

Terminal Pleistocene/Early Holocene human occupation of El Pinacate: reassessment of Julian Hayden's lithic collections at the Amerind Museum

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The state of Sonora in Northwest Mexico has produced a wealth of information on the earliest peopling of southwestern North America. This record of Terminal Pleistocene and Early Holocene (~13,000 – 8,000 cal yr B.P.) human occupations of what is now the Sonoran Desert includes hundreds of isolated stone artifacts diagnostic of the Clovis culture and possibly of late Paleoindian techno-complexes (Gaines et al. 2009), archaeological sites with surface concentrations of Paleoindian lithics (e.g., El Bajío, El Gramal, and El Aigame) (Sanchez 2016), and the only buried Clovis context yet discovered south of the United States is at the site of El Fin del Mundo (Sanchez et al. 2014; Holliday et al. 2024). These sites and isolated finds are concentrated in the Hermosillo Plains, in the north-central part of Sonora between the central coast of the Gulf of California and the Sierra Madre Occidental, and between the city of Guaymas and the town of Trincheras (Figure 1). This geographic pattern may be the result, at least partially, of the paucity of archaeological research conducted in more remote and less accessible terrain farther from major urban areas and roads.

In 2021, it was reported that surface concentrations of archaeological and paleontological materials containing one Clovis point and skeletal elements of Pleistocene fauna including mammoth (*Mammuthus* sp.), tortoise (*Gopherus* sp.), and camel (*Camelops* sp.) were discovered during surveys conducted in a remote location within El Pinacate and Gran Desierto de Altar Biosphere Reserve, in the northwesternmost area of Sonora (Figure 1). A bi-national project focused on the early human occupation of El Pinacate formally started that year under the direction of John Carpenter (INAH), Guadalupe Sanchez (INAH), and Benjamin T. Wilder (then with U of A Desert Laboratory). Within the framework of this project, systematic surveys and limited test excavations were conducted in the area, including at the site of Las Tortugas, where the Clovis point and the faunal remains were recovered. Work at Las Tortugas has concluded, and publications are forthcoming. These field investigations also resulted in the documentation of archaeological materials of mostly Hohokam affiliation elsewhere in the Biosphere Reserve outside of the Las Tortugas core site. No definite Paleoindian artifacts or remains of Pleistocene fauna besides those originally reported in 2021 have been located.

Therefore, one of the project's main questions is whether the original finds represent an isolated instance of Clovis artifacts and extinct megafauna within El Pinacate or if there are other localities with evidence of Terminal Pleistocene and Early Holocene human occupations. To answer this question thoroughly, it is necessary to revisit the previous work conducted in the area. The research reported here consists of a study of temporally diagnostic lithic artifacts from the archaeological collections recovered by Julian Hayden in El Pinacate during the late 1950's

and 1960's (Hayden 1966, 1967, 1976). Hayden conducted extensive surveys and documented approximately 70 archaeological localities, determining that some of them contained surface concentrations of lithic artifacts associated with the San Dieguito techno-complex, interpreted as dating to the Terminal Pleistocene and Early Holocene (Rogers 1939, 1958; Warren 1967) and potentially containing projectile points of the Lake Mojave and Silver Lake typologies, which have been recently reported from contexts with dates contemporaneous or even older than Clovis (Davis et al. 2014; Davis et al. 2019; Smith et al. 2020). Thus, Hayden's report of a San Dieguito component in El Pinacate is significant in that it potentially indicates multiple occurrences of early sites in this region of Sonora.

As a first step of the reassessment of Hayden's collections from El Pinacate, this study revisited the projectile points and other potentially diagnostic lithic materials (i.e., those labeled as end scrapers and bifaces) from these collections with the objective of identifying previously unrecognized artifacts diagnostic of early (i.e., Terminal Pleistocene and Early Holocene) human occupations. With the financial support of the Arizona Archaeological and Historical Society, this analysis was conducted at the Amerind Museum in Dragoon, Arizona, where Hayden's collections are currently curated.

