Fig. 1. Gila Monster (*Heloderma suspectum*) photographed on 5 August 2019, Rincon Mountains, at an elevation of 2,089 m.

RESEARCH ARTICLE

Origin of an Arizona Population of the New Mexico Whiptail Lizard (*Aspidoscelis neomexicanus*): Evidence from Skin Grafting and Review of an Enigmatic Specimen

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Aspidoscelis neomexicanus (New Mexico Whiptail; Fig. 1) is a diploid unisexual (all-female) lizard species that arose through hybridization between *Aspidoscelis marmoratus* (Marbled Whiptail; = *Aspidoscelis tigris marmoratus* of Wright 1993) and *Aspidoscelis inornatus* (Little Striped Whiptail; Lowe and Wright 1966, Brown and Wright 1979, Cole et al. 1988, Densmore et al. 1989, Wright 1993). Like all known unisexual whiptails, *A. neomexicanus* reproduces through parthenogenesis, whereby females lay unfertilized eggs that hatch into more females, all of which are genetically identical to their mothers (e.g., Persons and Wright 2009). One consequence of parthenogenesis is that new populations can be founded by single individuals, increasing the chances that accidental introductions will result in established populations. *Aspidoscelis neomexicanus* is an evolutionarily young species, its origin postdating the subspecific radiation of *A. tigris* (Tiger Whiptail) *sensu lato* (Brown and Wright 1979, Densmore et al. 1989). In this paper we follow Reeder et al. (2002) in using the genus name *Aspidoscelis* rather than *Cnemidophorus* for North American whiptails, and we use the specific name *neomexicanus* rather than *neomexicana* following the explanation by Tucker et al. (2016) of why the genus name *Aspidoscelis* should be considered masculine.

Aspidoscelis neomexicanus is native to the Rio Grande Valley in New Mexico and western Texas, including some adjacent closed basins in southern New Mexico (Axtell 1966, Wright 1971, Cole et al. 1988, Degenhardt et al. 1996; Fig. 2). Leuck et al. (1981) reported a disjunct population at Conchas Lake, San Miguel County, New Mexico, in the Canadian River drainage, which they interpreted as likely resulting from human introduction. However, Walker et al. (1992) challenged this assertion, suggesting that the population at Conchas Lake may in fact be native. Subsequently, additional populations of *A. neomexicanus* were discovered in eastern New Mexico, near Fort Sumner in De Baca and Roosevelt counties in

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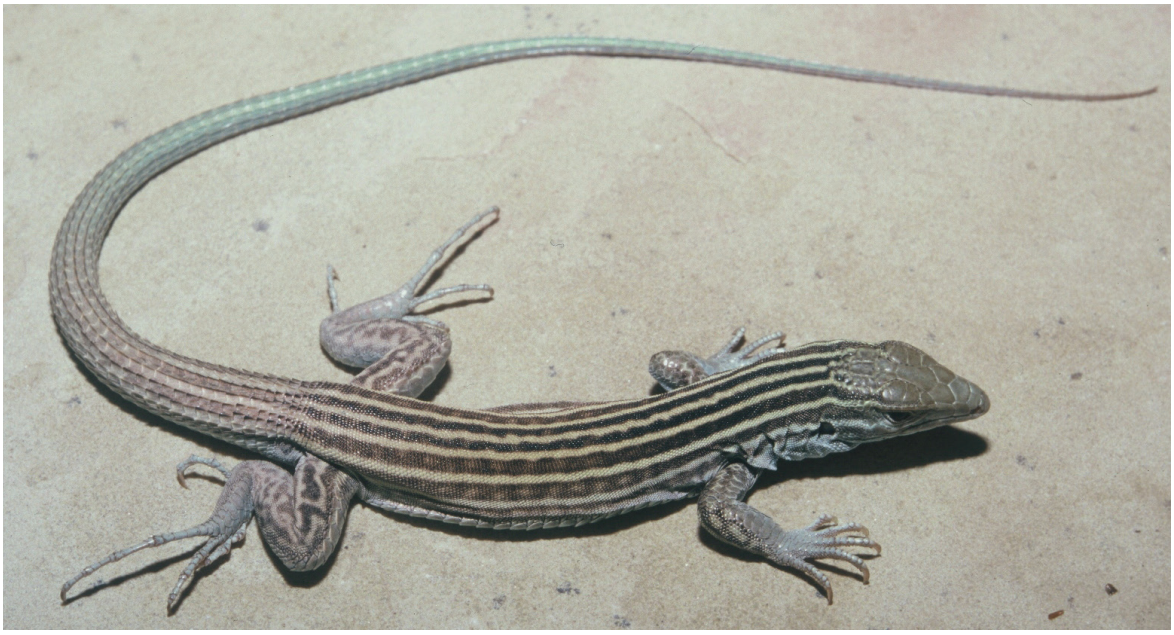

