

Journal of Texas
Archeology and History



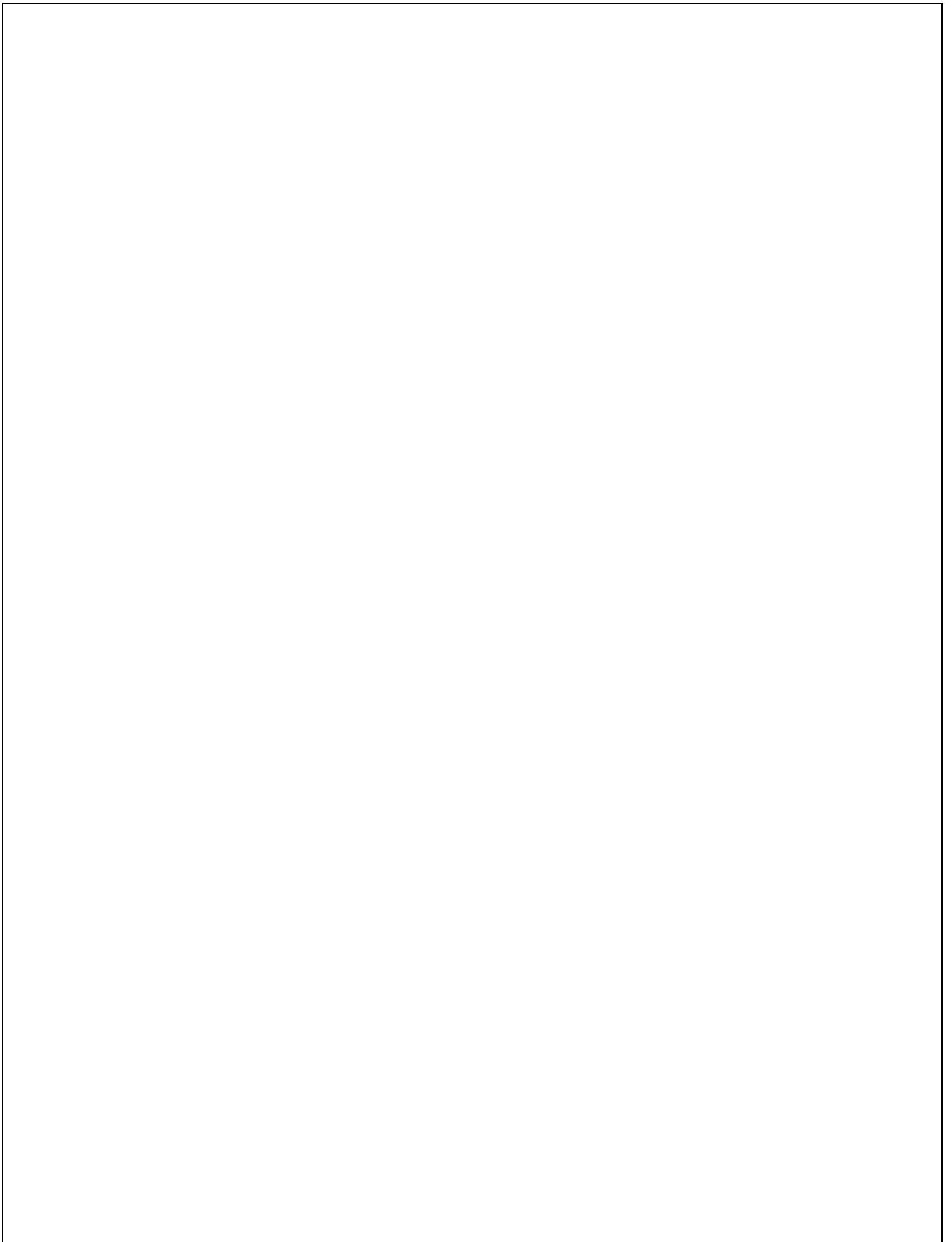
Dr. Todd M. Ahlman, Co-Editor-in-Chief

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Steve Davis, Publisher

Volume 4 (2017/2018)

July 2018



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THE JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY

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Published

by the

Journal of Texas Archeology and History.org, Inc.

Austin, Texas

July 2018

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Online/Digital publication: ISSN 2334-1874

Domestic print and Kindle publication: ISBN 1725915308

International print publication: ISBN 978-1725915305

The online and print versions of the publication “*Journal of Texas Archeology and History*” are published
by

Journal of Texas Archeology and History.org, Inc.,
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The **cover art border design** gracing Volume 4 features a representative sampling of archaic and Clovis projectile points from the Gault site which spans the entire human occupation of North America. Included in the border art are four 3-D renderings of Clovis points (at the corners) that were imaged by Dr. Robert “Zac” Selden and 2-D images of archaic points by Antonio Arcudi. They are in alphabetical order beginning in the upper left. For a description of each of the projectile points, refer to the article titled “*A Visual Guide to the Archaic Points Found at the Gault Site (41BL323) with Clovis Points for Comparison*” by Dr. Tom Williams on page xi or, inclusively, click on the image of interest. This is the first in a series of special cover designs for the JTAH by the talented team at the Gault School of Archaeological Research at Texas State University. Future covers may highlight subjects such as the Andice point collection, Folsom points, and the “older than Clovis” tool kit. On this cover, we encourage you to click the various images for “extra” content and [click here](#) for an appendix describing all of the points shown.

On the **front cover, center panel**: the painting featured on the front cover is Figure 9, page 19 from Article 1: *Chasing the Phantom Ship: Revisiting Interpretations of the Boca Chica No. 2 Shipwreck on the Texas Coast*. The scene illustrating the engagement off Brazos Santiago, April 3, 1836 is entitled “*Invincible vs. Bravo*”. This artwork was created especially for the Amy Borgens article by Peter Rindlisbacher (2017).

INTRODUCTION: The Journal of Texas Archeology and History.org is an organization dedicated to furthering research, education and public outreach in the fields of archeology and history concerning Texas and its bordering states of Louisiana, Arkansas, Oklahoma, New Mexico and Northern Mexico; a region we call the “Texas Borderlands.” This volume is comprised of articles of original research that have been peer reviewed. We proudly present our signature publishing effort for the year 2017/2018 – “*The Journal of Texas Archeology and History, Volume 4.*”

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FOREWORD TO VOLUME 4 (2018): PUBLISHER'S REFLECTIONS

For the fourth time, I look back on the past year in amazement of what great work our talented and dedicated group of volunteers and authors has produced. As we look forward to the fifth anniversary of the J.T.A.H. in November and our initiatives planned for the coming year, a deep heartfelt word of gratitude is owed to the individuals who have graciously contributed their time and effort to this publication, and to the corporate governance of the non-profit organization. The fifteen or so professionals who make up our Editorial Board, and the five who constitute our corporate board of directors, have made it possible for the J.T.A.H. to grow and offer new products, publications and services to the archeology and history community.

In Volume 4, we feature three outstanding articles covering a wide range of topics that the reader will enjoy and derive a great deal of knowledge and understanding of the subject. One of these is a fascinating, detailed study of a long-disputed Texas Revolution era shipwreck written by Texas Marine Archeologist, Amy Borgens. We plan to make this interesting article our first dual-language publication due to its common interest for our neighbor to the south, Mexico. In the future, we plan to feature additional articles and publications that will be published in both English and Spanish.

This past spring, the J.T.A.H. Board of Directors and Editors approved a plan to produce special publications comprised of graduate level research from the universities in the Borderlands Region; Louisiana, Arkansas, Oklahoma, New Mexico, Texas and Northern Mexico. This will include a series of journal style publications entitled "Graduate Papers from the Borderlands". Our invitation to participate in this special series will go out in September seeking submittals from graduate students to send their thesis or dissertations for review and consideration. We project the first of this special series will be available in the fall of 2019

This year we welcomed three new members to our Editorial Board: Dr. Ashley Lemke, University of Texas – Arlington; Dr. Karen Steelman, Director of Research at SHUMLA; and Kay Hinds, M.A., City of San Antonio Archeologist. These women are each a leading scholar in their field and bring a great deal of expertise to, and improve the gender balance of, our Editorial Board. We are proud of the group of experts that constitute our board and thank them for donating their time and expertise to the pursuit of free and open-access publication of important new research.

The JTAH will once again sponsor and organize an international symposium for the October 2018 T.A.S. Annual Meeting in San Antonio. This year's theme is focused on the 300th anniversary of the City of San Antonio. Several symposiums are being organized to delve into the Spanish Colonial influence on the development of the State of Texas. Our symposium will bring in three invited scholars from Mexico that are researching the Spanish Colonial era influencing the "Borderlands Region". We are especially thankful to the Gilmore Foundation and the Friends of the Texas Historical Commission for their financial support which will be used to defray travel expenses for our special guests from Mexico.

We have already begun planning the 2019 J.T.A.H. Book Festival for the next T.A.S. Annual Meeting. Two authors with new books have already received an invitation to participate. It has been a good year. We look forward to another great year serving the archeology and history community of the Texas Borderlands region.

Steve Davis, Publisher

Independence Day 2018

LIST OF AUTHORS

Amy A. Borgens, State Marine Archeologist, Texas Historical Commission, Austin, Texas (amy.borgens@thc.texas.gov).

Steven D. Hoyt, Former State Marine Archeologist, Texas Historical Commission, Austin, Texas.

Tim Riley, Curator of Archaeology, Utah State University Eastern Prehistoric Museum, Price, UT 84501 (tim.riley@usu.edu).

Anthony C. Schienschang II, Department of Anthropology, University of Virginia, Charlottesville, VA 22903 (<acs5yg@virginia.edu>).

Thomas J. Williams, Ph.D., Assistant Executive Director, Gault School of Archeological Research, Texas State University, San Marcos, Texas (tom.williams@txstate.edu).

A VISUAL GUIDE TO THE ARCHAIC POINTS FOUND AT THE GAULT SITE (41BL323) WITH CLOVIS POINTS FOR COMPARISON

Thomas J. Williams, Ph.D.

Archaeological excavations at the [Gault Archaeological Site](#) (41BL323) have revealed an almost complete stratigraphic record of the prehistoric occupation of Central Texas (Collins 2002, 2004). Furthermore, ages obtained from Area 15 of the site confirms good stratigraphic agreement between the diagnostic artifacts, cultural horizons, and stratigraphic units ([Rodrigues, et al. 2016](#); [Williams, et al. 2018](#)). This includes some of the earliest evidence for a projectile point technology in North America (Williams, et al. 2018). Like many areas in Central Texas, the combination of water, raw materials, and its position along the Balcones Escarpment provided abundant resources essential to survival.

The Gault Archaeological Site has a long [history](#). The site takes its name from a previous landowner, Henry Gault, and the first scientific excavations were conducted there in 1929 under the supervision of J. E. Pearce. In 1990, David Olmstead reported a unique find; an Alibates Clovis point sandwiched between two limestone plaques with engraved geometric designs. This led to a site visit by Dr. Tom Hester and Dr. Michael Collins. This finding was followed in 1997 by the discovery of an extremely fragile mandible of a juvenile mammoth by the Lindsey family. These discoveries prompted the recent archaeological excavations at the site, which began in 1999 and lasted until 2002. As many archaeologists will attest, the most interesting findings came at the very end of the 2002 field season, when archaeologist Sam Gardner exposed cultural material stratigraphically below Clovis in a small test unit. This led to negotiations between Michael Collins and the Lindsey family that resulted in the purchase of the property by Dr. Collins and its donation to the Archaeological Conservancy. Between 2007-2014, Area 15 was excavated to expose the cultural materials below. With the cessation of excavations in 2014, research focuses on reporting these findings and how this early archaeological assemblage in Central Texas is redefining the search for the earliest human occupants of the Americas.

The front cover of this issue of the Journal of Texas Archeology and History highlights two specific chronological periods in Texas. Firstly, in each corner you will find interactive 3D scans of four Clovis points that have been recovered from the site (Seldon et al. 2018). In between these, you will find an array of Archaic projectile points that have been recovered from the various excavations conducted between 1999-2002 and 2007-2014. This includes Early Archaic points such as the Hoxie and Martindale; Middle Archaic points including, Kinney and Nolan; and Late Archaic points including Pedernales, Marshall, and Bulverde. Clovis artifacts including, projectile points, blade cores, and diagnostic debitage have been recovered from a total of 9 excavation areas.

We will expand on these covers in the future to cover specific research projects currently being undertaken by the [Gault School of Archaeological Research](#) staff. The Gault School of Archaeological Research is a non-profit, 501(C)3 charitable organization dedicated to innovative, interdisciplinary research archaeology and education focusing on the earliest peoples in the western hemisphere and their cultural antecedents. The reader is encouraged to “click” around on the various cover images comprising the front and back cover border artwork to find and explore the additional rich content

hidden there. [Click here](#) to open or download an informative “Appendix to the Cover Art containing this article, descriptive attribute data and a larger image of all projectile points shown on the front and back covers.

ACKNOWLEDGEMENTS

Sincere thanks go to Dr. Michael B. Collins, Dr. D. Clark Wernecke, and Nancy Velchoff at the Gault School of Archaeological Research. As some readers may well be aware, Texas projectile point typologies can divide opinion and every effort has been made to provide appropriate references. All of the types here were identified by Elton R. Prewitt, Dr. Robert Lassen, and Sergio Ayala as part of an ongoing analysis of the archaeological materials recovered from the Gault Site. Excavations at the Gault Site were funded in part by NSF Grant 0920549 to Texas State University, San Marcos. The Gault School of Archaeological Research is funded with the generosity of private donors.

To learn more about the [Gault Archaeological Site click here.](#)

To find out about Dr. Zac Selden’s work at the [Center for Regional Heritage Research click here.](#)

To find out about the important research and working with the [Gault School of Archaeological Research click here.](#)

Text: Thomas J. Williams, Ph.D.

3-D Interactive Imaging: Robert Z. Selden, Jr., Ph.D.

Cover Border Artwork Images: Antonio Arcudi, Sergio, and Thomas J. Williams, Ph.D.

Central Texas Chronology sheets: Thomas J. Williams, Ph.D., text by Antonio Arcudi.

Border Art Cover Design and Layout: Steve Davis.

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JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY

CALL FOR PAPERS – VOLUME 5 (2018/2019)

The *Journal of Texas Archeology and History.org* has been established to protect, preserve, and promote archeology and history through public outreach, publishing, and distribution. Our signature work is a peer-reviewed publication that promotes professional and graduate academic level research in the fields of archeology and history regarding a geographic region centered around the State of Texas that includes Louisiana, Arkansas, Oklahoma, New Mexico, and the northern portions of Mexico. We call this region the “Texas Borderlands.”

The JTAH journal is an open-access online publication whose text is discoverable via Google Scholar and other prominent search engines. It is freely available to authors and readers worldwide. It is word searchable in common Portable Document Format (.PDF) file format and indexed to be discoverable on the internet. We have no deadline for authors to meet; simply submit the completed manuscript to Co-Editors-in-Chief [Dr. Todd M. Ahlman](#) and [Dr. Mary Jo Galindo](#). They will begin the peer review processes upon receipt. All submissions should follow *American Antiquity* style:

http://www.saa.org/Portals/0/SAA/Publications/StyleGuide/StyleGuide_Final_813.pdf.

Upon peer review and approval by our Co-Editors-in-Chief and final preparation for publication, the article will be published in the online journal. Additionally, articles published online will appear in our annual volume and the print version. Volumes close on June 30 and the next volume is begun on July 1st of each year.

The online version of the Journal is a 100% digital publication; authors are encouraged to take full advantage of technology to enhance their article through use of features not available in traditional publications. These enhancements include: extensive color, high-resolution photography, video clips and embedded sound bites, 3-D interactive renderings, and hypertext links to outside content and websites. Authors are encouraged to include separate appendixes of supporting data that will be published in the online version and available as a stand-alone digital download.

Additionally, the JTAH.org now publishes a high-quality, full-color, print version of its annual volume of peer reviewed research. The print publication is made available through Amazon.com at near direct cost as a service to the research community and authors.

CHASING THE PHANTOM SHIP: REVISITING INTERPRETATIONS OF THE BOCA CHICA NO. 2 SHIPWRECK ON THE TEXAS COAST

*Amy A. Borgens, Texas Historical Commission
with contributions by Steven D. Hoyt*

ABSTRACT

Boca Chica Beach spans the south Texas coast in Cameron County for a distance of roughly 12 kilometers between Brazos Santiago Pass and the mouth of the Rio Grande River at the Texas and Mexican border. More than 165 historic ships have been reported lost along the south Texas coast in this general area and at least four, or portions thereof, have been discovered so far. The most well-known of the shipwreck remains is archeological site 41CF184, nicknamed Boca Chica No. 2, which has gained almost mythological status in the region as it has long been circumstantially linked to the Mexican warship *Moctezuma*; not-so-coincidentally one of the most famous shipwrecks in the region. Is Boca Chica No. 2 the famous warship, once believed to be a “phantom” because it so often eluded the Texian patrols? Evidence suggests otherwise but the significance of both the historic ship and the archeological site invite reexamination of this unresolved mystery.

INTRODUCTION

Like other coastal shipwrecks discovered on the beach, site 41CF184, known as Boca Chica No. 2, for years has intrigued archeologists and the public alike. The shipwreck has been known to the Texas Historical Commission (THC) for almost two decades, during which time its periodic exposure on the beach near the mouth of the Rio Grande River (Figure 1) has allowed for semi-regular monitoring and recordation. Artifacts have not been observed and there is a strong likelihood this vessel was heavily salvaged at the time of its loss, including perhaps parts of the ship itself. Local folklore has long suggested this might be the Mexican Navy vessel *Moctezuma* (often also referred to as *Montezuma*, *Bravo*, and *General Bravo*), supposedly sunk by the Texas Navy schooner *Invincible* in April of 1836. This is considered an important milestone in Texas history as Mexico had successfully employed this vessel to both deter Texians from receiving revolutionary supplies and assist in preparations for the Mexican military advance. The local hypothesis that Boca Chica No. 2 is *Moctezuma* has not been supported by any archeological or historical evidence.

A renewed look into the case of *Moctezuma* has only further emphasized the inherent difficulty in conclusively identifying historic shipwrecks with limited evidence and, more specifically, the problems with linking this vessel to site 41CF184. Historical research demonstrates at least three armed sailing vessels called *Montezuma*/*Moctezuma*/*Bravo*/*General Bravo* were used by Mexico between 1825 and 1838 before a fourth steamship of that name (*Montezuma*) was acquired in 1842. The 1830s naval vessel is

JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY

VOLUME 4:1-42

THE ONLINE PUBLICATION JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY (ISSN 2334-1874)

IS PUBLISHED BY JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY.ORG.

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reported to have been lost at both the Brazos Santiago Pass and the mouth of the Rio Grande River. Secondly, Mexican sources may suggest that *Moctezuma* survived the 1836 naval engagement and was still in use the following years. Can new research tease out the answer to this mystery?

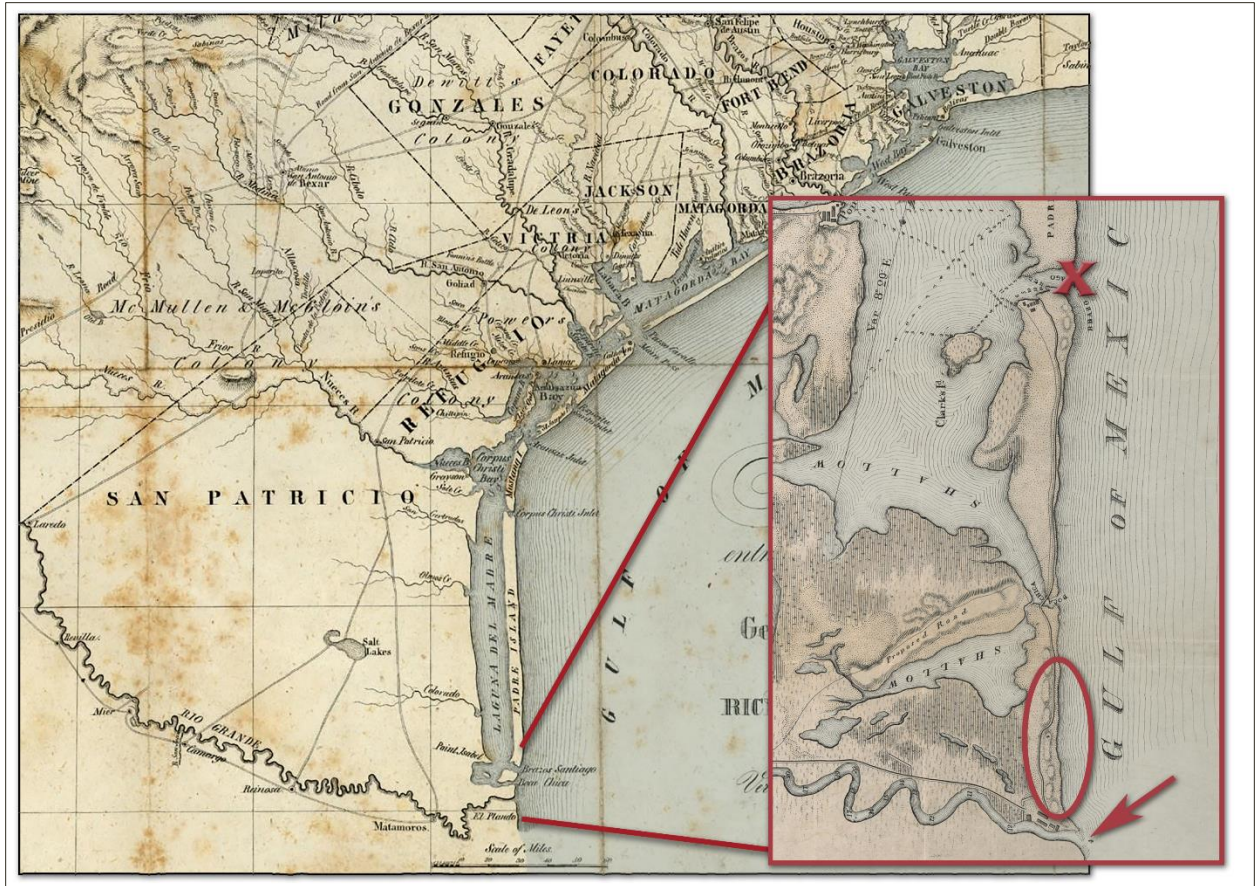


Figure 1. Color-modified maps from 1839 (Hunt and Randel 1841) with 1847 inset detail (Webster et al. 1847) showing Brazos Santiago Pass (X), the mouth of the Rio Grande River (arrow) and approximate location of 41CF184 (circle) (image by author, 2017).

THE DISCOVERY

Randy Blankenship of Texas Parks and Wildlife Department (TPWD) reported the archeological site to former State Marine Archeologist Steve Hoyt of the THC in 1999. It had become exposed following a storm and damaged by a Cameron County beach cleaning crew (Hoyt 1999a:1). Hoyt contacted the County Engineer’s Office and requested a halt to work activities and visited the site in May 1999 (Figure 2). Portions of the bow and stern were exposed and Hoyt observed 29 frames on the port side, some doubled. The observed frames were not evenly spaced with gaps of as large as 3.3 m (10 ½ ft) as many were missing. Hoyt suggested that the framing gaps could be due to natural erosion beneath the sand line but speculated that this was likely caused by heavy equipment damage (Hoyt 1999a:3). A detached hanging knee and ceiling plank were previously recovered by TPWD and reviewed by Hoyt. The knee was recorded as having a broken, incomplete vertical height of 33.0 cm (13

in) and a horizontal length of 68.6 cm (27 in). The ceiling plank had an incomplete length of 2.9 m (9.5 ft) with a thickness of 3.8 cm (1.5 in) (Hoyt 1999a:4; Hoyt 1999b:6).



Figure 2. Site 41CF184 in 1999 (photo by Steve Hoyt, 1999).

Historic and prehistoric archeological sites such as this on state public lands are protected by Texas state law. Incidentally it was the unsanctioned recovery of artifacts from a 16th-century shipwreck off Padre Island that led to the enactment of the Antiquities Code of Texas in 1969 (Arnold and Weddle 1978:xiii–xiv). Texas thereby became one of the first states to create legislation that specifically protects historic shipwrecks. Boca Chica No. 2 was designated a State Antiquities Landmark in 2004, the highest protective status for a historic site that is issued by the state.

The THC, with help from its volunteer group (the marine stewards) and local citizens, have monitored the wreck since 1999 and have documented its migration from the dunes into the intertidal area. This has greatly accelerated the degradation of the hull timbers. The combined destructive forces of the wave action, wood consumption by the “shipworm” *Teredo navalis*, and injuries to the wreck through beach cleaning activities, vandalism, and looting have all contributed to the rapid decline of this important site.

