

TRANSACTIONS
OF THE
SAN DIEGO SOCIETY OF NATURAL HISTORY

VOLUME IX, No. 32, pp. 353-376

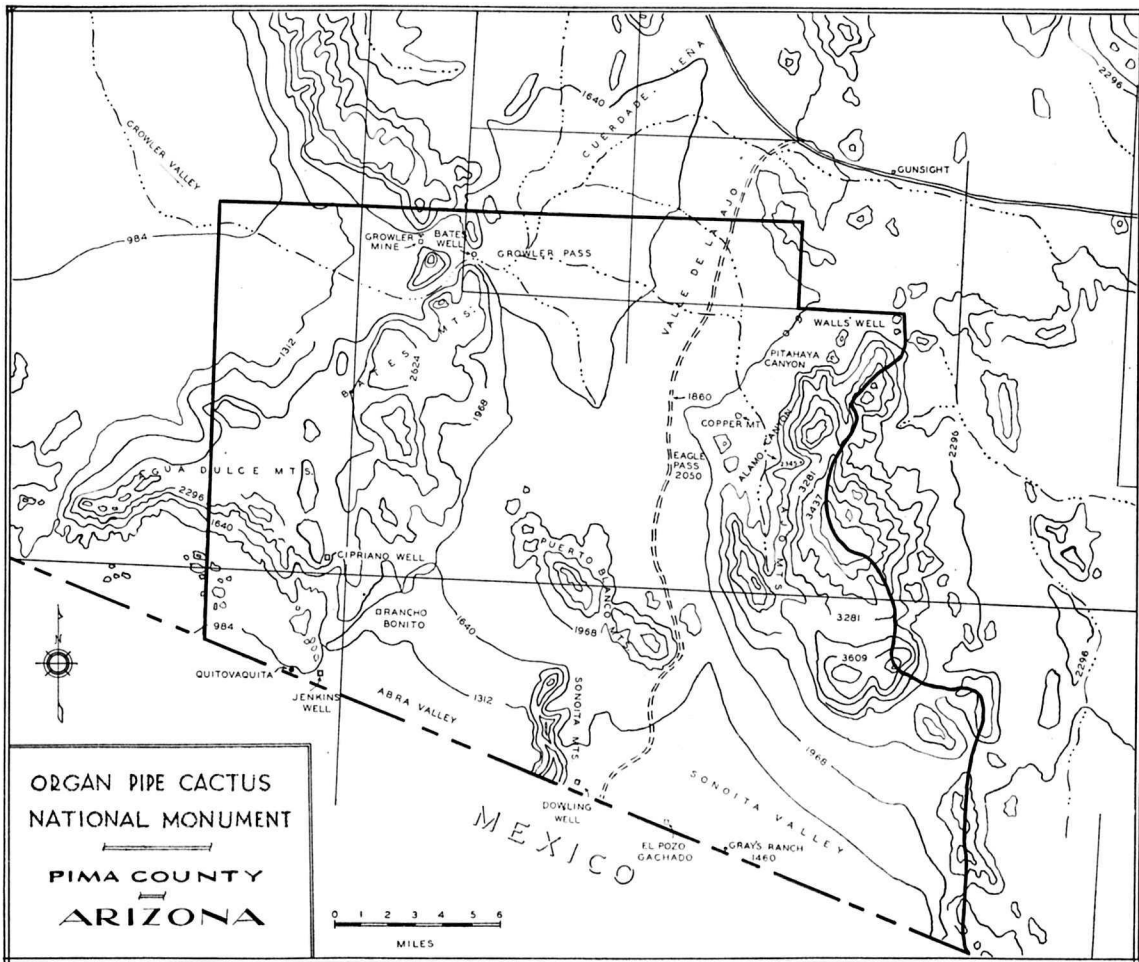
**A VERTEBRATE FAUNAL SURVEY OF THE
ORGAN PIPE CACTUS NATIONAL MONUMENT,
ARIZONA**

BY

LAURENCE M. HUEY

Curator of Birds and Mammals, San Diego Society of Natural History

SAN DIEGO, CALIFORNIA
PRINTED FOR THE SOCIETY
FEBRUARY 17, 1942



ORGAN PIPE CACTUS
 NATIONAL MONUMENT

PIMA COUNTY
 ARIZONA



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This report records the occurrence of such vertebrate species as were found within the Organ Pipe Cactus National Monument during three visits, aggregating 90 days, made by the writer and an assistant in 1939. The survey was undertaken at the suggestion of the National Park Service, which requested the cooperation of the San Diego Society of Natural History in the project. The writer was appointed "Collaborator at Large" on February 14, 1939, and camp was established and work commenced on February 22 at the Growler Mine, within the Monument.

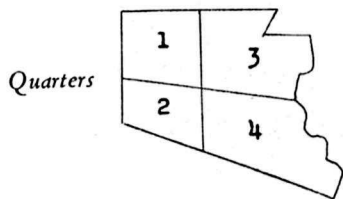
The Organ Pipe Cactus National Monument comprises an area of 330,619 acres or 516.7 square miles. After a study of maps, it was decided to divide this large area into four nearly equal parts, to establish a base camp at some central point in each, and to radiate exploratory excursions from that point as time would allow. A complete and detailed survey of the vertebrate fauna of so huge a tract by two individuals within a three months' period was naturally impossible and it is evident that much remains to be done. This is particularly true of both mammals and reptiles. The bird life of the Monument was more nearly covered.

The three field-trips to the Monument are tabulated in the accompanying chart. For each period has been designated the geographical quarter of the Monument where investigations were carried on, the dates of arrival and departure at each locality and the number of specimens collected. The writer's assistant during the first and second periods was Philip Lichty and during the third period was Charles F. Harbison.

By the end of the first period, it was clear to the writer that the whole Monument, judging from its general flora and fauna, was within the Lower Sonoran life zone. To analyze further the faunal position of the Monument, one must look to the east and west. Towards the east, in the neighborhood of Tucson, such characteristic birds and mammals as Cardinals, Bronzed Cowbirds, Palmer Thrashers, Antelope Jack

CHART OF ACTIVITIES

	<i>Quarter</i>	<i>Locality</i>	<i>Arrived</i>	<i>Departed</i>	<i>Birds Collected</i>	<i>Mammals Collected</i>	<i>Amphibians & Reptiles Collected</i>	<i>Fishes Collected</i>
<i>1st Period</i> Feb. 22 to March 24 (31 days)	1	Growler Mine	Feb. 22	March 4	38	48	11	
	2	Quitovaquita	March 4	March 9	24	26	22	25
	3	Alamo Canyon, Ajo Mts. 4 mi. n. Copper Mts.	March 9 March 17	March 17 March 18	41 0	50 4	25 0	
	4	S. end Puerto Blanco Mts. Gray's Ranch	March 18 March 19	March 19 March 24	1 10	6 37	1 26	
<i>2nd Period</i> April 20 to May 14 (24 days)	1	Bates Well	April 20	April 27	53	18	31	
	2	Cipriano Well Quitovaquita Rancho Bonito	April 27 April 28 May 1	April 28 May 1 May 2	0 40 11	1 3 7	2 13 12	
	3	Alamo Canyon, Ajo Mts.	May 2	May 8	40	0	15	
	4	2 mi. e. Dowling Well Gray's Ranch	May 8 May 10	May 10 May 14	11 9	9 25	4 17	
<i>3rd Period</i> Nov. 15 to Dec. 19 (35 days)	1	Bates Well	Nov. 15	Nov. 26	50	47	21	
	2	Quitovaquita Rancho Bonito	Nov. 26 Nov. 30	Nov. 30 Dec. 9	31 30	1 11	5 3	
	1	S. end Growler Valley	Dec. 9	Dec. 11	9	3	0	
	3	Alamo Canyon, Ajo Mts.	Dec. 11	Dec. 19	29	11	4	
		Total			430	307	212	25



Birds	430
Mammals	307
Reptiles	212
Fishes	25
Total of Specimens Collected	974

Rabbits and Banner-tailed Kangaroo Rats are found. All are living in what might be termed as a "lush desert growth" at an altitude of over 2000 feet. Towards the west from the Monument, the region becomes progressively more arid as the elevation declines. More drought-tolerant species find their habitats there, outstanding examples of which are Leconte Thrashers and Giant Desert Kangaroo Rats.

The present survey has shown that the Organ Pipe Cactus National Monument is saddled on the line of demarcation between these two desert regions. This is no hard and fast line, but the merging of one area into the other. Thus breeding Cardinals, Bronzed Cowbirds, and breeding Palmer Thrashers, also Antelope Jack Rabbits and Banner-tailed Kangaroo Rats were found in the eastern sections of the Monument, while in the western part, Leconte Thrashers and Giant Desert Kangaroo Rats were at home. Further evidence of the line of demarcation was given by two species of reptiles which found the western limits of their range in the region. These were the Pima Leaf-nosed Snake and the Black-tailed Rattlesnake.

It has long been known that life zones can be further divided into clearly defined areas, called "associational areas." These areas are often indicated by the abundance of one or more species of plants and are further emphasized if, as is often the case, a certain species of bird or mammal adheres closely to the particular plant association. Other factors, such as the geological features, may also set these particular areas apart. It was found that in the Organ Pipe Cactus National Monument there were four major associational areas. These may roughly be designated as:

THE WESTERN AREA. This area lies along the extreme western boundary of the Monument and includes the southeastern part of Growler Valley, the area about Quitovaquita and an arid part of the western side of the Valley of the Ajo. It is more arid than other parts of the Monument and a greater portion of the vegetation is creosote bush. The soil is sandy-silt in places, ranging to pebbly ground in other parts. In the softer, sandy-silt soil, Giant Desert Kangaroo Rats were found in two localities.