Fig. 1. *Aspidoscelis neomexicanus* from near the Puerco River at Petrified Forest National Park, Apache Co., Arizona (LACM 147015). Photo by T.B. Persons.

the Pecos River drainage (Taylor 2002, Cordes et al. 2011). While the existence of multiple, disjunct populations may indicate a more widespread native distribution, both Conchas Lake (site of a popular state park) and Fort Sumner (along roads and railway lines) are logical places where *A. neomexicanus* could conceivably be accidentally or intentionally introduced. A range extension reported from southwest of Carrizozo in Lincoln County, New Mexico (Burkett et al. 2004) may represent a natural extension of its distribution north along the Tularosa Valley from the Rio Grande Valley near Las Cruces and El Paso.

Outside of New Mexico and western Texas *Aspidoscelis neomexicanus* has been reported from Petrified Forest National Park, Arizona (Persons and Wright 1999a, Emmons et al. 2015) and in the vicinity of Salt Lake City, Utah (Oliver and Wright 2007), and populations in both of these areas are presumed to have originated from human introductions. Fig. 2 includes all reported locations for *A. neomexicanus*, native and introduced. At Petrified Forest, *A. neomexicanus* was first discovered in 1998 along the Puerco River west of the main park road, Apache Co. (Persons and Wright 1999a). Then, in 2010, it was found near the developed area at the south park entrance, Navajo Co., ca. 26 km (16 mi.) south of the original Puerco River site (Emmons et al. 2015). Intensive herpetofaunal surveys in this southern area beginning in 1997 and continued pitfall trap monitoring since (Drost et al. 2001, Emmons et at. 2015), without detections of *A. neomexicanus* prior to 2010, suggest that the southern population is recently established. While an independent introduction from the native range of the species in New Mexico (e.g., from a park visitor or delivery of goods from Albuquerque) is possible, perhaps more likely is inadvertent transport from the Puerco River location. The original location is adjacent to the Puerco Ruins visitor site, which includes bathroom facilities, and an associated pump house and small sewage pond are located across (west of) the main park road, in the area inhabited by *A. neomexicanus*. Maintenance activities (driving into *A. neomexicanus* habitat, loading and unloading construction materials, etc.) could provide a means for lizards to hitchhike to the park's south entrance developed area. Livo et al. (2019) invoked a similar scenario involving "vehicular rafting" on military equipment moved between an armory

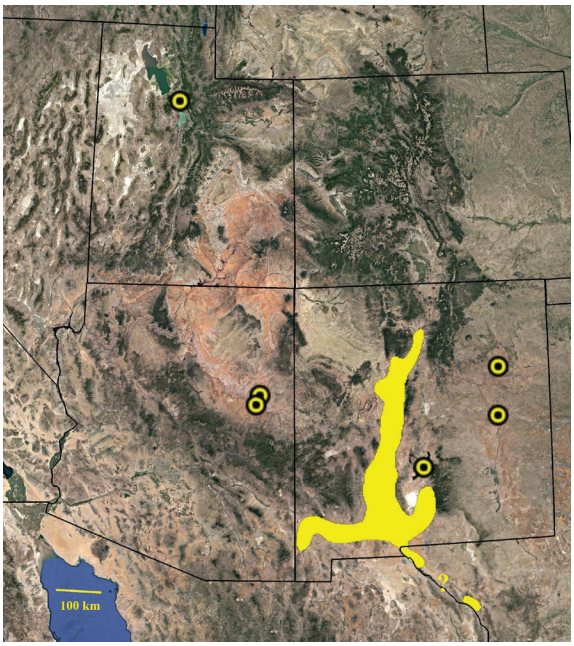

Fig. 2. Approximate distribution of *Aspidoscelis neomexicanus*. Solid yellow shading indicates presumed native range, and dots in Utah and Arizona represent presumably introduced populations near Salt Lake City and Petrified Forest National Park. Disjunct populations in eastern New Mexico may also be introduced (see text).