Typological, metric, and qualitative data (e.g., raw material and condition) were collected from 177 artifacts from 32 sites. Most of the studied lithics were projectile points (Figure 2), but data was also collected from secondary bifaces (likely representing preforms of projectile points and other unfinished implements), drills, and a few end scrapers (Table 1). Typological classification of projectile points was based on specialized publications, including Justice (2002a, 2002b;) and Sliva (1997, 2015). Temporal classification of artifacts other than projectile points, whenever possible, was based on morphology (based on Sliva 1997 and reports of Archaic artifacts from the site of La Playa [Ochoa D'Aynés 2004]). Those that lack any diagnostic features for their typological or temporal classification were considered indeterminate.

Over half of the studied lithics (52 percent) are of Late Prehistoric association (Table 2), dominated by Hohokam projectile point typologies, including Classic Triangular, Livermore, Snaketown Triangular, Hodges contracting stem, and Late Classic side-notched types. Archaic and Early Agricultural Period (EAP) artifacts are less ubiquitous (28 percent), but several projectile point types are represented including Middle and Late Archaic typologies such as Pinto, San Jose, Gypsum, Chiricahua, Cortaro, and Datil, as well as EAP types such as Empire and San Pedro. Some bifacial artifacts were classified as drills of potentially Archaic or EAP temporalities, as similar artifacts have been recovered from the EAP site of La Playa in northern Sonora, which has produced an important Archaic component as well (Ochoa D'Aynés 2004). Some Historic Period artifacts (4.5 percent) were also documented and consisted entirely of Sobaipuri type projectile points. Indeterminate artifacts consist mostly of secondary bifaces, but also include fragmentary artifacts, drills and end scrapers that lack any temporal/typological diagnostic features. Temporal patterns of raw material provisioning are markedly different between the Archaic/EAP components and the Late Prehistoric/Historic components. While Late Prehistoric/Historic materials are almost completely dominated by obsidian (96 percent), this raw material only represents 12 percent of Archaic and EAP artifacts, which show much more

variability of utilized rocks, including basalt, rhyolite, and chert. It is possible that these patterns are the result of selective exploitation of lithic resources. Late Prehistoric projectile points are significantly smaller than Archaic and EAP points, thus, obsidian may have been selected due to its workability into smaller and finer artifacts. It is also possible that the differences in exploited raw materials resulted in part from different patterns of landscape use, including mobility strategies and utilized landscapes.

No artifacts of clear Paleoindian or San Dieguito association were identified during this study. This information, along with the data recovered to date from our field investigations in El Pinacate, suggests that the surface findings from Las Tortugas are, in fact, a rare occurrence. Despite the lack of clear evidence for a Terminal Pleistocene/Early Holocene component in the investigated lithic materials, this study provided important information that will be helpful in planning future field investigations. The Archaic of Northwest Mexico is an understudied period, and its investigation is essential to understanding the development of early agricultural lifeways, which gave rise to the better-known complex societies of the Southwest/Northwest. Through this study, we identified four sites that contained predominantly Archaic and Early Agricultural Period projectile points, including Pinacate Peaks, Sitio Celaya, Tinaja del Cuervo, and Tinaja Doble. These sites represent localities with the potential for preserving pre-ceramic surface components and buried contexts and will be investigated during future fieldwork.

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Figure 1. Top: General location of El Pinacate and Gran Desierto de Altar Biosphere Reserve where Las Tortugas and the sites identified by Julian Hayden are situated. Bottom: Locations of some of the archaeological sites (indicated by red stars) with Paleoindian components in north-central Sonora and the San Pedro River Valley in southeastern Arizona in relation to El Pinacate.