THE SONOITA AREA. This area lies south of the Bates and Puerto Blanco Mountains and southwest of the Ajo Mountains. It comprises parts of two large valleys or plain-like regions, known as the Abra Valley and the Sonoita Valley. The desert vegetation in this section is more lush than in the Western area. In two places, one in each valley, it might be classed as luxuriant desert growth. Mesquite trees of large size, with other desert trees and shrubs in proportion, were found. This area also has the largest forests of giant cactus, though this plant is to be found over the greater part of the foothills in the

Monument. This section of the Monument stands out from the others in being the only one in which Allen's Jack Rabbit occurred, the one in which the few Grasshopper Mice were taken, and the only one in which Bronzed Cowbirds were recorded. The case of the Grasshopper Mice may well have been fortuitous, however, as other parts of the Monument appeared to be acceptable to them.

The effect of the nearby Sonoita River, which parallels the International Boundary but lies entirely in Mexico, was plainly evident. The larger mesquites and more luxuriant growth of other species of plants provided ample evidence of the more moist soil conditions. The soil over this section of the Monument varies from firm silt to pebbly and rocky, hard ground, affording no habitat suitable for Giant Desert Kangaroo Rats; but in the eastern part, near Gray's Ranch the firm soil did support a small colony of Banner-tailed Kangaroo Rats, their westernmost point of record in this southern section. The vigorous vegetative growth here was also suited to certain birds, including Cardinals, which found their western limit here.

THE MOUNTAIN AREA. This area includes the rocky, hilly, mountainous parts of the Monument. Little brushy vegetation exists over the more exposed summits and rocky outcroppings, but in the shaded arroyos, especially of the Ajo Range, are to be found sizeable trees of several species. In Alamo Canyon, which, in spite of its name, contains no cottonwoods ("Alamo" being Spanish for "cottonwood") are small groves of two or more species of oak trees. This occurrence marks the only tendency in the Monument towards Upper Sonoran zonal conditions. The area is so limited, however, that few of the birds, which further eastward would be found in this association, were present. Yet some of the species, such as Cardinals, Phainopeplas, Orioles and Goldfinches, that require heavier growth for their environment, were here. The winter visitants and spring migrants in these canyon areas were interesting and the occurrence of some species such as Spotted Towhees, Juncos and Black-chinned Sparrows, was due to the congenial type of cover.

The rocky ridges of this section afforded suitable range for a small number of Mountain Sheep. Evidence of their presence was found in both the Ajo and Bates Ranges. It was in this type of rocky slopes that Rock Pocket Mice were found abundantly, and they and the sheep might be called the particular indicators for this section.

THE GUNSIGHT AREA. This area is formed by the lower slopes of the Ajo Mountains and covers the greater part of the eastern, central and southern parts of the Valley of the Ajo. Numerous mesquite-lined washes are found within this section, yet it appears to be drier than the Sonoita area and not as arid or barren as the Western area. Vast stretches of creosote bush cover the more level parts, and in some places grasses abound. Over this Gunsight area large colonies of Banner-tailed Kangaroo Rats were found, marking the westernmost limit of the species. Soils of hard-packed silt to rocky talus prevail, which are the soil types preferred by Banner-tails. Indicators might well be designated also from the list of reptiles.

This part of the report could hardly be concluded without mentioning the few watering places, natural or man-made, within the

Monument, and their influence on the fauna. Four watering troughs, one each at Bates Well, Rancho Bonito, Gray's Ranch and Alamo Canyon, are kept in constant repair, offering water to the various forms of wild life in the vicinity. About these places a substantial population of Desert Quail exists, of much greater numbers than would be the case were not constant drinking water available. No doubt the abundance of other species of birds has been increased by these sources of water.

Natural watering-places in the desert are not common. In the Organ Pipe Cactus National Monument three natural tanks or springs were made known to the writer, two of which were visited. A chain of natural tanks in the upper reaches of Alamo Canyon was seen to serve myriads of migratory doves and other birds during the writer's late spring visit, and no doubt plays an important role in the life of the Mountain Sheep. I was informed of a natural spring, called "Dripping Springs," near the center of the Monument, but was unable to visit the locality.

Perhaps the largest flow of natural water within the Monument is at Quitovaquita. Here an Indian has concentrated the flow of several springs by means of a system of ditches, into a small reservoir and uses the water to irrigate a few acres of grain and fruit trees. At this place a notable representation of visiting water birds was found. However, it should be stated that the main cause of attraction was not this small pond of less than one-half acre in extent, but the nearby flowing section of the Sonoita River that parallels the Boundary on the Mexican side for nearly twenty miles before sinking into the desert sands.

In all there are representatives of 5 orders of mammals, 15 orders of birds, 1 order of amphibians, 2 orders of reptiles and 1 order of fishes in the final tabulation of the Monument's vertebrate inhabitants that were recorded. These include 31 species and subspecies of mammals, 150 species and subspecies of birds, 4 species of amphibians, 21 species and subspecies of reptiles and 1 species of fish. All reptiles and amphibians were identified by Dr. Laurence M. Klauber, Curator of Reptiles and Amphibians, San Diego Society of Natural History.

MAMMALS

***Myotis californicus pallidus*.** DESERT LITTLE CALIFORNIA BAT. One specimen was taken under a water tank at the Growler Mine on March 2, and three others from a cleft in a rocky bank near Quitovaquita on March 5. Of the latter, two were females and one a male—the first instance in the experience of the writer of this species being found other than singly in its day roosts. As this bat is migratory, the captures provide dates of passage in this region.

Pipistrellus hesperus australis. CANYON BAT. Specimens were taken at Bates Well, Growler Mine and Quitovaquita during the months of February, April and November. This would appear to indicate spring and fall migration dates, but so little is known about these nocturnal fliers, that considerable caution must be used in expressing conclusions.

Tadarida mexicana. MEXICAN FREE-TAILED BAT. One specimen was shot on April 25 at Bates Well. At the same time several others were seen. The writer was informed that an old mining tunnel north of the Monument's boundary in the Growler Mountains harbored a colony of bats; and the presence of this species at Bates Well would indicate that the inhabitants of the tunnel were of this species.

Spilogale gracilis arizonae. ARIZONA SPOTTED SKUNK. Two specimens were collected from the rocky mountainsides at Bates Well during November. It doubtless occurs in suitable situations at many places within the Monument.

Taxidea taxus berlandieri. BADGER. Evidence of this mammal's presence was found in the shape of large-sized excavations, that descended seldom to a depth of over four feet, in the colonies of Round-tailed Ground Squirrels, Banner-tailed Kangaroo Rats and Desert Kangaroo Rats. Such signs were found over parts of the level plain near Gray's Ranch, Abra Valley, Growler Valley and the Valley of the Ajo. On the night of March 17 a Badger was plainly seen in the Valley of the Ajo, when its eyes were reflected by the spot-light of the car, in the center of the road.

Vulpes macrotis arsipus. DESERT KIT FOX. The presence of Kit Foxes was made certain when, on April 27, their tracks, well known to the writer, were found in the sandy soil about a Desert Kangaroo Rat colony in Growler Valley.

Urocyon cinereoargenteus scottii. SCOTT GRAY FOX. Common in the neighborhood of the mountain ranges. Four specimens were collected between Nov. 22 and Dec. 10, and on one occasion a Gray Fox was routed from his day bed in an ironwood tree.

Canis latrans mearnsi. DESERT COYOTE. Common throughout the Monument. Their calls could be heard almost every morning about sunrise. Three specimens were taken, on Dec. 16, 17 and 19, near the mouth of Alamo Canyon, where we used a dead horse to attract them.

Lynx rufus baileyi. DESERT WILD CAT. A specimen was collected on Dec. 7 near Rancho Bonito Well. Tracks were also seen at Bates Well, Alamo Canyon and Gray's Ranch. This species would be expected wherever sufficient cover and quail or rabbits occur.

Citellus variegatus grammurus. SAY ROCK SQUIRREL. Found scatteringly through rocky areas. An occasional Rock Squirrel was seen in Alamo Canyon and a single specimen was collected at Growler Mine on March 1.

Citellus tereticaudus neglectus. ROUND-TAILED GROUND SQUIRREL. Found living in silty or sandy areas of flat ground. A lone individual was seen out of its hole at Bates Well on Feb. 22, but these squirrels did not become active in numbers until late March and early April. Seven specimens were taken between March 17 and 23. Not recorded during the Nov.-Dec. visit, as the entire population was apparently hibernating.

Citellus harrisi harrisi. GRAY-TAILED ANTELOPE GROUND SQUIRREL. Never found abundantly, but singly, as individuals, here and there. Their chief centers of habitation were near rock-bound hills, where safe shelters were to be had. At times they were seen atop bristling-spined cholla cactus, where they sat erect to view the surrounding area. How they could negotiate the climb over the vicious thorns was always a question, for the soft pads of the feet on specimens taken in such positions never contained spines nor were there scars to indicate former difficulties. Seven specimens were collected at five stations.

Thomomys bottae growlerensis. GROWLER VALLEY POCKET GOPHER. Restricted to alluvial silt along the margins of the larger washes, where heavy mesquite growth was present. Thirty specimens were collected from the following localities: Bates Well, south-eastern end of Growler Valley, south end of Puerto Blanco Mountains, Gray's Ranch, and Quitovaquita. Numerous plants supplied food, the chief of which was *Fraseria ambrosioides*.