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and a training site to possibly explain the introduction of unisexual *Aspidoscelis neotesselatus* (Colorado Checkered Whiptail) near Denver, Colorado. Tamarisk control activities in the Puerco River floodplain could also conceivably provide opportunities for inadvertent transport of *A. neomexicanus* to other areas of the park. As with the original park inventory of Drost et al. (2001), recent surveys in areas of the park between the Puerco River and Rainbow Forest have failed to detect *A. neomexicanus* (Andy Bridges, pers. comm.). Thus, the existence of the recently discovered southern population is unlikely to be the result of natural expansion from the Puerco River location.

Genetic Origin of the Arizona Population as Revealed Through Skin Grafting

Although presumably introduced, we initially considered the possibility that the population of *A. neomexicanus* at Petrified Forest arose through a separate hybridization between *A. tigris* and *A. inornatus*. While apparently isolated populations of *A. inornatus* occur at Petrified Forest (Persons and Wright 1999b), *A. tigris* is not known from the immediate vicinity of the park (Drost et al. 2001). However, *A. tigris* does occur elsewhere in the Little Colorado River Basin, including near Winslow to the west, which has a direct connection to Petrified Forest via the Puerco and Little Colorado Rivers, and, at the time, we did not know the distributional extent of the newly discovered population of *A. neomexicanus*. Although *A. tigris* and *A. marmoratus* are currently regarded as separate species (e.g., Crother 2017), a hypothetical parthenogen derived from hybridization between *A. tigris* and *A. inornatus* in Arizona would likely appear similar to *A. neomexicanus*.

Shortly after discovery in Arizona we initiated a skin grafting study to attempt to confirm our suspicion that *A. neomexicanus* from Petrified Forest was conspecific with lizards from within its native range in New Mexico. Studies have shown *A. neomexicanus* to be genetically uniform throughout its range, using protein electrophoresis (Parker and Selander 1984, Cole et al. 1988), mitochondrial DNA (Brown and Wright 1979, Densmore et al. 1989), and histocompatibility (Cuellar 1977) analyses. In parthenogenetic *Aspidoscelis*, acceptance of skin grafts between individuals demonstrates that they are histocompatible, and are therefore likely isogenetic (Cuellar 1977, Cuellar and Wright 1992). Isogenicity suggests that individuals are derived from a common ancestor, i.e., the same original hybrid-derived parthenogenetic female (Cuellar 1977, Cordes et al. 1990, Abuhteba et al. 2000). Maslin (1967) demonstrated that *A. neomexicanus* will reject skin grafts from another species, *Aspidoscelis tesselatus*, and therefore does exhibit an immune response. Skin grafting has been used previously to demonstrate isogenicity in *A. neomexicanus* from throughout its range in New Mexico (Cuellar 1977); and between a population in Texas, at the southern edge of the range of the species, and the possibly introduced population at Conchas Lake in northeastern New Mexico (Cordes et al. 1990). Histoincompatibility (as expressed by rejection of skin grafts between individuals) can occur among unisexual whiptails of the same species due to postformational mutations at histocompatibility loci (Cole et al. 2019) and is thus not necessarily an indication of separate hybrid origin. However, histocompatibility (as expressed by acceptance of skin grafts) strongly suggests the same hybrid origin (Cuellar 1977, Cuellar and Wright 1992).

Methods

In 1998 we collected two individuals of *A. neomexicanus* from the newly discovered population near the Puerco River, Petrified Forest National Park, Apache County, Arizona, now preserved as specimens at the Natural History Museum of Los Angeles County (LACM 162343-4; cross-cataloged with the National Park Service as PEFO 15283 and 15276), and two individuals from within the native range of the species along the Rio Puerco at US Highway 66, Bernalillo County, New Mexico (LACM 162345-6). We also collected two individuals of *Aspidoscelis velox* (Plateau Striped Whiptail), to be used as a source of xenografts for all four *A. neomexicanus*. These were collected in 1998 at Mormon Crossing of West Chevelon Creek, Sitgreaves National Forest, Coconino Co., Arizona (LACM 162349) and at San Francisco Wash, Coconino National Forest, Coconino County, Arizona (LACM 162350). Lizards were permanently marked by toe-clipping.