Field observations and additional examination of the 1999 photography show that when site 41CF184 was first discovered, it still retained outer hull planks and internal ceiling planking, had two of its hanging knees (these support the deck beams; Figure 3), the sternpost, and gunwale stanchions projecting above the natural termination of the frames – all of which indicate that hull structure was once preserved at or above the deck level. Most of the hanging knees were missing, in addition to all of the deck beams, deck planking, and all superstructure and attributes typically situated atop the deck. The absence of these timbers could be due to environmental processes, but often beached wrecks could

be salvaged not just for their cargo but also their robust timbers—especially in areas that were sparsely inhabited or lacked local abundant timber resources. Even in spite of its incomplete condition, site 41CF184 at its time of discovery constitutes one of the most complete and well-preserved shipwrecks ever discovered in Texas.



Figure 3. Detail of site 41CF184 showing exposed ceiling planking at the bow, hawse timbers, framing, starboard outer hull planking, a hanging knee, and the bowsprit step. (Photo by Steve Hoyt, 1999).

THE SHIP

More extensive examination of 41CF184 occurred in 2002, at which point the vessel had again been uncovered. Steve Hoyt visited the shipwreck in May, almost three years to the day after his original introduction to the site. At this time Hoyt more extensively recorded many basic diagnostic attributes. He suggested the length overall (LOA) was 22.0 m (72.2 ft) with a maximum beam of 7.7 m (25.3 ft). He mapped the transom in detail and determined the width across the expanse of ceiling/deck planking measured 4.7 m (15.5 ft). The octagonal main mast measured 43.2 x 44.5 cm (17 in x 17.5 in) flat-to-flat. The chainplate on the port side was visible at this time. Hoyt recognized that ceiling planking observed at the bow in 1999 was missing (Hoyt 2002a:1–2). Previously in 1999, Hoyt recorded molded and sided dimensions of the futtocks as 15.2 x 15.2 cm (6 x 6 in) (Hoyt 1999a:3).

Later in August 2002, the THC's marine stewards mapped the exposed timbers using trilateration (Figure 4). This work was largely undertaken by Andrew Hall, Gary McKee, Tom Oertling, John Luce, and Doug Nowell (Hall et al. 2002; Hoyt 2002b; Oertling 2002). This investigation determined 41CF184 was 21.9 m (72 ft) in preserved hull length with a hypothesized complete LBP (length between perpendiculars) of 24.1 m (79 ft) (Oertling 2002:3). A reexamination of the 1999 photography indicates that the hull was at or above the deck level, which is the point that LBP—the length from the fore part of the stem to the after part of the stern—was calculated for enrollment and registration for floating vessels (Lyman 1945:226); it is suggested in this article that the enrollment/registration length of 41CF184 likely did not exceed 22.9 m (75 ft) and was probably fairly close to the measured LBP of the hull.



Figure 4. THC marine stewards mapping site 41CF184: (a) creating mapping datum points; (b) uncovering the stern (photos by Bill Pierson, 2002).

The maximum breadth, calculated using the measured half width of 3.5 m (11.5 ft) was 7.0 m (23 ft) (Oertling 2002:3). The vessel was both treenail and iron fastened (Oertling 2002:2). In 2002 the mainmast and bowsprit step (also bitt or knighthead) were the only internal central features exposed and an unsuccessful attempt was made to excavate and locate the foremast. Oertling focused on two attributes to help indicate an age for the shipwreck: the rake of the mainmast 5 degree aft and the semi-circular arrangement and pronounced rake of the hawse (bow) frames. Collectively these suggested to Oertling (2002:3) a 1790–1840 build date. A wood sample taken of a futtock (number P30) indicated it was oak (Oertling 2002:3).

In addition to mapping the wreck, THC staff Bill Pierson conducted a magnetometer survey of the beach at the wreck site (Figure 5). Only a portion could be surveyed due to the surf and this showed the locations of the iron fittings and fasteners within the largely wood fastened-hull (Hoyt 2002a:3).

Additional excavation and mapping of the shipwreck was planned for June 2006, through a joint collaboration between the Texas Historical Commission and the PAST Foundation. Unfortunately by

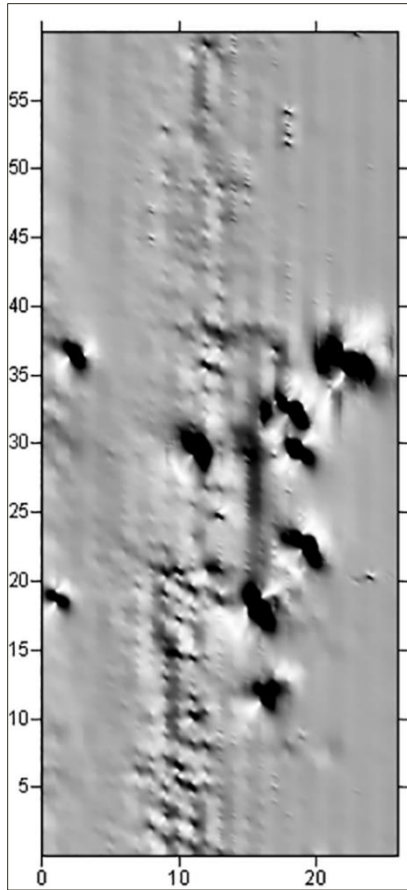


Figure 5. Magnetometer Map (Bill Pierson, 2002).

the time the project was coming to fruition, the beach had dramatically eroded and Boca Chica No. 2 was in the intertidal area and surf zone. The PAST mapping project never commenced (Andrew Hall, personal communication 2017).

In 2016, the THC acquired the foremast that had been collected from the archeological site in 2010. The report of its removal had been shared by archeologist Mark Willis. He had been informed that it was removed so that it could be carved into a bird. The THC later learned that the prospective wood artisan recognized the foremast from the wreck so it was retrieved and stored in a local bait shop before it again changed hands. Upon learning the bait shop was closing, local resident Keith Reynolds asked if he could have the foremast. In an effort to find the true owner of the artifact, Reynolds contacted Bill Turner, then-president of the Texas Navy Association, who then contacted the THC (Borgens 2016a:2). In January 2016, Turner and the author visited Reynolds in Brownsville and collected the foremast. Currently this is the only portion of the shipwreck curated by the THC.

The remaining foremast represents the stump, essentially the bottom of the mast, where it would have been mortised into the keelson. It is believed to weigh more than 200 lbs. and even though it is heavily *Teredo*-damaged, the lower 38 to 50 cm (15.0–19.7 in) still retains its original surface. The mast was octagonal in shape, like the mainmast, with a distance between flats of 46.6 cm (18.3 in) at the base; the octagon planes are irregular and range in width from 12.8 to 21.2 cm (5.0 to 8.3 in). An iron band 9.2 cm high and 2.7 cm (3.6 and 1.1 in) thick was at the base of the mast. The overall preserved height of the foremast is 144.7 cm (4.8 ft) including the 129.8 cm (4.3 in) mast and 14.9 cm (5.9 in) heel tenon (Borgens and Cabading 2016). The height of this artifact suggests that the preserved depth to the bottom of the keel was approximately 2.1 m (7 ft) or greater when the wreck was exposed in 2002, as this would have been attached to the keelson which overlies the frames and keel. By this time most of the frames were no longer preserved to their natural termination as evident in the 1999 photography. Wood sample analysis conducted by Macrobotanical Analysis for the THC in 2016 determined the foremast was fashioned from *baldcyprus*, a timber predominantly local to southern U.S. coastal states (Steffy 1994:257; Bush 2016). Masts could become easily damaged and were replaceable, therefore the origin of the wood only conclusively shows the origin of the mast itself, which may or may not represent where the ship was built.

An important consideration for deducing the age and potential function of a historic vessel is the presence of copper sheathing. So far over the years there has been no evidence of copper sheathing on site 41CF184 or the cupreous and copper fasteners associated with sheathed vessels. Copper sheathing

emerged in the 1760s as a military technology for sheathing and protecting submerged naval hulls from *Teredo* damage and fouling. Britain was the leader in developing this technology, being the first to copper sheath a ship, HMS *Alarm*, in 1761, and with more than 20 ships sheathed by 1777 (Staniforth 1985:23–24). France and the United States sheathed their first naval vessels *Le Gorée* and *Alliance* in 1767 and 1781, respectively (Boudriot 1986:241; Steffy 1994:175). Adoption of copper sheathing as hull protection was gradual due to the galvanic corrosion of the underlying iron fasteners. Once a successful “composition” cupreous fastener type was developed in the late 1780s, coppering became more widespread. By 1812 it was considered common practice in the construction of British vessels (Staniforth 1985:25; Pering 1812:36).

The use of copper sheathing for the United States Navy occurred later, with it only becoming a regular practice in the beginning of the nineteenth century. Though the U.S. had manufactured its own copper since 1815, it was unable to produce the requisite quantities and in 1850 it was still importing this commodity from Britain—enough to sheath 600 vessels (Kauffman 1968:117; Ronnberg 1980:125). By 1832 a new alloy copper sheathing (60 percent copper to 40 percent zinc) was patented by G. F. Muntz, though its use only began to supersede that of regular copper by the mid-nineteenth century (Staniforth 1985:23, 27). Copper sheathing technology gradually diffused to use on merchant and recreational vessels but during the early to mid-nineteenth century this still added a considerable expense to vessel construction and maintenance. Vessels advertised in the newspapers for charter promoted coppering such as the copper fastened and coppered *Mexicano* (New Orleans Bee [NOB] 1836a) as it alluded to a finer quality and better-maintained vessel.

As a general rule of thumb, the appearance of copper sheathing typically indicates a late eighteenth-century to late nineteenth-century use or manufacturing date for a shipwreck. On late eighteenth- and early-nineteenth century wrecks this can suggest naval use, as this was before it adopted for large-scale commercial use. Additionally, Muntz metal is typically used to theorize pre or post mid-nineteenth century dates. The lack of sheathing can also indicate pre-1780s dates as well but this needs to be coupled with other evidence as less costly constructed ships were frequently not coppered. The absence of sheathing on 41CF184 suggests a non-naval vessel of perhaps more humble origins.

Photographic Monitoring

Much of what has been learned about the shipwreck, aside from site mapping in 2002, is known from photographic monitoring (Figure 6). Prior to 2010, the THC files for 41CF184 contained images from 1999, 2002–2006, 2008, and 2009. In 2016 Kay Polt of the Power Squadron, donated additional photography she had taken in 2002, 2003, and 2005. Later in 2017, Harlingen resident Rebecca Lozano provided the earliest photos the THC now has on file, dating to the mid-1990s (Figure 7). The THC visited the location of 41CF184 in 2010 and 2016 and the shipwreck was not visible, therefore it could not be photo-documented (Borgens 2016a:4).

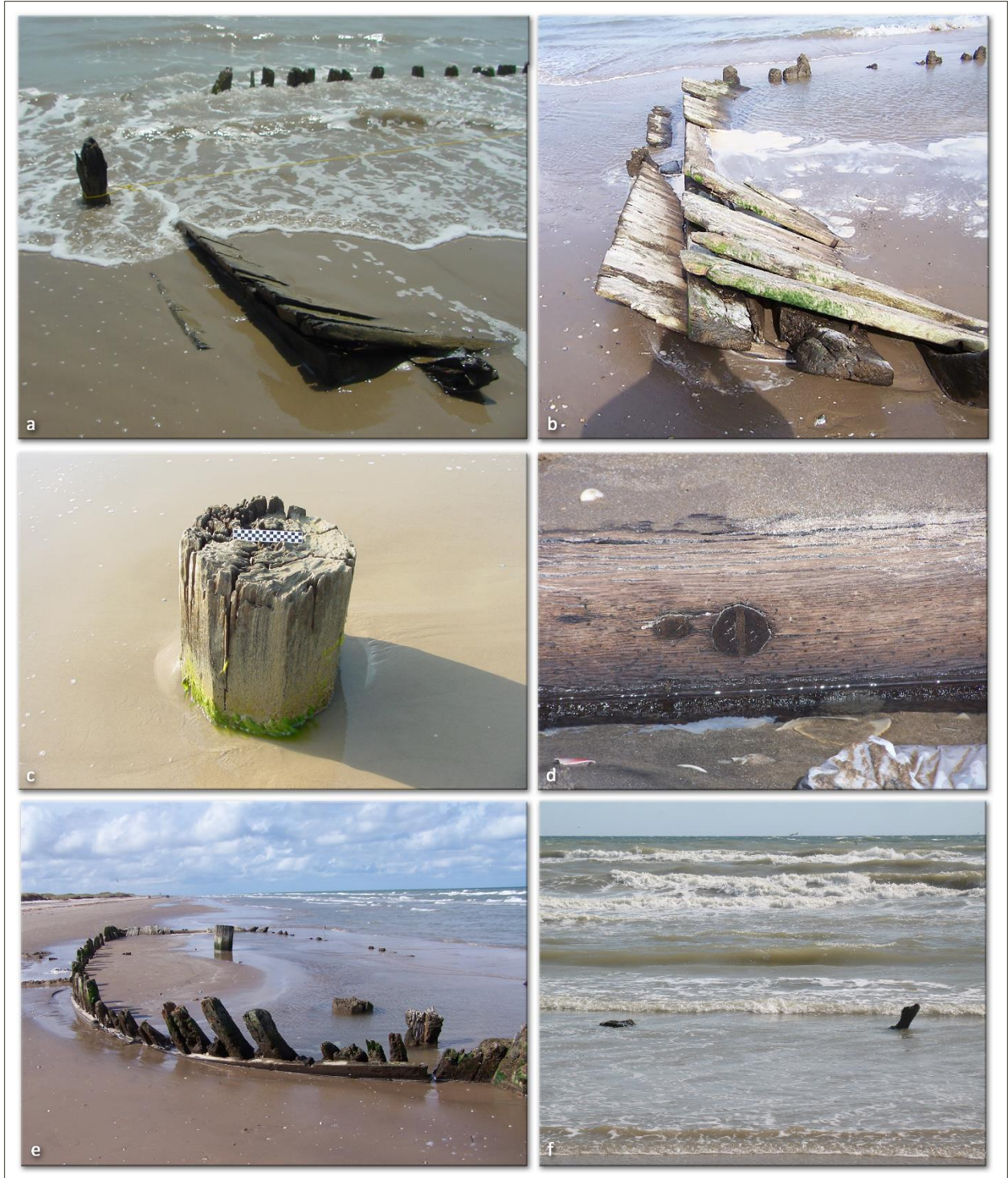


Figure 6. Details of 41CF184 since 1999: (a) transom in 2002 (photo by Steve Hoyt, 2002); (b) transom in 2005 showing more exposure, timber loss, and details of fashion pieces and outer planking (photo by Kay Polt, 2005); (c) the octagonal mainmast in 2002 (photo by Steve Hoyt, 2002); (d) Treenail with wedge (photo by Kay Polt, 2005); (e) Overall site from September 2005 showing both masts, bowsprit step, outer hull planking, and (far right) stem (photo by Kay Polt, 2005); (f) only the stem and foremast are visible in October 2009 demonstrating substantial loss and rapid degradation of remaining timbers (photo by Jeff Durst, 2009).

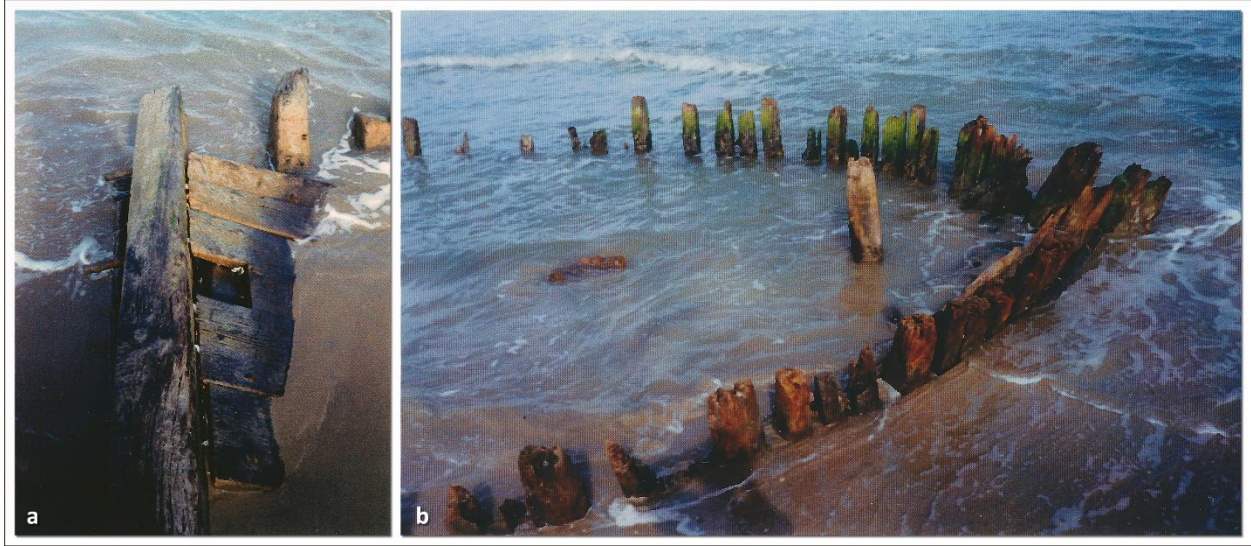


Figure 7. Early details of 41CF184: (a) port transom and (b) bow with foremast and bowsprit step visible (photos by Rebecca Lozano, ca. 1995).

The Polt images were used to illustrate an online-article for the Texas Navy Association that proposed *Montezuma* as the identification of 41CF184 (Drake 2005) – this article is no longer hosted online. The THC photos from 1999 and May 2002 along with the Polt images from September 2005 provide some of the best imagery of the shipwreck when the majority of the upper buried attributes were visible. A series of photographs taken by Hoyt in 2002 captured the run of all the port and starboard frames from the vantage point of the centerline. Lozano’s photos from ca. 1995 are the first on file that show the exposed foremast – this feature was often buried under sediment. Polt’s 2005 images show important framing details and provide the best documentation of one of the treenails. This demonstrates that the treenail ends were finished with a wedge bisecting the circumference of the tip.

In 2016, the author augmented the 2002 Andrew Hall site map by adding the transom recorded by Hoyt in 2002 and then interpolating the position of the remaining frame ends, the outer hull planks, bow ceiling planking, and the foremast from photography (Figure 8). The spacing between the sets of double frames, as deduced from photography, was approximately 15.2 cm (6.0 in) (Borgens 2016b:18).

Comparative New Orleans Vessel Statistics

In 2006, the author created a database version of volume 1 (1804–1820) of the New Orleans Registers and Enrollments (Survey of Federal Archives in Louisiana 1941) which can be used to statistically analyze comparative vessel sizes for watercraft that may have frequented this important historic Gulf port during the early 19th century. This data has been used in other studies, notably the Mardi Gras Shipwreck project wherein averages were generated for vessel sizes (Ford et al. 2008, Ford et al. 2010; Horrell and Borgens 2017). Based on this data, the average length and maximum beam for all schooners in volume 1 was 18.2 x 5.4 m (59.6 x 17.7 ft) and 23.3 x 6.9 m (76.3 x 22.8 ft) for brigs (Borgens 2008:58, Table 4.2). The size of the hull of 41CF184 therefore closely corresponds to the average merchant brig registered and enrolled at New Orleans between 1804 and 1820.

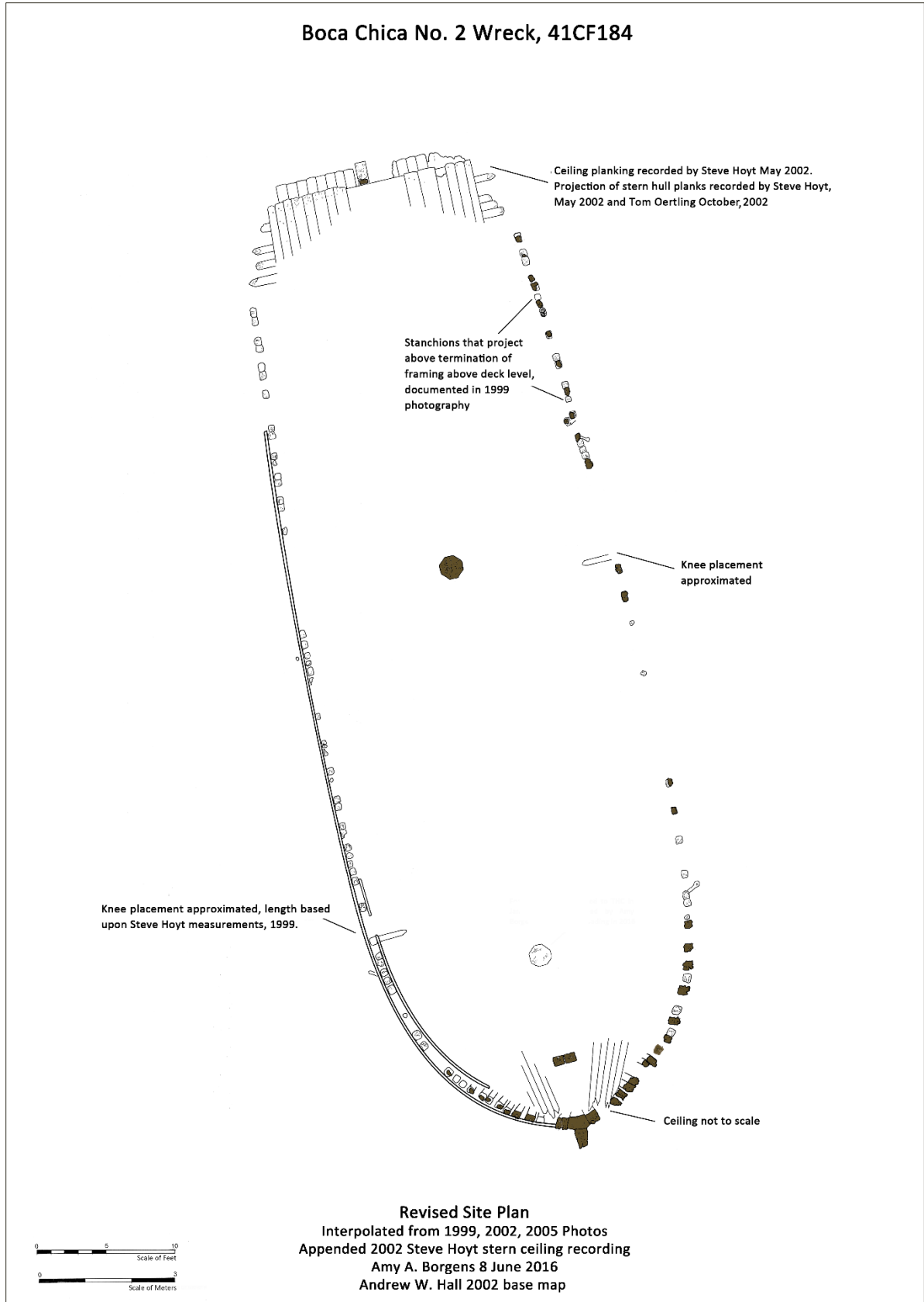


Figure 8. Revised site plan. Timbers depicted in the 2002 map are highlighted (Borgens and Hall, 2016).

Almost half the 924 entries in volume 1 were two-masted vessels; such data was missing for 9% of the watercraft. Using the preserved hull LBP of (21.9 m 72 ft) and an approximated hypothetical preserved LBP of 22.9 m (75 ft), two-masted New Orleans entries ranging in length from 21.9–22.9 m (72–75 ft) from volume 1 were compared (n=29): 14 were schooners, 14 were brigs, and there was a single snow. All but two vessels in these categories were listed as having a single deck—these exceptions both being brigs. The two-masted sailing vessels in this size range all had a square stern. The average for sailing vessels in this range specifically is 22.3 x 6.6 m (73.3 x 21.7 ft). The tonnages for vessels of this length are quite variable, ranging from 44 to 169 tons displacement, with an average of 127.9. The depth of hold ranged from 1.2–3.0 m (4 to 10 ft) with an average of 2.8 m (9.1 ft). Based on the New Orleans data for 1804–1820 and more specifically for the 21.9–22.9 m (72–75 ft) size range, 41CF184 conforms equally to a single-decked, two-masted merchant brig or schooner. The type of rigging more than the hull shape was typically the distinguishing factor between a brig and a schooner.