Perognathus amplus taylori. PIMA POCKET MOUSE. Found in fair numbers, after the middle of March, where suitable conditions existed. These were primarily amid the creosote bushes that were growing in sandy or semi-sandy soil on reasonably level ground, and not near mesquite thickets or large washes. Such conditions were found near Copper

Mountain in the Valley of the Ajo, near Bates Well, and in the open drier sections of the Sonoita Valley near Gray's Ranch. In all, 37 specimens were collected. Earliest and latest dates of capture were on March 17 and Nov. 26. By the latter date, hibernation had started for most individuals.

Perognathus baileyi baileyi. BAILEY POCKET MOUSE. Active throughout the year, but never found in numbers. Its choice of habitat is amid the creosote bushes, in drier, mesa-like locations, where the soil is often filled with pebbles. Occasionally a specimen may be captured on silty ground amongst mesquites, but this is the exception. Seven specimens were collected in four localities, namely Alamo Canyon, near Copper Mountain, Growler Mine and Gray's Ranch.

Perognathus penicillatus pricei. SAND POCKET MOUSE. Abundant on the more level sandy valley floors, in sparse mesquite-palo verde growth. Of 29 specimens preserved, the greater number were captured in the vicinity of Gray's Ranch, though smaller numbers were captured at the following places: Growler Mine, Alamo Canyon, Cipriano Well, Rancho Bonito and Bates Well.

Perognathus intermedius intermedius. ROCK POCKET MOUSE. Every rocky slope or stone-studded plateau, and every mountain range where the least vestige of annual growth could be found in the rocky crevices, was heavily populated with this mouse. Four collecting localities, which permitted trapping operations in such territory, were Growler Mine, Quitovaquita, Alamo Canyon, and Bates Well. In all, 35 specimens were preserved and many more were damaged by the traps and not saved.

Dipodomys merriami merriami. MERRIAM KANGAROO RAT. By far the most abundant and widespread mammal inhabitant of the Monument. Specimens were taken from almost every trap line set over sandy, brushy or moderately rocky ground. Only rocky outcroppings, mountain tops or very steep, rocky hillsides were without them. They were often taken in traps set at the entrance to the burrows of both the Banner-tailed and Giant Desert Kangaroo Rats, suggesting joint habitation of the burrows or perhaps expeditions for the purpose of pillooning the larger animals' stores. A total of 42 specimens was preserved, of which 40 were taken between Feb. 22 and May 11. Eleven of these were pregnant females, containing an average of 2.45 foetuses, which is not an especially prolific rate of increase. Capture of the pregnant females ranged evenly through the collecting period and offered no definite data on the breeding season.

Dipodomys spectabilis perblandus. BANNER-TAILED KANGAROO RAT. A large area along the western alluvial slopes of the Ajo Mountains from the vicinity of Copper Mountain south around the extreme southern end of the Valley of the Ajo was found to be inhabited by these large pocket rats were found within the boundaries of the Monument. Banner-tailed Kangaroo Rats have so far been reported. A small colony was also found about a mile northeast of Gray's Ranch. Seventeen specimens were collected, only one of which was a pregnant female. It was taken on March 16 and contained two large foetuses. The capture of half grown young, actively foraging on the same date, would indicate either a prolonged breeding season or that more than one brood is raised during a season.

Dipodomys deserti deserti. GIANT DESERT KANGAROO RAT. Two small areas inhabited by these large pocket rats were found within the boundaries of the Monument. One is located a mile east of Quitovaquita, near the International Boundary in the Abra Valley, and the other lies in the extreme southeastern part of the Growler Valley, about three miles southwest of the Growler Mine. Three specimens were collected, which were obtained from the Quitovaquita colony in March.

Onychomys torridus perpallidus. YUMA SCORPION MOUSE. So little is known of the habits of Scorpion or Grasshopper Mice, that it is impossible to state in more than a superficial way what their particular choice of habitat or association may be. Four specimens were taken on the survey and all were captured on dry mesa soil, amid creosote bushes, near Gray's Ranch. They were trapped with oatmeal bait which would indicate that their diet includes vegetable as well as insect food.

Peromyscus eremicus eremicus. DESERT WHITE-FOOTED MOUSE. Twenty-nine specimens were taken in four localities out of nine where trapping operations were carried on within the Monument: Alamo Canyon, Bates Well, Growler Mine and Quitovaquita.

Post-mortem examinations of five females taken during the late winter and spring visits revealed this to be the breeding season.

***Neotoma albigula albigula*.** WHITE-THROATED WOOD RAT. Well distributed over the entire Monument, the habitat of this rat included mesquite stumps, old mine buildings, tunnels, cactus patches and, especially, rock piles and large rock outcroppings on the mountainsides. Thirty-one specimens were taken from six localities. Three females taken in February were not pregnant. Of six taken in March, one contained two fetuses and two others three each. No pregnancy was found in the five specimens taken during November or December. [The Organ Pipe Cactus National Monument is so situated as to embrace the westernmost limits of the range of *Neotoma albigula albigula* and the easternmost limits of that of the lighter-colored *Neotoma albigula mearnsi*. Intergrades tending towards the latter form were occupying the valley floors, while the darker-pelaged specimens, whose affinities leaned towards the former form, were taken from the more elevated localities in the mountain ranges. Neither populations were typical of their respective races, so all are here listed as *Neotoma albigula albigula*, to which all of the specimens most nearly approach in characters.]

***Neotoma lepida harteri*.** AJO WOOD RAT. Two specimens were taken from traps set on Feb. 28 amid boulders on a hill that lay just north of the Growler Mine. Only one of this pair was preserved. The other was partly destroyed by cannibalistic wood rats. This is the only locality in which a specimen of the *lepida* group was taken, and it marks the southern limits of the range of *N. l. harteri*.

***Lepus alleni alleni*.** ANTELOPE JACK RABBIT. The writer's assistant, Philip Lichty, saw one two miles west of Quitovaquita on March 6 and two near Gray's Ranch on May 13, but was unable to secure any of them. This general region is the westernmost limit of the Antelope Jack Rabbit's range in Arizona. Both Mr. Gray and José Juan, the Papago Indian living at Quitovaquita, informed the writer that these large rabbits were rather common a few years ago but lately had almost disappeared, due, no doubt, to rabbit plague.

***Lepus californicus deserticola*.** DESERT JACK RABBIT. Found over the greater part of the plains or valley floors of the Monument. Two specimens were collected, one at Rancho Bonito in the Abra Valley and the other in the southeastern corner of Growler Valley. Comparison of these with examples of the races that occupy regions east and west of the Monument reveals them to be non-typical of either, but nearer the western race.

***Sylvilagus audubonii arizonae*.** ARIZONA COTTONTAIL. Fairly common along the wooded washes near Bates Well, Quitovaquita, Rancho Bonito, Gray's Ranch and in the mouth of Alamo Canyon. Two taken at Bates Well during November were preserved.

***Pecari angulatus sonoriensis*.** PECCARY or JAVELINA. Not uncommon over the more level portions of the Monument, but extremely shy. Fresh tracks were seen at Gray's Ranch, Rancho Bonito, Alamo Canyon wash, Bates Well and west of Growler Mine. On Dec. 1, at Rancho Bonito, Charles Harbison, my assistant during the fall visit, was returning to camp about mid-day, when he came upon an old sow and two tiny pigs. His approach had apparently startled the mother and she was seen rapidly running away, in spite of her vociferous young which could not keep up with her. The two baby Javelinas were gathered into a butterfly net and brought to camp where they were tended with gentle care. But one died on Dec. 2 and the other on the 11th. These two little pigs were extremely interesting, and the one that lived longest became so attached to Harbison that it would follow him all about the camp.

Odocoileus hemionus subsp. MULE DEER. Three reports of deer were made to me by Mr. Gray, though I never saw one myself. The first was shortly after I had established camp at Bates Well in early April, when Gray rode into camp and presented me with a deer's tail. He had found the remains of the animal a few days before in the Valley of the Ajo, where poachers had made a kill and left the hide behind. During November Gray saw a large buck when riding between Bates Well and Rancho Bonito; and again two large does were seen by him when riding range along the mesquite-filled wash west of Alamo Canyon.

***Antilocapra americana americana*.** PRONGHORN ANTELOPE. Antelopes are known to live in limited numbers over the deserts west of the Monument. Within its

boundaries, two were seen near Cipriano Well on March 1 by Mr. and Mrs. Gray. When passing this locality four days later, I found freshly used beds and fecal matter where two antelopes, probably the same ones, had rested in the sandy road since the Grays had driven over it. When I returned in the fall, I learned that Indians had killed an Antelope near Quitovaquita during the summer; but I could not determine with certainty whether the animal had been killed in the Monument or in Mexico.

Ovis canadensis subsp. BIGHORN or MOUNTAIN SHEEP. Mountain Sheep were reported by several persons as occurring on all the higher ranges within the Monument. Beds in caves used by sheep and quantities of fairly fresh fecal matter were found and examined by the writer on the Ajo Mountains and on the rocky peaks lying north of Rancho Bonito. Near the summit of the latter mountains, Harbison discovered a partial skeleton of a five or six year old ram in a cave. The skull and horns were well preserved and were saved as a specimen. However, the exact form of this sheep is not known to the writer, as specimens of the three forms that are found in this general desert region have not been available for comparison.

BIRDS

Colymbus dominicus bangsi. MEXICAN GREBE. A single specimen was collected on April 28 from the small pond at Quitovaquita and constitutes one of the few Arizona records for the species. When first seen this tiny swimmer ducked into the sheltering branches of a partly submerged willow tree, and at the same moment issued a rather loud alarm call.

