	Precipitation	Departure	Temperature	Departure	Precipitation	Departure
January	39.4	+18.2	0.50	−0.37	17.6	−3.6	0.29	−0.58	29.0	+7.8			30.4	+9.2	0.02	−1.06
February	33.4	+6.9	0.50	−0.49	26.6	+0.1	0.17	−0.82	27.3	−0.8	0.60	−0.33	34.6	+8.1	0.00	−0.93
March	40.2	+5.6	0.50	−0.60	45.6	+11.0	0.00	−1.10	43.2	+8.6			37.1	+2.5	0.14	−0.78
April	46.2	+2.5	0.00	−0.78	50.6	+6.9	0.05	−0.73	43.6	−0.1	0.04	−0.54	43.2	+0.5	0.06	−0.52
May	52.0	−1.1	0.30	−0.44	56.8	+3.7	0.06	−0.68	51.2	−1.9	0.04	−0.60	51.9	−1.2	0.00	−0.64
June	66.3	+3.6	0.20	−0.33	63.0	+0.3	T.	−0.53	63.1	+0.4	0.02	−0.39	61.6	−1.1		
July	70.2	−0.4	0.00	−0.11	72.9	+2.3	0.43	+0.32	72.0	+1.4	0.00	−0.16	72.0	+1.4		
August	71.2	+2.1	0.02	−0.12	66.4	−2.7	0.00	−0.14	65.4	−3.7	0.00	−0.18	66.2	−2.9	0.27	+0.09
September	59.4	+1.3	0.00	−0.11	58.2	+0.1	0.07	−0.04	55.4	−2.7			53.8	−4.3	0.28	+0.06
October	48.8	+4.0	0.07	−0.18	48.0	+3.2	0.06	−0.19	44.2	−0.6			45.2	+0.4	0.84	+0.46
November	36.4	+2.9	2.95	+2.62	38.8	+5.3	0.03	−0.30	32.4	−1.1			41.4	+7.9	0.93	+0.41
December	19.6	−6.8	0.81	−0.43	32.7	+5.7	0.84	−0.40	21.5	−4.9	0.06	−1.14	29.4	+3.0	0.97	−0.23
Annual	48.6	+3.2	5.85	−1.34	48.1	+2.7	2.00	−5.19	45.7	+0.2			47.2	+1.8		

Summary of Annual Temperature and Precipitation for the Years 1909—1912

TEMPERATURE

YEAR	HIGHEST	LOWEST	ANNUAL MEAN	KILLING FROSTS
1909	112 Aug. 17*	—10 Dec. 20	48.6	All Months
1910	105 July 25*	—17 Jan. 5	48.1	"
1911	109 July 16	—11 Dec. 24	45.7	"
1912	106 July 11*	—24 Jan. 2	47.2	"

PRECIPITATION

YEAR	GREATEST MONTHLY	LEAST MONTHLY	TOTAL	TOTAL SNOWFALL
1909	2.95 Nov.	0.00 Apr.*	5.85	26.2
1910	0.84 Dec.	0.00 Mar.*	2.00	11.0
1911		0.00 July*		
1912		0.00 Feb.*		14.2

*Also in other months.

TOPOGRAPHY.

As in other parts of the Great Basin, the mountains have a general north and south trend and are separated by a broad in-filled valley.[1] The Humboldt River enters this valley, which may for convenience be called Maggie Basin, at the east through Moleen Canyon, and, flowing directly across the southern end along the northern limit of the Pinyon Range, leaves it through a gap in the Cortez Range. Maggie Creek, a permanent stream, flows lengthwise of the basin.

[1]For a topographical map of this region see Bull. 408, U. S. Geological Survey.

The altitude of Carlin, situated at the southern end of the basin on the margin of the Humboldt Valley, is given on the government maps as 4,930 feet. In general then, it can be said that the basin floor has an elevation of about 5,000 feet, but unlike many of the Great Basin valleys it is very far from being level. The only extensive flats are in the valleys of the larger streams, viz., along the Humboldt River, Maggie and Susan Creeks (Pl. I, Figs. 1, 2, Pl. II, Fig. 1). Elsewhere the basin floor has high ridges of waste material separated by deep valleys tributary to the Annie, Maggie and Susan Creeks (Pl. II, Fig. 2). The general height of these ridges increases toward the mountains, the ridges are continuous with the divides between the canyons on the mountain slopes, and the valleys merge into the mountain canyons (Pl. II, Fig. 2, Pl. III, Fig. 1).

In a general way, the soils vary from a rather compact loam on the flood plain of the Humboldt River, and a fine silt-like loam interspersed with alkali spots on the flats at the foot of the slopes along the sides of this valley and in the valleys of the other basin streams, through a more or less gravelly loam on the basin ridges, which becomes coarser toward the mountains, to a stony loam interspersed with rock outcrops and boulders on the mountain slopes (Pl. III, Fig. 2).

The highest elevations in the area investigated are in the Cortez Mountains, the Carlin Peaks in this range attaining a height of 7,754 feet. As on the parts of the other ranges examined, however, which are much lower, there are relatively few rock outcrops. The outcrops are, nearly everywhere, of small extent (Pl. III, Figs. 1, 2), and many of them have also been broken up into large rocks, while many of the talus slopes have disintegrated into stony soil. The extensive rock outcrops occur where the larger streams flow through the ranges,

e. g., at Moleen Canyon, Maggie Canyon and where the Humboldt cuts through the Cortez Range, and even in these places, with the exception of Moleen Canyon, the cliffs are buried in talus nearly to their summits.

The basin is comparatively well drained. The Humboldt River crosses it at the southern end and receives the drainage by several creeks. The river varies in width but flows continuously and with moderate velocity. The discharge in second feet at Palisade[2], just west of the basin, is given as 485, 850, 929, 759, 756, 284, and 13 for selected dates in April, May, June, July and September, 1905. It has a flat-bottomed valley (Pl. I, Fig. 1), and the meanders are frequently cut off to form oxbow ponds. The bed is mostly fine mud except where the river cuts through the mountains. In addition to the ox-bow ponds in the valley, there are numerous irrigation ditches, which contain water during a part of the summer.

The only other permanent and continuous stream on the basin floor is Maggie Creek, which enters the basin between the Seetoya and Cortez Ranges and, crossing it, empties into the Humboldt near Carlin. This stream also flows in a flat-bottomed valley (Pl. II, Fig. 1) and meanders considerably, but it has sufficient current to keep the bed rather free from water plants. It only has stony banks where it cuts into the talus slopes in Maggie Canyon, and in this canyon there are a number of small ox-bow ponds.

The other three streams on the basin floor are Annie (locally Mary), Susan and James Creeks. The first two empty into the Humboldt, the latter into the Maggie. Susan Creek drains the valley between the Seetoya and River Ranges, and becomes entirely dry during the summer. Annie Creek and James Creek drain the eastern slope of the Cortez Mountains by many canyons. On the basin floor the former becomes

[2]U. S. Geol. Surv., Water-Supply and Irrigation Paper No. 176, p. 75.

entirely dry during the summer months, except during the last half mile of its course, where it is fed by a large spring. In the summer James Creek is discontinuous on the basin floor (Pl. II, Fig. 2).