The length-to-beam ratio for the preserved hull of 41CF184 is 3.1:1; the adjusted length-to-beam ratio for the 22.9 m (75 ft) length is 3.4:1. The length-to-beam ratio for the average registered and enrolled merchant schooner is 3.4:1 and brig is 3.3:1. The average for two-masted sailing vessels in general for the 21.9–22.9 m (72–75 ft) range is 3.4. By comparison the length to beam ratio for the 83-ft. schooners of the Texas Navy (*San Antonio*, *San Bernard*, and *San Jacinto*) launched in 1839 was 3.9:1; the 110-ft. brigs *Archer* and *Wharton* were also 3.9 (Dawson and Williams 1839). Essentially, armed warships are typically longer for their beam than are merchant vessels.

In summary, 41CF184 is hypothesized to be a two-masted, wooden-hulled, double framed, and largely wooden-fastened sailing schooner dating from the late-eighteenth to the mid-nineteenth centuries. It is heavily built and has an overall length to beam ratio of approximately 3.4:1, which is more consistent with the “fatter” cargo carrying merchant vessels and not necessarily typical for the conventional finer, sharper-hulled warships of the time. The lack of sheathing on 41CF184 for this period is again suggestive of mercantile use and not naval purposes.

EXAMINING MONTEZUMA AS A WRECK CANDIDATE

The belief that 41CF184 is *Montezuma* has long persisted despite evidence to the contrary. This is unfortunately often the case for historic shipwrecks wherein local folklore can sometimes immediately associate an archeological site with the most famous shipwreck in the area. Generally, Texas wrecks are often attributed by local mythology to be either Spanish galleons, Civil War wrecks, or pirate ships belonging to Jean Lafitte. The question therein is, what is currently known about *Montezuma* to suggest it as a candidate for Boca Chica Shipwreck No. 2?

This begins as a tale of four (maybe five) *Moctezumas/Montezumas/Bravos*, all of which appear to have been conflated with one another over the years. Both the author and Steve Hoyt independently developed timelines summarizing the history of *Montezuma* in the Gulf and chronicling the change in the vessels’ names. These timelines have been combined and are included as Table 1.

Table 1. Timeline Summary of the Various Vessels by the Names of *Ariel*, *Bravo*, *General Bravo*, *Montezuma*, and *Moctezuma*

Date	Event	Names
1824	<i>Bravo</i> was purchased from England in 1824 and was formerly built as a nobleman's yacht named <i>Ariel</i> (Bidwell 1960:331). Bonilla (1946:23) has 1823 as the purchase date.	<i>Ariel</i>
1825 Aug. 6	An index of documents in the English archives relating to Mexico mentions a French letter of August 6, 1825 that provides information on the ships <i>Avend-Prindien</i> and <i>Ariel</i> (Grajales 1969:84). These were two of the three ships purchased through new loans negotiated with English lending houses. <i>Avend-Prindien</i> was renamed <i>Libertad</i> and had been expected to arrive in January but did not arrive in Mexico until September 13 (Bidwell 1960:349). All three vessels arrived in the fall of 1825 as <i>Victoria</i> reached Mexico on August 18, 1825 after stops in New York and Jamaica and <i>Bravo</i> arrived on September 20th (Bidwell 1960:349).	<i>Ariel</i>
1825 Sept.	The ministerio de hacienda (treasury minister) Ignacio Esteva, inspected the navy and commented on the weakened condition of <i>Bravo</i> (Escamilla 2008:245).	<i>Bravo</i>
1825 Oct. 5	One of several vessels ordered to attack Spanish ships sighted off Veracruz including <i>Libertad</i> , brigs <i>Victoria</i> and <i>Bravo</i> , schooners <i>Paploapan</i> , <i>Tampico</i> , and <i>Orizaba</i> , and the sloop <i>Chalco</i> (Bonilla 1946:94).	<i>Bravo</i>
1825 Nov.	<i>Bravo</i> 's launch approached the Spanish fortress at San Juan de Ulúa to see how close they could get without detection (Bidwell 1946:370).	<i>Bravo</i>
1826	Another document in the English archives relating to Mexico provides general information on the frigates <i>Libertad</i> , <i>Ariel</i> , and <i>Victoria</i> (Grajales 1969:103). At this juncture <i>Ariel</i> is formally part of the Mexican Navy yet not being referred to as <i>Bravo</i> in this letter.	<i>Ariel</i>
1826 May	New Commodore Porter arrives in Veracruz and witnesses the existing Mexican Navy: small frigate <i>Libertad</i> of 32 guns, mostly carronades; old brig <i>Victoria</i> with 18 18-pounders; <i>Guerrero</i> ; <i>Bravo</i> brig of 14 24-pounder carronades; <i>Herman</i> , hermaphrodite brig of 5 guns; and two small schooners stationed at Campeche (Porter 1875:348,352).	<i>Bravo</i>
1827 Jan.	Listed as a ship in the Mexican Navy (Ward 1828:307-308; Bonilla 1946:109).	
1826 Dec.	<i>Bravo</i> arrives off Key West in December as part of the Mexican fleet's enterprise to capture Spanish prizes off Veracruz (Viele 1999:107).	<i>Bravo</i>
1827 March	Listed as part of the Mexican fleet off of Key West with 18 guns and a crew of 100. Also mentions <i>Libertad</i> 40 guns, 250 men), <i>Victoria</i> (18 guns, 80 men) and a schooner. The crew of this fleet was comprised of 2/3 "Indians" and 1/3 American and English (New Times 1827:2).	
1828	<i>Bravo</i> was part of the navy operating off of Cuba and had captured 13 prizes (Bonilla 1946:102).	<i>Bravo</i>
1828 July 31	The weak force of the Mexican Navy described as it appeared at Veracruz on July 31, 1828: <i>Congress</i> 64 guns, <i>Libertad</i> of 36, <i>Bravo</i> of 18 guns, and two schooners (London Morning Post 1828:3).	<i>Bravo</i>
1832 Sept. 4	Reported from New Orleans that the Mexican Schooner <i>Montezuma</i> of Tampico, Captain Villereal, was captured by <i>Grampus</i> , Captain Tatnall, with 37 soldiers and a crew of 43 (British Traveler and Commercial Law and Gazette 1832:2; Washington National Intelligencer: 1832:3; Niles' Weekly Register 1832:82-83). It was captured off the Tampico River for piracy committed near Matanzas. <i>Montezuma</i> was unlawfully fitted out by Mexican generals as part of an uprising against the Mexican government. It carried a pivot and two other guns (Jones 1878: 39). Villereal was convicted of piracy in U.S. courts and the vessel was not turned over to Mexico as requested.	<i>Montezuma</i>
1833	Schooner <i>Montezuma</i> , captain Don Tomas Marin traveled to Matamoras with troops and in November traveled to New Orleans with troops (Bonilla 1946:118).	<i>Montezuma</i>
1835	By 1835, the navy of 1829 (when Porter left) was reduced to brig <i>Veracruzano</i> and schooner <i>Moctezuma</i> . According to Bonilla, this encouraged the purchases of 1836: <i>Iturbide</i> , <i>Vencedor del Alamo</i> , <i>Libertador</i> , <i>Mexicano</i> , <i>General Bravo</i> , <i>General Cos</i> , and <i>General Urrea</i> (Lerdo de Tejada 1857:5; Bonilla 1946:118). The budget for 1835 was \$826,584 (Bonilla 1946:118).	<i>Moctezuma</i> , <i>General Bravo</i>

Table 1. Timeline Summary of the Various Vessels by the Names of *Ariel*, *Bravo*, *General Bravo*, *Montezuma*, and *Moctezuma*

Date	Event	Names
1835 May 3	Seizure of the American schooner <i>Martha</i> from New Orleans by John Calva, first Lieutenant in charge of Mexican Schooner <i>Montezuma</i> (Washington Globe 1835:2; Forysth 1836).	<i>Montezuma</i>
1835 May 7	Some passengers traveling on the warship <i>Moctezuma</i> in 1835 did not have passports (Tenorio 1835a).	<i>Moctezuma</i>
1835 May 18	Arrival of warship <i>Moctezuma</i> with troops and money (Tenorio 1835b).	<i>Moctezuma</i>
1835 July 5	Letter from Eduardo Gritten to Domingo de Ugartechea stating his belief that an American ship was expressly seeking the national schooner of war <i>Moctezuma</i> (Gritten 1835:204).	<i>Moctezuma</i>
1835 Sept.	The 4-gun <i>Montezuma</i> has an engagement with <i>Ingham</i> . <i>Montezuma</i> has a 50-man crew wherein <i>Ingham</i> has 4 guns and only 24. <i>Ingham</i> ran towards shore and is stated to have commenced the attack (London St. James Chronicle and General Evening Post 1835:4).	<i>Montezuma</i>
1835 Oct. 2-9	<i>Montezuma</i> was at Veracruz fitting out to take on arms and munitions to General Cos, but was not ready in time to sail with the packet—it is suspected these will be landed at Matagorda Bay. There was a temporary embargo at Veracruz from Nov 2-9 [possibly to keep this information secret...]. (London Public Ledger 1835:3).	<i>Montezuma</i>
1835 Oct. 28	Report that " <i>Montazuma</i> ," now <i>Bravo</i> , has been ordered to cruise Aransas without troops (Bryan 1835).	<i>Montazuma</i> , <i>Bravo</i>
1835 Oct. 28	A Mexican cruiser is "off of this place" (letter is from Quintana) and has been seen over the previous two days—it fired a shot at Velasco which fell short of shore. Brinkley (ed.) assumes this is <i>Montezuma</i> (McKinney and Williams 1835a).	<i>Montezuma</i>
1835 Nov. 4	<i>Moctezuma</i> fired at Velasco and cannon fire was returned from the shore, at which point <i>Moctezuma</i> retreated. On the 28th volunteers on <i>San Felipe</i> went in pursuit first towards Galveston, then heading towards Matagorda where they found it anchored. <i>San Felipe</i> waited for a smoother sea to commence attack but was instead wrecked on shore. <i>Moctezuma</i> and <i>San Felipe</i> , aground, exchanged fire (Fisher 1836; McKinney 1835a; Powers 2006:80).	<i>Montazuma</i> , <i>Moctezuma</i> , <i>Montezuma</i> <i>Bravo</i>
1835 Nov. 9	McKinney is in Matagorda fitting out another vessel to go after <i>Montezuma</i> (<i>San Felipe</i> is lost ca. Nov 6). McKinney believes a vessel named <i>Crawford</i> caused the wreck of <i>San Felipe</i> as <i>Montezuma</i> was in Brazos Santiago on the 28th. <i>Veracruzana</i> is also off Matagorda and they want two more commissions (McKinney and Williams 1835b).	<i>Montezuma</i>
1835 Nov. 14	Mentions the schooner <i>Montezuma</i> and " <i>Vera Cruzana</i> " (off Galveston) are cruising in the Gulf. <i>Montezuma</i> was in Brazos Santiago from information received six days ago. Also mentions, perhaps mistakenly that <i>San Felipe</i> was gotten off (McKinney 1835b).	<i>Montezuma</i>
1835 Nov 19	<i>Bravo</i> drives <i>Hannah Elizabeth</i> aground and puts on board a prize crew (Fannin 1835:158-159; Dienst 1909a:184). Another account calls this vessel <i>General Bravo</i> (Tornel 1836). Five Americans taken by force and imprisoned at Brazos Santiago (Smith 1835:173). Mexican authorities argue they were warranted in their actions as <i>Hannah Elizabeth</i> was carrying contraband canon and arms (Guerra 1835:188). <i>William Robbins</i> retakes <i>Hannah Elizabeth</i> and captures its prize crew. The Mexican Lt. says he is of <i>Bravo</i> and not <i>Montezuma</i> . Twelve Mexican crew were captured, one died of exposure and drunkenness (Fisher 1835).	<i>Bravo</i> , <i>General Bravo</i>
1836 Jan 8	Another mention of the Mexican sloop of war <i>Moctezuma</i> as being in the bay of Galveston and that Texas does not have a navy to contest its presence - <i>Invincible</i> is offered by McKinney and Williams. The governor is advised and authorized to issue Thomas F. McKinney a letter of appointment as commander of <i>Invincible</i> as a national vessel of war. Volunteers are requested (Barrett 1836; Telegraph and Register 1836:2).	<i>Moctezuma</i>

Table 1. Timeline Summary of the Various Vessels by the Names of *Ariel, Bravo, General Bravo, Montezuma, and Moctezuma*

Date	Event	Names
1836 April 3	According to a Mexican account from Matamoras, the schooner-of-war <i>Bravo</i> , formerly called <i>Montezuma</i> , commanded by Captain Davis, and schooner <i>Correo Secundo</i> (formerly <i>New Castle</i> , Captain Watkins) were fitting out to transport troops and supplies for Copano. <i>Correo</i> was purchased by Mexico and under the command of Captain Thompson. It was armed with two guns. Lt. Levenue [sic] of cutter <i>Invincible</i> taken prisoner. Pierce's account uses the name <i>Correo de Mexico</i> instead of <i>Correo Secundo</i> , though these are the same vessel (New Albany Gazette 1836:2; Pierce 1917:22). <i>Bravo</i> runs aground and is fired into by <i>Invincible</i> (Hall 1835). Captain Davis of <i>Bravo</i> mentions that his vessel was barely damaged. The Matamoras port official refers to this vessel as <i>General Bravo</i> (Espino 1835). Zimmerman, a crew member on <i>Invincible</i> , claims <i>Montezuma's</i> starboard side was stove in (Zimmerman 1836).	<i>Montezuma, Bravo, General Bravo</i>
1836 April	According to Dienst, <i>Bravo</i> is one of three Mexican vessels that engaged <i>Independence</i> in a draw (Dienst 1909a:189). This is likely an error as the <i>Bravo</i> naval action of April 1836 involved <i>Invincible</i> (not <i>Independence</i>) and included two and not three navy vessels.	<i>Segundo Bravo</i>
1836 April 5	General Filisola mentions <i>Segundo Correo</i> and <i>Segundo Bravo</i> are ready to leave Matamoras (Filisola 1849:242).	<i>Segundo Bravo</i>
1836 May 16, 17	On May 16, a letter sent by Filisola to the commander of <i>Segundo Bravo</i> discusses orders forwarded to Matamoras on <i>Segundo Correo</i> . Another letter from Filisola on May 17 mentions <i>Segundo Bravo</i> and <i>Segundo Correo</i> are to pick up food for the army (Filisola 1849:291–292).	<i>Segundo Bravo</i>
1836 June	A summary of governmental expenses for 12 years ending 30 June 1836 mentions both the schooner <i>Moctezuma</i> and the brig <i>Bravo</i> (Mexico Ministerio de Hacienda 1837).	<i>Moctezuma, Bravo</i>
1836 July	According to New Orleans papers of July 1836 <i>Bravo</i> was lost on its way to Veracruz from Matamoras with all on board except Captain Thompson and two marines (Dienst 1909a:139). A different account has the lost vessel as <i>Correo Secundo</i> (London Shipping Gazette 1836:1).	<i>Bravo</i>
1836 July 20	Letter from the office of the Secretary of War and the Navy that mentions a commission for Thompson for <i>Bravo</i> , payment of the vessel's crew, and also supplies to Matamoras. The document lists the armament and crew of the squadron of the time consisting of the brigs <i>Iturbide</i> , <i>Libertador</i> , and <i>Vencedor del Alamo</i> , the brigantine schooner <i>Fama</i> (<i>General Urrea</i>), schooner <i>Bravo</i> with a 16 pounder pivot gun and four 9 pounder carronades. <i>Bravo</i> has a crew of 60 with 10 soldiers and a garrison sergeant. This also mentioned two vessels being purchased from the Yucatan: <i>General Terán</i> and the schooner <i>Hidalgo</i> and two 50 horsepower steamboats that are armed each with a 16 pounder (Secretaria de Guerra y Marina 1836).	<i>Bravo</i>
1836 August	"The Mexican Fleet consisting of the brig <i>Fama</i> and the schooner <i>Bravo</i> were at Vera Cruz on the 9th [August 1836]– they were preparing to make a cruise" (Boston Morning Post [BMP] 1836:2)	<i>Bravo</i>
1837 Feb 11	Naval schooner <i>Bravo</i> with the infamous Capt. Thompson arrived at Sisal to take General Toro on board – he was being removed as commander general of Yucatan. Thompson went 10 leagues inland to the capital "Menda" (sic, Mérida) (BMP 1837a:2).	<i>Bravo</i>
1837 April 12-16	USS <i>Natchez</i> engages <i>General Urea</i> , <i>General Terán</i> , and <i>Bravo</i> at Brazos Santiago in dispute over detained US schooners (Hill 1987:70–71).	<i>Bravo</i>
1837 April 9-17	<i>Bravo</i> "practically blocked" in mouth of Rio Grande during the <i>Natchez</i> engagement—this was likely Brazos Santiago and not at the Rio Grande River (Hill 1987:71).	<i>General Bravo</i>
1837 July 9	Report that Captain Thompson and his lieutenant deserted <i>Bravo</i> and were headed in an open boat northward towards Texas from Mexico (BMP 1837b:2).	
1837 Aug.	In Veracruz harbor with <i>General Terán</i> and <i>Independence</i> (Hill 1987:87).	<i>General Bravo</i>

Table 1. Timeline Summary of the Various Vessels by the Names of *Ariel*, *Bravo*, *General Bravo*, *Montezuma*, and *Moctezuma*

Date	Event	Names
1838 Aug 28	<i>General Bravo</i> is part of a flotilla that arrives at Campeche that also includes <i>Fama</i> and <i>Vencedor del Alamo</i> (Bonilla 1946:118).	<i>General Bravo</i>
1842 April	Being built by Greens and Wigrams in England. A heavy-timbered wooden vessel with 1111 tons displacement, mounting one Paixhan 68-pounder, two long 32's, four 32-pounder carronades, and a small 9-pounder (Hill 1987:172–173).	<i>Moctezuma</i>
1843 April 30	Battle with <i>Austin</i> and <i>Wharton</i> off Campeche. Commander and twenty crew members of <i>Moctezuma</i> killed. The Mexican fleet withdrew (Hill 1987:183–188).	<i>Moctezuma</i>
1843 May 16	Second engagement with <i>Austin</i> and <i>Wharton</i> . Mexican fleet defeated (Jordan 2006:263–261).	<i>Moctezuma</i>
1846	Repossessed by England for failure of payment (Scheina 1969:262).	<i>Moctezuma</i>

*yellow indicates row where more than vessel is mentioned.

The First *Bravo* (1825–ca. 1835)

The first documentation of a Mexican naval vessel of this name occurs in the mid-1820s. It was one of three vessels purchased from England in 1824, soon after Mexico's independence (Bonilla 1946:82; Bidwell 1960:331). It was originally the 322 27/94 brig-rigged yacht *Ariel*, built on the Thames River in 1824 and registered in London to the Earl of Harborough (Bidwell 1960:331; von Mach, personal communication 2017; von Mach, personal communication 2018). It likely arrived in Mexico in the fall of 1825, in close proximity to the delivery of *Victoria* in August and *Avend Prindien* (renamed *Libertad*) in September (Bonilla 1960:349). In 1825, *Aerial*, renamed *Bravo*, was one of several naval vessels protecting San Juan De Ulúa, an island fortification off Veracruz (Bonilla 1946:98). In 1826, U.S. Captain David Porter abandoned his commission in the U.S. Navy to serve as the Commodore for the Mexican Navy. This brig was part of the Mexican fleet when he took command.

In his memoir, Commodore Porter's son David Dixon Porter, a midshipman in the Mexican Navy, recollected *Bravo* as having 14 24-pounder carronades when first inspected by his father at Veracruz in 1825 (Porter 1875:352; Long 2014:265). Other accounts list 18 guns, which seems to be the most consistently described armament, and 20 carronades (New Times 1827:2; Bidwell 1946:444; Bonilla 1946:98). In late December 1826, Porter relocated his Mexican fleet to the Florida Keys as a staging area and temporary headquarters for his planned offensive to capture Spanish vessels off Cuba. *Libertad*, *Victoria*, and *Bravo* soon began seizing prizes and in retaliation Spanish forces blockaded the Mexican fleet at Key West. Porter's vessels were successful in dodging the blockading vessels and ultimately captured 21 prizes while stationed in the area (Ward 1828:307–308; Bonilla 1946:102; Viele 1999:105–106). The Mexican Navy's activities at Key West challenged U.S. neutrality and interfered with regional trade between the U.S. and Cuba. When President John Quincy Adams signed a bill prohibiting prizes from entering Key West (and thus selling their goods) Porter's principal means of paying his crews was quelled. After a tenure of five months in the keys, Porter's fleet traveled to New Orleans to collect the newly acquired Mexican brig *Guerrero* and to solicit crew before returning to Veracruz (Viele 1999:114–115).

The Armed Mexican Transport *Montezuma* (1832)

While the brig *Bravo* was still in use, a schooner of the name *Montezuma* entered the scene. In early August 1832, under the command of Captain Pedro Villareal, the armed schooner *Montezuma* detained and robbed the U.S. schooner *William A. Turner* near Matanzas, Cuba. (British Traveler and Commercial and Law Gazette 1832:2; Niles Weekly Register 1832:82–83). It was armed with 3 cannon, one of which was a heavy pivot gun (Jones 1878:39). Later in October, the U.S. schooner-of-war *Grampus* captured *Montezuma* off Tampico in retaliation for its action against *William A. Turner*. When it was captured, *Montezuma* was being used as a troop transport and carried 40 soldiers in addition to a crew of 36. It was adjudicated at New Orleans (Washington National Intelligencer 1832:3; Jones 1878:39–41).

The U.S. government learned that the vessel was not an official Mexican naval schooner but instead had been unlawfully outfitted as an armed vessel by military officers, including Santa Anna, as part of an uprising against the Mexican government. Mexico requested the vessel be turned over to their consul. This was denied in October 1832, on the grounds that it was not an official vessel of the Mexican government and had engaged

in an act of piracy (Livingston 1832; Montoya 1832). On October 1, 1832 it was condemned by the U.S District Court and sold; it was renamed *Annette* and registered the following month at New Orleans under new owner Alexander Baron and master Henry L. Thompson, later Commodore of the Texas Navy. According to its registration, *Annette* was 61 37/95 tons 17.32 x 5.43 x 2.16 m (56.83 x 17.83 x 7.08 ft) and was described as having one deck, two masts, a square stern, and plain head (Survey of Federal Register 1942:9; von Mach, personal communication 2018).

During this same period, in 1833, author Juan de Dios Bonilla (1946:118) describes a schooner named *Montezuma*, under the command of Don Tomas Marin, as transporting troops to Matamoras and then New Orleans in November. It is unclear if this vessel is the recently captured schooner with inaccurate historic information regarding the later transport dates or if another ship with this name is also being used in this capacity since *Montezuma's* capture.

The New Threat *Moctezuma/Montezuma*, Alias *Bravo/General Bravo* (1834–1836)

On May 3, 1835 a vessel referred to as both *Moctezuma* and *Montezuma* seized the New Orleans schooner *Martha* at Galveston Bay and brought it to Veracruz. First Lieutenant John Calva of *Montezuma* was accredited with the capture (Washington Globe 1835:2). Days later, in letters dated May 7 and 18, the Mexican commander at Anahauc, Antonio Tenoria, commented on the arrival of *Moctezuma* with troops and money and mentioned that some of the passengers did not have passports (Tenoria 1835a; 1835b). These May 1835 accounts are an early indication of activity by a new vessel bearing this name. *Moctezuma* appears to have been variably called *Montezuma*, *Bravo*, *General Bravo*, and possibly *Segundo Bravo* throughout the following years.

Is this schooner *Moctezuma* the former brig *Bravo* or an altogether new vessel? Less is known of the activities of the brig *Bravo* during these years with no references to it discovered by the author after 1836. At this juncture, the brig *Bravo* and schooner *Moctezuma* briefly coexist and are both listed in the official summary of naval expenses for the 12 years ending in 1836 (Mexico Ministerio de Hacienda 1837). Author Robert Scheina (1970:47) mentions that the schooner *Moctezuma* was already part of the navy when new vessels were acquired in 1835. This is likely based on an 1857 history of Veracruz (Lerdo de Tejada 1857:417) that states Porter's navy of 1829 was all but gone by 1835 except for the schooner *Moctezuma* and the brig *Veracruzana*. Scheina and Lerdo de Tejada can only be referring to the brig *Bravo* and not the schooner *Moctezuma*, as a schooner of this latter name seems to first occur in 1834 and does not appear to part of the 1820s fleet. At this time, the brig *Bravo* would have been in Mexican service for a decade following its use in England—it may have been retired at this time and placed in ordinary. Interestingly Mexican accounts refer to the new schooner as *Moctezuma*, whereas U.S. and Texas accounts often, possibly mistakenly, call this vessel *Montezuma*. In the following discussion, *Moctezuma* will be used.