Ardea herodias treganzai. TREGANZA or PALLID GREAT BLUE HERON. An individual, or perhaps one of a pair, was seen flying away from the pond at Quitovaquita several times during our stay in March.

Nycticorax nycticorax hoactli. BLACK-CROWNED NIGHT HERON. Seen and heard several times about the pond at Quitovaquita. On April 28 two were flushed from their day roost in a large heavily-leaved cottonwood tree that was growing on the edge of the pond.

Plegadis guarauna. WHITE-FACED GLOSSY IBIS. First observed as a migrant at Quitovaquita, where, on April 28, three individuals were flushed from the pond. The next day 11 were seen.

Mareca americana. BALDPATE. Three were flushed from the pond at Quitovaquita at an early hour on the morning of March 6.

Dafila acuta tzitzhoa. AMERICAN PINTAIL. Two pairs were in the midst of a mixed flock of ducks that flushed from the pond at Quitovaquita when we drove in on March 4.

Nettion crecca carolinense. GREEN-WINGED TEAL. Three pairs were in the above-mentioned flock and a single pair was seen at the same pond upon our return on April 28.

Querquedula cyanoptera. CINNAMON TEAL. A pair was in the flock of ducks mentioned above, but the greatest number seen was on March 6, when 16 individuals flew up from the pond. Cinnamon Teals were not found on our return visit.

Spatula clypeata. SHOVELLER. First seen at Quitovaquita on March 4, when a single pair was found in the mixed flock of ducks seen on that day. On April 28 two pairs were present. A lone female frequented a small reservoir during our stay at Gray's Ranch, March 19-22, and was said by Mr. Gray to have been there for three weeks previously.

Cathartes aura teter. WESTERN TURKEY VULTURE. Common and seen every day during the early and late spring visits to the Monument, but were entirely missing during the Nov.-Dec. visit.

Coragyps atratus atratus. BLACK VULTURE. A flock of over 200 was seen at Quitovaquita circling high into the air on March 6. After gaining elevation they passed out of sight towards the northeast, but were seen returning an hour later.

Accipiter striatus velox. SHARP-SHINNED HAWK. Not uncommon as spring or fall migrants, and a few remain through the winter. A specimen was taken at Quitovaquita on May 1 and another at Bates Well on Nov. 20.

Accipiter cooperii cooperii. COOPER HAWK. Regular migrant, with a few remaining during the winter. May also nest, as a bird or a pair of birds was seen with almost daily regularity not only at Quitovaquita but also at both Alamo Canyon and Gray's Ranch during our April-May visit.

Buteo borealis calurus. WESTERN RED-TAILED HAWK. Common in the Monument and observed on every visit and at all collecting stations. Several nests were found, placed in branching giant cactus. Laying apparently starts about the beginning of March, as a nest examined on March 4, near Cipriano Well, was lined with fresh grass and yucca leaves, ready for eggs.

Buteo albonotatus. ZONE-TAILED HAWK. On the afternoon of May 9, at our camp 2 miles east of Dowling Well, a Zone-tailed Hawk flew directly over my head as I sat preparing specimens. Before I could pick up my gun it had passed out of range. Another Zone-tail, or perhaps the same one, was seen flying over the mesquites at Gray's Ranch on the afternoon of May 13. This locality is about five miles east of the first-mentioned station and quite within the hunting range of a single pair of these hawks.

Parabuteo unicinctus harrisi. HARRIS HAWK. One was unmistakably seen on March 23 at Gray's Ranch.

Aquila chrysaetos canadensis. GOLDEN EAGLE. Two pairs were known to be living in the Monument and were often seen. One of these had its headquarters in the range north of Rancho Bonito and coursed the Abra Valley; the other lived in the northern end of the Ajo Mountains and hunted over the Valley of the Ajo.

Circus hudsonius. MARSH HAWK. Recorded over the Monument on all three of the visits, wherever open flat areas existed. At Quitovaquita, during the latter part of April, a Marsh Hawk was seen almost daily, which probably had its nest in the bottom lands bordering the Sonoita River just below the International Boundary.

Falco mexicanus. PRAIRIE FALCON. Seen at Gray's Ranch on March 21 and 23—on the latter occasion stooping at a brood of half-grown fowls. A pair was also seen at the entrance of Alamo Canyon. They were preying on doves during our stay in April-May. When a kill was made the falcon was seen to disappear to the southward over the mountain crest, no doubt to a nest full of young on some precipitous canyon wall.

Falco sparverius phalaena. DESERT SPARROW HAWK. A common resident. Its chief habitat was amongst the giant cactus, whose tall trunks offered not only splendid vantage points from which to watch for prey, but also provided nesting sites in the shape of either natural cavities or suitable woodpecker holes. Occupied nests were found during the April-May visit. Two specimens were secured.

Lophortyx gambeli gambeli. GAMBEL QUAIL. Common wherever suitable cover for its protection was to be found. Eight specimens were taken. Early in March, the males were heard voicing their single-noted nuptial call and this continued even after the first of May. At Rancho Bonito, during the evening of May 1, a quail kept up his nuptial call until after we went to bed at 10:30. On May 6, at Alamo Canyon, several families of newly hatched quail were seen along the mesquite-filled arroyo beyond the mountain's base. On that day, too, a female quail was flushed from her nest containing 12 incubated eggs.

Fulica americana americana. AMERICAN COOT. A single Coot came into the pond at Quitovaquita during the night of March 6 and stayed until we left the locality on March 9. When we visited Quitovaquita in late November, a number of pieces of Coot skin with feathers attached, probably the victim or victims of a local hunter, were found scattered about the pond, thus establishing the species as a fall migrant.

Oxyechus vociferus vociferus. KILLDEER. About a dozen Killdeer lived about Quitovaquita, where conditions were ideal for them. They were found at this locality each time we visited it.

Capella delicata. WILSON SNIPE. During our stay at Quitovaquita, March 4-9, from one to five Wilson Snipe could be found near the shore of the pond at any time. Upon our return visit, on April 28, a single bird was present, and it was still about on May 1 when we left. This species was not found during our visit in November.

Actitis macularia. SPOTTED SANDPIPER. Observed but once, when two birds were flushed from the pond upon our arrival at Quitovaquita on April 28.

Tringa solitaria solitaria. EASTERN SOLITARY SANDPIPER. Two of six Solitary Sandpiper specimens, taken from the pond at Quitovaquita between April 28 and 30, were of this form.

Tringa solitaria cinnamomea. WESTERN SOLITARY SANDPIPER. Four of the above-mentioned specimens collected at Quitovaquita proved to be of the western race of Solitary Sandpiper.

Catoptrophorus semipalmatus inornatus. WESTERN WILLET. On April 28, when we drove past the pond at Quitovaquita, a bunch of 27 Western Willets flew up. Next morning they were gone.

Totanus melanoleucus. GREATER YELLOWLEGS. On the evening of March 6, when I was passing the pond at Quitovaquita en route to the spring to fill the water buckets, I flushed a lone Greater Yellowlegs. This proved to be the only record for the Monument.

Erolia minutilla. LEAST SANDPIPER. About a dozen were probing the mud on the edge of the pond at Quitovaquita when we arrived on March 4. During the next three days the number varied from three or four to eight or nine. These were the only times the species was observed.

Himantopus himantopus mexicanus. BLACK-NECKED STILT. A single Black-necked Stilt was wading in the pond at Quitovaquita when we arrived on April 28. On April 29 another one joined company with it and both were present when we left on May 1.

Steganopus tricolor. WILSON PHALAROPE. On April 28 there were six Wilson Phalaropes on the pond at Quitovaquita and one was collected. Two more were collected on April 30, the last date they were observed.

Zenaidura macroura marginella. WESTERN MOURNING DOVE. One of the commonest birds of the Monument. A few had been seen at each camp on the first visit, but when we reached Bates Well on April 20 the dove migration was in progress and thereafter we encountered them abundantly at every point that we visited. By far the greatest number was seen when we were camped in Alamo Canyon between May 2 and 8. In over 30 years of ornithological observation, the writer had never seen such a concentration and parade of Mourning Doves. A general tapering down in number was noticed after May 3, as the migrants departed. Nests of the residents were found quite numerously at this time.

Melopelia asiatica mearnsi. WESTERN WHITE-WINGED DOVE. This dove is perhaps the most conspicuous bird in the cactus belt. The first arrival was seen at Bates Well on April 23. After this date they increased in abundance until, at the end of our stay in May, they were fairly abundant. Our departure came before they had occupied nests, but the mated pairs had selected their territory and were proclaiming their presence vociferously. The tops of tall giant cacti were their favorite "cooing" perches, and I often watched the males spinning around on these limited stamping grounds. They reminded me of male domestic pigeons, when they turn around and around on the small landing platforms of their cotes as they make love to their mates.

Columbigallina passerina pallescens. MEXICAN GROUND DOVE. A single specimen was collected at Gray's Ranch on May 12, which was the only record. This small dove is known from localities both east and west of the Monument, where more moist conditions prevail, and in all probability it nests regularly along the Sonoita River bottom just below the Boundary.

Geococcyx californianus. ROAD-RUNNER. Not uncommon in the Monument and recorded at every station from its peculiar tracks in fresh wind-blown sand or silty soil. A bird in Alamo Canyon was heard daily, during our April-May visit, uttering its descending mournful song. A specimen was collected on Dec. 3 at Rancho Bonito.

Otus asio gilmani. SAHUARO SCREECH OWL. Never common, but evenly distributed throughout the giant cactus area. The tremulous song was heard at every camp. Four specimens were collected. During daylight hours these owls usually resorted to old woodpecker holes or natural cavities in the giant cactus or desert trees. An exception was a bird discovered roosting in a mesquite tree in the southern end of Growler Valley on Dec. 10.