Near the heads and frequently along the sides of most of the canyons in the Cortez Range which are tributary to the Annie and James, there are small cold springs, some of which flow throughout the summer while others disappear in July and August. From these springs small streams are formed in the summer which usually flow for a short distance and then disappear entirely or reappear farther down the canyon. Frequently such streams appear and disappear several times in their course and all of them finally vanish on or before reaching the valley, except that James Creek flows for a short distance on the basin floor. In the spring and during cloudbursts they are probably continuous throughout most of their courses. In the parts of the Seetoya and River Ranges studied, the canyons are without springs and wholly dry in the summer. In the Pinyon Range, Woodruff Creek is undoubtedly spring fed, for in July and August the east branch had a continuous stream of water which only terminated near the mouth of the canyon, while the west branch was dry. There are other springs, both hot and cold, in the region but these are not important factors in the distribution of the vertebrates. They are mostly at the base of the talus slopes when these are near streams. Thus there are several on the bank of the creek in Maggie Canyon, a few along the bank of the Humboldt in Moleen Canyon, and one spring from which a considerable stream of water issues in the summer was found in a small gorge in the southern end of the Cortez Range.

There are very few permanent ponds or lakes in the region. The few ox-bow ponds in the valley of the Humboldt and in Maggie Canyon have been mentioned. Just south of the junc-

tion of the north and south branches of James Creek, there are three ponds, the largest of which probably covers two or three acres. The smallest of these becomes dry in July and August, but the other two are perennial at the present time, probably primarily because a ditch has been dug to them from the north branch of James Creek so that they are enlarged in times of high water. They are strongly alkaline. The only other perennial body of quiet water in the region is a small lake, about one-fourth of a mile in diameter, in the Cortez Range. This lake was not studied.

Vegetation.

A brief description of the vegetation will be sufficient. The sagebrush covers the whole area from the margin of the Humboldt Valley to the summit of the ranges (Pl. I, Fig. 2; Pl. II, Fig. 2; Pl. III, Fig. 1). On the mountains it is smaller and more mixed with other plants, such as *Balsamorhiza sagittata,* and a few junipers (*Juniperus utahensis* Lemm.) and shrubs, and in the valley of the Humboldt and in the mouth of the valleys of the Maggie, Annie and Susan Creeks it is replaced by a zone of *Chrysothamnus pinifolius* Greene, and this along the streams by a zone of grasses (principally *Elymus condensatus*). On the salt-spots shrubs of the genus *Atriplex* are dominant.

Along the permanent streams and a few of the irrigation ditches on the basin floor there are clumps of willows and numerous shrubs (Pl. I, Fig. 1), and in the mountain canyons there are small groves of poplar, buffalo berry and other small trees and shrubs (Pl. III, Fig. 1).

Habitats and Habitat Distribution.

The differences in topography, soil and vegetation provide a number of reptile and amphibian habitats which may be listed as follows:

Water Habitats.

1. Streams.
   On the basin floor.
      Permanent. Humboldt River, lower part of Annie Creek, Maggie Creek, James Creek and Woodruff Creek.
      Intermittent. Susan Creek, main course of Annie Creek, irrigation ditches in Humboldt Valley.
   In the mountains.
      Permanent. Woodruff Creek, James Creek, Annie Creek (Poplar Brook), small brooks along Humboldt Valley.
      Intermittent. Headwater branches in many canyons in all of the ranges.
2. Ponds and lakes.
      Transient. Ponds in Humboldt Valley, ox-bow ponds in Maggie Canyon, pond on north branch of James Creek.
      Permanent. Two ponds on north branch of James Creek, Mary Lake.

LAND HABITATS.

3. Basin floor valleys.
      With permanent streams. Humboldt Valley, Maggie Valley.
      With intermittent streams. Main valleys of Annie and Susan Creeks and lowest part of James Creek.
4. Mountain valleys.
      With permanent streams. Headwater valleys of James Creek, Woodruff Creek, and Annie Creek (Poplar Brook).
      With intermittent streams. Many canyons.
5. Basin floor ridges.
6. Mountain slopes.
   Soil areas.
   Rock areas.

The habitat distribution of the reptiles and amphibians is as follows:

Habitat Distribution of the Amphibians and Reptiles of Maggie Basin

Ecological Distribution	Species	Local Distribution
Occurring in all land habitats	*Pituophis c. deserticola* *Bascanion c. velustum* *Bascanion taeniatum*	Mountain and basins at all altitudes
Apparently preferring vicinity of rocks but not confined to them	*Crotalus lucifer*	Common in mountains at all altitudes; rare on basin floor
Occurring only on rock cliffs or among or in immediate vicinity of rocks	*Sceloporus biseriatus*	Common in mountains at all altitudes; on basin floor only in one place (rocky hill)
	Uta s. nevadensis	Common at base of mountains in two places
	Crotaphytus c. baileyi	Rather common at base of mountains in one place
	Eumeces skiltonianus	Found in one place in mountains (7,500 ft.)
Preferring fine soil	*Sceloporus graciosus*	Common on basin floor; rare in mountains but occurring nearly to summits
	Phrynosoma hernandesi	Basin floor in one place; not abundant
	Crotaphytus wislizenii	Basin floor in one place; not abundant
	Cnemidophorus tigris	Basin floor in one place; common
General vicinity of larger water courses. Breed in water but can endure rather dry habitats during other times of the year	*Hyla regilla*	Canyons in mountains; common
	Bufo boreas	Basin floor valleys and mountain canyons nearly to highest elevations; common
	Scaphiopus hammondii	Large basin floor valleys to mountains; rather common
Persistently low wet areas. Breeds in water	*Rana pipiens*	Valley of Humboldt and lower part of tributary valleys; common
Immediate vicinity of water. Feed in water	*Thamnophis o. elegans* *Rana p. luteiventris*	Immediate vicinity of permanent streams on basin floor; common

The writers believe that the above table shows that the local distribution of the species is principally controlled by the habitat preferences. Among the land forms those preferring a fine soil are principally basin floor forms, the saxicolous forms are almost exclusively mountain species, and those with general habits have a general distribution. The distribution of the amphibious forms is determined by the permanence of the streams and the degree to which the species are dependent upon the presence of water. The limnicolous and paludicolous forms are found only on the basin floor, while those which can endure dry habitats for most of the year also occur in the mountains. As yet unexplained is the apparent confinement of several species to single localities.

List of Species.

Eighteen reptiles and amphibians were found in the region. As previously stated the habits, distribution, and characteristics of the forms were studied, and these are summarized in the following pages.

Rana pipiens Schreber.

Common in the Humboldt Valley.

The specimens show little variation from Dickerson's (The Frog Book, 171) description. The ground color in life was almost invariably dark gray, only one green specimen being secured; small and recently transformed individuals were grayish brown in color with small, round, dark brown spots.