A newspaper article from 1834 reports the arrival of the schooners of war *Moctezuma* and *Consolation* (79 tons) and the 111-ton pilot-boat schooner *Correo de Tampico*, with the navy on April 17. *Consolation* and *Correo de Tampico* had crews of 11 and 8 men respectively (Procurador del Pueblo 1834; von Mach, personal communication 2018). According to the Memoria del secretario de estado y del despacho de la guerra published in Mexico in 1834, *Moctezuma* was armed with one 12-pounder *culebrina* and two 8-pounder cannon; it had four

officers and a crew of 33 men. It had recently been outfitted at New Orleans (von Mach, personal communication 2018).

In late 1835 *Moctezuma* began regularly cruising the coast from the Rio Grande River to Galveston and into Galveston Bay, alarming revolutionary leaders. Texas had yet to declare its independence (the following March) so undeniably Mexico recognized the escalation in hostilities and the undisguised movements to both supply Texian volunteers and enlist privateers as unlawful actions. The “new” schooner *Moctezuma* became an immediate threat to Texas and U.S. commerce along the Texas coast as it attempted to deter revolutionary activities and prevent the shipment of contraband supplies to Texas. The presence of *Moctezuma*, and to a lesser extent *Veracruzano*, were a direct influence on the formation of the Texas Navy of 1836.

In June, *Moctezuma*, under the command of Lieutenant Calvi, was fired upon by the U.S. revenue cutter *Ingham*, though there is a debate as to which vessel fired the first shot. The revenue cutter was stationed off Texas to monitor perceived threats against American shipping by Mexico, aggravated by *Moctezuma*'s capture of *Martha* earlier in March. The “clipper-built schooner” *Moctezuma* was sighted off Brazos Santiago on June 14 and, by American accounts, quickly approached *Ingham* and opened fire. This shot was also interpreted as a “signal” to the revenue cutter. *Bravo* retreated, jettisoning heavy items as to lighten its load to cross the bar. The two vessels continued to exchange fire until Calvi inadvertently ran his vessel upon the bar. Captain Jones of *Ingham* decided not to sink the damaged *Bravo* as it lay grounded (Wells 1998:469–472). A newspaper summary of this engagement described *Moctezuma* as having four guns and a crew of 24 (London St. James Chronicle and General Evening Post 1835:4).

In October, the now-recovered Mexican schooner reportedly fired a shot at the town and fort of Velasco (McKinney and Williams 1835a) and in November it chased, ran aground, and captured the U.S. schooner *Hannah Elizabeth* with a contraband cargo of arms at Pass Cavallo (Fannin 1835; Fisher 1835). *Moctezuma* then indirectly caused the Texan privateer *San Felipe* to run around on Matagorda Peninsula before later approaching and firing into it (Fleury 1874; Wilson 1874).

Talks began immediately to formally create a navy to counter this activity. On November 9, Thomas McKinney was reported to be fitting out a vessel to pursue *Moctezuma* (McKinney 1835a). Days later, commissions (for privateers) were requested to protect the coast from *Montezuma* and *Vera Cruzana* (General Council 1835:8). On January 8, *Invincible* was offered by McKinney to serve in the new navy and the governor was additionally authorized to issue McKinney a letter of appointment as commander of the schooner as “a national vessel of war” (Barrett 1836). On January 9, volunteers were requested, likely to man the vessel, in pursuit of *Moctezuma* and on the 11th the purchase of the warship was officially announced (McMullen 1836; Telegraph and Register 1836:2). Other navy purchases would soon follow in January including *Brutus*, the former revenue cutter *Ingham* now called *Independence*, and the former privateer *William Robbins*—newly rechristened *Liberty* (Powers 2006:52–53). The captain and crew of *Invincible* felt it was their mission to capture the elusive *Moctezuma* and searched in vain for sight of it.

By April, historic accounts show that *Moctezuma/Montezuma* was renamed *Bravo* and under the command of Captain Fernando Davis. It was in convoy with the newly purchased two-gun schooner of war *Correo Secundo* (commanded by infamous Captain Thomas M. Thompson) preparing to transport troops and supplies to Copano in preparation for an Mexican military advance against the revolutionary Texians. *Bravo* and *Correo Secundo* were

at Brazos Santiago, the ocean-port for the river-town of Matamoros, located 88.5 km (55 mi) up the Rio Grande River. This river emptied in the Gulf of Mexico at a location approximately 12.9 km (8 mi) southwest of Brazos Santiago Pass. Before regular steam navigation, goods intended for Matamoros were shipped to the harbor at Brazos Santiago and then transported overland via two beach roads accessible at low tide. Scow barges carried passengers and freight to the mainland during high tide and flooding (Powers 2006:77–78). It is at this point in history that *Invincible* encounters *Bravo* after three months of searching. What happens next is still debated.

The bare and undisputed facts of the case are thus: *Bravo* is unattended (*Correo* was likely anchored in the harbor) and in the process of repairing its rudder that became damaged on the bar. Captain Thompson from *Correo* is helping with the rudder replacement. *Invincible*, flying American colors, approaches the vessel and immediately recognizes it as its nemesis *Moctezuma*. Officer Living convinces Captain Jeremiah Brown, against his better judgment, to allow him to proceed to *Bravo* in disguise as a U.S. revenue officer as a means to gain intelligence on Mexican activities. Living is taken by ship's boat to *Bravo* and is secured on board while *Bravo* sends its launch with Captain Thompson to *Invincible* to confirm Living's papers. Captain Brown recognizes Thompson and fires upon the launch and then at *Bravo* once the Mexican Navy has moved Living to shore. *Bravo* attempts to retreat but without a working rudder runs further aground on the bar and is fired upon by *Invincible* (Figure 9). During the engagement *Invincible* notices the approaching brig *Pocket* and leaves in pursuit—*Pocket* is captured and taken by *Invincible* to Galveston.



Figure 9. Engagement off Brazos Santiago, April 3, 1836; *Invincible* vs. *Bravo* by Peter Rindlisbacher (2017).

The main Mexican account of this transaction offers a slightly different perspective on *Invincible*'s departure from the battle—described as an actual retreat as opposed to a change in *Invincible*'s military priorities (the Texian version of events), i.e. capturing an unknown brig three to four miles distant instead of irrefutably sinking *Bravo*.

Captain Davis of *Bravo*, in his report to Jose Maria Espino, the captain of the port of Matamoros, acknowledged that *Bravo* was vulnerable as it lay aground on the bar, but described *Invincible* as retreating due to reinforcements in the form of the approaching armed *Correo* and the adjusted position of the land artillery (Espino 1836). Perhaps Jeremiah Brown felt that *Invincible*, in its slightly damaged condition, was more capable of capturing an unarmed brig as opposed to prolonging an armed engagement with *Correo*, *Bravo* with its pivot cannon, and shore artillery.

Two important facts of this event are heavily disputed: where this engagement occurred and if *Bravo* sank. Differing eyewitness and second-hand accounts of the “battle” are presented in Table 2, in chronological order of the historic report. Most often the early accounts place this naval exchange at Brazos Santiago wherein later post-19th-century authors instead place this at the mouth of the Rio Grande River. This may be, in part, due to misunderstanding Texas geography and perhaps not recognizing that Matamoros’ ocean port at this time was not at the river mouth but 8 mi. further northeast at Brazos Santiago Harbor and Pass. Some reports mention artillery firing upon *Invincible* and this, in itself, decidedly places the event at Brazos Santiago near the Mexican garrison. Living was also tried as a spy and executed at Brazos Santiago, and not Matamoros (Pierce 1917:22; Powers 2006:78–81), which lends additional credence to this location as the site of the battle. Finally, Brown, *Invincible’s* captain, explicitly states *Pocket* was captured off Brazos Santiago which should leave no room for doubt (Brown 1836).

Whether or not *Bravo* actually sank is more difficult to solve. U.S. and Texian eyewitness accounts and newspapers typically describe *Invincible* as prevailing in this incident with *Bravo* “sinking,” “wrecked by a broadside,” and “gone to pieces” (Table 2). Some newspaper reports do not describe the outcome—only that *Bravo* ran aground. Not so coincidentally, a Mexican account claims *Bravo* was largely uninjured and merely suffered a cannon shot to the poop (stern deck) and minor damages to the rigging (Espino 1836; Hill 1987:51–52). The captain sought to get the vessel off the bar, but a curious comment in the letter suggests *Bravo* may have been taking on water (Espino 1836). The mystery only deepens as a sailing vessel by the name *Bravo* continues to serve an active role in the Mexican Navy until 1838—more than a year after its “sinking.” The author reviewed a *Bravo* logbook in the collection of the Briscoe Center for American in Austin, TX (Añorga 1835), but unfortunately the last entry dates to December 1835, many months before the events on the Texas coast.

Table 2. Accounts of the Sinking of *Bravo*.

Source	Account Summary	Location*	Demise
William Gray 1836 (1909:154–155)	According to his diary account of April 7, 1836, William Gray was on board <i>Brutus</i> when it was approached by <i>Invincible</i> just returning from Brazos Santiago with the prize <i>Pocket</i> . Gray was told that when <i>Invincible</i> encountered <i>Montezuma</i> , “now called <i>Bravo</i> ,” both Davis and Thompson were on board. <i>Bravo</i> was run aground and “disabled” and could not be boarded due to the shallow waters and the presence of 1000 Mexican troops on the beach. The account mentions that Lt. Living was left on board <i>Bravo</i> but that the crew of the waiting launch took off when the action began. This occurred on April 3 which was Easter.	BS	Disabled
Walter Zimmerman 1836	Walter Zimmerman, who had been part of General Mexia’s expedition to Tampico, enlisted as crew on <i>Invincible</i> . He described <i>Montezuma</i> as being superior in men and guns. According to Zimmerman, after a conflict of 2 hours the “enemy went down with his larboard side entirely stove in.” It pursued a merchant brig [<i>Pocket</i>] after <i>Montezuma</i> sank, thinking it was an armed 18-gun vessel. There are problems with this source as <i>Invincible</i> had more crew and almost twice as many cannon.	—	Sunk
Newspaper Account 1836 (reprinted in Dienst 1909b:253)	This account mentions that <i>Invincible</i> approached the Mexican brig [<i>Bravo</i>] and made an inquiry then sent a boat out to meet it. <i>Invincible</i> exchanged gunfire with the Mexican vessel [<i>Bravo</i>] “which fired several guns each” - the schooner with the Mexican flag bore away towards shore and “the other vessel [<i>Invincible</i>] tacked ship and stood for his brig [<i>Pocket</i>], she being about three or four miles distant.”	BS	Retreated
Covington Western Constellation (1836:2)	“The Texian armed schooner <i>Invincible</i> , Captain Brown, fell in with the Mexican schooner <i>Montezuma</i> , at anchor off the Brasos Santiago. An action immediately took place, with a running fight of several hours, which terminated in the sinking of the <i>Montezuma</i> , before she reached the shore to which she was running. When last seen her yards were underwater. She was preparing to convey to Galveston Bay about two thousand men the expedition is now destroyed. The <i>Invincible</i> was somewhat cut in her sails and rigging but had not a man wounded. The fate of the <i>Montezuma</i> crew is not known.”	BS	Sunk
London Morning Post (1836:5)	“A naval engagement between the Mexican schooner <i>Montezuma</i> , and the Texian schooner <i>Invincible</i> , off the Brasos [sic] de Santiago, is reported to have taken place, which terminated, after a running fight of several hours duration, in the sinking of the former.”	BS	Sunk
Jose Maria Espino 1836	The captain of the port of Matamoras (Espino) relays information forwarded by <i>Bravo</i> ’s Captain Fernando Davis. While they were repairing <i>Bravo</i> ’s rudder, an American vessel approached and an officer from an American vessel came aboard <i>Bravo</i> wanting to communicate with the port. He describes the vessel [<i>Invincible</i>] as firing upon Thompson in the launch and also at <i>Bravo</i> . Levine [sic] was taken prisoner once they were attacked [by <i>Invincible</i>]. <i>Bravo</i> only sustained a shot to the stern and damage to the rigging. The battle lasted over an hour and was cut short when the vessel left in pursuit of another brig. The letter implies that the approach of <i>Correo</i> and firepower from the beach encouraged the retreat of the warship [<i>Invincible</i>].	BS	Afloat and aground on the north side of the bar – only a shot to the stern
Edward Hall (Powers 2006:80)	Ed Hall was informed by an eyewitness that “the <i>Montezuma</i> is on the bar and so injured as to be abandoned: her guns taken on shore and put on other vessels.”	—	Abandoned
General Filisola 1836 (1849:242, 290-292)	Reported on April 5 that <i>Segundo Bravo</i> and <i>Segundo Correo</i> are completely prepared to leave Brazos Santiago.	BS	Active
Morning Chronicle (1836a:4)	“The Texian armed schooner <i>Invincible</i> fell in with the Mexican schooner <i>Montezuma</i> , off the Brasos Santiago [sic]; an action took place, which terminated in the sinking of the <i>Montezuma</i> .”	BS	Sunk

Table 2. Accounts of the Sinking of *Bravo*.

Source	Account Summary	Location*	Demise
David Conrad 1836 (Powers 2006:80)	<i>Bravo</i> , after grounding had gone to pieces in the breakers.	—	Broken Apart
Rueben Potter 1836 (Powers 2006:80)	" <i>Bravo</i> sank more quickly that was would have been expected from a mere thumping."	—	Sunk
Hayes (1974 [1879]:146)	<i>Invincible</i> encountered <i>Montezuma</i> while cruising off Brazos Santiago and after a two-hour engagement <i>Montezuma</i> "was driven ashore and left in a sinking condition." Hayes incorrectly has the captain of <i>Montezuma</i> as Thompson and that <i>Invincible</i> returned to Galveston for repairs after the conflict and before capturing <i>Pocket</i> —both points disagree with other accounts.	BS	Sinking
Bancroft (1889: 272)	<i>Invincible</i> crippled <i>Bravo</i> and drove her ashore. <i>Invincible</i> only had injured rigging which was repaired. <i>Invincible</i> went in pursuit of <i>Pocket</i> .	—	Crippled
Dienst (1909b: 252- 253)	<i>Bravo</i> loses rudder crossing the bar at the mouth of the Rio Grande River. It ran aground near the north beach and was wrecked by a broadside from <i>Invincible</i> . Dienst's account disagrees with his use of a direct quote from a newspaper article that says this exchange occurred at Brazos Santiago.	RG	Wrecked
Fischer (1976:133- 134)	Account mentions <i>Bravo</i> losing its rudder crossing the bar and that Leving [sic] came aboard. Because the vessel could not be steered it ran aground. Mentions a brief engagement and that <i>Bravo</i> was put out of action by a broadside. Leving and the crew went ashore. The engagement interrupted by the arrival of <i>Pocket</i> .	RG	Put out of action
Pierce (1917:22)	<i>Invincible</i> arrives at the port of Brazos Santiago and encounters <i>General Bravo</i> and <i>Correo de Mexico</i> with food supplies for Mexican troops near Copano. Livine [sic] sent aboard <i>General Bravo</i> seeking to go ashore to speak to the American Consul of Matamoras. <i>Invincible</i> fired upon <i>Bravo</i> when <i>Bravo</i> 's launch approached without Levine [sic] present. <i>Bravo</i> returned fire, <i>Correo</i> got under sail to attack <i>Invincible</i> , and Mexican shore artillery fired upon <i>Invincible</i> . <i>Invincible</i> retreated towards the bar or pass.	BS	Aground
Hill (1987:51-52)	<i>Bravo</i> at the mouth of the Rio Grande River with <i>Correo Segundo</i> in convoy. Lost its rudder and attacked by <i>Invincible</i> . After an hour in the engagement, the brig <i>Pocket</i> spotted and <i>Invincible</i> leaves in pursuit. Thomas Thompson was on <i>Bravo</i> helping with the replacement of a new rudder. Lt Leving [sic] went on board <i>Bravo</i> and Thompson was sent in a boat to <i>Invincible</i> to make arrangements to have Leving [sic] go ashore. <i>Invincible</i> 's Captain Brown recognized Thompson and let him come aboard and imprisoned him below deck (this disagrees with other accounts) and fired a broadside. No injuries to <i>Bravo</i> other than a round shot to the poop and two minor injuries to the rigging. The battle was cut short when <i>Invincible</i> left in pursuit of <i>Pocket</i> . Hill's account paraphrases Espino's report to some extent but changes details (see above).	RG	Barely injured
Powers (2006:78-81)	<i>Invincible</i> , flying American colors, recognized and approached <i>Bravo</i> . It was commanded by Fernando Ricardo Davis, an American that started as a midshipman in the Mexican Navy in 1823. Living dressed in a revenue cutter's uniform and was taken to <i>Bravo</i> . Thompson on board <i>Bravo</i> believed the unknown vessel to be <i>Invincible</i> . Capt. Davis sent Thompson on a sloop-rigged harbor boat over to <i>Invincible</i> to verify Living's story. He recognized Captain Brown and reversed course and Brown fired upon <i>Bravo</i> . <i>Invincible</i> 's boat was released (though Living was taken ashore) and at this point <i>Invincible</i> fired into <i>Bravo</i> as it was trying to get underway without its rudder. <i>Bravo</i> "lodged on the bar, where a few shots from <i>Invincible</i> filled her with water" <i>Bravo</i> fired return shots and was abandoned.	BS	Abandoned

Table 2. Accounts of the Sinking of *Bravo*.

Source	Account Summary	Location*	Demise
Jordan (2006:52-53)	<i>General Bravo</i> and <i>Segundo Correo Mexicano</i> stood guard at the mouth of the Rio Grande to keep news of the impending Mexican invasion from leaving Matamoras. They were to meet <i>John M. Brandel</i> , <i>New Castle</i> , and <i>Pocket</i> with their respective supplies to convoy them to Matagorda Bay. <i>Invincible</i> sights <i>Bravo</i> and <i>Correo</i> off Brazos Santiago, at the mouth of the Rio Grande, and recognized <i>Bravo</i> as having a damaged rudder. Eventually an hour or so gun battle ensues, <i>Bravo</i> runs aground at the river's mouth. <i>Invincible</i> captures <i>Pocket</i> .	RG	Run aground

*BS=Bravos Santiago; RG=mouth of the Rio Grande River

The *Bravo* and *Segundo Bravo* Puzzle (1836-1838)

In spite of Texian confidence in the loss of *Bravo* at the hands of *Invincible*'s gunfire, *Bravo* appears later in 1836-1838 now under the command of Captain Thompson, formerly of *Correo Mexicano/ Segundo Correo*. The author is grateful to colleague John Powers (2006) for being the first author encountered during research to question the veracity of the differing battle accounts and to acknowledge the disparity between the wrecked and surviving versions of *Bravo* after April 1836. His work was revisited in preparation for this study. Unless an extremely informative letter(s) is discovered, this mystery may never be satisfactorily resolved. Though it seems the evidence weighs more heavily towards the complete irreparable loss of *Bravo*, there is also evidence that suggests it did not, in fact, sink.

After the “sinking” of *Bravo* on April 2nd, later on May 17, it was reported that “*Segundo Bravo*” and “*Segundo Correo*” were at Brazos Santiago to pick up supplies for the army at Copano Bay (Filosola 1849:290–291). There were other earlier Filosola communications from April 5 and May 16 in regard to both vessels. Powers (2006:n. 37, 247–248) suggested that *Segundo Bravo* may indicate a replacement warship as an explanation for the disparity between these reports, the problematic timeline of the *Invincible* engagement, and the reference to the Mexican warship as the “second” *Bravo*.

An alternative explanation for “*Segundo*,” however may simply be that the 1835 schooner *Moctezuma* became the “second” *Bravo* when it was renamed later that year, since the brig *Bravo* was already a recognized commissioned naval vessel. The use of “*Segundo*” does not necessarily imply a substitute schooner-of-war by that name—which would technically have been a third, and not second, vessel of the name *Bravo* to serve the Mexican government. It could have instead been a convenient way to differentiate between the schooner and the earlier brig.

In his report to Fernando Fernandez, Commandant of the Department of Nuevo Leon and Tamaulipas, the commander of Matamoros, Jose Maria Espino, relays the account of the naval engagement. This information had been provided by Captain Fernando Davis of *Bravo*. Two key passages allude to the condition of the vessel: (a) the statement that *Bravo* was barely injured only having sustained a shot to the stern with two crew injured by a broken pulley and (b) that *Bravo* was aground on the north side of the bar awaiting a strong wind; they were working on saving the vessel though it was taking on water (Espino 1836). The eyewitness report to Edward Hall (Powers 2006:80) indicating the guns were removed from *Bravo* does not necessarily mean they were being salvaged from the presumed wreck and placed on other vessels. This action was the typical measure taken to lighten a grounded vessel so that it could be refloated by removing heavy items such as guns, cargo, and ballast. The cannon may have only been temporarily relocated with the intent to replace them on *Bravo* later. The Espino (1836) report showing that *Bravo* had a pivot cannon and broadside guns is consistent with the armament described on the later still-active *Bravo* in July 1836.

Curiously, historian Alex Dienst (1909a:139) in his early works on the Texas Navy references accounts from an unnamed July 1836 New Orleans newspaper claiming *Bravo* sank on its way from Matamoros to Veracruz with the loss of all on board except Thompson and two marines. Perusal of the *New Orleans Bee* for July failed to relocate such an article, but a similar account from the *New York Courier*

and Enquirer (reprinted in the September London Shipping Gazette 1836:1) describes the exact same event, excepting that this misfortune instead befell *Correo Secundo*. Considering Thompson at this time was the commander of *Correo Secundo (Segundo)* and not *Bravo*, this latter account is perhaps more compelling and believable.

It is tempting to consider if Thompson, upon his return to Veracruz without a ship to command, was made captain of the refloated *Bravo*; however the other option would be that he was given command of an altogether different vessel rechristened *Bravo*. Letters in the Mexican archives from July 1836 discuss Thompson as commander of the schooner *Bravo* (Figure 10a) and also summarizes its arms and crew as part of a larger discussion of naval affairs (Figure 10b, 10c) including a list of the crew and armament of all current navy vessels. *Bravo*, as described in a document dated July 20, was armed with a 16-pounder pivot cannon and four 9-pounder carronades. The 16-pounder is not a commonly recognized cannon “caliber” and may be the error of the original document’s author. *Bravo, Hidalgo* and two other gunboats were described as having 16-pounder cannon. A copy of the same document also describes the *Bravo* pivot gun as 16-pounder. *Bravo* had a crew of 60 including 10 soldiers and a garrison sergeant (Reibaud 1836; Secretaria de Guerra y Marina 1836). Is this an altogether different vessel than the previously described *Bravo* of four guns and a crew of 50 (London St. James Chronicle and General Evening Post 1835:4), with the additional pivot gun mentioned by Captain Fernando (Espino 1836)? This is difficult to say, especially with the misidentifications and errors occurring in the historic sources.

In August 1836, *Bravo* and the brig *Fama* (also called *General Urrea*) were preparing to disembark from Veracruz on a cruise (BMP 1836:2). Later in February 1837 Captain Thompson transported General Sayas on *Bravo* to Sisal to replace General Toro as the commander general of the Yucatan (BMP 1837a:2). *Bravo* was also involved in what was considered a scandalous incident at Brazos Santiago in April 1837 which resulted in an exchange of cannon fire between vessels of the U.S. and Mexican navies. The U.S. merchantmen *Champion* and *Louisiana* had been detained at Brazos Santiago and the U.S. Navy intervened to secure their release. USS *Natchez* arrived at Brazos Santiago and left in convoy with *Louisiana*.

Upon returning for *Champion*, *Natchez* encountered the Mexican fleet consisting of *General Urrea*, *General Teran*, and *Bravo*. Without provocation *Natchez* captured *General Urrea* on April 16 and was fired upon by both *Bravo* and the port artillery but both were at too great a distance to have an effect. A shot however did accidentally strike the U.S. merchant vessel *Climax*. This was viewed by Mexico as hostile action by the United States. Commodore Dallas of the U.S. Navy, with a fleet of five vessels including USS *Constellation*, traveled to Veracruz to deliver a formal apology to the Mexican government (Pierce 1917:23–24; Hill 1987:70–71). *General Urrea* was returned to Mexico. *General Bravo* is furthermore mentioned as being part of a flotilla including *Fama* and *Vencedor del Alamo* that arrived at Campeche in late August 1838 (Bonilla 1946:118).