Bubo virginianus pallescens. WESTERN HORNED OWL. We never seemed to be out of ear-shot of Horned Owls at any camp, but seeing this elusive bird was quite another matter. Only once did I have an opportunity to collect one, when an adult female was flushed from its day roost in a dense mesquite at Rancho Bonito on Dec. 1.

Micropallas whitneyi whitneyi. ARIZONA ELF OWL. The first observation of this tiny owl was on May 2 at Alamo Canyon. After this date Elf Owls were recorded each evening that we were camped in the vicinity of giant cactus. It was here that they could find nesting sites or daytime retreats in old woodpecker holes. When we went "jack-lighting" Elf Owls, we usually located the birds by hearing their single call note, then found them perched on a limb, sometimes well into the center of the tree. Sometimes when the beam of light first struck the owl, it would burst forth with an excited chattering, revealing its whereabouts promptly. Six specimens were secured.

Speotyto cunicularia hypugaea. WESTERN BURROWING OWL. The unmistakable calling of a Burrowing Owl was heard during the evening of Dec. 10, when we were camping in the southern end of Growler Valley.

Asio wilsonianus. LONG-EARED OWL. On Dec. 10, while I was hunting in the southeastern end of Growler Valley, three Long-eared Owls were flushed from their day roost in a small grove of mesquite trees and one was collected.

Phalaenoptilus nuttalli adustus. SONORA POOR-WILL. During the early summer visit, Poor-wills were found at every camp. At Bates Well they were abundant and specimens collected there proved to be breeding. At Gray's Ranch, a series of low rocky hills provided ideal habitat for Poor-wills. At least two pairs occupied this territory and on May 12 a pair with two nearly grown young was located exactly on the International Boundary line.

Chordeiles acutipennis texensis. TEXAS NIGHTHAWK. The first Texas Nighthawk recorded for the season was seen at Quitovaquita on the evening of March 8. This bird was the vanguard of a host to follow, for later the species was a common breeder. One specimen was collected at Gray's Ranch on May 14.

Chaetura vauxi. VAUX SWIFT. The first observation of the northward migration of the Vaux Swift was a lone individual on April 23 at Bates Well. Two more were seen, of which one was collected, on May 6 near the mouth of Alamo Canyon.

Aeronautes saxatalis saxatalis. WHITE-THROATED SWIFT. The steep cliffs of the walled canyons of the Ajo Mountains provide an ideal home for the White-throated Swift. It was observed several times in Alamo Canyon both in spring and in winter. On Dec. 14 the sight was truly spectacular. The higher air was fairly teeming with White-throated Swifts—hundreds and hundreds of them, darting about capturing insects that had been carried from the canyon by an up-draught of wind.

Calypte costae. COSTA HUMMINGBIRD. The abundant growth of spring flowers during the 1939 season was most propitious for the presence of this hummingbird, and it was found on each of our visits. Specimens were taken in February, March and December. At Quitovaquita on March 7 a female was seen engaged in building operations, and a nest containing two fresh eggs was found in Alamo Canyon on May 5. In early May, too, many young of the year were observed feeding among the flowers. The presence of these juveniles and the finding of nests with fresh eggs at the same time gave rise to speculation as to whether there had been a double nesting program for this region that year or whether perhaps some pairs had been disturbed earlier in the flats below and had moved up into the canyon to try again.

Calypte anna. ANNA HUMMINGBIRD. Two specimens were taken in Alamo Canyon on Dec. 14 and 18. Both were young birds, hatched the previous spring, and illustrate the vagrant habits of first year birds.

Selasphorus rufus. RUFOUS HUMMINGBIRD. A male was collected in Alamo Canyon on March 17. This date corresponds with the time Rufous Hummingbirds pass in migration along the Pacific coast. Two other Rufous Hummingbirds were observed in Alamo Canyon, one on March 14 and the other on March 16.

Megaceryle alcyon caurina. WESTERN BELTED KINGFISHER. A lone Belted Kingfisher was seen about the small pond at Quitovaquita on April 28. A second observation of a Kingfisher on May 2 in dry Alamo Canyon was very surprising. Its rattling call as it

flew up the wash attracted the attention of a Western Kingbird, which vigorously attacked it.

Colaptes cafer collaris. RED-SHAFTED FLICKER. Seen sparingly during the winter. It was collected at Bates Well on Nov. 16 and was noted at each camp during the Nov.-Dec. visit. The latest date of record was Feb. 24, at Growler Mine.

Colaptes chrysoides mearnsi. MEARN'S GILDED FLICKER. Common resident; eight specimens collected. The population centered in the giant cactus belt, where not only were nesting sites available, but protected retreats in which to roost.

Centurus uropygialis uropygialis. GILA WOODPECKER. To the Gila Woodpecker may go the credit of being the noisiest resident of the Monument. Gilas share the giant cactus belt with the Gilded Flickers, but, unlike the flickers, the Gilas prefer the proximity of man. Wherever there is an adobe house, a well or a corral, there is surely to be found a pair of Gilas. Five specimens were collected.

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER. During the Nov.-Dec. visit, three specimens were taken, one each at Bates Well, Quitovaquita, and Alamo Canyon. All were females. The species was thus established as a winter visitant generally through the Monument, where trees of sufficient size for its needs were growing.

Dryobates scalaris cactophilus. CACTUS WOODPECKER. Met with frequently and specimens taken in February, March, November and December. Its habitat was most generally found to be amongst the ocotillos on the drier hill-slopes, though at times it foraged through the mesquites that grew along the washes. Several old nest cavities were found drilled in the blossom stems of Spanish bayonet, which in the writer's experience is the most favored nesting site of the Cactus Woodpecker.

Tyrannus verticalis. WESTERN KINGBIRD. Fairly abundant during the spring migration, but after the wave had passed only a few pairs remained. A breeding pair was found at each of the following localities during the April-May visit: Bates Well, Quitovaquita, Rancho Bonito, Alamo Canyon and Gray's Ranch. One specimen was taken at Bates Well on April 22.

Myiarchus tyrannulus magister. ARIZONA CRESTED FLYCATCHER. The first Arizona Crested Flycatcher was seen perched on top of a giant cactus near the mouth of Alamo Canyon on May 6. From this date on, they were found fairly commonly throughout the sahuaro association. Four specimens were collected. Near Gray's Ranch, on May 11, a pair was seen flying in and out of a woodpecker hole in a tall giant cactus. They appeared to be building their nest.

Myiarchus cinerascens cinerascens. ASH-THROATED FLYCATCHER. Found along the mesquite-lined washes throughout the year, although there is an increase in numbers during the spring and summer. Any cranny in the trunk of a tree or old woodpecker hole in a cactus serves as a nesting site. Specimens were collected on each of the visits.

Sayornis nigricans nigricans. BLACK PHOEBE. At the various cattle troughs and at Quitovaquita, one was certain to find a lone Black Phoebe, during the winter, catching insects over the water. A specimen was taken at Bates Well on Feb. 28.

Sayornis saya saya. SAY PHOEBE. Seen about rocky canyons and on open cactus-covered tracts, being more numerous in the winter. Specimens were taken in March and November. During our February stay at Bates Well an individual came regularly each evening at sundown to roost in a tunnel. During the April-May visit two occupied nests were found in old wells—one near Quitovaquita and the other near Dowling Well.

Empidonax hammondi. HAMMOND FLYCATCHER. A single individual was collected in Alamo Canyon, on May 2. No doubt this flycatcher passes through the Monument regularly on migrations.

Empidonax griseus. GRAY FLYCATCHER. Found only during a short period in late fall and at one locality, namely Bates Well. Here, on Nov. 17, 22 and 23, a specimen was taken each day. They were encountered singly on the drier fringes along the mesquite-lined washes, and were very wild. No doubt the species was southward bound and would have been met at other similar places during the same period.

Empidonax difficilis difficilis. WESTERN FLYCATCHER. Abundant spring migrant and found commonly through the mesquites at all stations visited between April 24 and May 12. A number of specimens was taken between these dates.

Myiochanes richardsoni richardsoni. WESTERN WOOD PEWEE. Seen at Alamo Canyon on May 5, 7, 8 and 9, and one specimen taken on the first date.

Pyrocephalus rubinus flammeus. ARIZONA VERMILION FLYCATCHER. Found sparingly along the southern boundary of the Monument. One specimen was collected. A handsome male at Quitovaquita claimed all insect-catching rights over the small pond and tried continuously to chase away a Black Phoebe that was wintering there. Nesting pairs were observed at both Gray's Ranch and Quitovaquita during our late spring visit, and at Gray's Ranch the dainty nest was located, on May 10, typically situated about 14 feet above the ground on a horizontal fork of a large mesquite. It was well within the tree, protected from the hot sun, and contained two tiny nestlings, which were constantly attended by both parents.

Tachycineta thalassina lepida. VIOLET-GREEN SWALLOW. Observed in migration at Quitovaquita on March 4, when numbers were seen coursing over the fields and over the pond.

Iridoprocne bicolor. TREE SWALLOW. A number seen at Quitovaquita during our first visit. One specimen was collected there on March 6.

Stelgidopteryx ruficollis serripennis. ROUGH-WINGED SWALLOW. Rough-winged Swallows of both sexes were collected at Quitovaquita on April 28 and at Gray's Ranch on May 13. The presence of apparently mated pairs coursing over the fields at Gray's Ranch in mid-May seemed ample evidence that the species was nesting in the vicinity—in all probability along the banks of the Sonoita River just below the Boundary.