Surgical procedures were performed on 7 December 1998 at the BioScience Annex at Northern Arizona University. Lizards were anesthetized with an intraperitoneal injection of Ketamine Hydrochloride at a dosage of 0.2 mg/gram lizard body weight. Circular pieces of skin, 3 mm in diameter, were excised using a Miltex disposable biopsy punch. Grafts were removed from the paravertebral light stripes on the lizard's dorsal surface, and when returned were rotated 90 degrees so that the light stripes within the grafts were perpendicular to the paravertebral light stripes, facilitating graft recognition (e.g., Cuellar 1977, Cuellar and Wright 1992, Abuhteba et al. 2000). Grafts were carefully positioned with forceps and sealed with New Skin liquid bandage. Lizards were housed in clean 10-gallon aquaria without water, food, or substrate for 48 hours to minimize risk of grafts becoming dislodged. Thereafter lizards were given water, sand substrate, and folded paper towels for cover. Lizards were fed commercially available crickets and mealworms, and given water *ad libidum*. Aquaria were housed in the offices of the Colorado Plateau Research Station at Northern Arizona University. Evaluation of grafts were made ev-

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ery few days for the duration of the study. The experiment was terminated on 14 June 1999, after 189 days. At termination lizards were sacrificed, fixed in 10% formalin and preserved in 70% ethanol, and deposited in the herpetology collection of the Natural History Museum of Los Angeles County (above).

Results

Each of the four *A. neomexicanus* received five skin grafts, as follows. One autograft, as a control (graft removed, rotated, and replaced on the same individual); one intrapopulational allograft (between each individual from the same population); two interpopulational allografts (between individuals from the Petrified Forest and New Mexico populations); and one xenograft from *A. velox* to test for presence of an immune response. Results of the experiment are shown in Fig. 3. Six of the eight interpopulational allografts (three of four from each pair of lizards) between individuals from Petrified Forest and New Mexico were permanently accepted. In addition, all four autografts were accepted, and all four *A.velox* xenografts were rejected. Both intrapopulational allografts exchanged between the New Mexico lizards were accepted, but both of the intrapopulational allografts exchanged between the Petrified Forest lizards were rejected.

Aside from gross examination of the lizards, we also examined shed skins to determine graft acceptance. Lizards shed frequently during the study, and often pieces of shed skin were large enough to encompass one or more grafts. We were able to salvage an excellent example from LACM 162344 from Petrified Forest, shed 4 or 5 April 1999. Examination of this shed skin (Fig. 4) clearly shows both interpopulational allografts, as well as the autograft, to be incorporated into the dermis to the degree that the shedding process did not distinguish between the different skins.

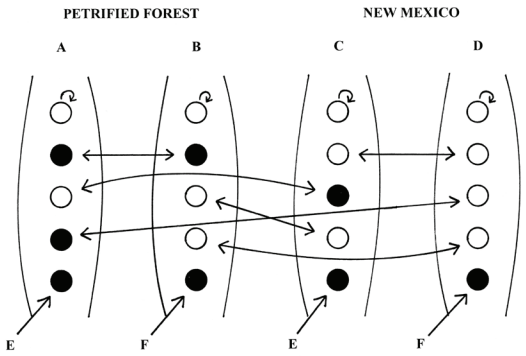

Fig. 3. Diagram and results of skin graft exchange in four *A. neomexicanus* from Petrified Forest National Park, Arizona (A = LACM 162343, B = LACM 162344) and Bernalillo Co., New Mexico (C = LACM 162345, D = LACM 162346). Anterior of lizards are to top of diagram. On each lizard, from top to bottom, sequence of five grafts are autograft, intrapopulational allograft, interpopulational allograft (2), and xenograft donated by *A. velox* (E = LACM 162350, F = LACM 162349). Open circles indicate graft acceptance, filled circles graft rejection.