The leopard frog was the most common amphibian of the region and a large series of specimens was secured. Small frogs with tails longer than their bodies were frequently observed hopping about in the grass around the ponds. Adults were usually found in the water of stagnant pools or on their banks; only occasionally were they observed in running water.

The color was admirably adapted for concealment, and this, together with the fact that they were more shy than the eastern leopard frog, made them hard to capture. The stomach contents examined contained many small toads and a few tadpoles and insects.

Specimens containing eggs were collected on July 18.

Rana pretiosa luteiventris Thompson.

Common in the Humboldt and Maggie Valleys.

This species was described from material obtained by the expedition.[3]

R. pretiosa luteiventris was observed frequently in Maggie Creek and Annie Creek, and only occasionally in stagnant pools. In habits the species is much like the eastern *R. clamitans*. The frogs were always found along the edge of flowing streams or with the head projecting above the vegetation of ponds. They were very shy and disappeared quickly when disturbed, but usually reappeared within a short time in about the same place.

The stomachs examined contained ants and water beetles.

Bufo boreas Baird and Girard.

(PL. IV, FIG. 1.)

Not uncommon in the Humboldt Valley and James Canyon.

A comparison of our specimens of *B. boreas* with the published descriptions reveals deviations from the latter only in the shape of the ear patch, which is a distinct oval in eight out of the eleven adult toads examined, and in the length of the leg to the heel, which may be less than the distance to the arm insertion by a half inch or may equal the distance to the rear end of the parotids. The color was a dull brownish gray, with a broad light vertebral stripe, a patch of light color beneath the eye, a conspicuous black blotch between the thighs on the

[3]Proc. Biol. Soc. Wash., XXVI, 1913, 53-56.

ventral surface, and with the tubercles on the fingers and toes tipped with orange.

Only eleven adult *B. boreas* were collected, although the large number of tadpoles and young individuals observed indicate that the species is abundant both in the Humboldt Valley and James Canyon. The tadpoles were so numerous in the pools that the water was frequently black with them, and in late July the trails in James Canyon were fairly covered with tiny, recently transformed toads.

Adults were first observed along the irrigation ditches near Annie Creek, on July 16, and several of the females taken on this date contain eggs. They were found in the dense grass along the edge of the ditches, and when disturbed slipped into the water, where they floated, making no further effort to escape. As soon as the water was turned back to the creek the toads disappeared and were not seen again until August 9, when the ditches were again filled.

In habits our toads correspond closely to Miss Dickerson's description of *B. halophilus* (The Frog Book, 114). The adults were large and tame, they usually walked instead of hopped, and when confined in a bag they scolded much like *B. americanus*.

The stomach contents consist of ants and beetle fragments.

Hyla regilla Baird and Girard.

A large series of this species was secured in the upper part of James Canyon and on the Carlin Peaks.

The sixty-one specimens collected show little variation from the descriptions of Test (Proc. U. S. Nat. Mus., XXI, 1898, 477-492) and Dickerson (The Frog Book, 134-135). The adults were light gray in color, with brownish gray markings on the back. They vary in size from 1½ to 2 inches; the

length of the hind limb to the heel equals the body length forward to the eye or nostril; the tibia is longer than the femur. Small specimens were of a uniform dark green color when collected, but changed quickly to the characteristic adult coloration.

The species was not found in the Humboldt Valley although it was fairly abundant in James Canyon to the basin floor. Early in August many partly grown specimens were collected under stones and in the sage brush around the two small alkaline ponds near James Creek. Many tadpoles belonging to this species were observed in Mary Lake, and three recently transformed individuals were found under stones on its bank. Two adult specimens were taken in rock slides on the Carlin Peaks, one not far from a spring, the other several miles from water.

This little tree frog was frequently heard singing on wet nights early in August, among the willows along James Creek.

Scaphiopus hammondii Baird.

Common in the Humboldt Valley about Carlin. One partly grown specimen taken in a spring in the lower part of James Creek.

The single adult spadefoot obtained is quite typical of the species. Many half grown and recently transformed specimens were taken. Those partly grown had the adult coloration except that the tubercles were tipped with orange red. The younger specimens were much darker in color with little or no trace of the curving dorsal stripes; the toes and fingers were frequently tipped with black, and the sole tubercle was prominent.

The western spadefoot is apparently common in the Humboldt Valley, although but one adult specimen was secured,

and is rare in the valleys of Maggie and James Creeks. The adult was found at night under a well curb in Carlin. On July 4, many small, recently transformed specimens were collected in mud cracks in the bed of a dried up irrigation ditch near Maggie Creek (Pl. IV, Fig. 2). It was found that the easiest method of collecting them was to stamp on the ground. The vibration disturbed them and they would thrust their heads out of the cracks. If the jar continued, they came out and hopped about on the ground where they were conspicuous and easily captured, but when the stamping ceased they soon disappeared. A few had completely transformed, but the majority had tails varying in size from mere rudiments to the length of the head and body. Later many half grown specimens were observed coming up out of the ground behind the mowers in a hay field near Annie Creek.

Crotaphytus wislizenii Baird and Girard.

Three adults, two partly grown specimens, and two newly-born individuals taken on the flat west of the lower part of Annie Creek.

Our specimens conform closely to the descriptions of Cope, VanDenburgh and Ruthven. The femoral pores are 19-22, average in five specimens, 20. In two large females taken July 13 and July 18 the under surface of the tail and two rows of spots on each side of the body were bright orange in color.

The species is apparently rare in Maggie Basin. It was found in but one locality—the low flat north of the Humboldt River and west of Annie Creek, and all of the specimens were observed within an area a quarter of a mile square, although the surrounding region was worked with great care. As a rule, individuals are not easily alarmed, but if frightened they

run with great speed and occasionally seek shelter in burrows. A large female taken on July 13 contains eggs but a second one does not. The first young (129 mm. in total length) were seen on August 14.

The stomachs examined only contain insect remains; vegetable matter is entirely wanting, as in those from New Mexico and Arizona examined in 1906[4], which is at variance with Merriam's statement[5] that the "leopard lizard is chiefly a vegetarian."

Crotaphytus collaris baileyi (Stejneger).

Seven males and seven females from the Cortez Mountains at the Humboldt River.

Our material agrees with the type description, and shows that the characters used to distinguish the form are sufficient. The snout is longer than in *C. collaris* and there are two rows of interorbital scutellae in every specimen. The coloration of our specimens is the striking and variable one characteristic of the species. In both males and females the black collars are well defined and but narrowly interrupted on the median dorsal line. In the females they are both broadly interrupted on the throat, but in the males the anterior band is broadly continuous in this region. All of the males have a large black blotch in the region of the groin. The femoral pores are 14-19, average in thirteen specimens 16.5.