Hirundo erythrogaster. BARN SWALLOW. Seen in company of other species of migrating swallows during late April and early May at both Quitovaquita and Gray's Ranch.

Petrochelidon albifrons albifrons. NORTHERN CLIFF SWALLOW. Seen feeding abundantly over the fields about Quitovaquita and Gray's Ranch after the migrating flocks had passed, thus offering evidence that nesting colonies lived not far distant. One specimen taken.

Aphelocoma californica woodhousei. WOODHOUSE JAY. One female, collected on Nov. 18 at Bates Well, and another bird seen on the following day at the same locality constituted the only records.

Corvus corax sinuatus. AMERICAN RAVEN. Several pairs were resident within the Monument and a bird or pair of birds was seen almost every day during all visits made. A single specimen was collected at Alamo Canyon on Dec. 14. It was caught in a trap set for coyotes.

Auriparus flaviceps acaciaram. ARIZONA VERDIN. Resident throughout the Monument wherever mesquite trees were growing, and several specimens collected. The small globular nests were kept in repair and used for roosting during all seasons.

Troglodytes domesticus parkmanii. WESTERN HOUSE WREN. Fairly common winter visitant. Several specimens were taken. The latest spring record was at Quitovaquita where a bird was shot on March 4, and the first winter record was a specimen collected at Bates Well on Nov. 17.

Thryomanes bewicki eremophilus. BAIRD WREN. A single female specimen was taken at Bates Well on Nov. 20. Baird Wrens are regular, though not common, winter visitors to the southwestern deserts, and had more time been spent in the Monument during the colder part of the winter season, there would perhaps have been more observations of this species.

Heleodytes brunneicapillus couesi. NORTHERN CACTUS WREN. Not as abundant as would be expected. Their choice habitat amongst the cholla cactus was occupied commonly by Palmer Thrashers and the competition appeared to be too much for the wrens. The greatest abundance was about Rancho Bonito, where old nests were seen in the crotches of giant cactus, mesquite trees and cholla cactus. This bird, like the Verdin, keeps a nest in full repair at all times for roosting and but a single bird occupies the roosting nest. Four specimens were collected.

Telmatodytes palustris plesius. WESTERN MARSH WREN. A single male specimen was collected at Quitovaquita on March 7. Two others were seen at the time, marking the only occurrence of the species that came under our observation.

Catherpes mexicanus conspersus. CANYON WREN. Present wherever cliffs or steep canyon-sides existed. One specimen was collected near Bates Well on Nov. 15. A nest was found, located in a crevice in the face of a cliff, in Alamo Canyon on March 12. The contents could not be seen, but the actions of the parents indicated young.

Salpinctes obsoletus obsoletus. ROCK WREN. The most generally distributed wren in the Monument. It was found inhabiting canyon-sides and even well out along washes that issued from rock-bound canyons. Three specimens were taken.

Mimus polyglottos leucopterus. WESTERN MOCKINGBIRD. Present in fair numbers wherever there was sufficient cover. Three specimens were taken. A nest with three eggs, situated in a dense fruitea bush, was found near Gray's Ranch on May 11.

Toxostoma curvirostre palmeri. PALMER THRASHER. Found nesting in numbers within the Monument. The area marks the westernmost limit of its breeding range and to find it so abundant was remarkable. Evidently the number was nothing irregular, for almost every cholla cactus of any size held an old nest, indicating the continued abundance of the species for many years. The nesting season is of long duration for desert birds. A pair was seen building a nest at the Growler Mine on Feb. 24 and a nest with eggs was found in Alamo Canyon on May 2. At this latter locality during our first visit in March several occupied nests were located. These thrashers appear to be resident and to remain paired, for during the Nov.-Dec. visit pairs were found in about the same general vicinity that they had occupied and nested in during the spring. A number of specimens was secured.

Toxostoma lecontei lecontei. LECONTE THRASHER. A very wild, shy bird, which was twice observed, once on Feb. 22 about four miles west of Growler Mine, and again on Nov. 26 about eight miles north of Cipriano Well. Both were in the creosote bush association.

Toxostoma dorsale dorsale. CRISSAL THRASHER. Found in several places—Bates Well, Quitovaquita, along the large wash in the Valley of the Ajo, along the well-wooded washes about Gray's Ranch and at the south end of the Puerto Blanco Range. Specimens were taken in March, April, November and December. The nesting season commences early. On March 5 a nest containing one fresh egg was found at Quitovaquita, and on April 25, at Bates Well, a fully feathered bird of the year was collected. The tail and flight feathers were completely grown out and the bird was already on its own, unattended by either parent.

Oreoscoptes montanus. SAGE THRASHER. A winter visitant. Specimens were taken at Rancho Bonito on Dec. 7 and at Gray's Ranch on March 22.

Turdus migratorius propinquus. WESTERN ROBIN. When I visited Bates Well on Feb. 22, a flock of over 200 Western Robins was there, and two were collected. They were feeding on mistletoe berries. The species was last seen in the spring when we left Growler Mine on March 4. Upon our return on Nov. 15, a lone Robin was seen near Bates Well and two others at the same locality three days later. Another single Robin was seen at Rancho Bonito on Dec. 1.

Hylocichla guttata guttata. ALASKA HERMIT THRUSH. A Single female was collected at Bates Well on Nov. 25.

Hylocichla guttata slevini. MONTEREY HERMIT THRUSH. On April 22, at Bates Well, two small, pale-colored thrushes were seen and one was collected. It proved to be a Monterey Hermit Thrush and is the only spring hermit thrush record.

Hylocichla ustulata ustulata. RUSSET-BACKED THRUSH. During the period of May 5-8, numbers of Russet-backed Thrushes were present in Alamo Canyon, and six specimens were collected, all males. The migration wave of this species is usually of very short duration.

Myadestes townsendi. TOWNSEND SOLITAIRE. A lone Townsend Solitaire was collected on March 15 at Alamo Canyon.

Polioptila caerulea amoenissima. WESTERN GNATCATCHER. Found commonly as a winter visitant during the Nov.-Dec. visit and three specimens taken.

Polioptila melanura lucida. ARIZONA BLACK-TAILED GNATCATCHER. The common resident gnatcatcher and found at every station visited. Four specimens taken. It nests early

and after the first week of April family parties were found scattered through the mesquites. A nest tucked in a clump of dead mistletoe was found on April 22. The three young were all ready to leave and did so when I looked in.

Corthylio calendula calendula. EASTERN RUBY-CROWNED KINGLET. Observed or collected, as a winter visitant, in many localities. Extreme dates of capture were Nov. 15 and April 24.

Bombycilla cedrorum. CEDAR WAXWING. A single specimen was collected on Nov. 30 at Quitovaquita. This proved to be the only waxwing seen or heard.

Phainopepla nitens lepida. PHAINOPEPLA. Abundant and present at all seasons. Four specimens were collected. During the spring visits many nests were found. The hatching season was from the middle of April until the end of the first week of May. Both parents incubate the eggs and care for the young.

Lanius ludovicianus sonoriensis. SONORA WHITE-RUMPED SHRIKE. This is the resident form and it is not common. Two specimens were taken in March and two in November. During the spring visits, it was seen at only three scattered localities, a pair at each. These were: Quitovaquita, near Rancho Bonito, and near the south end of the Puerto Blanco Mountains.

Lanius ludovicianus gambeli. CALIFORNIA SHRIKE. During our winter visit, in Nov.-Dec., the Monument was found to be fairly well populated with visiting shrikes from the north. However, they were extremely wild and but two specimens were collected.

Vireo belli arizonae. ARIZONA LEAST VIREO. On May 10, at the station located 2 miles east of Dowling Well and about 50 yards north of the Mexican Boundary in Sonoita Valley, an Arizona Least Vireo, in full song, came into camp and was collected. This represented the only occurrence of this vireo within the Monument.

Vireo solitarius cassini. CASSIN VIREO. The collecting of three female specimens, two at Bates Well on Nov. 16 and 20 and the other at Rancho Bonito on Dec. 2, would indicate that these birds were wintering in the Monument.

Vireo gilvus swainsoni. WESTERN WARBLING VIREO. Among the most abundant spring migrants through the mesquites along the desert washes. The first one taken for the season was at Bates Well on April 22, and from that date the species was seen at every station and on almost every day until we left the Monument on May 14.

Vermivora celata orestera. ROCKY MOUNTAIN ORANGE-CROWNED WARBLER. Two specimens were taken at Bates Well on April 21 and 26.

Vermivora celata lutescens. LUTESCENT WARBLER. Two specimens, collected in Alamo Canyon on March 15, were among the vanguard of the host of migrating warblers that was soon to follow.

Vermivora luciae. LUCY WARBLER. A fairly common breeder in the mesquite association. The first specimen for the season was collected at Gray's Ranch on March 22 and apparently had but recently arrived from its southern wintering grounds. Three nests were found during early May. At that time, the three young which each nest held were about to leave.

Dendroica aestiva rubiginosa. ALASKA YELLOW WARBLER. A single male of this race was taken at Gray's Ranch on May 12. This date was practically the end of our activity in the Monument, which may well account for our failure to obtain other examples of this late passing species.

Dendroica auduboni auduboni. AUDUBON WARBLER. Common and widespread during the winter and early spring. Specimens were obtained and observations made at all points visited in the Monument. The earliest and latest dates of capture were: Nov. 27 at Quitovaquita, and April 27 at Bates Well.

Dendroica nigrescens. BLACK-THROATED GRAY WARBLER. Two examples, one female at Rancho Bonito on May 1 and another female at 2 miles east of Dowling Well on May 9, were taken.