Discussion

That six of eight grafts exchanged between individual *A. neomexicanus* from Petrified Forest and New Mexico were accepted, with at least one graft accepted on all four lizards, indicates that lizards from the two populations are histocompatible, and therefore likely genetically identical (Cuellar 1977). This result eliminates the possibility that the Petrified Forest population arose through a separate hybridization between *A. tigris* and *A. inornatus*. These results indicate that the Petrified Forest population either represents a range extension of the native Rio Grande Valley distribution or is the result of an introduction. Introduction is supported by the fact that the Petrified Forest population is separated by ca. 240 km (149 mi.) from the nearest known population in the Rio Grande Valley of New Mexico, and this separation includes ca. 95 km (59 mi.) of unsuitable habitat straddling the continental divide (Persons and Wright, 1999a). In addition, there are numerous plausible scenarios to explain an introduction, as the Petrified Forest locality is adjacent to both Interstate 40 and the Santa Fe railroad line, two routes that connect Petrified Forest with Albuquerque, New Mexico, where *A. neomexicanus* is common.

Because at least one interpopulational allograft was accepted by each of the four *A. neomexicanus*, we surmise that the two rejected interpopulational allografts

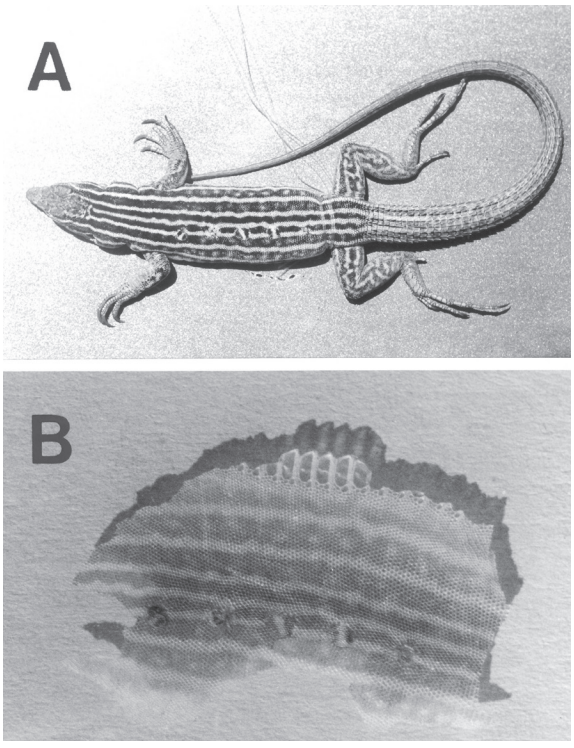

Fig. 4. (A) Photograph of preserved *Aspidoscelis neomexicanus* (LACM 162344) from Petrified Forest National Park, Arizona showing results of present skin grafting experiment. (B) Photograph of shed skin of same individual *A. neomexicanus*, shed 4 or 5 April 1999, showing acceptance (as indicated by coordinated shedding) of autograft (far left) and both interpopulational allografts.

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were not rejected due to histoincompatibility, but rather to complications from surgery, such as infection. The other two rejected grafts that we predicted would have been accepted were exchanged between the two individuals from Petrified Forest. However, because the two intrapopulational allografts between the two New Mexico lizards were both accepted, and because the two Petrified Forest lizards each accepted interpopulational allografts from the New Mexico lizards, it follows that the two Petrified Forest lizards would be histocompatable with each other. As with the rejected interpopulational allografts, the rejected intrapopulational allografts likely resulted not from an immune response, but from infection or initial lack of adhesion of grafts.

A unique aspect of this study is the use of shed skins in determination of graft acceptance. To our knowledge, this has not been reported in other studies of skin grafting in lizards. Coordinated shedding of graft and host skin strongly suggests that grafts have been accepted and incorporated into the host skin, indicating histocompatibility between the two individuals. This technique could be useful in studies such as ours, in which graft acceptance disproves the null hypothesis that individuals are not genetically identical. Although the eventual acceptance or rejection of grafts in this study was apparent early on, we maintained lizards alive for over six months for consistency with other studies (e.g., Cuellar 1976, Cuellar 1977, Cordes et al. 1990, Cuellar and Wright 1992). Ecdysis cycles in captive *Aspidoscelis* are frequently much shorter than the time required to confidently demonstrate graft acceptance (personal observation). If coordinated shedding does in fact indicate histocompatibility, then studies such as this could be terminated sooner, saving time and expense.