We only found the collared lizard in one locality and habitat—the rocky summits of the Cortez Range at the Humboldt River. It was not common, as not more than six were ever seen in four or five hours work, and on many days we could not find a single specimen. On one or two occasions we observed individuals on the ground, but they were mostly found on the rocks. Apparently they do not climb with the facility

[4]Bull. Amer. Mus. Nat. Hist., XXIII, 517-518.
[5]No. Am. Fauna, No. 7, 168.

of the *Sceloporus biseriatus* and *Uta stansburiana nevadensis,* but are usually found upon the tops of rocks or clinging to sloping rock faces and not on cliffs. When alarmed they rush down into the crevices. The stomach of one specimen contains only insects and spiders; another contains insects and some vegetable matter, the latter probably taken accidentally.

Uta stansburiana nevadensis Ruthven.

Thirty-four specimens taken in the Cortez Range at the Humboldt Valley and twenty in Moleen Canyon.

The specimens have been fully described by Ruthven.[6]

After a careful study of the forms of *Uta stansburiana,* Richardson[7] has concluded that the specimens from the northern part of the Great Basin are subspecifically distinct from those from the desert regions of the southwest, but retains the name *U. stansburiana* for the northern form and gives to the southern variety the name of *U. stansburiana elegans* (Yarrow), thus making *U. s. nevadensis* a synonym of *U. stansburiana.* From Richardson's investigations it seems not improbable that the species was described from the northern form, but until this has been determined by an examination of specimens from the type locality we feel justified in distinguishing the specimens from Maggie Basin as *U. s. nevadensis.*

This lizard was not common in the Cortez Range but in Moleen Canyon it occurred in some numbers. It was closely confined to the vicinity of rocks. Occasional specimens were found on the ground, but the majority were on the large rocks along the cliffs, upon which it climbs with all the facility of *Sceloporus biseriatus.* The stomach contents of two specimens are made up of insects and spiders. Females taken on July 6

[6]Proc. Biol. Soc. Wash., Vol. XXVI, 27-30.

[7]Richardson, C. H., Reptiles of Northwestern Nevada and Adjacent Territory. Proc. U. S. Nat. Mus., Vol. 48, 403-435.

contained large eggs while those taken on July 8 had none, which would indicate that they were laid about this time. On August 14 the young were seen for the first time. On this date four individuals between 22-24 mm. in body length were found on the ground between the large rocks in Moleen Canyon. They were very agile and when alarmed quickly sought shelter under loose stones.

Sceloporus biseriatus Hallowell.

(PL. V, FIG. 1.)

One hundred and twenty-nine specimens taken on the eastern slope of the Cortez Range from the Humboldt Valley to Maggie Canyon, in the Seetoya Range east of the canyon, in the River Range from Moleen Canyon northward for several miles, and on the low rocky hills between Susan and Maggie Creeks.

Our material is not relatively very variable. In no specimen is there more than one gular spot, the females all have bluish abdominal spots, and the posterior side of the thighs (particularly along the femoral pores) and the posterior side of the forelimbs are nearly always bright orange yellow. With age the dorsal spots, generally very distinct in the young, tend to become less distinct, and in very old specimens may be quite obscure, but they are generally discernible even in the old individuals. The white of the ventral parts is nearly always more or less spotted or suffused with black in the males and with grayish slate in the females, but the extent of maculation is very variable and not plainly influenced by age. The abdominal spots vary from a deep greenish blue to a pale bluish in the males; in the females they are generally bluish slate but occasionally nearly as in the males. The femoral pores vary from 13 to 19, with an average of 16.8 in 110 specimens.

This lizard is the characteristic reptile of the mountains, and was found elsewhere only on the group of low hills between the Susan and Maggie Creeks and in the lower part of James Canyon. It was not, however, of general distribution in the mountains nor confined to particular elevations, but was very closely restricted to rocky places such as cliffs, outcrops, talus slopes, stream beds and similar places. Wherever such conditions were encountered, from the basin of the Humboldt to the top of the Carlin Peaks (7,754 feet), the species was found in numbers. Occasional individuals both in the mountains and on the plain were observed at a little distance from rocks but these were only rare stragglers. The importance of rocks in the habitat was also shown by the presence of a considerable colony on the group of low rocky hills in the valley of Maggie Creek and several miles from other outcrops. It is of interest that the species was also present in some numbers on large blocks of earth at the foot of a steep bank in the lower part of James Canyon. In this place the earth was very hard and the blocks were quite like rocks in form. That it was not found in the Pinyon Range is with little doubt to be attributed to the fact that the outcrops in the area studied were very small.

As has often been noted, this *Sceloporus* is an excellent climber. It clings with ease to a vertical or even overhanging rock face and when alarmed rushes away with surprising swiftness. In this habitat it is quite inconspicuous, the pattern of light-colored individuals resembling the color of the rock, and the dark individuals appearing very like a crevice or angle in the rock face. When on the rocks, many of the old individuals are entirely black above to the obliteration of the pattern, but this color rapidly changes when they are removed. This black color is not only acquired when the lizard is upon black rocks but also when it is on red or brown rocks.

From the local distribution just described, it is evident that one cannot from our material conclude with Taylor[8] that *S. biseriatus* is less typically a mountain-dwelling species than *S. graciosus*. According to Taylor's observations it does not in Humboldt County, Nevada, range much higher than 5,000 feet, but in our region it not only occurs principally in the mountains but at least to an elevation of 7,754 feet. We believe that it may be said that *S. biseriatus* is in this region almost exclusively found in the mountains because it is a saxicolous form and suitable habitats are almost entirely confined to the hills.

On warm days the lizards, after they appear in the morning, are quite common everywhere over the rocks until the hottest part of the day, when they retire to the shaded side. The food in the stomachs examined consists entirely of insects. Large females taken on and before July 12 contain large eggs apparently about ready to be laid, while those collected on July 22 had deposited their eggs. The first young were observed on August 14. On the latter date several young ones which could have been but a few days old were found among the rocks in Moleen Canyon. The one obtained measures 55 mm. in total length and 25.5 mm. exclusive of the tail. They ran about over the ground and small rocks at the base of the cliff and were very agile and shy, quickly seeking concealment under loose stones when alarmed.

Sceloporus graciosus Baird and Girard.

(PL. V, FIG. 1.)

Eighty specimens collected in the basin and on the slopes of the Cortez and Pinyon Ranges.

The specimens need little description. In nearly all of the old females the lower light band from the eye to the shoulder,

[8]Univ. of Cal., Pub. in Zool., Vol VII, 349.

the pale vertical line in front of the shoulder, the edge of the lateral neck fold and the area partially covered by the fold are bright orange. The ventral blue spots characteristic of the male are usually absent but occasionally present in the females.

Sceloporus graciosus is the most common and widely distributed lizard in the region. We found it in Maggie Basin from the grass and *Chrysothamnus* zones along the streams to an altitude of about 7,500 feet in the Cortez Range. It was also observed in the Pinyon Range and will undoubtedly be found to occur in the Seetoya and River Ranges. Although of quite general distribution in the region, *S. graciosus* was not equally common everywhere. It was very abundant on the low flat and first hillside north of Carlin, and quite common along the sides of the valleys of the Susan, Maggie, Annie, and lower part of James Creek, on the basin floor. Only occasional specimens were found on the higher ridges in Maggie Basin and in the Cortez Range. It was not observed among the rocks except very rarely and then only where there was considerable soil.