Dendroica townsendi. TOWNSEND WARBLER. First observed on its northward journey at Bates Well on April 25, when a bright male was collected. Toward the end of this visit the species was abundant and six specimens were taken between May 6 and 13.

Dendroica occidentalis. HERMIT WARBLER. Appeared at about the same time as the Townsend Warbler, though not nearly so abundantly. Of both species, the males seem to arrive first. A full plumaged male, taken at Bates Well on April 22, and a female at Gray's Ranch on May 13, mark the extreme dates of capture.

Oporornis tolmiei. MACGILLIVRAY WARBLER. Found in migration amid the mesquite, and three specimens taken, at Bates Well on April 24 and 25, and again observed at 2 miles east of Dowling Well on May 9.

Geothlypis trichas occidentalis. WESTERN YELLOWTHROAT. At the Quitovaquita pond on April 28, 29, and 30, five male Western Yellowthroats were collected. These migrants proved to be of this form.

Wilsonia pusilla pileolata. NORTHERN PILEOLATED WARBLER. Birds of the *Wilsonia pusilla* group were seen from March 15 to May 11. Of eight specimens taken, six were of this form. The extreme dates were: a male collected at Bates Well on April 21, and a male and female taken at Alamo Canyon on May 6.

Wilsonia pusilla chryseola. GOLDEN PILEOLATED WARBLER. Two specimens of the above-mentioned eight proved to be *Wilsonia pusilla chryseola*. One was collected at Alamo Canyon on March 15, and the other on April 25 at Bates Well. Both were males.

Passer domesticus domesticus. ENGLISH SPARROW. Thoroughly established in the Monument. Colonies were found at Bates Well, Growler Mine, Quitovaquita and Gray's Ranch. A number of specimens were taken.

Sturnella magna liliana. LILIAN MEADOWLARK. A single male specimen was collected at Gray's Ranch on March 21 and marks the most westerly record of this race.

Sturnella neglecta. WESTERN MEADOWLARK. Recorded and specimens collected at three localities—at the south end of Growler Valley on Dec. 9, at Quitovaquita on Nov. 27-29, and March 7-8, and at Gray's Ranch on March 21.

Xanthocephalus xanthocephalus. YELLOW-HEADED BLACKBIRD. A single adult male was taken at Quitovaquita on April 28.

Agelaius phoeniceus sonoriensis. SONORA RED-WINGED BLACKBIRD. The first specimen, an adult male, collected near the pond at Quitovaquita on March 4. Another male was collected at Bates Well on April 21. But the greatest numbers were seen, and from the lot a few specimens taken, at Quitovaquita and Gray's Ranch during the last days of April and the first of May. Dissection revealed that they would not have been nesting until late May or early June.

Icterus cucullatus californicus. ARIZONA HOODED ORIOLE. Common nesting birds in the mesquites. First record of arrival from the south was at Gray's Ranch on March 23, when a full-plumaged male was taken. Nesting pairs were seen at Bates Well, Alamo Canyon, Quitovaquita, Rancho Bonito, 2 miles east of Dowling Well and Gray's Ranch.

Icterus bullocki. BULLOCK ORIOLE. Common migrants. Two male specimens were taken at Alamo Canyon on March 11 and 17. A single pair was found nesting at Quitovaquita on April 28. Other Bullock Orioles were seen at 2 miles east of Dowling Well and at Gray's Ranch during late April and early May.

Cassidix mexicanus nelsoni. NELSON GREAT-TAILED GRACKLE. On May 14, during the last few hours of our summer visit, we saw and collected, in Alamo Canyon, a strange black bird at the water-trough. It was sent to Dr. Alexander Wetmore of the U. S. National Museum who identified it as of this species.

Molothrus ater obscurus. DWARF COWBIRD. First seen and collected at Quitovaquita on April 30. They were then in company of Red-winged Blackbirds. Later they were seen at other localities searching for nests of small birds in which to deposit their eggs. There were generally three or more individuals in one group, often two males and one female, and they were comparatively shy and hard to approach. A female in laying condition was taken at Alamo Canyon on May 2.

Tangavivus aeneus milleri. BRONZED COWBIRD. Early on the morning of May 14, at Gray's Ranch, a pair of Bronzed Cowbirds came into a tree near camp. A long shot dropped the male, which proved to be in breeding condition. It represents the westernmost record for the species.

Piranga ludoviciana. WESTERN Tanager. Western Tanagers came through in a great wave. The first seen was on April 21 at Bates Well, and they were then recorded in increasing numbers at each station visited until we left on May 14. Four specimens were secured.

Richmondia cardinalis superba. ARIZONA CARDINAL. Present at Bates Well (2 pairs), Rancho Bonito (1 pair), Alamo Canyon (3 pairs), and south end of the Puerto Blanco Mountains (1 pair). A nest, containing three heavily incubated eggs, was found at Bates Well on April 22. Several of the pairs found during April and May were still in the same location in November and December. Three males were taken.

Hedymeles melanocephalus papago. ROCKY MOUNTAIN BLACK-HEADED GROSBILL. Seen as migrants, though may possibly nest in Alamo Canyon. Specimens collected there on May 2 and 3, however, showed no signs of breeding, nor did another bird taken on May 9 at 2 miles east of Dowling Well. All were feeding on squaw berries (*Lycium*).

Guiraca caerulea interfusa. WESTERN BLUE GROSBILL. A single specimen was taken at Quitovaquita on April 30 and another was seen there on May 1. They were feeding in a field of nearly ripened wheat.

Passerina amoena. LAZULI BUNTING. First seen at Bates Well on April 22 and fairly common at Quitovaquita, in the Indian's wheat field, at the end of the month. The last record was of a small migrating flock seen at Alamo Canyon on May 8. Specimens were taken on April 22, 24 and 28.

Carpodacus mexicanus frontalis. HOUSE FINCH. Common resident and during our spring visit nesting pairs were found at almost every station. A brood of young with wings and tails fully grown was found at Alamo Canyon on May 6. During the Nov.-Dec. visit, vagrant flocks were observed. Specimens were taken on each visit.

Spinus psaltria hesperophilus. GREEN-BACKED GOLDFINCH. Seen sparingly in small groups during the first visit. At Bates Well, on Feb. 22, five individuals were seen drinking from a dripping faucet beneath the water tank. One specimen was collected at Bates Well on April 21. A nest was found, containing four young ready to leave, at Alamo Canyon on May 7.

Oberholseria chlorura. GREEN-TAILED TOWHEE. Perhaps the most generally distributed winter visitor. While never in concentrated numbers, it was found singly in almost every place where vegetation was dense enough to give it shelter. There seemed to be two populations that changed places during early spring—those that had wintered in the area, and the northbound migrants that invaded the region toward the latter part of April. Migration was in progress when we left on May 14 and again when we returned on Nov. 15. Specimens were taken both spring and fall.

Pipilo maculatus montanus. SPURRED TOWHEE. A male specimen was collected in Alamo Canyon on Dec. 13 and another was seen on Dec. 14. They were wanderers from more northerly sections.

Pipilo fuscus mesoleucus. CANYON TOWHEE. Several resident pairs were found both at Bates Well and at Alamo Canyon. Specimens were collected at each place, establishing the westernmost record for the species in the southwestern deserts.

Calamospiza melanocorys. LARK BUNTING. Found as a migrant near Rancho Bonito on May 1, when a flock estimated to contain between 150 and 200 birds was seen and several specimens collected. During the winter trip a few scattered individuals were found in the southeastern end of Growler Valley. Three specimens were collected there, Dec. 10-11.

Passerculus sandwichensis anthinus. WESTERN SAVANNAH SPARROW. Quitovaquita was the only place that offered any attraction for Savannah Sparrows. Three specimens were taken there, all of different subspecies. One of them, collected on March 4, was of this form—a far vagrant from the Alaskan coast region.

Passerculus sandwichensis nevadensis. NEVADA SAVANNAH SPARROW. Another of the above-mentioned three specimens, collected on Nov. 29, belonged to the form that nests in the Great Basin, not far distant to the north.

Passerculus sandwichensis brooksi. BROOKS SAVANNAH SPARROW. The third specimen was a rather surprising take, far to the east of its normal coastal range. It was collected on Nov. 29 near the pond.

Poocetes gramineus confinis. WESTERN VESPER SPARROW. Found as a winter visitor in the areas where dry grasses were present or where the galleta grass was growing on open flats. Specimens were collected at 2 miles northeast of Bates Well, Quitovaquita, the south end of Puerto Blanco Mountains and Gray's Ranch. Extreme dates were Nov. 15 and March 20.

Chondestes grammacus strigatus. WESTERN LARK SPARROW. Resident, though in very limited numbers. A pair was seen at Growler Mine on Feb. 24, and another pair at Quitovaquita had a nest in a pomegranate grove in the Indian's garden. Two specimens were taken in November.

Amphispiza bilineata deserticola. DESERT SPARROW. Resident and well distributed. By the end of March nest construction was well under way. During winter there was a great influx from the north, which bunched up with Brewer and Chipping Sparrows and wandered over the flats in large flocks. Several specimens were secured.

Amphispiza nevadensis nevadensis. NEVADA SAGE SPARROW. Very few were seen. Dates and localities of the three specimens collected were: Growler Mine, Feb. 27; Bates Well, March 2; and Quitovaquita, March 5.

Amphispiza nevadensis canescens. CALIFORNIA SAGE SPARROW. A single individual was taken from a flock of five seen near the springs at Quitovaquita on Nov. 28.

Junco hyemalis hyemalis. SLATE-COLORED JUNCO. A single specimen was collected in Alamo Canyon on March 13. The rather steep-walled canyons of the Ajo Mountains, with their shrub-filled bottoms and partially chaparraled slopes, were ideal for wintering juncos of several species.