The Mystery of Adamana

When first discovered, in 1998, no previous specimens or reports of *A. neomexicanus* were known from Arizona (Persons and Wright 1999a). However, shortly afterwards, while reviewing museum specimen records of whiptails from Arizona, we discovered a catalog entry at the National Museum of Natural History (NMNH, Smithsonian Institution) of an *A. tigris* collected on 5 June 1907 at Adamana, Apache County, Arizona (USNM 58699). While *A. tigris* occurs elsewhere in the Little Colorado River Basin, it is not known from the immediate vicinity of Petrified Forest (Drost et al. 2001). JWW and SWG examined the specimen, which turned out to be an *A. neomexicanus* (Fig. 5). Persons and Wright (1999a) had already noted that the old Adamana station and siding of the Santa Fe railway was located only about 2 km (1.2 mi.) west of the area inhabited by *A. neomexicanus* at Petrified Forest (Fig. 6), and was therefore a possible source of introduction (e.g., lizard stowaways in freight originating near Albuquerque). Thus, it appeared that the species may have been introduced to the Petrified Forest area sometime prior to 1907. Additional research and field surveys, however, provided equivocal support for this hypothesis.

USNM 58699 was collected by Julius Hurter (1842-1916) of St. Louis, Missouri, for whom Hurter's Spadefoot (*Scaphiopus hurterii*) is named (Johnson 2000). Hurter collected extensively in the Southwest, and apparently spent the month of June 1907 primarily in Albuquerque, Flagstaff, Phoenix, and Tucson. Unfortunately, we could not locate additional data (such as field notes) at NMNH other than what was included in NMNH catalog entries; we did, however, find a letter from the executor of Hurter's estate indicating that there was no field catalog, and that the

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Fig. 5. *Aspidoscelis neomexicanus* (USNM 58699) cataloged as being collected at Adamana, Apache Co., Arizona by Julius Hurter on 5 June 1907. Photo by S.W. Gotte.

Fig. 6. Location of old Adamana railway siding and *Aspidoscelis neomexicanus* (red dots) observed or collected south of the Puerco River at Petrified Forest National Park, Apache Co., Arizona, 1998-2000.

data on tags and jars was all that was known. Based on 85 amphibian and reptile specimens at NMNH collected by Hurter in June 1907, his itinerary for the month began in Albuquerque 1-3 June, followed by a trip to Adamana or vicinity on 5 and 6 June, a return to Albuquerque on 7 June, then a return to Arizona (Flagstaff, Phoenix, and Tucson) 10-30 June. Table 1 lists all specimens Hurter collected on 5 and 6 June, including the Adamana *A. neomexicanus* (USNM 58699). Anomalies in this two-day period include a specimen of *A. tigris* (USNM 58703) from Phoenix and a specimen of *Phrynosoma hernandesi* (Greater Short-horned Lizard; USNM 58422) from Albuquerque, both supposedly collected the same day (5 June) as the *A. neomexicanus* from Adamana. Two other Phoenix specimens collected in June have suspect dates: USNM 58394 is a *Urosaurus ornatus* (Tree Lizard) collected 11 June, which is sandwiched between multiple specimens collected at Flagstaff 10 and 12 June; and USNM 37962 is a *Phrynosoma solare* (Regal Horned Lizard) collected 16 June, the same day as other specimens collected at Flagstaff. Especially given travel conditions in 1907 (e.g., passenger train rides of ~8-12 hours each between Albuquerque and Flagstaff, and Flagstaff and Phoenix) it seems unlikely that these dates are correct. In particular, it is virtually impossible that Hurter collected lizards in Albuquerque, Adamana, and Phoenix on the same day.

If it were not for the current presence of *A. neomexicanus* at Petrified Forest, it would be logical to surmise that, due to the confusion regarding collection dates, the "Adamana" specimen of *A. neomexicanus* was likely actually collected in Albuquerque in the days prior to 5 June. Hurter is listed as having collected 27 specimens in Albuquerque on 1-3 June, including four specimens of *A. neomexicanus* (USNM 58433, 58435-7). However, it would be a strange coincidence indeed for such an error to involve a location almost exactly where the species was found 91 years later.