This distribution, which is very similar to the distribution in Humboldt County described by Taylor[9], may be explained by the fact that the species is in this region pre-eminently a ground form (see below), and prefers a fine soil. In Maggie Basin it is much more a plains form than a mountain species, for it is by far the most abundant on the finest soil which is found along the sides of the valleys on the basin floor.

One generally finds this lizard on the ground beneath the sage and other bushes and in this situation the coloration is protective (Pl. V, Fig. 1). It climbs about among the branches of the bushes to some extent, but when alarmed generally runs to the ground to seek safety under dead brush or in a convenient burrow. At night it buries itself in the loose soil. The food

[9]Loc. cit., 349.

consists of insects, as shown by the examination of stomachs. Females collected on July 4 contained large eggs apparently about ready to be laid, while those taken on July 11 and subsequently had none.

Phrynosoma hernandesi Girard, variety.

Thirty specimens taken in Maggie Basin at Carlin and near James Creek.

The Nevada specimens differ from Utah (Green River) specimens in having larger spines, both on head and body, and a flatter temporal region. As these characters are constant in the series of thirty obtained, the Nevada specimens may represent a distinct race. Our material is not sufficient for a determination of this point.

The size is large. The length of the largest specimens is 112 to 128 mm., of which the tail constitutes 29.9-31-4%, average 30.9%, in eleven females, and 37.1-39.2%, average 37.6% in three males. The femoral pores vary from 13-18 with an average of 15 in thirty specimens.

The coloration of the adults is as follows. The ground color varies from pale gray to a dull yellow, the smaller specimens (100 mm.) being more generally gray, while the larger ones are more yellow or brown. The black spots are distinct and margined rather definitely behind, and indistinctly in front with pale yellow. Specimens 100 mm. or more in length exhibit a varying amount of red. This first appears as a broken line above and below the peripheral spines, and on the lips. In the largest individuals it is spread over the back, tail and limbs as irregular reticulations, suffuses the temporal region and temporal horns, but seldom the occipital horns, and often occurs on the gular region and throat and as spots on the bases of the abdominal scales. The ventral surfaces are pale yellow with black spots, the latter varying from only a few on the

gular region to many on the gular region and belly, the former being sometimes nearly entirely black. Generally there is a preanal streak of orange yellow. The youngest specimens (38-40 mm.) are pale gray with dull white heads; the dorsal spots are indistinct with the exception of the tail and nuchal spots which are rather better defined and the ventral parts are white with a very few indistinct spots.

We found this lizard decidedly local in its distribution. It was observed in but two places—north of the town of Carlin to Annie Creek on the flat that extends along the valley of the Humboldt (an area not more than a mile long and a half mile wide), and a low ridge near James Canyon. Although said by the residents to be usually common north of Carlin, we did not find it in numbers; only seventeen adults and thirteen young of the year were taken although the area was worked carefully at various times. One young specimen was captured on the ridge near James Creek, and Mr. George Arthur informed us that he had often seen them there but nowhere else except at Carlin.

As a rule the horned toads were found during the warmer parts of the day. At night they burrowed beneath the surface of the ground. The adults kept rather closely to the shelter of the bushes, in which situation their coloration is quite protective as they very closely resemble the lumps of earth spotted with shadows which are common in this habitat. The young seem to roam about more than the adults, at least they were more often found in the open. Owing to their form and the absence of markings they look very much like small lumps of earth in the sunshine. The single stomach examined was gorged with ants and contained small sticks, leaves and stones. The vegetable matter consists of a very few dry fragments and, like the stones, was undoubtedly eaten accidentally.

As is well known, this species is viviparous. The females

were all pregnant on July 26, and on August 7 and 8 the young were found in numbers, and all of the adult females taken had given birth to their young.

Cnemidophorus tigris (Baird and Girard).

One hundred and twenty-two specimens collected between the lower part of the valley of Annie Creek and the Cortez Range.

The material needs little description, for while the variations are extensive they are mostly within the known limits for the species. The stripes are easily distinguished in every specimen. They are particularly distinct anteriorly where they in no specimen encroach upon the black midfields sufficiently to lose their identity. Posteriorly, in old specimens, the pale color of the stripes usually encroaches upon the black ground color sufficiently to break up the latter into spots, and in the largest individuals partly crowd out the spots, so that the posterior part of the body tends to become unicolored, but this tendency does not in our material go so far as to cause the stripes to disappear. The markings on the ventral surface also vary considerably. The dark blotches are usually black, but occasionally dark slate, and are principally on the chin, throat and anterior part of the abdomen. However, the posterior part of the abdomen is also more or less spotted, occasionally nearly as much as anteriorly. The spots on the gular region are obscure in the smallest specimens (60-63 mm. from snout to vent) although distinct on the belly, and in the larger individuals they are fewer in number but larger than those on the belly. In 114 specimens the femoral pores vary from 16 to 23 with an average number of 19.24.

With the exception of two specimens, this lizard was only found on the flat north of the Humboldt Valley, between the east side of the valley of Annie Creek and the Cortez Range.

Two specimens were found among the rocks on the eastern-most ridge of the mountains bordering the flats. It was very common among the sagebrush, salt bushes and *Chrysothamnus* bushes on the flats, by far the most abundant where the *Chrysothamnus* was dominant and the vegetation was thus densest, and was less common in the more open places dominated by the sagebrush and *Atriplex*. In this habitat specimens were decidedly inconspicuous, the light and dark markings resembling the lights and shadows beneath the bushes. When alarmed they take to flight, running swiftly with the tail elevated from the ground, or dodge into a mammal burrow. All but one of the stomachs examined contain spider and insect remains exclusively, grasshoppers, beetles, larvae, pupae and spiders being identifiable. One stomach of a lizard taken on August 14 contains a young *Cnemidophorus* but recently hatched. The females collected as late as July 13 still carried their eggs, but those taken on August 8 had laid them, and, as mentioned above, an adult brought in on August 14 had eaten a young one but recently hatched. It is preyed upon by the racer (*Bascanion taeniatum*) a colony of which lived in the habitat.

It is difficult to explain the local distribution of this lizard, which is paralleled by that of several other species in the region. The same vegetation prevails over scores of square miles of adjacent territory, and while the soil is finer than on the ridges to the north, it is to all appearances the same as in the valley of the Humboldt east of Carlin, and these areas are continuous.

Eumeces skiltonianus (Baird and Girard).

Five specimens taken on the most northern of the Carlin Peaks.