Junco oreganus shufeldti. SHUFELDT JUNCO. The most common junco, and the only one found away from sheltered canyons of the Ajo Mountains. Specimens were taken at Bates Well in February, March, November and December, and in Alamo Canyon in March and December.

Junco oreganus mearnsi. PINK-SIDED JUNCO. Two specimens were taken from different flocks of juncos in Alamo Canyon, one on Dec. 13 and the other on the 14th.

Junco caniceps caniceps. GRAY-HEADED JUNCO. Fairly abundant in the Ajo Mountains. Six specimens were collected and many more seen. The extreme dates of capture were Dec. 13 and March 10.

Spizella passerina arizonae. WESTERN CHIPPING SPARROW. Fairly common and widespread during winter. Found associated with juncos in the Ajo Mountains and with Brewer Sparrows at other localities. Two females in breeding condition were taken in Alamo Canyon on May 7 and 8, providing evidence that a small nesting population remained where conditions were favorable.

Spizella breweri breweri. BREWER SPARROW. Found commonly over the open creosote bush flats during winter. They were frequently associated with Desert Black-throated and Chipping Sparrows, and formed congregations of often over a hundred birds. Extreme dates of capture, both at Bates Well, were Nov. 15 and April 22. Other localities where specimens were taken were Quitovaquita and Rancho Bonito.

Spizella atrogularis atrogularis. MEXICAN BLACK-CHINNED SPARROW. Two specimens were taken in upper Alamo Canyon on Dec. 15, and another in the same locality on Dec. 18. They were found in the company of Chipping Sparrows and juncos.

Zonotrichia leucophrys leucophrys. WHITE-CROWNED SPARROW. In keeping with the reputation of this species as a late spring migrant, white-crowned sparrows taken on April 25 at Bates Well and on May 12 at Gray's Ranch were of this form. At this latter date almost all the *Zonotrichia* seen were *leucophrys*, while those seen on or before April 25 were largely *gambeli*.

Zonotrichia leucophrys gambeli. GAMBEL SPARROW. Found wintering commonly. It occurred in small flocks foraging in the more densely wooded washes. Earliest and latest dates based on specimens, both at Bates Well, were Nov. 15 and April 22.

Melospiza lincolni lincolni, MOUNTAIN LINCOLN SPARROW. Widely distributed during spring migration, though never abundant. Their passing was of short duration, the first specimen being taken at Bates Well on March 2 and the last at Alamo Canyon on March 16.

Melospiza melodia merrilli, MERRILL SONG SPARROW. So uninviting is the Monument to Song Sparrows, that it was with surprise that I shot a specimen at Quitovaquita on Nov. 28. It was found to belong to the race that occupies, during summer time, the northern portion of the Great Basin in eastern Washington and Idaho.

REPTILES AND AMPHIBIANS

Scaphiopus couchii, SONORAN SPADEFoot TOAD. Two specimens were taken from the bottom of a prospect shaft, 10 feet deep, near Bates Well on Nov. 24.

Bufo alvarius, GIANT TOAD. Two were found resting on a floating board in the well, 25 feet below the surface of the ground at Rancho Bonito. After considerable fishing with an improvised dip net, one was collected on Dec. 8.

Bufo punctatus, DESERT SPOTTED TOAD. Five specimens were collected from small ponds in the creek bed in Alamo Canyon on March 16. Egg-laying had not yet commenced, as two pairs were clasping, awaiting either more water in the creek or warmer weather. Two immature specimens were collected from a natural tank in Grass Canyon, Ajo Mountains, on Dec. 13.

Bufo cognatus, GREAT BASIN TOAD. Four specimens were collected from the irrigated grain field at Quitovaquita, on April 28-30.

Coleonyx variegatus, WESTERN GECKO. Found by lantern light about 9 o'clock on the evenings of May 8 and 9, in a sandy wash 2 miles east of Dowling Well. Also found under loose rocks on a damp hillside at Bates Well on Nov. 17 and 24.

Dipsosaurus dorsalis dorsalis, DESERT CRESTED LIZARD. One specimen was taken from an *Atriplex* association at Gray's Ranch on March 22 and another at the same locality on May 11. At Quitovaquita, in the mesquite-creosote bush association, two specimens were collected on April 29.

Sauromalus obesus, CHUCKWALLA. Two specimens were taken at Alamo Canyon on March 10. These were the first ones seen for the season, and no doubt many more could have been taken in the rocky terrain of the Monument during the warmer weather of the summer.

Crotaphytus wislizenii, LEOPARD LIZARD. One specimen was taken on a mesquite-covered flat at Bates Well on April 25 and another was found in creosote bush-malpais association at Gray's Ranch on May 11.

Callisaurus ventralis ventralis, DESERT ZEBRA-TAILED LIZARD. One of the more common species, occurring generally over the open flat terrain of the Monument. In all, 38 specimens were collected. They were found on pebbly, flat ground, where mesquites and creosote bushes were growing, or in sandy washes. The first specimens were collected on March 13 and they became progressively more numerous as warmer weather arrived. Apparently they had gone into hibernation by November, as they were not represented in the early winter collection.

Uta ornata symmetrica, ARIZONA ROCK UTA. Abundant in almost every locality, and active at all times. It was found at every camp, and 46 specimens were taken. At Bates Well my assistant hung his coat in a mesquite tree in camp and did not disturb it for a week. When the coat was removed, no less than four specimens of this lizard were captured in the pockets and several others escaped.

Uta stansburiana stejnegeri, DESERT SIDE-BLOTCH LIZARD. Like the preceding, this lizard was abundant and occurred at every camp we made. It was found in almost every type of association and during the fall trip some were captured when rocks were overturned. In all 31 specimens were preserved.

Sceloporus magister magister, DESERT SCALY LIZARD. Three specimens were taken from as many localities between March 4 and May 3. Two were found in mesquite

trees and one in a pile of boulders. From the three localities—Quitovaquita, Rancho Bonito and Alamo Canyon—it would be surmised that the species was fairly well distributed over the Monument.

Sceloporus clarkii clarkii. CLARK SCALY LIZARD. Two specimens were collected, both of which were found in mesquite trees. One was taken at Gray's Ranch on March 20 and the other at Bates Well on April 25.

Phrynosoma solare. REGAL HORNED TOAD. Found at two localities, but unquestionably occurred also in other open gravelly sections. Seven specimens were collected: four at Bates Well and three at Alamo Canyon. Catches were about equally divided between Nov.-Dec., and April-May.

Heloderma suspectum. GILA MONSTER. The capture of two specimens, one at Bates Well on April 25 and the other at Gray's Ranch on May 11, establishes another record of the Gila Monster toward the westward edge of its range.

Cnemidophorus tessellatus tessellatus. DESERT WHIPTAIL LIZARD. Fairly common in sandy or gravelly areas, especially where some brush occurred. Nineteen specimens were taken. Found at Gray's Ranch during the last few days of the first visit and at all the camps during the late spring visit.

Coluber piceus. BLACK WHIPSNAKE. A single specimen was collected in the south end of the Valley of the Ajo on May 4.

Coluber flagellum frenatus. RED RACER. A specimen was collected at mid-day from a sandy wash 2 miles east of Dowling Well on May 9.

Phyllorhynchus browni browni. PIMA LEAF-NOSED SNAKE. A single specimen was collected in a sandy wash 2 miles east of Dowling Well on May 9. It was found by lantern light and was very agile in its movements. The capture of this specimen extends the known range of the species to the westward.

Pituophis sayi affinis. ARIZONA GOPHER SNAKE. About noon on April 28, while the writer was busily preparing specimens at Quitovaquita, a large Arizona Gopher Snake came into camp and was captured. When opened, eight Desert Quail eggs, containing young almost ready to hatch, were found in its stomach. The eggs were all unbroken, but the gastric juices had bleached out most of the mottling on their shells.

Crotalus molossus molossus. BLACK-TAILED RATTLESNAKE. One specimen was collected in the jojobe association on the upper slopes of the Alamo Mountains on Dec. 17. This is, with one exception, its westernmost point of occurrence to date.

Crotalus atrox. DESERT DIAMOND RATTLESNAKE. On March 19 in a sandy wash near the south end of the Puerto Blanco Mountains, I heard the whirr of a rattlesnake about 20 feet distant. It was captured and, when opened, a full-grown Bailey Pocket Mouse was found in its stomach.

Crotalus cerastes. SIDEWINDER. Two records were made during the survey, representing early and late dates. A very small Sidewinder was found resting under a bush in the south end of Growler Valley on April 27, and on Nov. 15 an individual was found freshly crushed on the road, just north of Bates Well.

Crotalus scutulatus scutulatus. MOHAVE RATTLESNAKE. Three specimens were taken. One collected at Gray's Ranch on March 21 was tracked down after a slight sprinkle of rain had laid the dust. It had caught and eaten a Round-tailed Ground Squirrel. Another specimen in a fresh condition was found crushed on the highway in the Valley of the Ajo on March 24. The third was collected near the roadside at mid-afternoon on April 27, in the south end of Growler Valley.

Gopherus agassizii. DESERT TORTOISE. Numbers of empty shells were found at different localities—Rancho Bonito, Quitovaquita and Growler Mine. Some of these were only about two inches in diameter, evidently very young. The one living specimen found was taken from the same prospect hole in which the Sonoran Spadefoot Toads were secured on Nov. 24.

FISHES

Cyprinodon macularius. PURSY MINNOW. Abundant in the springs and reservoir at Quitovaquita. These were the attraction that caused the several species of fish-eating birds to be found within the boundaries of this desert Monument.