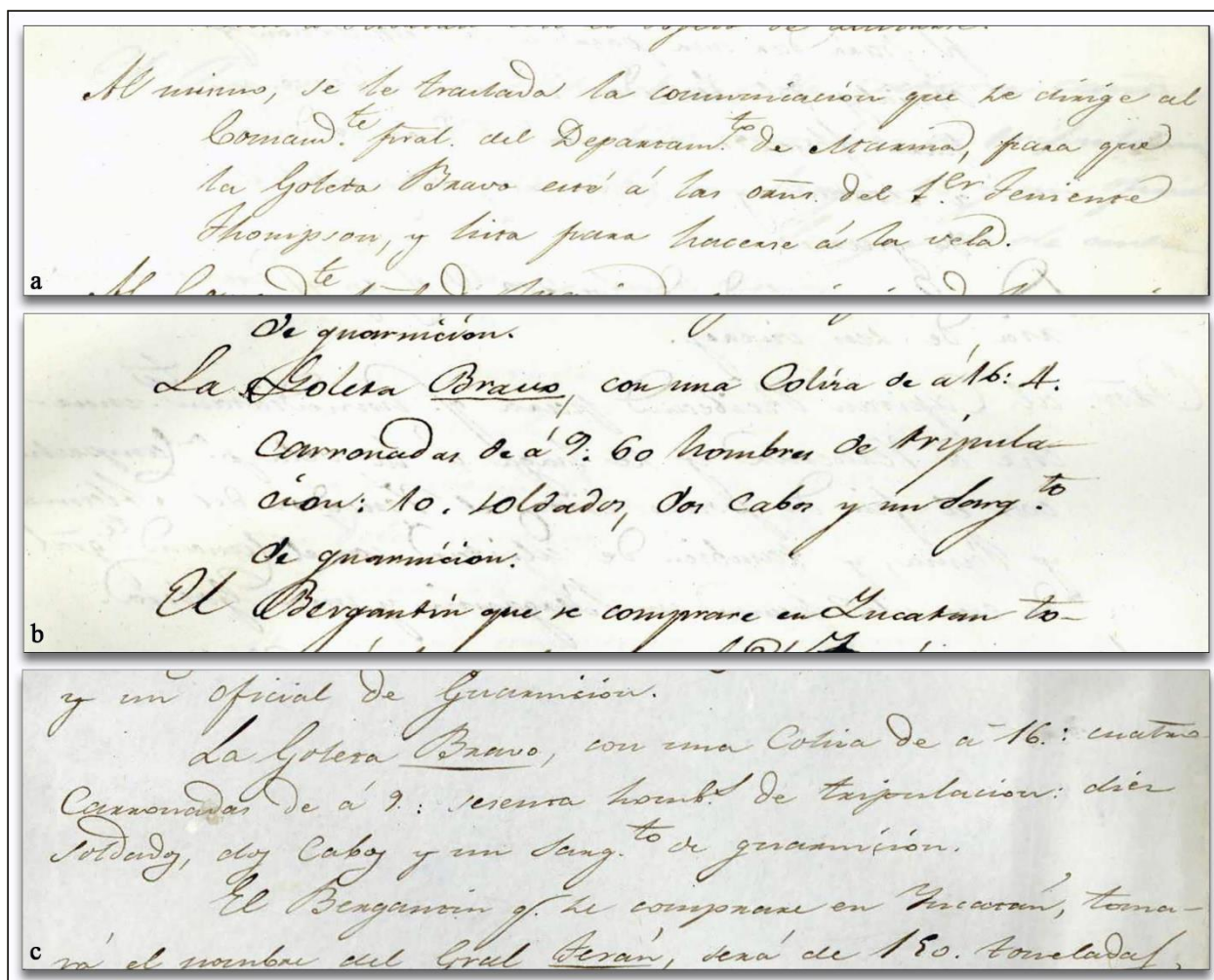


Figure 10. Mexican military documents referring to Bravo after its loss at Brazos Santiago in April 1836: (a) indicating Thompson as commander of Bravo and who is being asked to prepare Bravo to sail; (b) description of Bravo; and (c) copy of Bravo description. (Secretaria de Guerra y Marine 1836; Reibaud 1836).

During the Pastry War between Mexico and France in 1838-1839, the French Navy captured the entire Atlantic fleet of the Mexican Navy at Veracruz on November 28, 1838, including the corvette *Iguala*; brigs *Irtubide*, *Libertador*, and *Urrea*; and schooners *Terán* and *Bravo*, before French forces returned to France in March of 1839 (Penot 1976:451; Meed 2001:109; Jordan 2006:116). It is believed all these vessels were fairly new acquisitions, built in Baltimore (Jordan 2006:116; Williams 2010) though the original source of this information is not referenced.

Documentation suggests *Iturbide*, *Libertador*, *Urrea*, and *Bravo* were restored to Mexico in December 1838, though it appears Texas intended to acquire these captured prizes, evidenced by a new law to authorize such a purchase passed by the Texas Congress in 1838 (Wells 1988:4-5; Demerliac 2007:191). Additionally, the Memoria del secretario de estado y del despacho de la guerra of 1839 records that *Iturbide* had been sold by the French, *Teran* and *Urrea* had been disposed of, *Iguala* was still owned by France, and *Bravo* was at Tampico (von Mach, personal communication 2018). Some of these historic sources are not in agreement, so the fate of *Bravo* after the conclusion of the Pastry Wars is unclear.

The Final *Montezuma* (1842–1843)

Ultimately by 1842, the various sailing vessels *Moctezuma*, *Montezuma*, *Bravo*, *General Bravo*, and *Segundo Bravo* appear to no longer be active. The Mexican Navy acquired a new state-of-the-art warship, the 204-ft steamship *Montezuma* built by Greens and Wigrams in England and armed with one 68-pounder shell gun, two long 32 pounders, four 32-pounder carronades, and one small 9 pounder. It was outfitted with two 140 horsepower engines and had a displacement of 1111 tons (Hill 1987:172–173). It participated in the Battle of Campeche in 1843 but ultimately Mexico was unable to afford payment on the vessel and it was repossessed in 1846.

In summary, four armed vessels bearing the names *Moctezuma*, *Montezuma*, *Bravo*, *General Bravo*, and/or *Segundo Bravo* were in operation off the Texas and Mexican coasts between 1825 and 1846—this quantity expands to five if it is believed the 1835 schooner *Moctezuma* legitimately sank at Bravos Santiago in April 1836. For simplicity they are listed in Table 3.

Table 3. Armed Vessels Named *Bravo*, *Moctezuma*, or *Montezuma* in Operation in Mexico During the Early-to-Mid Nineteenth Century.

No.	Name(s)	Vessel Type	Use Period	Armament
1	<i>Aerial/Bravo</i>	Brig	1825—ca. 1835	14 24-pdr. Carronades; 18 guns; or 20 carronades.
2	<i>Montezuma</i> *	Schooner	?—1832	A pivot cannon and two other guns
3	<i>Moctezuma</i> , <i>Montezuma</i> , <i>Bravo</i> , <i>General Bravo</i> , (<i>Segundo Bravo</i> ?)	Schooner	1834—1836?	1 pivot cannon and 4 guns
4	<i>Bravo</i> , (<i>Segundo Bravo</i> ?)**	Schooner	1836?-1838	16-pdr. pivot cannon and four 9-pdr. carronades
5	<i>Montezuma</i>	Steamship	1842-1846	68-pdr. Shell gun, two long 32 pdrs., four 32-pdr. carronades, one small 9-pdr.

*not part of the official Mexican Navy but used during a governmental coup.

**only a separate vessel if record no. 3 above truly sank in April 1836.

OTHER LOWER RIO GRANDE VALLEY SHIPWRECKS

Considerable time has been spent in an attempt to unravel the mystery behind *Bravo* and its loss as a means to investigate its promise as a wreck candidate for 41CF184. Other vessels sank in the general vicinity of the archeological site and these shipwrecks may be the key to realizing Boca Chica No. 2's role in Texas' history. Not much is known about most of these reported shipwrecks so the following discussion serves merely as an introduction to this still tantalizing puzzle—if not *Bravo* what could this shipwreck be?

As of January 2017 there are 297 historic shipwrecks in the THC's shipwreck database that have been reported in Cameron County: 49 are listed as being lost in or near the mouth of the Rio Grande River, approximately 120 wrecks are lost in Brazos Santiago harbor/pass, and nearly a dozen are

reported near shore between the river mouth and the pass. In considering potential alternative candidates for 41CF184, all vessels near the mouth of the Rio Grande River were initially selected as well as those in the area of south Boca Chica Beach (n=49). Nine of the vessels in this area were steamers and one was a barge—6 are unknown and the remaining 34 were sailing vessels that included 11 sloops, 2 barks, and lighters. Of the 21 verified two-masted sailing vessels from this group (Table 4), all were schooners. The THC database only has dimensions for two of these schooners, *Lodi* (wrecked 1832) and *Liberty* (wrecked 1892).

Table 4. Two-Masted Vessel Losses near the Mouth of the Rio Grande River

Vessel Name	Year Built	Year Lost	Vessel Type	Length	Breadth	Depth of Hold	Cause of Loss	Database Nos.*
<i>Alice And Mary</i>	—	1863	schooner	—	—	—	—	THC 671
<i>Bonita</i>	1831	1837	schooner	60	19.3	5.9	storm	THC 680, GOM 120
<i>Caroline</i>	—	—	schooner	—	—	—	—	THC 687
<i>Coffin</i>	—	1847	schooner	—	—	—	storm	THC 697, GOM 1552
<i>Emma</i>	—	1878	schooner	—	—	—	—	THC 712
<i>Farmer's Return</i>	1837	1842	schooner	60.6	19.6	5.6	—	THC 719, GOM 411
<i>Florence Bernice</i> <i>General C. C.</i>	—	1800s	schooner	—	—	—	fire	THC 721
<i>Pinckney</i>	—	1863	schooner	—	—	—	—	THC 724
<i>Halcyon</i>	1829	1836	schooner	72.5	22	8	—	THC 731, GOM 513
<i>Hunter</i>	—	1847	schooner	—	—	—	—	THC 733, GOM 1571
<i>Ike Davis</i>	—	1864	schooner	—	—	—	—	THC 736
<i>James Duckett</i>	—	1865	schooner	—	—	—	—	THC 739
<i>Liberty</i>	1866	1892	schooner	66	21	4	—	THC 756
<i>Lodi</i>	1835	1836	schooner	71	21	6	—	THC760, GOM 691
<i>Louisiana</i>	—	1837	schooner	—	—	—	—	THC 761, GOM 70
<i>Mary Emma</i>	—	1847	schooner	—	—	—	—	THC 765, GOM 1579
<i>Mary Marshall</i>	—	1846	schooner	—	—	—	—	THC 766, GOM 1578
<i>Phoenix</i>	—	1834	schooner	—	—	—	—	THC 790, GOM 913
<i>Spartacus</i>	1834	1835	schooner	71.2	18.6	7.9	—	THC 813, GOM 1084
<i>Virginia</i>	—	1847	schooner	—	—	—	—	THC 828, GOM 1597
<i>W. C. Preston</i>	—	1848	schooner	—	—	—	—	THC 832, GOM 1595

*GOM references author's personal database

Cross-referencing the remaining 19 vessels against the author's personal database on early nineteenth-century regional watercraft only produced additional dimensions for *Farmer's Return*, *Halcyon*, *Spartacus*, and *Bonita*, though it is difficult to confirm if these are in fact the same vessels listed in the THC database. Without information such as the size, captain, city of build, or origin it can be hard to link vessels to register and enrollment data (Survey of the Federal Archives 1942) as many vessels shared the same names. The dimensions for the remaining 15 vessels in Table 4 are still unknown. There are likely other shipwrecks that are unknown to the THC and not documented in the agency's database.

Bonita, *Farmer's Return*, and *Liberty* are smaller than 41CF184, though *Lodi*, *Halcyon*, and *Spartacus* are close in size. With a beam of 5.5 m (18 ft), *Spartacus* is too narrow for serious consideration as a candidate and *Lodi* is more than a foot shorter, though this may be nominal due to the inexactness in considering the true registration dimensions of 41CF184. The schooner *Halcyon* is the most similar in size to 41CF184, with registration dimensions of 22.1 (length) x 6.7 (breadth) x 2.4 m (depth) (72.5 x 22 x 8 ft). It had a displacement of 110 22/95 tons. It was built in Sussex County, Delaware in 1829 and was first registered at Baltimore in 1831 (Survey of Federal Archives 1942:92). The first advertisement in the *New Orleans Bee* (1836b:2), discovered by the author, that lists its availability for Matamoros suggests it was not coppered as this was not described, which is typically the fashion for charter vessels at this time.

Halcyon was a well-known New Orleans schooner that cruised frequently between New Orleans and Matamoros. It was regularly advertised for Matamoros in the *New Orleans Bee* between May 7 and November 4, 1836 at which time it was under new ownership to Thomas Cucullu, Manuel Simon Cucullu, and Jean Martial Lapreyre (NOB 1836b:2, 1836c:1; Survey of Federal Archives 1942:92). They operated this vessel on behalf of M.S. Cucullu Lepeyre & Co. and also acted as agents in the slave trade emanating from Havana. *Halcyon* was registered to this company on May 12 (NOB 1836d:1; Macauley and Lewis 1839; Survey of the Federal Archives 1942:92). Not only did it carry freight and passengers but was also used to convey dispatches and relay news of occurrences in Mexico to the newspapers (BMP 1835:2; NOB 1836e:1, 1836f:2; Huron Reflector 1836:2; The Morning Chronicle 1836b:1). In June and August 1836, it transported almost \$200,000 in specie from Matamoros to New Orleans (NOB 1836g:2; 1836h:2; Huron Reflector 1836).

During one of its trips in the Gulf, *Halcyon's* crew became inadvertently involved in an international incident at Tampico, Mexico. General José Antonio Mexía conspired with supporters in New Orleans and Texas to plan and supply an expedition to attack Tampico, Mexico. After arriving off Tampico on November 14, 1835, Mexía's vessel grounded while trying to approach the city under the cover of night, his troops having to wade ashore during the early hours on November 13. The delay in landing allowed Mexican troops to prepare a response and Mexía and his troops were unsuccessful in their attempt to attack the town. His soldiers retreated and dispersed with many being taken prisoner. For an additional 10 days Mexía remained at the fort, but in the absence of expected reinforcements he chartered the schooner *Halcyon* for \$2000 to affect his return to New Orleans. He abandoned some of his troops, many of whom later claimed to not be aware of the true nature of the enterprise. They were tried and executed on December 14 (Gomez 1835; Barker 1903:171–177).

According to a list of shipwrecks compiled by historian Albert Alfonso Champion and sent to the THC (Champion 1974), *Halcyon* sank at the mouth of the Rio Grande River in 1836. The THC has not been able to independently verify this wrecking event, though charter listings for *Halcyon* in the *New Orleans Bee* were not discovered after early November 1836, perhaps suggesting it sank towards the end of the year. An altogether different vessel, the copper-fastened and copper-sheathed *Mexicana*, formerly advertised for general charter to Mexico, was specifically listed for Matamoros (as had been *Halcyon*) by November 22 (NOB 1836i:1, 1836j:2). *Halcyon* is not registered at New Orleans after May 12, 1836 (Survey of Federal Register 1942:92).

In general, 41CF184 is consistent with the size and wreck location of *Halcyon* and is only slightly larger than *Spartacus*—close enough to perhaps also maintain this latter schooner as a candidate. *Halcyon* was built in Sussex County, Delaware which is a regional source of baldcyprus and the northernmost occurrence of this species in the United States. Despite this circumstantial information, the dimensions of 41CF184 are fairly common for merchant vessels being used in the Gulf and the current analysis could easily be overlooking other potential historical candidates for which the hull dimensions are not known. Without more complete historical information regarding the known, and as yet undocumented historic wrecks in this region and in the absence of historic artifacts at 41CF184, it may not be possible to ever conclusively identify this significant State Antiquities Landmark.

CONCLUSION

As 41CF184 does not appear to contain any of its cultural material, likely salvaged at the time of its loss and in the years since, only its hull dimensions and characteristics may truly advance or eliminate historic vessels as candidates. Regardless of the complexity of the varying histories of *Moctezuma*, *Montezuma*, *Bravo*, *General Bravo* and whether or not one ultimately wrecked at Brazos Santiago or at the mouth of Rio Grande River, none of the available published studies on the Mexican and Texas Navies, associated archival documents, or regional histories perused by the author have included dimensions for these Mexican navy sailing vessels.

Historic evidence indicates the candidate *Moctezuma*, if it was successfully sunk by *Invincible*, went aground on the north side of the bar at Brazos Santiago Pass and not near the mouth of the Rio Grande River—the latter of which is the location of 41CF184. The reliability of these historic accounts and the strong possibility that *Bravo* did not sink, offer enough doubt to remove *Bravo* from consideration as a wreck candidate.

In addition, 41CF184 does not have any of the attributes that would typically identify this as a naval vessel of the period, especially one described as a clipper schooner. The hull dimensions, length-to-beam ratio, and absence of copper sheathing are more consistent with merchantman and in particularly a specific example (*Halcyon*) that frequented the area between 1835 and 1836. Other unknown or lesser documented vessels may equally qualify.

So the story of *Moctezuma* doesn't quite conclude, but merely teases a larger more complex narrative that also highlights the fallibility of historic and eyewitness accounts. The phantom ship is still elusive, not perhaps to its original pursuers in 1835 and 1836, but to those archeological investigators seeking that evidence of our history.

ACKNOWLEDGEMENTS

This article would not have been possible without the generosity and hard work of former State Marine Archeologist Steve Hoyt and the THC's Marine Stewards. The vigilant monitoring of the shipwreck since 1999 made this summary possible. A special thanks is extended to colleague, author, and historian Gregg Dimmick who has shared archival documents over the years, especially his more

recent research that included papers on the Mexican Navy. Similarly, Andreas von Mach provided invaluable data on some of these historical vessels taken from his personal research. The THC extends its gratitude and thanks to Keith Reynolds for rescuing the foremast from 41CF184, an important and informative artifact, and to Bill Turner for coordinating its return to the THC. Additional thanks to David Camarena and Gregg Dimmick for assistance in translating aspects of the Mexican archival documents. Peter Rindlisbacher generously created the image of the battle between *Invincible* and *Bravo* expressly for this article.

My deepest gratitude is also extended to Boca Chica No. 2 investigators Steve Hoyt, Andy Hall, and Tom Oertling for their review of this article and editorial comments. These archeologists conducted the principle work on the shipwreck, which I myself (unfortunately) have never visited.

Publisher’s Note: the author has prepared additional documentation on her topic that appears in a separate linked folder. The appendix will feature a sample of the photographs of Boca Chica No. 2 from the Texas Historical Commission’s (THC) photography collection. There are currently more than 700 images for this shipwreck in the form of color slides, 35 mm print film, and digital photography. The images in the appendix are provided for research use only and are Copyrighted intellectual property of the Texas Historical Commission, Austin, Texas. **They may NOT to be used in any publication format without express written permission of the Agency.** If there is an interest in using these photographs for publication, marketing, or any commercial use, please contact the THC regarding the agency’s image use policy. Please allow for a lengthy download time due to file size. [Click here for the Appendix.](#)

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ETHNOHISTORIC RECORDS OF HUNTER-GATHERER DIET OF THE TEXAS/MEXICO BORDERLANDS: IMPLICATIONS FOR STAPLE FOODS OF THE LOWER PECOS CANYONLANDS DURING THE HOLOCENE

Tim Riley, Utah State University Eastern Prehistoric Museum, Price, UT 84501 (tim.riley@usu.edu)

ABSTRACT

Hinds Cave (41VV456) and other rockshelters excavated in the Lower Pecos Canyonlands have yielded thousands of coprolites spanning the Holocene. To date, several hundred specimens have been analyzed, providing a detailed record of meals consumed by hunter-gatherers who called this landscape home. This article compares the paleodietary records derived from these specimens with the foodways documented in the ethnohistoric records available for the Lower Pecos Canyonlands and adjacent landscapes. This comparison confirms the deep temporal roots of the foodways recorded in the earliest written records of the Texas/Mexico borderlands. Coprolite data corroborate the strong dependence on the seasonal staples of lechuguilla (*Agave lechuguilla*), nopales (*Opuntia sp.*), and tunas (*Opuntia sp.*) observed in the ethnohistoric literature. The temporal endurance of this subsistence strategy suggests that there may be some components of this dietary pattern that could inform on many of the diet-related health issues observed among modern Native American and other populations.

The Lower Pecos Canyonlands and adjacent regions have some of the oldest European written records of native foodways as well as incredible preservation of coprolites (desiccated feces) that span the Holocene. Across this region, hunting and gathering lifeways persisted with little interruption from the northward expansion of maize agriculture and throughout the tumultuous time of early European contact. These ethnohistorical accounts provide a framework of known seasonal resource exploitation to assess the coprolite data from Hinds Cave (41VV456). Due to the dominance of indigestible plant resources reflected in coprolite data, the review of the ethnohistoric literature in this manuscript focuses on floral resources and does not reflect patterns of faunal exploitation. Staple resources identified in the literature are corroborated in dietary data from archaeological sites, providing a view of a remarkably stable adaptation to the arid landscapes of the Lower Pecos Canyonlands and beyond. The time-depth of this adaptation has implications for dietary health concerns among contemporary native groups.

JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY

VOLUME 4:43-62

THE ONLINE PUBLICATION JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY (ISSN 2334-1874)

IS PUBLISHED BY JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY.ORG.

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THE LOWER PECOS CANYONLANDS

Located on the eastern periphery of the Chihuahuan desert (Figure 1), the Lower Pecos Canyonlands have a long history of archaeological investigations, due primarily to the remarkable preservation conditions of the numerous rockshelters and distinctive rock art styles (Shafer 2013:1-2). The Lower Pecos Canyonlands is bound by the mesquite-chaparral zone of the Tamaulipan biotic province to the southeast, the oak-cedar zone of the Balconian biotic province to the northeast, and the sotol-lechuguilla zone of the Chihuahuan biotic province to the west (Figure 1) (Blair 1950; Dering 2002). These biotic provinces are defined primarily by the distribution of fauna without detailed references to the underlying floral communities (Blair 1950). A review of the distribution of vascular plants demonstrates that nearly all plant species identified as food resources in the Lower Pecos Canyonlands archaeological record are found in surrounding biotic provinces (Hatch et al. 1990:13-14). The mosaic of habitats in the Lower Pecos provided a remarkably diverse environment for the prehistoric hunter-gatherers (Dering 1979). The diversity of habitats allowed human populations in the area to engage in an extremely broad-based subsistence strategy, with many seasonally available resources supplementing the cactus and succulent staples including agave and sotol (Dering 1999).

ETHNOHISTORY OF STAPLE PLANT RESOURCES THROUGHOUT THE BORDERLANDS

Ethnohistorical source material documents the use of wild plant resources as foods. This section recounts the seasonal subsistence patterns noted in the earliest reports of native lifeways in the general region. Most of the available literature is based on early Spanish reports of the nomadic hunter-gatherers of the modern states of Nuevo Leon and Coahuila, Mexico, as well as south Texas. Although a number of secondary sources were consulted (Beals 1973; Campbell 1979, 1983; Griffen 1969; Hester 1989; Kenmotsu and Wade 2002; Newcomb 1961; Taylor 1972; Thoms 2007), most of the data about the region presented in these sources is based upon Don Alonso de León's First Discourse (Brown 1988; De León 1971) or the account of Cabeza de Vaca (Krieger 2002). This review of ethnohistoric accounts from the region follows a broadly chronological approach, presenting details about seasonality and intensity of use for each resource. This is followed by a brief overview of the more recent ethnographic literature on the use of each of the three previously identified staples across the Greater Southwest. The seasonal availability of foods identified in these records is summarized in Table 1.