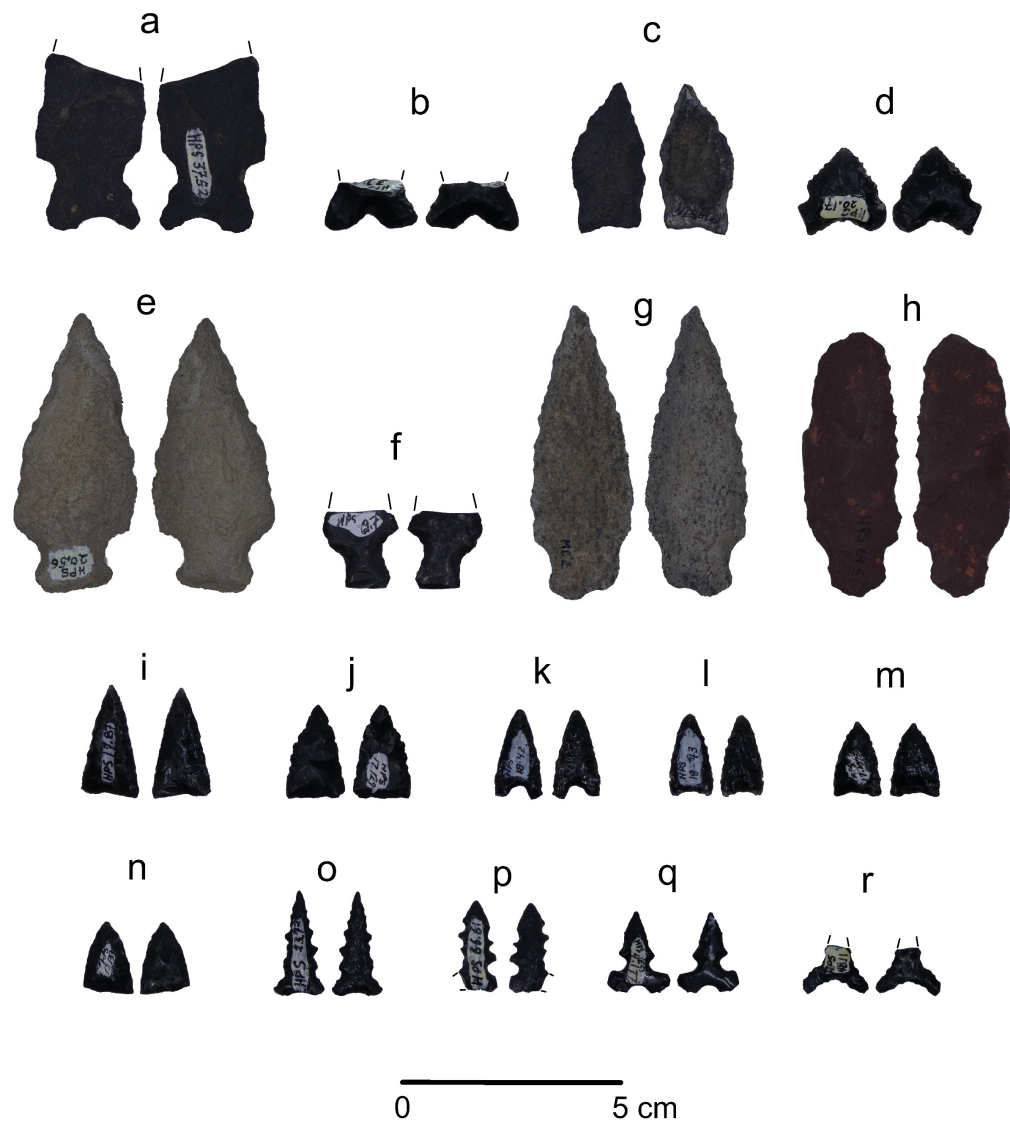


Figure 2. Selected examples of projectile points in Hayden's collection from El Pinacate. Middle Archaic types: a – b, Pinto; c, San Jose; d, Chiricahua. Early Agricultural Period: e – f, San Pedro; g – h, Empire. Late Prehistoric: i – j, Classic triangular; k – n, Classic concave base triangular; o – p, Snaketown triangular concave base; q, Pueblo side-notched. Historic period: r, Sobaipuri.

Table 1. Frequencies of the lithic artifact types studied for this project.

Artifact type	N
<i>Projectile points</i>	138
<i>2ry biface</i>	21
<i>Drill</i>	9
<i>Unidentifiable</i>	6
<i>End scraper</i>	3
Total	177

Table 2. Frequencies and proportions of the general temporal associations of the studied lithics.

Temporal association	N	%
<i>Archaic</i>	33	18.6
<i>Early Agricultural Period</i>	9	5.1
<i>Archaic/Early Agricultural Period</i>	8	4.5
<i>Late Prehistoric</i>	92	52.0
<i>Historic</i>	8	4.5
<i>Indeterminate</i>	27	15.3
Total	177	100

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