The specimens measure 52 mm., 55½ mm., 56½ mm., 60 mm., and 64 mm. in length (snout to vent). The stripes are

well defined on the head and body, the upper pair extending upon the base of the tail. The lower stripes are dull white, the upper brownish white and in one specimen dull reddish brown on the base of the tail. The upper stripes vary slightly in width, cover the adjacent two-thirds or three-fourths of the second and third scale rows from the median dorsal line and are bordered above with black. The ground color between the upper and lower stripes is black in two specimens, dark brown in one, and dark brown spotted with black in another. Between the upper stripes, the ground color is greenish or brownish olive and in three specimens is interrupted by dark brown or blackish stripes extending from the head upon the base of the tail. In one specimen the dark dorsal stripes are absent, in another they are indicated by small black spots. The ground color of the tail is greenish blue or pale yellowish olive at the base, and bright blue on the distal part. The belly is pale greenish or bluish slate, the chin, throat and median portion of tail dull yellowish white in three specimens. In two specimens the chin and throat are pale reddish orange, and in one of these the under surface of the tail is pale reddish. There are 26 scale rows in four specimens, and in the fifth an extra row is present on each side for a short distance behind the four limbs, making 28. The frontal is in contact with the azygos prefontal in four specimens and widely separated in one.

It will be noted that these specimens are typical *E. skiltonianus* and do not resemble *E. gilberti* Van Denburgh in any of the characters which are given as distinctive of that form. The habits are, on the other hand, those of the latter species, as described by Van Denburgh. Van Denburgh[10] says of *E. gilberti,* "common in the mountains near Yosemite Valley. * * * * It is often seen in grass and among roots, retreating

[10]Occ. Papers Cal. Acad. Sci., V.

swiftly to holes under stones and boulders when frightened," and of *E. skiltonianus* "this lizard seems to be most abundant in damp places, such as are found throughout the redwood forests of the Coast Range. Here it is usually found under decaying logs or behind the loose bark of old stumps." It will be seen from the following description of the habitat of the Nevada specimens that they live in an environment similar to that in which *E. gilberti* has been found.

Only seven of these skinks were seen, and the only place where they were found was at the head of the northern canyon of James Creek, on the east side, and near the summit of the most northern of the Carlin Peaks. The slope was covered by a rather profuse growth of grasses and short herbaceous plants, and there were many loose rocks. The skinks were found the rocks (Pl. III, Fig. 1).

This is apparently the first Nevada record for the species. As this is well in the northeastern part of the state and the U. S. Biological Survey[11] found it nearly as far east in southern California, it would seem to be a justifiable conclusion that it will be found throughout most of the state.

Bascanion taeniatum (Hallowell).

Four specimens secured on the flat west of Carlin, and one in the canyon west of Maggie Canyon in the Seetoya Range.

The specimens need little description. The upper labials are 8; the lower labials 9 or 10; the ventral plates 203, 204, 206, 206 in four females, 212 in a male; the subcaudals 122, 127, 128 in three females. Two females have a total length of 1111 mm. and 1217 mm., and a tail length of 339 mm. and 358 mm. respectively; two males have a total length of 1333 mm. and 1358 mm., with a tail length of 362 mm. and 418 mm.

[11] Stejneger, L., North American Fauna, No. 7, 201-202.

respectively. The ground color above is olive brown, darker on the body and lighter on the neck. The sides are pale yellow between the stripes. The belly is bright yellow for most of the length, on the posterior part and the tail becoming dull red or reddish orange. Along the ends of the ventrals is a more or less complete and distinct dusky band which on the anterior part becomes broken up into spots, and may be pale reddish orange. The chin and throat and anterior part of the ventral surface are spotted with black, the spots exhibiting a tendency to be arranged in two rows, and there may be two rows of small spots on the posterior part of the abdomen.

A colony of striped racers was found in the habitat of *Cnemidophorus tigris,* i. e., on the flat along the north side of the Humboldt Valley west of Annie Creek. Four specimens were taken here among or near some rocks which had been exposed. Another was seen on the sagebrush flat north of Carlin, and one was taken among large rocks in the canyon east of Maggie Canyon in the Seetoya Range. It is probably a comparatively common snake throughout the region. The stomach of one specimen contains an adult *Cnemidophorus tigris.*

Bascanion constrictor vetustum (Baird and Girard).

One specimen taken in the valley of the Humboldt River, one at the foot of the slope and two near the summit of the Cortez Range.

The dorsal scale formula is 17-15 in two specimens, and 17-15-13 in two. In one of the specimens with 17-15, the rows are dropped before the middle of the body, in the other just behind the middle. In the specimens with the formula 17-15-13, there are 17 only on the neck in one and 13 to beyond the middle of the body, in the other there are 17 nearly to the middle and 13 for only a short distance. There are 7 supra-

labials in two specimens and 8 in two. The infralabials are 9 in one and 8-9 in three. Three females have 173, 175 and 177 ventral plates, and one male has 169. The subcaudals are 72 and 79 in two females. Two females have a total length of 975 mm. and 870 mm., and a tail length of 216 mm. and 214 mm. respectively. In every specimen the greatest head width in the supraoccular region is one-half or a little more of the distance from the end of the snout to the posterior end of the parietal suture. The colors could not be determined accurately as most of the specimens were about to shed when captured, but they may be generally described as brownish olive above and yellow beneath. In one brightly colored specimen the ventral surface was pale orange yellow anteriorly, becoming much paler posteriorly; in the others the posterior part of the abdomen and the tail are also orange yellow.

The status of *vetustum* and *flaviventris* have not been satisfactorily determined and our material is not sufficient to throw much light on the question. It should be pointed out, however, that in the apparently strong tendency to have less than 17-15 scale rows, the Nevada specimens differ from typical *B. constructor* and from specimens of *B. c. flaviventris* from the Great Plains region. It is probable also that the head is slightly broader in *B. c. vetustum*.

This racer was found in numbers on a stony slope just beneath the northern peak of the Cortez Range, in an area about one-fourth of a mile square. One specimen was taken and another seen among the grass and bushes in the Humboldt Valley, and one was taken on the margin of the valley and mountain slopes. These observations indicate a wide range of habitat. The individuals seen were very agile, and in the mountains rushed away to the shelter of the rocks when alarmed.

Pituophis catenifer deserticola Stejneger.

Eleven specimens secured in Maggie Basin and the Cortez, Seetoya and River Ranges.

Our material seems to lend weight to the view that the Great Basin bull-snakes are recognizably different from those of California, but the differences are so slight and variable that their importance cannot be accurately determined until much more work has been done on the geographical variation within the genus. The number of dorsal scale rows varies within narrow limits. It is 27-25-27-29-27-25-23-21, 27-29-27-25-23-21, 29-31-29-27-25-23-21, and 29-31-29-27-25-23-21. The number of rows of smooth scales varies from 4 to 7, average between 5 and 6. The ventrals vary from 233-242 in eight females, and are 231 and 236 in two males. The subcaudals vary from 34-38 in seven females and are 61, 61 and 62 in three males. The largest specimen observed measured 1110 mm.; the proportionate length of the tail is 12.9%-18.8% in seven females, 14.3% and 14.6% in two males. The color needs no description except that the dorsal blotches vary from 33-66 on the body and from 13-18 on the tail.