Even before the discovery of the 1907 specimen of *A. neomexicanus* from Adamana we began surveying the area, hypothesizing that it could have been a point of introduction. On a total of eleven days in 1998, 1999, and 2000 we surveyed various locations on the

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Table 1. Amphibian and Reptile specimens at the National Museum of Natural History listed as being collected by Julius Hurter on 5 and 6 June 1907.

USNM	Species	Locality	Date (1907)
58403	*Holbrookia maculata*	Adamana, Apache Co, AZ	5 June
58404	*Holbrookia maculata*	Adamana, Apache Co., AZ	5 June
58422	*Phrynosoma hernandesi*	Albuquerque, Bernalillo Co., NM	5 June
58610	*Crotaphytus collaris*	Apache Co., AZ	5 June
58699	*Aspidoscelis neomexicanus*	Adamana, Apache Co., AZ	5 June
58703	*Aspidoscelis tigris*	Phoenix, Maricopa Co., AZ	5 June
38056	*Crotaphytus collaris*	Near Adamana, Apache Co., AZ	6 June
57064	*Ambystoma tigrinum*	Apache Co., AZ	6 June
57589	*Anaxyrus woodhousii*	Apache Co., AZ	6 June
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north side of the Puerco River (i.e., the Adamana side), including the railroad right-of-way, between 1.2 km (0.7 mi.) east of the Petrified Forest main park road [which is 2.8 km (1.7 mi.) due east of Adamana], around the ruins of the Adamana siding, and up to 5.6 km (3.5 mi.) west of Adamana (Persons 2001, and unpublished data). The only whiptail we observed during these surveys was *A. velox*, which was common throughout the area. We recorded a total of 162 *A. velox*, including 25 during a single morning survey at the Adamana site. During the same period, we continued to observe small numbers of *A. neomexicanus* at the original location of discovery south of the Puerco River and west of the Petrified Forest main park road (Persons 2001; Fig. 6).

The Puerco River, which is essentially a large dry wash, should not be a barrier to *A. neomexicanus*. Thus, it was surprising to not find a single lizard north of the river. The absence of *A. neomexicanus* north of the Puerco River, including around the ruins of the Adamana railroad siding, would seem to suggest that Adamana was not the point of introduction, but rather that the species was introduced on the south side of the river, in the area where it appears to be restricted to today. Furthermore, the limited distribution, especially if it is indeed at the point of origin, might suggest a recent introduction. However, it is difficult to draw inferences of past distribution or abundance of unisexual whiptails based on present distribution and abundance. For example, populations of *A. laredoensis* (Laredo Striped Whiptail), which is a diploid unisexual species that, like *A. neomexicanus* to its north, primarily inhabits sandy, disturbed habitats along the lower Rio Grande in southern Texas, appear to fluctuate dramatically. *Aspidoscelis laredoensis* consists of two distinct, independently derived clones (or species, depending on one's taxonomic philosophy), designated LAR-A and LAR-B, which are broadly sympatric with the much more widely distributed bisexual *A. gularis* (Texas Spotted Whiptail or Common Spotted Whiptail) (Walker et al. 1987a, 1987b). In the 1980s, LAR-B was the dominant clone of *A. laredoensis* in the region where it co-occurred with LAR-A, but by the 1990s their relative abundances had reversed (Walker et al. 1996, Paulissen et al. 2001). Also by the 1990s, *A. gularis*, which was formerly absent at many sites near the Rio Grande where *A. laredoensis* was abundant in the 1980s, had begun to make inroads (Walker et al. 1996, Paulissen et al. 2001). Now, it appears that LAR-B, previously the more abundant form of *A. laredoensis* in many areas, may be absent; LAR-A is uncommon; and *A. gularis* is the dominant whiptail throughout the region (Persons 2020). Similarly, there is no reason to assume that, once established, a population of *A. neomexicanus* at Adamana would remain stable or expand at a predictable rate over the course of a century. The ecology of co-occurring *A. neomexicanus* and *A. velox* has not been studied, but these two unisexual species, which are similar in size (Stebbins 2003), probably affect each other to some (perhaps a large) degree. It seems likely that in most situations (e.g., particular habitat types or climatic regimes) one or the other species would be ecologically superior. And, as appears to be the case with *A. laredoensis* in Texas, changing ecological conditions (perhaps in ways not immediately obvious to us) might be capable of dramatically altering relative abundances over short periods of time. It therefore seems plausible that *A. neomexicanus* first became established at Adamana in the late 1800s or early 1900s, expanded its population to include the area south of the Puerco River, and has since disappeared from Adamana.