Cabeza de Vaca (1530s)

Though he did not traverse directly through the Lower Pecos Canyonlands, the account of Cabeza de Vaca provides the earliest record of Native lifeways across parts of South Texas (Krieger 2002; Thoms 2008). For the sake of brevity, the reports of coastal lifeways near Galveston Bay will be bypassed, as the environment there is very different from the Lower Pecos Canyonlands. Upon moving to stay with bands in the area surrounding the lower reaches of the modern-day San Antonio and Guadalupe Rivers, Cabeza de Vaca provides an account of pecans (*Carya illinoensis*) as an important fall staple (Krieger 2002:189-190; Thoms 2007, 2008). Along with an unidentified "little grain", these

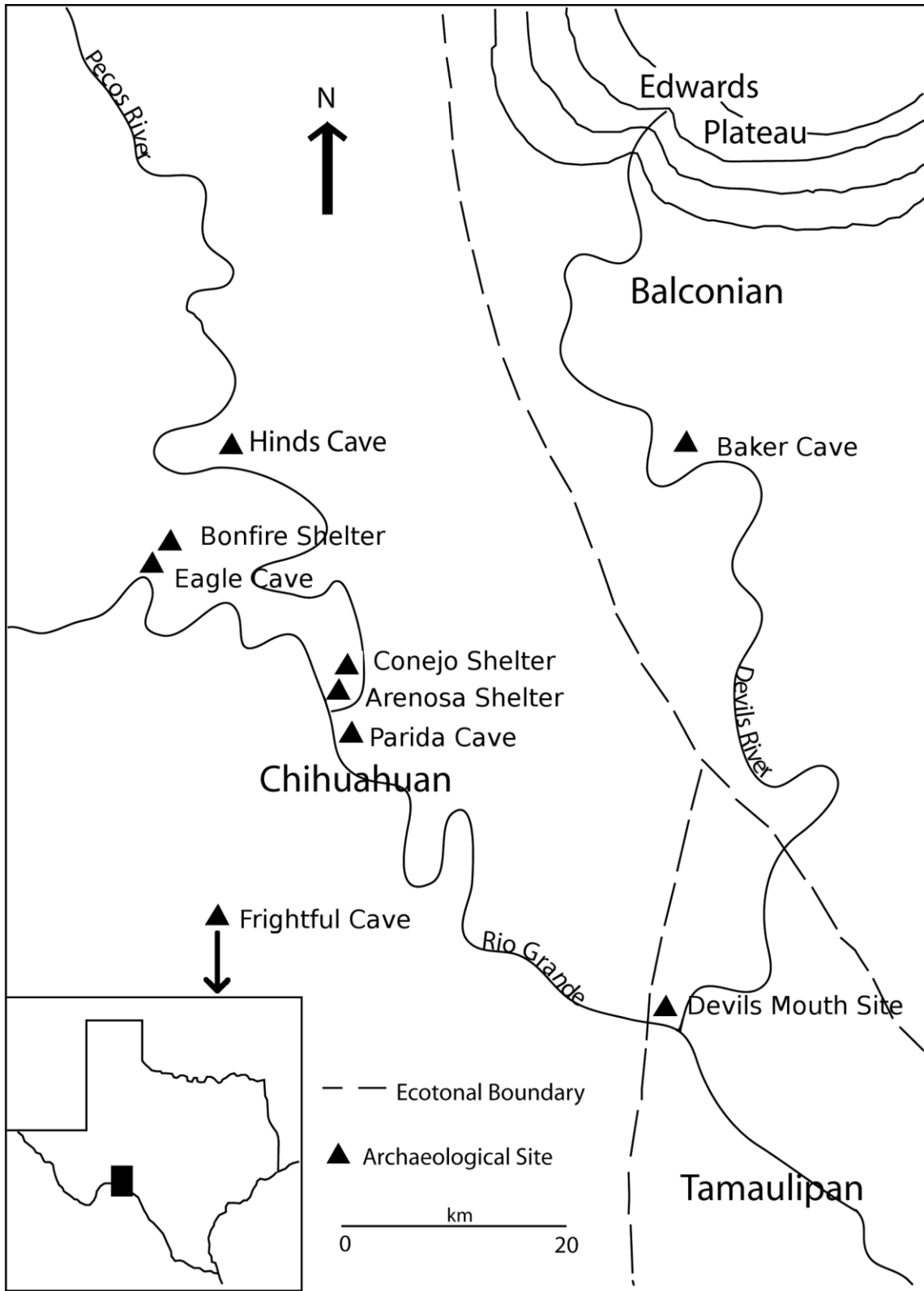


Figure 1. Map of the Lower Pecos Canyonlands

Table 1. Seasonality of Plant Use based on Ethnographic Sources

Species	Plant Part	Winter	Spring	Summer	Fall
Storage Organ					
<i>Agave lechuguilla</i>	Caudex	Heavy Use	Heavy Use	Available	Available
<i>Dasyllirion sp.</i>	Caudex	Heavy Use	Heavy Use	Available	Available
<i>Opuntia sp.</i>	Cladode	Available	Heavy Use	Heavy Use	Available
<i>Allium sp.</i>	Bulb	Available	Heavy Use	Available	Available
Fruit/Nut					
<i>Prosopis sp.</i>	Legume			Heavy Use	Heavy Use
<i>Carya illinoensis</i>	Nut				Heavy Use
<i>Juglans sp.</i>	Nut				Heavy Use
<i>Opuntia sp.</i>	Fruit		Heavy Use	Heavy Use	Available
<i>Opuntia leptocaulis</i>	Fruit		Available	Available	Available
<i>Echinocercus sp.</i>	Fruit			Available	
<i>Celtis sp.</i>	Fruit			Available	Available
<i>Dasyllirion sp.</i>	Fruit			Available	
<i>Diaspyros texana</i>	Fruit	Available			Available
SOLANACEAE	Fruit			Available	
<i>Vitis sp.</i>	Fruit			Available	
<i>Yucca sp.</i>	Fruit		Available	Available	
<i>Coryphantha sp.</i>	Fruit			Available	
FABACEAE	Legume			Available	
<i>Chamaecrista sp.</i>	Fruit			Available	Available
Cereal/Small Seed					
<i>Helianthus sp.</i>	Achene			Available	Available
<i>Chenopodium sp.</i>	Small Fruit		Available	Available	Heavy Use
<i>Amaranthus sp.</i>	Small Fruit		Available	Available	Heavy Use
POACEAE	Caryopsis			Available	Available
<i>Sporobolus sp.</i>	Caryopsis			Available	Available
<i>Panicum sp.</i>	Caryopsis			Available	Available
<i>Cenchrus sp.</i>	Caryopsis			Available	Available
CYPERACEAE	Seed			Available	
<i>Carex sp.</i>	Seed			Available	
<i>Polygonwn sp.</i>	Seed			Available	Available

nuts formed the majority of the diet for several months during years of good yield. Preparation methods are not recorded. During the winter, these inland groups, including the Mariames and Yguazes, subsisted almost entirely on geophytes, land plants with below-ground resting buds (Raunkiaer 1934:64-65) from several unidentified species (Krieger 2002:194-195). This is the earliest European account of earth oven cookery in North America (Thoms 2008). From the description of the several day cooking necessary to render them edible, it is clear that it must be a fructan-based storage organ. However, there is no mention of rock elements in the construction of these ovens. These carbohydrate-rich geophytes are underrepresented in the archaeological record, both in the remnants of earth ovens found across the region and in the direct evidence of diet supplied by coprolites (Riley 2010).

The use of the prickly pear (*Opuntia sp.*) nopales (stems) and green tunas (fruits) as a food is mentioned by Cabeza de Vaca in the year following his trek across the Tamulipan plain and the winter spent with the Avavares (Krieger 2002:195). Cabeza de Vaca references the cooking of green tunas and nopales in earth-ovens, recording that the pads are left to cook overnight in the earth oven. Again, there is no mention of a rock heating element. It is made clear in the account, that nopales were a marginal

food resource designed to satiate until the tunas were ripe. This corresponds with the low caloric return rate of this resource (Winkler 1982). For the Avavares, a group who lived entirely in the Tamulipan plains province, nopales and green tunas were the major staple recorded by Cabeza de Vaca (Krieger 2002:190-191). The account stresses that these populations, and other groups in South Texas, were highly dependent on prickly pear pads for sustenance during much of the year.

The late summer and fall was a time of abundance, with ripe prickly pear tunas serving as a major staple (Krieger 2002:195; Thoms 2008). This seasonal abundance of tunas provided a caloric surplus that encouraged bands to congregate at large tuna grounds in the Tamulipan Plains province. Prickly pear tunas were a productive resource across the plains province and were the focal point of the largest inter-ethnic gatherings observed by de Vaca in Texas (Krieger 2002:190). Large thickets of prickly pear drew native groups from the Coastal Prairie onto the South Texas Plains for a period of abundant food, celebration, and trade. According to Cabeza de Vaca, this resource was the major dietary staple of these groups for three months in late summer/early fall (Krieger 2002:190; Thoms 2008). It appears that tunas were an important seasonal resource for all of the Native groups that occupied the Tamulipan Plains province, as Cabeza de Vaca mentions them as the major food resource among the Native groups (Avavares, Cutalches [Cutalchiches], Malicones, Coayos, Susolas, Arbadaos) encountered from the time of their fleeing from the Mariames and Yguases in September until reaching groups near the Rio Grande that consumed mesquite (*Prosopis sp.*) flour (Krieger 2002:278). The tuna continued to be noted as an important dietary constituent among these groups near the river, as well as other groups further west that had access to maize (Krieger 2002:277). This indicates that tunas were a seasonally important resource in the basin and range province along the southwestern margin of the Tamulipan plain and were an important resource wherever they occurred in abundance.

While this very brief review does not account for the intra-province environmental variation of the Tamulipan Plains Biotic Province, it is clear that groups living around the margins of this area (which includes the Lower Pecos Canyonlands) were highly mobile and willing to move great distances for a productive and dense resource stand such as prickly pear tunas. Cabeza de Vaca and his companions clearly travelled through parts of the northern Chihuahuan desert, but there is no mention of any resources resembling agave or sotol in the account. Thoms (2007) argues that Cabeza de Vaca did not encounter the uplands of the Edwards Plateau where these desert succulents are prominent.

De León, the Elder (1580-1649)

Alonso De León, the elder, also provided an early account of native lifeways based on decades of observation. An early Spanish settler of the modern-day state of Nuevo Leon, Alonso de León recounted many ethnographic details of native populations living near the western margin of the Tamulipan Plains Biotic province from 1580 to 1649 (Brown 1988; Chapa 1997; De León 1971). The Native groups of Nuevo Leon and Tamaulipas living near the early Spanish settlements in the interior mountain ranges depended primarily on gathered plant resources for the majority of their diet, particularly in times of seasonal stress (Taylor 1972). De León claimed that the natives subsisted on three major staples throughout the year (Brown 1988). In the winter, the major food utilized was the caudex and basal leaves of lechuguilla (*Agave lechuguilla*). This season was described as a time of hunger

despite this dependence on lechuguilla, which De León claimed to have little substance (Brown 1988). During the spring and much of the summer, prickly pear was the foundation of the diet, both as green and ripe tunas (Brown 1988). Mesquite beans were an important staple during the late summer and fall, first as an edible raw “green bean” and then as a source of ground meal and dry bean once the pods dry. These Native populations also ate unnamed geophytes (Chapa 1997: location 345).

De León briefly recounted the cooking or “barbequing” of lechuguilla hearts over the course of two days and three nights. While there is no explicit mention of an earth oven, the length of time mentioned in the account suggests that the native groups described were using rocks as heating elements. Regardless of cooking method, the account clearly indicated that barbequed lechuguilla is the bulk of the diet across most of the cold season (Brown 1988).

As the prickly-pear blossoms in the spring, first the flowers (buds?) and then the green tunas were gathered and pit roasted (barbequed) (Brown 1988). De León claimed that there are great quantities of prickly pear in the region, allowing the natives to utilize the barbecued young tunas as the primary food supply without impacting the later tuna harvest (Brown 1988). When the tunas ripened, the local populations subsisted almost entirely on these fruits (both fresh and dried) (Brown 1988). There is no indication in this account of the use of the pads as a food resource. It is possible that De León did not distinguish green buds from the succulent young pads of the many prickly pear species.

Later Spanish Accounts

While no other sources provide the level of detail presented in the two previous accounts, there are some passing mentions of prickly pear, sotol (*Dasyilirion sp.*) and lechuguilla in later accounts that suggest they continued to be important dietary resources for Native populations in South Texas and neighboring regions (Foster 2008; Wade 2003). In January of 1674, Friar Larrios reported the staples of the native groups meeting with him at Mission San Ildefonso in Modern-day Coahuilla as subsisting on mescal, prickly pear tunas, acorns, small nuts, fish, deer, and buffalo (Wade 2003:7). Mescal may reference any agave species whose caudex was roasted for food (Castetter et al. 1938:10; Gentry 1982:14-16). Another account of this same expedition in 1674 mentions mescal as the staple food at the establishment of the Mission Santa Rosa de Santa Maria along the Rio Sabinas (Wade 2003: 9). During the ceremony establishing the mission, Captain Elizondo asked the natives to share food with the friars, who were subsisting solely on mescal (Wade 2003:9). Reports from later in the spring of 1674 referenced mescal as the primary food resource. Friars at these two mission sites reported that they and the congregated natives had only mescal and unidentified geophytes for food (Wade 2003:9). The location of this site about 50 miles south and west of modern-day Eagle Pass, TX suggests that it was probably lechuguilla. This is corroborated by reports from the military commander, Captain Barbarigo. In his report from that same spring, Captain Barbarigo recorded that the friars subsisted on the roots of lechuguilla, “tule”, and sotol once the stored maize and other resources had been exhausted (Wade 2003:10). “Tule” may refer to a species in the bulrush genus *Scirpus* or another such aquatic resource such as cattails (*Typha sp.*). There is no mention of the method of preparation of these resources. The small nut in the accounts may be little walnut (*Juglans microcarpa*), which is common in the archaeological record of the Lower Pecos Canyonlands, but this is speculative on the author’s part. The gathered natives at this mission

establishment numbered upward of 600 individuals from at least nine separately identified bands (Wade 2003:9). The account also mentions that many other people affiliated with these bands were engaged in logistic forays to the North for bison and other resources (Wade 2003:10). These statements hint at a very flexible social organization characterized by dispersal and congregation around seasonal resources.

Wade (2003:14) mentions the importance of prickly pear tunas in the dispersal of Native groups from the mission Santa Rosa during the harvest season, which began in June in this region. The friars had congregated over 3000 natives at the mission, who were subsisting on the large tuna grounds that abounded in the immediate vicinity of the mission (Wade 2003:14). The friars realized that the native populations would have to disperse once the tuna supply was exhausted and were desperate for supplies to keep the congregation together at the mission (Wade 2003:15). This account extends the recorded use of tunas as a seasonal staple to the western margins of the Tamulipan plains.

Griffen (1969) presents an overview of native lifeways recorded in Early Spanish accounts from the Bolsón de Mapimí of Central Northern Mexico. This closed drainage system is located to the west and south of the Lower Pecos Canyonlands, in the modern-states of Chihuahua, Coahuila, Durango, and Zacatecas. The majority of these accounts are from the Parras and La Laguna districts, which were better watered and became the center of Spanish colonial life in the region (Griffen 1969:6). The Spanish accounts from the late sixteenth and seventeenth centuries record a number of wild plant resources utilized as staple foods. For most of the groups in the region, mescal, tunas and mesquite were recorded as the major wild plant resources (Griffen 1969:110-111).

There are several reports of other terms for agave, including maguey and noas, as well as specific mention of lechuguilla use by natives in the area of modern-day Parras, Coahuila (Griffen 1969:110). The term “maguey” today references any of the large, thick leaved Agave species (Parsons and Darling 2000). However, the use of the term in the Spanish colonial records suggest that it is generally used as sub-grouping of mescal (Griffen 1969:110). Noas is another type of mescal, that is less fibrous than those species classed as maguey (Griffen 1969:110). Nopales are mentioned as a food resource for two groups in the region as well. At least two different aquatic resources were used by native groups in the region, “espadaña” (probably *Typha sp.*) and tule. Flour made from the roots of these resources, as well as mesquite, tunas, and mescal were all used to make solid loaves. Griffen (1969:110) also reports bread made from a small seed he tentatively identifies as the canarygrass, *Phalaris canariensis*, which grows in such abundance that it resembles a wheat field. The accounts also indicate that native groups made wine out of the staples of mescal, tunas and mesquite (Griffen 1969:110). The above accounts are centered on the relatively well-watered La Laguna district and may not be reflective of the region as a whole. Accounts recorded as early as 1598 characterize the diet of groups located in regions with minimal water as composed wholly of lechuguilla, mesquite, maguey, and tunas (Griffen 1969:111). This is re-emphasized in later accounts as well, indicating that some groups were entirely dependent on lechuguilla and wild maguey for the bulk of the caloric needs (Griffen 1969:111).

The Lipan Apaches incorporated mescal and prickly pear tunas and nopales into their seasonal round (Minor 2009:62). In 1761, the Lipan captain El Cabezón requested a military escort from Presidio de las Amarillas on the San Saba River during the prickly pear season (Wade 2003:93). In the following year, the captain of the Presidio agreed to establish a mission for another Lipan captain, El Turnio. El

Turnio made it clear that his group would abandon the mission during the prickly pear season (Wade 2003:194). The accounts of this mission from 1762 suggest that groups of Lipanes interrupted bison hunting to participate in the tuna harvest. Reports from the friars at Mission Santa Cruz de San Saba indicate that much of the mission population left in June to hunt bison, in August to gather tunas, and again in the fall to hunt bison again (Wade 2003:194-195). These two accounts recorded during the founding of the mission in 1756 (Wade 2003:186), along with the group name “Come Nopales,” which is Spanish for the “nopale eaters,” suggest that the prickly pear was an important seasonal resource for the Lipan Apache. The name “Come Nopales” suggests that the use of the pads as food was also encountered in the region, since only the pads of the prickly pear are referred to as nopales (Powell and Weedin 2004:74). This account has a dual importance in the current study. First, it indicates that the pattern of prickly pear dependence described for the Tamulipan plains by earlier accounts may also be an important component of the subsistence strategy of Native groups in the Edwards Plateau. Second, it suggests that the productivity of this resource was great enough that displaced groups migrating from areas with a low density of prickly pear, such as the Southern High Plains, would adopt this subsistence strategy in areas with a sufficient density of prickly pear. It appears that the drier areas of the Edwards Plateau have a high enough resource density to facilitate this shift to a seasonal dependence on prickly pear tunas by the Lipan and other Apache bands including the Mescalero, who are named for their dependence on mescal or agave (Opler 1983).

COPROLITE STUDIES FROM HINDS CAVE

Ethnohistoric records of hunter-gatherers exploiting the available wild plant resources available in the Texas/Mexico Borderlands provide a framework to evaluate the dietary data recovered from Hinds Cave coprolite specimens that span most of the Holocene. Six studies have been conducted on coprolites recovered from Hinds Cave (Belknap 2011; Edwards 1990; Reinhard 1989; Riley 2010; Stock 1983; Williams-Dean 1978). The coprolites analyzed in these studies span much of the Archaic occupation of the Lower Pecos (Turpin 1991). Each of these studies has added to our knowledge of diet and nutritional health of the hunter-gatherer groups that populated the canyonlands. There appears to have been a remarkably stable human exploitation of the landscape over this period (Edwards 1990; Stock 1983; Williams-Dean 1978). Data from three studies (Edwards 1990; Stock 1983; Williams-Dean 1978) were evaluated in Riley (2008) using cluster analysis. An additional 30 specimens were examined in Riley (2012). The coprolite studies from Hinds Cave inform on the exploitation of the Lower Pecos Canyonlands by hunter-gatherer populations across the Holocene. This robust dataset provides direct evidence of individual dietary choices. These prior studies suggest human populations occupying the canyonlands were highly dependent on a limited suite of xeric resources for the bulk of their caloric intake. However, few of the prior studies approached the reconstruction of diet at the scale of individual coprolite specimens and, by extension, individual actors in the archaeological record. The current study rectifies that by considering each specimen as a discrete record of seasonal exploitation of available food resources.

Each coprolite represents a combination of dietary items that can generally be considered to represent a meal (Fry 1985) or perhaps several meals (Sutton and Reinhard 1995), both relatively focused windows into an individual’s dietary decisions. This provides a framework for analysis, but it

also requires that each specimen be considered as a discrete unit in order to observe the relationship between dietary constituents recovered together. This is complicated by the large number of dietary items generally recovered in coprolite studies, which results in a cumbersome matrix with many empty cells. Patterning within this large data set is hard to explore without the use of statistics, which are limited, in turn, by the nature of coprolite quantification as well as comparability between studies (Jouy-Avantin et al. 2003).

Riley (2008, 2012) uses cluster analysis as an exploratory statistical technique to look for patterning in the macrobotanical components of the coprolite studies from the Lower Pecos Canyonlands. Further details on this technique are available in Riley (2010). Overall, this statistical approach yields patterns of similar dietary exploitation between coprolites while maintaining the relationship between various components in individual specimens. These patterns of resource combination inform on seasonality of deposition.

The three clusters of specimens from Riley (2012) correlate nicely with dietary predictions based on the ethnohistoric record (Table 2) (De León 1971; Krieger 2002; Thoms 2008). The first cluster (n=16) indicates a diet focused on the desert succulent resources of lechuguilla and sotol, with smaller amounts of onion bulbs also consumed. These specimens fit the expectations of a winter/early spring diet focused on the highest caloric return resources available in the canyonlands during that season. The inclusion of “calorically limited” onions (Sobolik 1991) may indicate that diet breadth for these spring and winter meals is fairly broad. However, there is little indication of small animal resources in these specimens compared with the other clusters. This cluster also includes the only direct evidence of large animal consumption from the current study. Overall, this cluster represents meals with a mixed diet-breadth, incorporating both low and high ranked resources available in the cold season. Thus, the dietary decisions reflected in these specimens are better understood as a reflection of seasonal availability rather than diet-breadth ranking (Table 3).

The second cluster (n=4) from Riley (2012) represents the digested residue of meals composed almost entirely of nopales and sotol hearts, with the nopales making up the bulk of the plant-based diet. These specimens represent a seasonal dietary strategy focused on low-ranked nopales somewhat supplemented by the relatively high-ranked sotol hearts. This cluster accords nicely with the seasonal expectations of a spring diet from the ethnohistoric record (De León 1971; Krieger 2002). The third cluster (n=10) consists of coprolite specimens that reflect a diet dominated by prickly pear tunas. Other than less predictable and abundant mast resources such as walnuts, tunas are the highest ranked resource in the diet-breadth model. Both the ethnohistoric record and the model predict that hunter-gatherer populations in the canyonlands would depend on these resources as a major staple during the summer. This is exactly what is seen in this cluster, which contains little evidence of other plant components in these meals. The diet reflected in these specimens is focused on highly-ranked tunas to the exclusion of other plant resources. Prickly pear cactus was an invaluable food resource across the Archaic. The tunas and seeds were a mid-summer staple and the nopales provided a reliable resource in times of seasonal scarcity.

Table 2. Seasonal Interpretations of Coprolite Clusters from Hinds Cave Data

Cluster	Chronological Period	Number of Specimens (n)	Major Dietary Compounds	Season of Operation
Riley 1	Early Archaic	16	<i>Agave sp. caudex</i> , <i>Dasyllirion sp. caudex</i> , <i>Allium sp. bulbs</i>	Winter/Spring
Riley 2	Early Archaic	4	<i>Opuntia sp. cladodes</i> and <i>Dasyllirion sp. caudex</i>	Winter/Spring
Riley 3	Early Archaic	10	<i>Opuntia sp. tunas</i>	Summer
Stock 1	Early Archaic	33	Unidentified epidermal tissue—may be <i>Agave sp.</i> , <i>Dasyllirion sp.</i> or other	Fall/Winter
Stock 2	Early Archaic	10	<i>Opuntia sp. tunas</i>	Late Summer/ Fall
Stock 3	Early Archaic	12	<i>Opuntia sp. cladodes</i> and <i>Allium sp. bulbs</i>	Spring
Williams-Dean 1	Early Archaic	31	<i>Opuntia sp. cladodes</i> and <i>Allium sp. bulbs</i>	Spring
Williams-Dean 2	Early Archaic	50	Bone fragments, <i>Agave sp. caudex</i> , <i>Juglans sp. nuts</i> , and <i>Opuntia leptocaulis</i> fruits	Fall/Winter
Williams-Dean 3	Early Archaic	19	<i>Opuntia sp. tunas</i>	Summer
Edwards 1	Early and Late Archaic	24	Burnt Bone	Fall/Winter
Edwards 2	Early and Late Archaic	7	<i>Opuntia sp. tunas</i> and <i>Diospyros sp. fruit</i>	Summer
Edwards 3	Early and Late Archaic	8	<i>Allium sp. bulbs</i> and unidentified epidermal tissue—may be <i>Agave sp.</i> , <i>Dasyllirion sp.</i> , <i>Opuntia sp.</i> or other	Spring

Table 3. Caloric Value of Known Food Resources from the Lower Pecos Canyonlands

Plant	Plant Part	Caloric Value/ 100g	Cooking Method	Source
<i>Agave lechuguilla</i>	Caudex	319	Intensive cooking	Dering 1999
<i>Dasyllirion sp.</i>	Caudex	343	Intensive cooking	Dering 1999
<i>Opuntia sp.</i>	Cladode	27	Varied	Sobolik 1991
<i>Allium sp.</i>	Bulb	35	Varied	Sobolik 1991
<i>Prosopis sp.</i>	Legume Pod	273	Pounding	Sobolik 1991
<i>Juglans</i>	Nut	618	Minimal	USDA 2006
<i>Opuntia sp.</i>	Fruit	41	Minimal	USDA 2006
<i>Diospyros texana</i>	Fruit	127	Minimal	USDA 2006
<i>Vitis sp.</i>	Fruit	69	Minimal	USDA 2006
<i>Helianthus sp.</i>	Achene	570	Minimal	USDA 2006
<i>Chenopodium sp.</i>	Small Fruit	195	Pounding	Sobolik 1991
<i>Amaranthus sp.</i>	Small Fruit	374	Pounding	USDA 2006
POACEAE	Caryopsis	314	Pounding	Cane 1987
<i>Polygonum sp.</i>	Seed	92	?	USDA 2006

Prickly pear cactus seeds and epidermal tissue were also important clustering variables in the other coprolite assemblages from Hinds Cave considered in this present study. Most specimens with high levels of tuna seeds [Stock Cluster 2 (n=10), Williams Dean Cluster 3 (n=19), and Edwards Cluster 2 (n=7)] have relatively low levels of other constituents, which reinforces the ethnohistoric record of the

seasonal dominance of cactus tuna as a mid-summer resource (Brown 1988; Krieger 2002; Taylor 1972; Wade 2003:14).