The bull snake is one of the wide ranging species. It was found in the *Chrysothamnus* zone along the streams, in the sagebrush on the hills and flats on the basin floor, and on the slopes and rock slides and in the canyons of all of the mountains (except the Pinyon Range) to the summit of the Carlin Peaks. It is apparently common everywhere, and we could not discover any habitat preference. A large female taken on July 30 contains large eggs. The specimens examined had all eaten small mammals, and to judge by the extent to which the alimentary duct was filled with remains the number consumed by this species must be enormous.

Thamnophis ordinoides elegans (Baird and Girard).

Twenty-eight specimens taken in the Humboldt Valley, along Maggie Creek from the Humboldt to Maggie Canyon, and in the lower part of the valley of Annie Creek. Thirty specimens were born in captivity.

The specimens obtained are typical *T. ordinoides elegans* (=*vagrans* Auct.) as understood by the senior writer. The dorsal scale rows are mostly 21-19-17, occasionally 19-21-19-17; the supralabials are 8 except in one specimen which has 7; the inferior labials are usually 10, occasionally 9 or 11; the ventrals vary from 169 (male) to 181 (female); and the subcaudals vary from 73 (female) to 89 (male). It is of interest to note that the preoculars, while usually single (on one side in six and on both sides in twenty in a series of twenty-seven), are occasionally divided, the dominant condition in northern California, east central Oregon and Washington, and probably in northeastern Nevada.

The gartersnake is common in the region studied but only along the larger permanent streams. It is abundant along the Humboldt and in the lower parts of the Annie and Maggie Creeks and occurs in smaller numbers along the upper part of the Maggie, at least to Maggie Canyon, but we did not find it along the Susan or any of the small streams in the Cortez Mountains. The species is quite aquatic in its habits. It is generally found in the immediate vicinity of water, and often in the streams or ponds. From the stomachs examined it would appear that most of the food is secured in the water. One specimen had eaten a small toad, and five others had captured fish and tadpoles. It is a voracious feeder. The stomach of one individual contained eight large tadpoles, that of another five fish, and one had eaten a fish 141 mm. in length

besides a smaller one. Three pregnant females brought back alive gave birth to eight, ten and twelve young on August 25, September 2 and September 10.

Crotalus lucifer Baird and Girard.

Five specimens from the Cortez Mountains.

The five specimens are typical *C. lucifer* as it occurs in the Great Basin. The ground color above is very pale, varying from pale gray to light olivaceous, dorsal blotches pale brown. The dorsal scale formula is 25-27-25-23-21 and 25-23-21-19, the upper labials 14-16, the lower labials 15-16. The ventral plates in three females are 183, 185, 188, and in a male 177; the subcaudals in three females are 17, 18 and 19, in a male 21.

This rattlesnake is not uncommon in the general region studied, according to the statements of the residents and our observations. We observed it at various places in the Cortez Range, a dead specimen was seen on the Southern Pacific Railroad tracks in Moleen Canyon, and it was reported to be very common in a canyon near the station of Moleen. In this region *C. lucifer* is primarily an inhabitant of the most rocky places and four of the specimens were found on talus slopes, but it is occasionally seen on the desert floor. A specimen was killed on one of the ridges near the lower part of James Canyon during our stay at that place, another in a cultivated field on James Creek, and residents informed us that rattlesnakes are occasionally observed in the Humboldt Valley near the mountains. The stomachs examined contained small mammals.

Large females taken on July 6 and 10 contain large eggs (36mm. long in one) upon which the embryonic area is visible.

PLATE I.

Figure 1. The valley of the Humboldt River in Maggie Basin. On the right the valley rises to the foothills of the Pinyon Range, on the left to a dry flat covered with fine soil. The lowest part of the valley has a vegetation of grasses, with small trees and shrubs along the streams, ponds and ditches, which is replaced near the sides by a zone of *Chysothamnus pinifolius,* and the reptile-amphibian fauna comprises the following forms: *Thamnophis ordinoides elegans, Rana pretiosa luteiventris, Rana pipiens, Bufo boreas, Pituophis catenifer deserticola, Bascanion constrictor vetustum* and *Bascanion taeniatum.*

Figure 2. The flat on the north side of the Humboldt Valley. The basin ridges of waste limit this flat on the north (background). The flat has a fine soil and numerous alkali spots, and supports an open growth of sagebrush. The reptiles found here were *Cnemidophorus tigris, Phyrnosoma hernandesi, Sceloporus graciosus, Crotaphytus wislizenii, Pituophis catenifer deserticola, Bascanion consirictor vetustum, Bascanion taeniatum.* No amphibians were found on the flat.

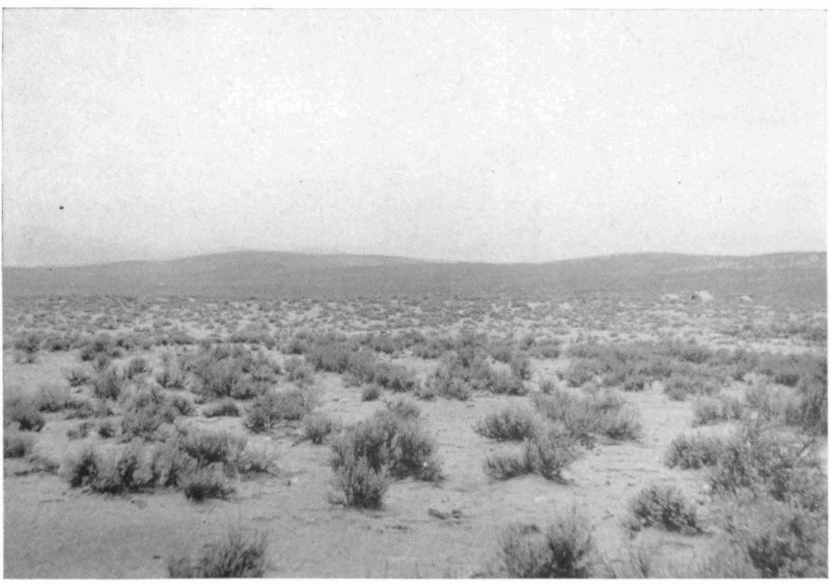


PLATE II.

Figure 1. The lower part of Maggie Creek. The photograph was taken in July and shows the normal size of the stream during the summer months. The flat valley may be seen in the background. In the creek or in the immediate vicinity were found *Scaphiopus hammondii, Rana pretiosa luteiventris, Thamnophis ordinoides elegans, Sceloporus graciosus, Bascanion taeniatum, Bascanion constrictor vetustum* and *Pituophis catenifer deserticola.*

Figure 2. The valley of James Creek, on the basin floor. The photograph was taken from the mountains and shows the ridges of waste which form the sides of such valleys on the basin floor, and the scanty growth of trees which borders the permanent streams. The reptiles and amphibians on the bottom of the valley are *Scaphiopus hammondii, Bufo boreas, Sceloporus graciosus* (fine soil at mouth of valley), *Sceloporus biseriatus* (occasional on rocks along stream), *Crotalus lucifer, Bascanion taeniatum, Bascanion constrictor vetustum* and *Pituophis catenifer deserticola.* The last four species make up the principal fauna of the ridges, and *Sceloporus graciosus* may be present in small numbers where the soil is fine.