Summary

Results of a skin grafting study demonstrated that individuals of unisexual *A. neomexicanus* from the population discovered in 1998 at Petrified Forest National Park, Arizona are genetically identical to individuals of *A. neomexicanus* from within the native range of the species in the Rio Grande Valley in New Mexico. This result rules out the possibility that the Petrified Forest population arose through an independent hybridization between *A. inornatus* and *A. tigris*, and supports a hypothesis of human-mediated introduction. Discovery of a 1907 specimen of *A. neomexicanus* from the historic Adamana railroad siding near where *A. neomexicanus* occurs today at Petrified Forest suggests the species may have been introduced over a century ago, perhaps as a stowaway on railroad cargo. Although inconsistencies in the collector's itinerary raise the possibility of cataloging errors and an alternative explanation that the specimen was collected, on a different date, in Albuquerque, New Mexico, it seems unlikely that such an error would happen to involve a location where *A. neomexicanus* would be discovered nearly a century later. While we may never know for sure, a pre-1907 introduction of *A. neomexicanus* to the Puerco River area at Petrified Forest seems the most likely. A second population of *A. neomexicanus* discovered at the south end of Petrified Forest in 2010, in an area where previous intensive surveys a decade earlier did not detect the species, may have originated by inadvertent transport of one or more lizards from the Puerco River site, or, possibly, by an independent introduction from New Mexico.

Discovery of a 1907 specimen of *A. neomexicanus* from the historic Adamana railroad siding near where *A. neomexicanus* occurs today at Petrified Forest suggests the species may have been introduced over a century ago, perhaps as a stowaway on railroad cargo.

Acknowledgements—We thank Charles Drost for cheerfully tolerating hyperactive lizards, as well as an endless parade of escaped crickets, in his office during the skin grafting study. Jeani Gaymer of the Northern Arizona University (NAU) Institutional Animal Care and Use Committee (IACUC) assisted in numerous ways. Andy Bridges provided information on lizard monitoring and recent sightings of *A. neomexicanus* at Petrified Forest. Collections were made under per-

mits to TBP from Petrified Forest National Park, the Arizona Game and Fish Department, and the New Mexico Department of Game and Fish. This study is NAU IACUC protocol no. 99-599.

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FICTION

Teen Herp Fantasies. Nobody should do this.

Listening to you I get the music

Robert L. Bezy, *robertbezy@gmail.com*

Dedicated to the memory of Charles Lowe and his three basic principles of herpetology.
All three are themes in these teen herp fantasies about perilous adventures done for love not money.

1. If it isn't fun, don't do it.
2. If it's money you're after, buster, go out and rob a goddam bank.
3. If you would not die for herpetology, you do not belong in it.

1. Nactis

Best Bud (BB) and I could hardly wait for the last day of classes. The bell of freedom rang and we could at long last herp non-stop. With our first drivers' licenses in hand, we gassed up old Nellie, a 1950 International Harvester Scout, and headed out on an adventure. Spring was in full swing: the Foothill Paloverdes (*Parkinsonia microphylla*) were glorious and the Nactis (*Chionactis,* Shovel-nosed Snakes) would be issuing forth just after sundown.

Puesta del sol, a chug of cold coffee saturated with sugar, and we were cruising by the start of the Nactis golden hour. "Hot dog! There's one streaking like greased lightning across our lane just ahead," yelled BB and I jammed on the breaks. Before Nellie with her bald tires came to a stop BB was out the door and scooped the snake up from in front of a big rig barreling down the middle of the road. It was clearly a *klauberi*, Best Bud's first, and he gave me a great hug and we did the Nactis dance down the pavement in front of the on-coming 18-wheeler.

I was very excited as this was a new locality for the species and my photo voucher would allow me to publish the record and contribute to the conservation of *klauberi*. My fascination with conservation and publishing was growing.

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