The clusters with high levels of prickly pear cactus epidermal tissue [Stock Cluster 3 (n=12), Williams Dean Cluster 1 (n=31), and Edwards Cluster 3 (n=8)] also have a low diversity of other constituents. Each of these clusters also has higher levels of onion bulb fragments than the other clusters. This supports the view of Edwards (1990) that cold season coprolites will contain a low diversity of dietary constituents and a heavy dependence on a handful of seasonally available staples such as nopales or onions (see Table 2).

The remaining clusters [Stock Cluster 1 (n=33), Williams Dean Cluster 2 (n=50), and Edwards Cluster 1 (n=24)] are more difficult to evaluate, due to the limited identification of primary dietary components noted above. Cluster membership seems to be due to the absence of high levels of prickly pear cactus seeds and epidermal tissue. The specimens in these three clusters (which account for most specimens in each study) reflect a high diversity and low abundance of dietary resources. I maintain that this is due to the lack of detailed identification of the major dietary constituents of fiber and epidermal tissue. It seems likely that some of these specimens reflect a dietary dependence on lechugulla and sotol hearts, while others may indicate a broad-based diet on seasonally available fruit and seed resources, similar to clustering exhibited by specimens from Baker, Frightful, and Parida Caves (Riley 2010).

Overall, the combined coprolite data presented here provide a robust set of data to explore the subsistence strategies employed by the Holocene hunter-gatherer populations occupying Hinds Cave. There are 224 coprolite specimens from Hinds Cave, ranging from the Early Archaic to the Late Archaic. While differing levels of identification and expertise limit direct comparison between these data sets, there are general observations that reinforce the more detailed analysis presented above. Of the 224 specimens analyzed by various researchers from Hinds Cave, 66 (29.5%) contain the digested residue of a meal including baked sotol or lechuguilla caudex (Table 4). Another 47 (20.3%) contain evidence of nopale consumption. Forty-three specimens also contain onion bulbs, suggesting that these two resources were frequently consumed together as a meal. Forty-six (19.8%) specimens from Hinds Cave are the residue of meals focused on tunas as a staple resource. The remaining 65 specimens (29.0%) from Hinds Cave are not classifiable due to a lack of identification of the primary components recovered from the specimens. It seems likely that many of these remaining specimens reflect the consumption of either desert succulent resources or nopales, but the lack of epidermal and fiber identification from these studies (Edwards 1990; Stock 1983) precludes any secure statement of dietary reconstruction.

Table 4. Dominant Dietary Resources in Coprolite Specimens

Dominant Resource	Hinds Cave	
	Number of Specimens	Percentage
Nopales	47	21.0
Tunas	46	21.0
Caudex	66	30.0
Unknown	65	29.0
Small Seeds		0.0
Total	224	100.0

The data indicate that the plant resource components of many of the meals represented by these coprolite specimens were dominated by one or two staple plant resources. While this is frequently supplemented with trace amounts of secondary resources such as hackberry fruits and other small fruits and seeds, the data indicate a stable exploitation of the four major resources considered in this study that spans the Holocene. This fits well with the ethnohistoric observations of Cabeza de Vaca and De León the elder, both of whom indicate that the seasonal diet of the native groups observed was almost monolithic in composition (Brown 1988; Krieger 2002; Thoms 2008). While this may be partly due to the outsider perspective and clear disdain accorded native lifeways by De León (1971), the coprolite data corroborates the overall pattern of heavy dependence on a few staple resources across the annual cycle.

The coprolite data demonstrate that nopales and onions are much more important resources than would be predicted with a diet-breadth model (Riley 2012). This brings into question the measured caloric value for these resources. As Wandsnider (1997) points out, fructans require extensive cooking times to render them digestible in the human gastrointestinal system. While the caloric values for sotol and lechuguilla are based on samples prepared using traditional earth oven technology (Dering 1999), the values for onions and nopales are based on modern cooking methods that likely under-represent their total potential caloric contribution in the paleodiets of the Lower Pecos Canyonlands (Sobolik 1991; Winkler 1982). Additionally, recent research by Lawrence et al. (2015) has also demonstrated that there is previously unidentified starch in both the nopales and tunas of the prickly pear cactus. This starch was not encountered in any of the coprolite specimens containing other microfossil traces of nopales (Riley 2010), which highlights the possible under-representation of starch-based resources in coprolites due to digestion.

A different explanation for the cluster of coprolites reflecting diets dominated by nopales and onions is a seasonal dependence on these low-ranked resources. The clusters exhibiting high amounts of prickly pear cactus epidermal tissue indicate a late winter/early spring occupation of the site and generally have little evidence of meals incorporating higher-ranked resources. Alternatively, a diet-breadth model based on a currency of gross caloric return may not fully explain the dietary choices made by human populations occupying the Lower Pecos Canyonlands. It is possible that onion bulbs and nopales were incorporated into the diet for reasons other than gross caloric intake. Nopales have been an important food resource across the Holocene among the human populations occupying the Lower Pecos Canyonlands.

As previous studies (Bryant 1974; Dering 1979; Edwards 1990; Sobolik 1991; Stock 1983; Williams-Dean 1978) have concluded, the human exploitation of the Lower Pecos environment appears to have followed a similar pattern across much of the Holocene. In the studies presented here, which span most of the Archaic, prickly pear cactus was an important seasonal resource, both during the summer when tunas were available and during the cool season, when the abundant nopales of these cacti would have been a low calorie but bulky food source. This study also indicates that Hinds Cave has been used as a habitation across the seasons during the Archaic. The present research suggests that the mobility of populations in the Lower Pecos was more random and opportunistic than predicted in the model

developed by Shafer (1986:117-119), responding to both long term and seasonal fluctuation in resource availability.

INFORMING CONTEMPORARY DIET THROUGH ARCHAEOLOGICAL AND DOCUMENTARY DATA

The data presented in this study show that the human populations living along the northern fringe of the Chihuahuan Desert were dependent on fructan-based plant resources for the majority of their carbohydrate intake. The temporal depth and spatial breadth of this strategy across most of arid North America has some important dietary implications for modern populations exhibiting genetic continuation with the pre-Columbian inhabitants of the region. Many populations living near the Mexican-United States border, especially Native Americans and Mexicans with indigenous heritage, have extremely high levels of diet-induced health issues, such as obesity and diabetes (Archer et al. 2002; Wiedman 2005). This is due, at least partly, to a major change in the carbohydrate composition of the diet of these populations over the last half-millennium of cultural change (Johnston 2007; Richards and Patterson 2006; Teufel 1996). Soluble dietary fibers generally, and specifically fructans, have been shown to have a positive, ameliorating effect on lipid and glucose metabolism (Beylot 2005; Daubioul et al. 2002; Daubioul 2005; Delzenne and Daubioul 2000; Roberfroid 1999; Williams and Jackson 2002). Studies have shown that the fructan components of both *Agave* sp. and *Dasyliirion* sp. have similar effects on metabolic function as the commercially available fructans derived from chicory root (*Cichorium intybus* (LINN.)) (Urias-Silvas et al. 2008). These data suggest that attempts to address the high prevalence of obesity and diabetes among indigenous populations in the Chihuahuan Desert with diet should focus on the promotion of neglected, traditional food resources, both as whole foods as well as sources of fructans for the food industry (Huazano-Garcia 2009; Lopez and Urias-Silvas 2007). In addition to the metabolic regulation benefits mentioned above, fructans have a positive impact on colon cancer (Leach 2007; Pool-Zobel and Sauer 2007; Taper and Roberfroid 2002) and general colonic health (Heizer et al. 2009) as a prebiotic soluble fiber. The incredible temporal depth of fructan consumption by human populations in the Chihuahuan desert has already been noted by some researchers (Leach 2007; Leach and Sobolik 2010) and, it is hoped, may inform on the community health strategies applied in the borderlands today.

CONCLUSION

The combined coprolite data available for the Lower Pecos Canyonlands record a long-term dietary pattern of seasonal dependence on a handful of staple resources, throughout the Archaic. There are three major seasonal menus reflected in the coprolite data. The first menu consists of nopales, and was principally, although not exclusively, consumed in the late spring. This menu is primarily consumed when other resources were not readily available and may be considered a dependable but undesirable meal. The second menu consists of pit-baked lechuguilla and sotol, common throughout the cool season. This menu entails high processing costs, but would provide a reliable caloric return. The third menu exhibits a monolithic reliance on tunas during the summer. The ease of harvest and consumption is reflected in the seasonal dominance of this resource, which was assuredly a highly desirable meal. These patterns of dietary consumption, which extend back eight thousand years, are corroborated by

the written accounts of early European observers in the broader region. This long temporal depth is a reflection of how successful this subsistence pattern was at extracting a living foraging in a marginal, arid environment.

ACKNOWLEDGEMENTS

This research was made possible by Drs. Vaughn M. Bryant and Harry Shafer, Texas A&M University, Department of Anthropology, and many graduate students who worked on the excavation and subsequent labwork.

DATA AVAILABILITY STATEMENT

All data utilized in this article is available in Riley (2010).

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FORGOTTEN SOLDIERS: BURIALS ON THE TEXAS FRONTIER AND SHIFTING PERCEPTIONS OF MILITARY INTERMENT

Anthony Schienschang
Williamsburg, VA 23185 (anthony.schienschang@gmail.com)

ABSTRACT

This research examines the interrelation between civilian and military burials on the Texas frontier in the 1850s with further discussion about the drivers for changing military burial practices. A soldier's life on the Texas frontier is briefly outlined along with some of the difficulties facing service members living in border forts. Special focus is placed on examining the socio-economic differences between officers and enlisted personnel, as well as the recording of deaths on the frontier. As a case study, the condition of the proposed location of the Fort Gates cemetery is explored and brief analysis of data gathered from the site is presented. The condition of the Fort Gates location is then compared to the nearby Sheridan Family Cemetery. The paper concludes by exploring how the American Civil War shifted civilian perceptions about military dead, leading to increased care for the remains of these deceased soldiers. Primary field research was conducted in Coryell County, Texas around the former site of Fort Gates, on the Fort Hood military installation, and in Gatesville, Texas.

INTRODUCTION

When Cain told God that he was not his brother's keeper, he was met with anger by God and told that the very ground cried out for his slain brother Abel (Book of Genesis, King James Version 2005). In the same way that Cain asked if he was his brother's keeper, Texans on the frontier in the 1850s were often callous about military burials. Though the ground may not have cried out in anger, from a modern American perspective, the negligent way soldiers were buried is almost unthinkable as it is a commonly held belief the United States always interred service members with care and dignity. This is not the case, however, as prior to the American Civil War active military and veterans were often not afforded any special recognition when interred.

For the average soldier on the Texas frontier in the 1850s, there were no illusions about the difficulties facing them while stationed at a border fort (Pugsley 2001). If a soldier were to die on the frontier, it was unlikely that their grave marker would survive for any appreciable amount of time. Perhaps more frustrating, burial records for soldiers from the time period are spotty at best and in many cases are non-existent. The limited contemporaneous written records that do exist are either military

JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY

VOLUME 4:63-80

THE ONLINE PUBLICATION JOURNAL OF TEXAS ARCHEOLOGY AND HISTORY (ISSN 2334-1874)

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diaries or letters kept by families to modern times. When these resources are not available, painstaking reconstruction must be undertaken by dedicated historians and archaeologists. Because of this lack of care and proper record keeping, many times soldiers were buried near border forts with little to mark their graves and without corresponding documentation.

There are numerous reasons why the graves of frontier soldiers may have been forgotten. War weariness after the Mexican-American War and the distance from the populous eastern part of the country are likely contributors. The perceived dangers posed by Native Americans also precluded families from traveling to retrieve the remains of their loved ones. The most significant contribution to the disparity between civilian and soldier burials on the Texas frontier was a result of the soldier's socio-economic status, the ever-expanding nature of the western frontier, and a lack of roots in the area. A change in the level of care for military graves would not occur until after a cultural shift following the Civil War, serving to elevate the status of veterans in American culture.

BORDER EXPANSION

To understand the mindset of those on the Texas frontier in the mid-nineteenth century, knowledge of the Mexican-American War is essential. In 1845 the United States annexed the Republic of Texas, and granted the new territory statehood in December of that year. This annexation took place after the United States failed to purchase the area of Texas that had seceded from Mexico. President James Polk stationed federal troops in the new territory to secure it. The initial deployment of these troops was conservative, with the majority of the soldiers placed in the northern portion of Texas. With pressure from Washington, however, federal troops were moved further south towards the Mexican border (Pugsley 2001). This prompted the Mexican government to launch a preliminary strike against the American dragoons operating in the area. This action by the Mexican Army in April of 1846 killed 11 US soldiers and would later be known as the Thornton Affair.

The movement of American forces south was a deliberate provocation by the government of the United States to create public support for a declaration of war against Mexico. Following a relatively quick and bloodless campaign by nineteenth century standards, the conflict ended with the signing of the Treaty of Guadalupe Hidalgo in 1848 (Sandoval 2015). This treaty had the effect of establishing the southern border of the United States at the Rio Grande, and Mexico ceding land that would form the majority of the American West.

With the acquisition of this new territory, it fell to federal troops to provide security for thousands of square miles of unsettled land. Though state and territorial militia did exist, these soldiers were often less disciplined than federal troops and were more likely to commit criminal actions in the event of hostilities between Native American and settlers or against Mexico (Guardino 2014). Limited engagements between the militia and Native Americans did occur in the period between the Mexican-American War and the US Civil War; however, most operations were small, localized conflicts. The larger campaigns and Native American resettlement operations that took place in this period were the responsibility of the more disciplined and better trained federal troops. When not actively deployed on a campaign, federal soldiers manned a series of small forts along the edge of the Texas frontier.

One reason for establishing a line of border forts was to protect settlers and travelers from hostile Native Americans. The government's and War Department's hardline stance was largely fueled by the pervasive institutional racism present at the time. Due to a long history of unfair deals, propaganda, and double-crossing between the two parties, it is easy to imagine the US-Native American relations by the offensive popular image of "savages out collecting scalps". This is an inaccurate understanding, however, as this period of border expansion was marked by relative quiet (Jones 2014).

Although there had been difficulties during the early years of the Republic of Texas, by the end of the Republic's existence relations between white settlers and Native Americans had cooled significantly due to proactive work by Sam Houston (Ginn 2011). During the Antebellum Era, it was not uncommon for members of the famed Texas Rangers to be of mixed Native American and Anglo descent (Ginn 2011). Peace along the frontier between settlers and Native Americans was generally the rule; yet to the average settler on what seemed to be the edge of civilization this may not have been of much comfort. It is interesting to note that the reaction and deployment of the United States Army at the time reflects this general attitude of peace. Had there been a much more significant threat posed by Native Americans, more resources would have been allocated to the frontier's defense. While they did respect their tracking, horsemanship, and hunting skills, commanders on the frontier often thought rather little of the local Native Americans as a legitimate military threat as the settler population increased (Pugsley 2001). This is likely due to the racist and classist undertones that pervaded the nineteenth century military.

The United States Army of the mid-nineteenth century was divided more sharply along class lines than it is today. At this point in the US Army's history, officers were generally educated, wealthy white males. Military service among this social stratum was not seen as a career or way to make a living, but rather a way to increase social status and prestige among their peers. This was due in no small part to the cost associated with being a commissioned officer; they were required supply their own uniforms, arms, and equipment. Being wealthy enough to provide their own equipment and afford top-of-the-line weaponry and other items was a form of bragging in its own right. This posturing may seem odd to modern sensibilities, to the gentry of the Victorian Era this conspicuous consumption was the norm.

Many men sought a commission out of a desire to serve their nation or because of other lofty romantic ideas. Men could also be commissioned based on what they could supply to a regiment. In several cases, commissions were handed out for furnishing horses or other supplies (S. Swafford to Family, letter, 15 May 1865, Private collection, Pikeville, Tennessee). The requirement for officers to furnish their own equipment made it difficult for anyone not well established in the country to obtain a commission. Because of their station and education, these men not only served as commanders, staff, and professionals but also acted as liaisons between local forts and nearby communities (Coker and Humphrey 1993).

Enlisted soldiers were in many cases the opposite of their commissioned counterparts. They were drawn from almost all walks of life and had varying levels of education and experience. Some were petty criminals who were offered the choice of enlisting or a jail sentence. Many were immigrants with little education and even less money. In the years before the American Civil War, an enlisted infantryman could make \$7 a month, with more being paid to artillery and cavalry counterparts (Smith

1999). Unlike commissioned officers, enlisted men and noncommissioned officers were provided with weapons and supplies, significantly offsetting the cost of being a professional soldier. Unfortunately, the equipment was almost always second rate and not always available. Shortages in equipment and materials were often due to breakdowns in the military supply chain. In the case of both officers and enlisted personnel, housing and food were supplied when available; when it was not available, they were expected to build their own shelter and forage for food.

Being a soldier normally provided steady pay, but was not often a path to long-term financial success. The monthly pay of a soldier provided enough to meet a person's basic needs and allowed for some creature comforts; a luxury not often afforded contemporaneous factory workers. Serving in the military also provided the chance to travel beyond cities that were undergoing rapid and often unhealthy industrialization. These advantages, in addition to jingoistic and adventurous appeal, heavily contributed to recruitment among newly arrived immigrants. Military service provided tangible benefits to its members and was often a way to speed up the process of receiving citizenship for recent immigrants (Segal and Segal 2004). As many of these young men were sent to the United States ahead of the rest of their families, the benefits of citizenship and consistent pay were considerable.

While many of these newly minted citizens served their country admirably, they were often viewed as outsiders. However, native-born Americans were not much better off than their immigrant counterparts; being poor and uneducated was nearly as much of a hindrance to gaining social status as being an immigrant. African-American soldiers of the time were also worse off than immigrants; they were not allowed to serve as commissioned officers and were relegated to the so called "Colored Regiments". However, African-American interments did benefit from an established cultural framework in the United States. Lacking this framework, it is unsurprising that immigrant soldiers received little consideration for their remains at death. Due to an enlisted soldier's class and means, they often did not receive burials that conformed to accepted norms nor have their remains returned to their families if they died on the frontier.

DEATH ON THE FRONTIER

Life on the Texas frontier was difficult for a Federal soldier; though it did have a lower mortality rate than other occupations due to the state-of-the-art healthcare available to soldiers at the time (Gerstle Smith 2013). A soldier on the frontier was far more likely to die from disease, in particular tuberculosis, than from a Native American raiding party. Interestingly, there does seem to be correlation between the rank of an individual and their susceptibility to disease. With officers being generally healthier, they suffered from diseases less often than their enlisted counterparts due to better diet and medical treatment (Steckel and Haurin 1994). Because of a lack of understanding of germ theory and disease propagation, hospitals and clinics on forts focused on the treatment of symptoms than on the prevention of disease.

Considered laughable today, these treatments included prescriptions of whiskey, arsenic, mercury, or bloodletting depending on how exactly the "humors" were imbalanced (Steckel and Haurin 1994). In the event that a soldier did not recover, they were either discharged or quarantined until they passed away. The act of quarantining a soldier and the conditions that they lived under saved more lives than

prescriptions of whiskey and arsenic. The quarantined soldiers were kept under isolation and required to get a certain amount of fresh air and sunlight each day. By segregating the soldiers who were suffering from disease, many times the camp at large could be spared.

Sadly, sunlight and whiskey were often not enough to combat tuberculosis or the cholera outbreaks that periodically ravaged frontier forts. Upon their deaths, the incident was recorded and the soldier was buried (Steckel and Haurin 1994). The method of burial depended on the soil in which a soldier was buried. In the case of the frontier forts in Texas, soldiers were often placed in a shallow grave with a large stone slab covering the burial site. Because of the shallow rocky soil, graves on the Texas Frontier were rarely dug to the traditional six feet. Should the soldier be lucky enough to have a relative that could be contacted, the family of the soldier would be notified by the local commander. In the event that no relative could be located, a diary entry by the commander would often suffice to record the event.

It is in the burial of Antebellum, Texas frontier soldiers that discrepancies between modern interment practices of soldiers and those of the past occur. Today the National Cemetery Administration takes every effort to keep track of the names and locations of buried service members and this was not the case prior to the Civil War (United States Department of Veteran's Affairs, [USDVA] 2015). This is surprising because of the relatively few service members serving in the period after the Mexican-American War. Between the Mexican-American War and the US Civil War, the nation's military population was at its lowest point in nearly a century; <0.01% of the national population was in the military during this period compared to just over 3% during the American Civil War (Segal and Segal 2004). At this point career soldiers were almost unheard of, and the only service members who would have a chance of retiring from service were officers. It is almost counterintuitive that with fewer soldiers serving during the 1850s, record-keeping suffered. Considering the transient nature of the US frontier and its distance from the War Department in Washington, DC, it is reasonable to see how a communication breakdown could occur. This was especially true of smaller forts that only existed for a short period of time before being abandoned.

The forts established after the American victory in the Mexican-American War were planned as a series of north to south "lines" that proceeded from east to west as time and settlement occurred (Figure 1). Numerous forts existed but due to their distance from one another, relative inexperience of the soldiers with the land around the forts, and a limited number of troops, the forts never provided any real security beyond their limited spheres of influence. While the War Department intended for westward expansion to happen in an orderly fashion, the discovery of gold in California in 1849 precipitated the expansion of the frontier by hundreds of miles in a few short years (Wooster ca. 2000s). Because of this rapid expansion, the forts built along these lines would normally only be occupied for two to three years before the frontier expanded to the point where holding the land around the forts was no longer a military necessity. As the forts were abandoned, the soldiers who were buried at the forts were often forgotten as the Army moved west. The graves and markers normally fell into such states of disrepair that even local civilian populations could not remember the original locations of the cemeteries.