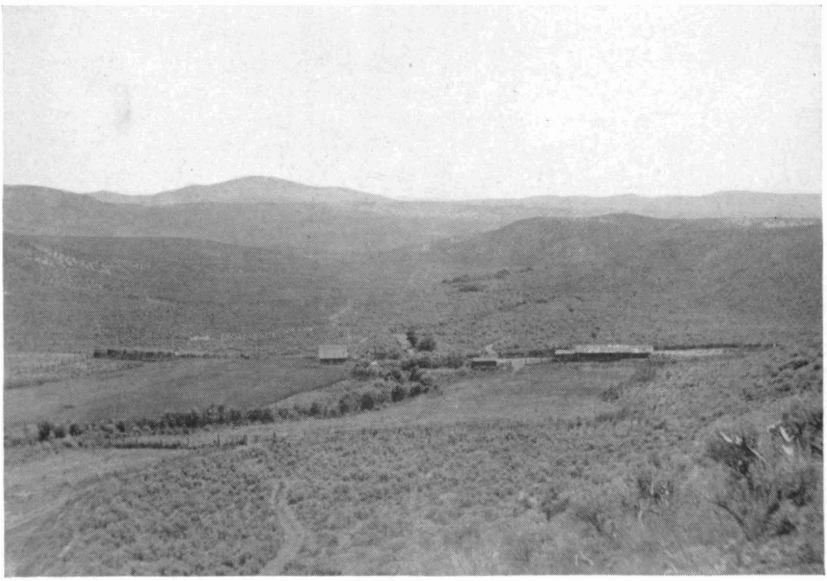
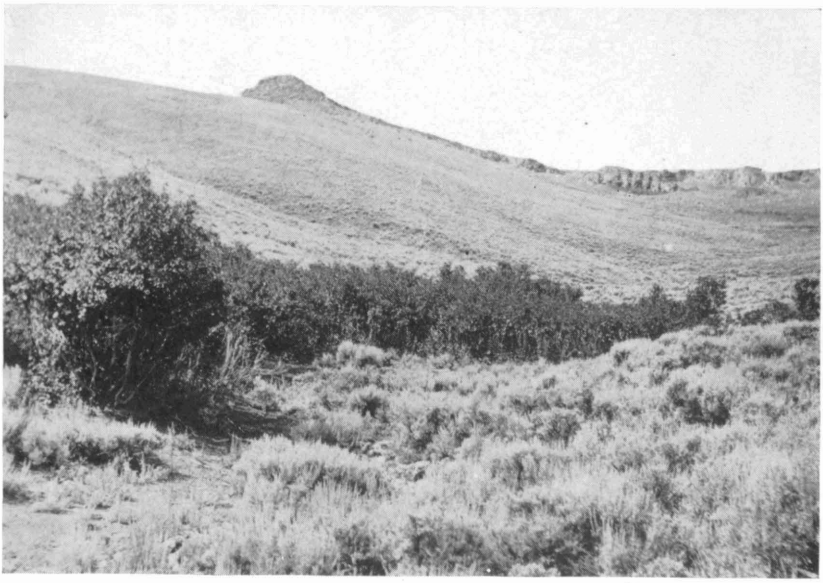


PLATE III.

Figure 1. One of the mountain valleys continuous with the main valley of James Creek, showing the stony slopes, restricted outcrops (background), and small groves characteristic of such valleys. The stream is spring fed but disappears during the summer months. The dominant plant on the ridges is the sagebrush. The reptiles and amphibians found at the bottom were *Hyla regilla, Bufo boreas* and *Sceloporus biseriatus* (where rocks were present), *Bascanion taeniatum, Bascanion constrictor vetustum* and *Pituophis catenifer deserticola.* On the stony slopes were found the last two species with *Eumeces skiltonianus, Crotalus lucifer,* and, in the few places where the soil was very fine, *Sceloporus graciosus.*

Figure 2. A rock outcrop in the Pinyon Range. These outcrops are small, except where the permanent streams cut through the mountains, and they are usually broken up into large blocks. *Sceloporus biseriatus* is to be found on nearly every outcrop, and *Hyla regilla, Crotaphytus collaris baileyi, Uta stansburiana nevadensis, Crotalus lucifer, Pituophis catenifer deserticola, Bascanion taeniatum* and *Bascanion constrictor vetustum* were also found in such places.



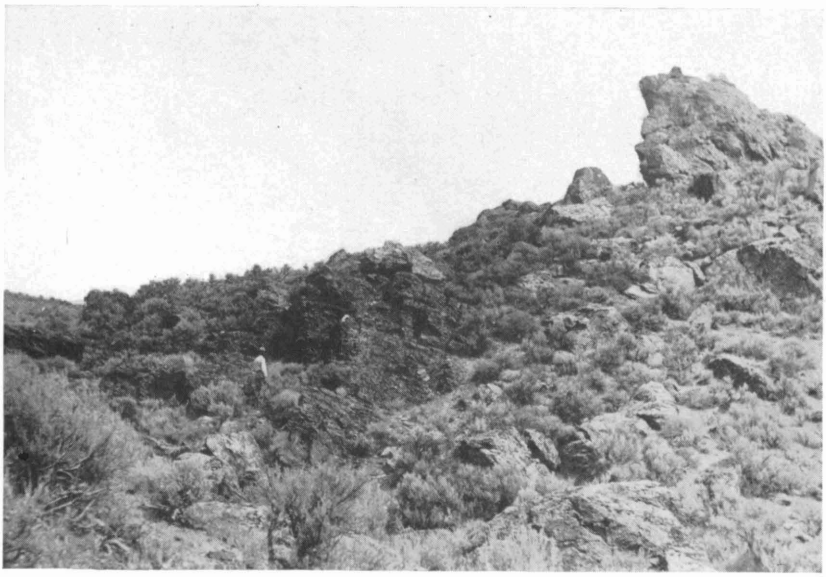


PLATE IV.

Figure 1. *Bufo boreas* Baird and Girard.

Figure 2. Mud cracks on an irrigated flat in Maggie Valley. In these cracks the recently metamorphosed spadefoot toads (*Scaphiopus hammondii* Baird) sought concealment.

PLATE V.

Figure 1. *Sceloporus graciosus* (right) and *Sceloporus biseriatus* (left) in their natural habitats. *S. graciosus* is on the ground on the litter under a sagebrush; *S. biseriatus* is on a rock cliff.

Figure 2. A specimen of the variety of *Phrynosoma hernandesi* which inhabits Maggie Basin.