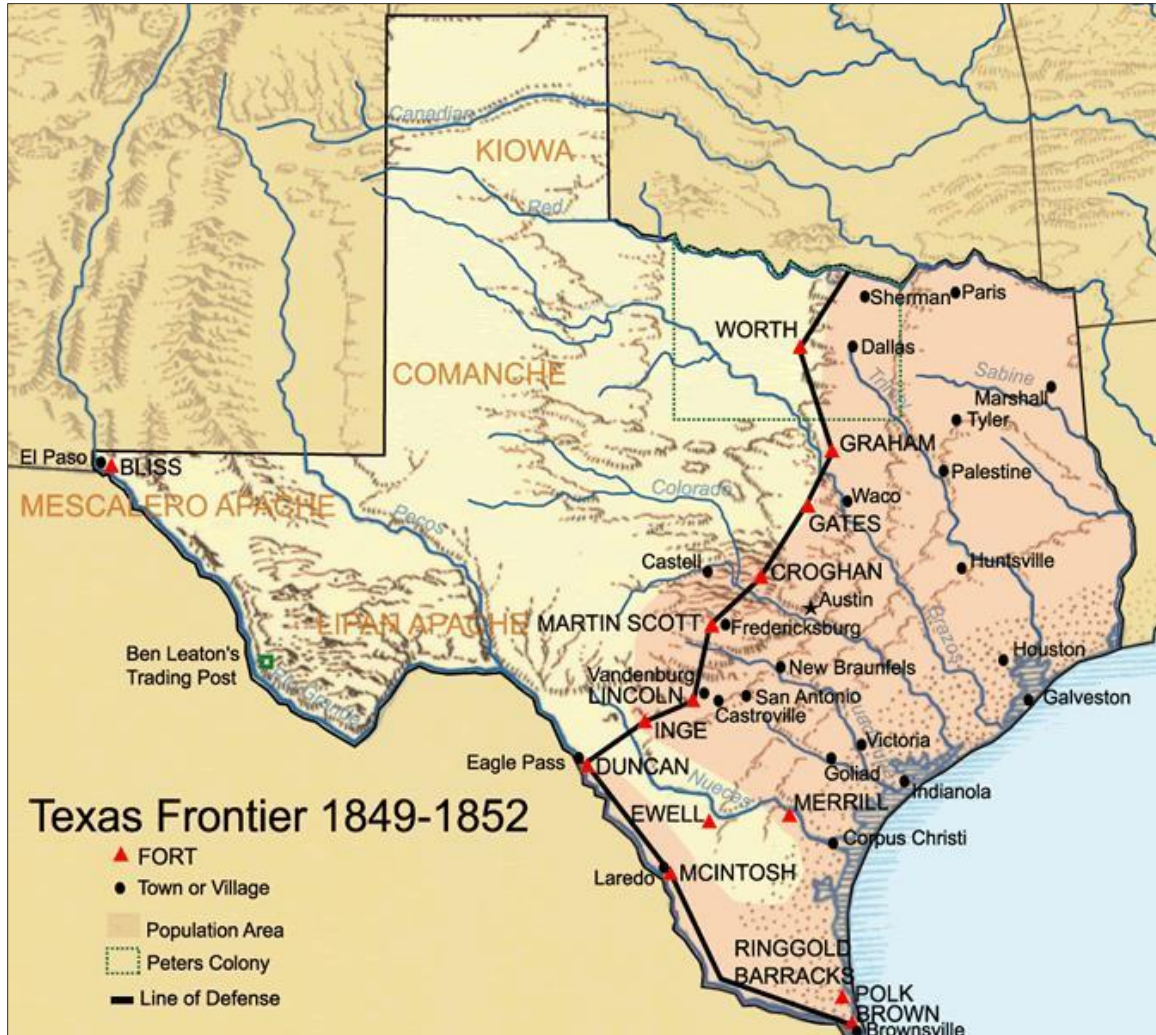


Figure 1. Texas Frontier Border Forts 1849-1852 (Wooster 2005).

FORT GATES CEMETERY

As one of the border forts along the line of the Texas frontier, Fort Gates serves as an excellent case study detailing how the location of soldiers' graves were forgotten following the abandonment of a fort. Operated for only three years, the fort was manned by the 8th US Infantry Regiment, who were charged to protect settlers against Native Americans. While the location of the fort is rather well known, the location of the soldier's cemetery was thought to be near the marker placed by the State of Texas. Recent research calls into question this assertion, and efforts were conducted to locate these graves (Miller and Sitters 2016). Using aerial photography, ground penetrating radar and magnetometers; exploration into the area around the location of the former Fort Gates provided data suggesting that the cemetery was not where the state marker proposed, but rather nearly 2 km to the southeast (Miller and Sitters 2016).

This location is marked by multiple stone features that are similar to contemporaneous grave markers used on the Texas frontier. Additionally, there are five magnetic anomalies that match the approximate dimensions and orientation indicative of a burial (Figure 2). The anomalies in Grid 4 are

oriented east to west and measure approximately 2 m across by 1 m wide; these magnetic anomalies fit the dimensions of traditional Judeo-Christian burials. Each anomaly shows high magnetic susceptibility, a common feature of decomposed organic matter or human soil disturbances (Miller and Sitters 2016).

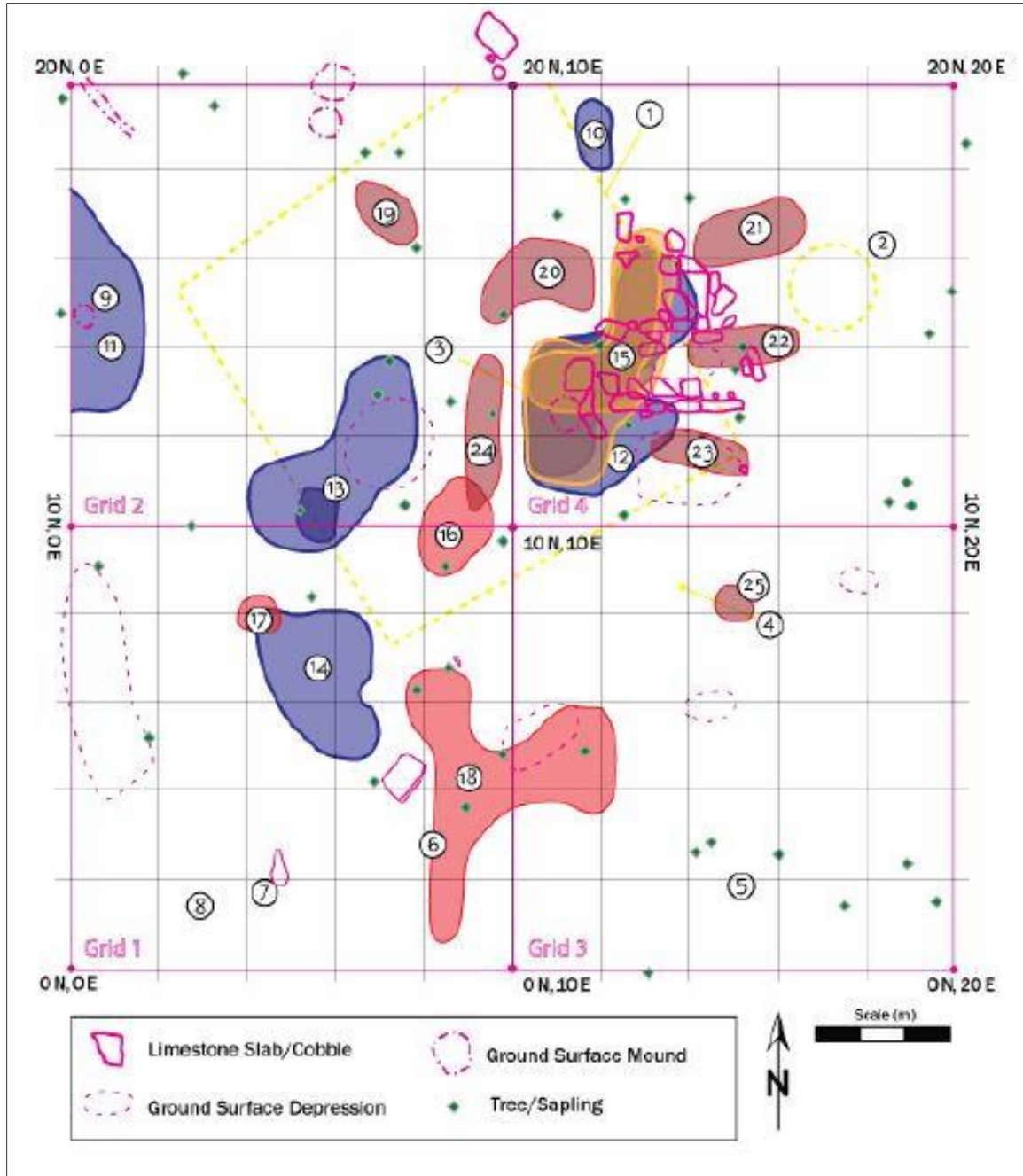


Figure 2. Summary of anomalies from the Fort Gates Cemetery survey (Miller and Sitters 2016).

The anomalies, numbered 19-23, are even spaced and located at a depth of approximately 150 cm. This regularity suggests that the anomalies are manmade and not random underground voids or pockets of water. Furthermore, the anomalies are clustered around the largest collection stone that could

indicate a burial (Figure 3). Unfortunately, the possible grave markers are in complete disarray and too worn for any signs of marking to be found, thus requiring further investigation. An additional anomaly that bears mention is anomaly number 24; this anomaly has a roughly north-south orientation and may be the grave of a criminal or other disgraced person. Based on the difficulty in establishing whether the site is in fact a cemetery, the Fort Gates cemetery has long been abandoned and fallen into extreme disrepair. Because of the social standing of the soldiers buried at Fort Gates, it is unsurprising that the cemetery's location was incorrectly recorded and neglected.



Figure 3. Possible deteriorated crypt feature from the proposed Fort Gates site.

Over the course of researching the possible Fort Gates soldier's cemetery, a site survey was also conducted of the nearby Sheridan Family Cemetery; this cemetery is nearly contemporaneous with the Fort Gates cemetery. The differences between the two cemeteries are quite drastic (Schienschang 2016). When identified, the location of the suspected Soldier's Cemetery was overgrown and potential inscriptions on the markers completely eroded. The civilian cemetery located less than 75 m away was relatively clear of vegetation and all the markers, while worn and eroded, are still legible. Some of the stone markers and features in the Sheridan Family Cemetery appeared to be similar in form to the stones found at the Fort Gates soldier's cemetery (Figure 4). The stones making up the burials at the Sheridan Cemetery were of similar dimensions to the large flat slabs of stone found at the Fort Gates Cemetery.

After cross referencing the names found on markers in the Sheridan Family Cemetery with Coryell County records, it became clear that descendants of the people interred at the cemetery continued living in the area for a long time. It is possible that familial descendants in the area maintained the Sheridan Family Cemetery graves up through the twenty-first century (USA, CRM cs. 2000s). This makes the relatively good condition of the Sheridan Family Cemetery unsurprising. Contrasted with the disrepair

of the Fort Gates cemetery, it is obvious that there was no organization to care for the cemeteries of soldiers on the Texas frontier once a fort had been abandoned. Without having established themselves in an area, and with no organization to care for their graves, the soldier's cemeteries eventually eroded both physically and from local memory.



Figure 4. Crypt feature from nearby Sheridan Family Cemetery. Note the similar shape and dimensions of this crypt feature to the stone slabs at the Fort Gates site.

TRANSIENT FRONTIER LIFE

The Texas frontier was constantly expanding and a soldier would only be stationed at a location for a few short years before moving to the most recently established line of forts. From 1849 to 1860, the location of the Texas frontier changed three separate times, occurring approximately once every 5 years (Wooster ca. 2000s). These shifts were not small changes of a few miles; in both cases of border expansion after 1849 the line of the frontier expanded hundreds of miles both west and north (Wooster ca. 2000s). As the frontier moved, the soldiers would move with the frontier, abandoning the previous forts and establishing new ones. Establishing new forts along the frontier was often the primary mission given to commanders by the War Department.

In addition to supporting the establishment of forts and the movement of the frontier, a soldier's normal duties would often preclude him from having the time to establish a family. Army regulations of the time prohibited enlisted men from marrying; officers faced no such restriction (Brown 2011). A soldier's normal duties around camp consisted mainly of maintenance and construction of defenses. Frontier forts along each line of defense were built and maintained almost entirely by the soldiers assigned to them. These forts were generally constructed of whatever materials were available locally;

in most cases this meant earthworks and timbers. Between arrival and construction of more permanent lodging, enlisted men and officers would sleep in weatherproofed canvas tents. Stables and other buildings to support horses and livestock, a valuable commodity on the Texas frontier, were built before the soldiers' barracks for soldiers. Following construction of stables and livestock buildings, storehouses and other logistical buildings were erected (Baker 2012). Frontier forts were considered transient in nature and simultaneously expected to fully serve the purpose of defending the frontier. During its tenure, Fort Gates eventually encompassed 17 permanent structures. A fort of this size was usually not constructed solely of nearby materials, some building materials were brought with the army when they moved to establish a new fort. When a water route was unavailable, larger building supplies had to be transported overland, often with great difficulty.

Generally, however, it was up to the soldiers assigned to these forts to make the supplies needed for their construction. If the soldiers could not fabricate the materials themselves, as was often the case for items such as construction nails and large metal fixtures, commanders could do business with the settlements that often sprung up near these forts. This had the twofold effect of stimulating the local economy and establishing friendly relations with the nearby settlements. Though the work was difficult, it provided a break to the monotony that could set-in around less exciting locations.

The other primary duty of soldiers on the frontier was to conduct drills to enhance military readiness. Of course, military readiness was a bit of a misnomer because forts were severely understaffed. Had the forts been fully manned, they still would have lacked the manpower to effectively patrol the hundreds of square miles under their control. Still, the soldiers needed to perform basic military tasks which included activities away from the fort. When not in camp, a soldier could be expected to conduct reconnaissance patrols against Native Americans and protect traders and settlers on their way to California (Wooster ca. 2000s).

Though these postings along the trails and scouting Native Americans were exciting, they left little time for a family, even among officers. By constantly doing hard labor and being away from the forts and small communities that sprung up around them, soldiers were unable to put down lasting roots in an area. With no local family support, when the inevitable deaths occurred, it is unlikely that many of these men's graves were marked or documented in any way beyond local diaries of commanding officers. When the graves of soldiers were recorded and marked, it was normally because they were not buried by comrades, rather they were buried with their family and the record annotated that they were veterans. This generally only occurred if a soldier left the service near a military installation on the frontier and started a family, as was the case with several of the men who served at Fort Gates (Coryell County, TX 2008).

One notable exception is for the graves that have fallen under control of the federal government, particularly on military installations that have expanded over the last 150 years. Through careful cross-referencing of available records, Fort Hood's cultural resource management team has been able to identify some of the previously unknown graves. In cases where the graves could be identified, their locations are marked and fenced off to prevent tampering. These locations are then regularly maintained and can be visited by researchers and the public (Figure 5). Maintenance of the existing cemetery by Fort Hood has led to some relatively well preserved grave markers for individuals from this time period,

soldier and civilian alike (Figure 6). In some cases, these graves contain the remains of service members who served in the Civil War. These veterans settled in the area and spent the remainder of their lives as members of local communities.

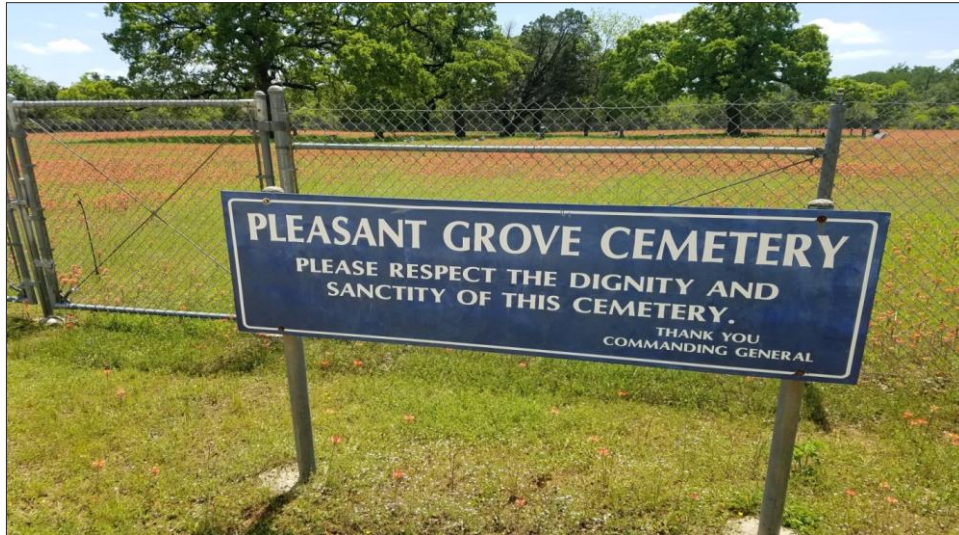


Figure 5. Pleasant Grove Cemetery located near the possible Fort Gates Soldier's Cemetery and Sheridan Family Cemetery. This cemetery is maintained by the federal government.



Figure 6. Relatively well preserved grave marker of John Cummings at the Pleasant Grove Cemetery located on Fort Hood, Texas. Because John Cummings settled in the area and established roots, his marker is still legible.

There is evidence to suggest that many soldiers completing their tour of duty elected to remain near their previous fort, as opposed to returning to the place of their enlistment. At Fort Gates, many of the original surrounding small communities were led by veterans, which would eventually become incorporated into Gatesville, Texas (USA, CRM ca. 2000s). This can be extrapolated from records of the soldiers that served at Fort Gates compared to those that initially settled in the area around Fort Gates after the post was abandoned. This decision to remain near the forts is likely due to the arduous journey that returning east would entail (Gerstle Smith 2013). Even the relatively easy journey by boat to the east coast could take as long as a month if the ship met with good conditions (Dixon 2014). The journey overland could take twice as long and would be considerably more difficult. It was likely much safer to risk life on the frontier than to undertake the journey of several hundred miles over largely untamed land or the expensive journey by sea. Once these soldiers settled on the land and began raising families, their legacies were less likely to be forgotten. This stands in contrast to the unknown soldiers who died while in service and were buried with no loved ones near them.

SHIFTING PERCEPTIONS OF MILITARY BURIALS

The disparity between soldier and civilian graves raises the question as to when the shift towards record-keeping and accountability took place. The American Civil War was the main galvanizing factor that caused the public to take notice of the burial of their military dead (USDVA 2015). The scale of death that the average American witnessed during the Civil War was unprecedented in the nation's history until that point. Previous military encounters had either occurred in a distant place, such as the Mexican-American War, or in a relatively limited area such as in the War of 1812. Violent death due to warfare was far from the norm at this point in North America. Soldiers on the frontier aside, the average person could reasonably expect to live and die a proper death (Faust ca. 2010s). A proper death in this case meant dying of illness or old age; violent or accidental deaths were much more shocking and undignified. The wholesale carnage of the US Civil War shocked the nation into reconsidering its treatment of those who died fighting to defend it.

The American Civil War was the deadliest conflict in the nation's history; conservative estimates of military dead are around 620,000 (Faust ca. 2010s). More American soldiers died during the Civil War than all other US wars combined. The military dead accounted for 2% of the population of the United States at the time; compared to today's population, this is equivalent to 6 million soldiers being killed today. Civilian deaths directly attributable to the war approached an additional 50,000. Proportionately, the Confederacy suffered considerably more devastation than the Union. In Europe, the only area that experienced similar levels of civilian casualties was Central Europe during the Second World War (Faust ca. 2010s). Popular opinion at the time was that nearly every household had some member killed in the war. Whether killed by enemy action on the battlefield or disease, service members and civilians were killed in droves.

Death now became something that most people witnessed either first hand or through the loss of a loved one. The average person in the 1800s was more accustomed to dealing with death than their twentieth century counterparts. High infant mortality rates, death in childbirth, and the slaughter of animals at home for food were relatively commonplace occurrences. Combat deaths, however, were a

new experience for most of the country's population and took a much different toll on the nation's culture and psyche. Instead of death being at the end of a long life, people were being slaughtered in the prime of their lives. To the Victorian Era mind, this often shocked the sensibilities, especially among the upper class. In many cases, these lives were wasted; thousands killed for relatively minor tactical gain.

It is important to remember however, that large scale death due to war was far from a foreign idea at the time. Largely insulated from the brutal nationalist and civil wars that had ravaged Europe, Americans were unaccustomed to seeing heaping mounds of their fellow citizens and loved ones. The reason that the Civil War had such an impact on the psyche and culture of the United States was because it brought war to the people's doorsteps. New technology only added to the mortality rates of Civil War battles. Gone were the days of the single shot musket, soldiers on the battlefields of the Civil War fielded the latest in military technology including lever action rifles, accurate artillery, and machine guns (Hacker 1993). Just as manufacturing was becoming systematic and industrialized, so too did warfare.

Though warfare was becoming dehumanized and machine-like, there still existed a strong emotional attachment to the dead. These emotions were not limited to the families who had lost loved ones, but were also shared by comrades and in some cases, their enemies. Because of this new intimacy with combat deaths and emotional attachment to the dead, efforts were made by volunteers to respectfully bury the thousands of dead that littered the numerous battlefields. In the case of the Battle of Antietam, 23,000 dead covered the battlefield after one day. Due to the sheer scale of removing the remains, many times the bodies would remain on the battlefield for days (Figure 7). In the



Figure 7. Bodies of soldiers killed at Marye's Heights during the Battle of Fredericksburg in 1863 (Library of Congress 1863).

words of one Union surgeon, "the dead were almost wholly unburied, and the stench arising from it was such as to breed a pestilence" (Faust ca. 2010s). When the dead were finally buried it was not done from a solely humanitarian perspective; disposing of the bodies was a matter of public health.

Though the general public did not have a firm grasp on the causes of disease, they did understand that leaving thousands of dead uncovered would lead to unsanitary and less than pleasant conditions. If the remains of the dead were not collected, scavengers could be expected to descend upon the veritable feast that remained. Interestingly, the term scavenger does not only apply to animals, but also to opportunistic individuals looking to loot the bodies of the fallen. This was not necessarily done with criminal intent or for profit. At times, looting was the best way for victorious soldiers to resupply after a hard won fight (Turner 1990). Severe material shortages suffered by soldiers in the Civil War, especially those of the Confederacy, meant that many times picking up a discarded weapon was a more

reliable way to upgrade a soldier's equipment. Not only did this solve the immediate issue of resupply, it also did not further tax an already stretched supply-chain.

Eager to prevent scavengers from descending upon their property, land owners were quick to remove the bodies. In most cases, these dead were simply dumped into mass graves with a marker indicating the fallen regiment and affiliation if known. Little care was given to the preservation of these bodies; the main goal was to cover them as quickly as possible. In the Confederacy, these bodies were normally collected and buried by African-American slaves. For battlefields in Union controlled territory, corpses were collected and buried by soldiers or the poor (Figure 8). These mass graves posed numerous problems of identification, especially in the case of enemy dead, as these soldiers were less likely to receive special treatment.



Figure 8. African Americans remove bodies near Cold Harbor (Library of Congress 1865).

Adding to the difficulty that mass graves presented, soldiers rarely carried anything in the way of identification, unless that person were an officer or someone of importance. The closest thing to identification issued to soldiers were their uniforms and equipment; the uniforms of certain branches were marked with different colored trim or unit specific buttons. Those soldiers that were concerned with the identification of their remains in the event of their death commissioned personalized metal tags with their names and other information stamped or engraved on the surface. These pieces of metal were worn on either the wrist or neck and secured with a chain or length of cord. Eventually, the War Department would adopt this idea into identification tags, now more commonly known as “dog tags”. For those soldiers who could not afford to purchase these identification tags, some would take care to write their name clearly on a piece of paper and then pin it to the inside of their uniforms.

IDENTIFYING BATTLEFIELD REMAINS

Whether a public health issue or a humanitarian effort, attempts were made to identify remains to the best of a volunteer's ability. While commendable, these efforts lacked any clear organization and, in most cases, were simply groups of family members looking for their loved ones (Faust ca. 2010s). These burial expeditions were often funded at great cost by the families of soldiers who operated on information sent by survivors of the battles, if they could be reached at all. Because of this expense, it generally precluded families of lower economic means from ever learning about the ultimate fate of their family members. Several charities and organizations were established to assist with the identification of remains. Even with the support of these charities, the task of recording the dead in field hospitals and across battlefields was daunting. Without any centralized record-keeping agency, this

documentation was notoriously difficult to sort through (Faust ca. 2010s). If a family was fortunate to receive a letter stating that their loved one had been killed, this tended to be the exception to the rule.

While it was possible for bereaved families to receive a letter about their loved one, it is unlikely that they would be able to leave their farms or factories to sort through thousands of bodies to identify their fallen family member. If a family had not heard from their loved ones in several months, and knew that their love one's regiment had been in combat, families could piece together the likely location of death through tracking the movement of armies via the press and rumor. Of course, this piecemeal effort was difficult in its own right as the press was considerably less reliable than today.

FEDERAL GOVERNMENT RESPONSE

In response to this disorganization, the United States Congress began the process of creating a new organization to standardize the interment of military remains (USDVA 2015). Due to the disjointed nature of American politics it would be several decades after the end of the Civil War before a unified government organization was established. Eventually, the National Cemetery Administration, which would later become a part of the Department of Veteran's Affairs, was created in the 1870s. With the creation of the National Cemetery Administration, several national cemeteries were designated along with the criteria needed for interment in them (National Cemetery Administration 2015). While the initial criteria for interment was not broad enough to allow any veteran to be buried, it did provide a baseline which would later be expanded over the next 150 years.

The effort to identify remains led to a significant increase in the number of Civil War soldiers being identified. Generally, after being exhumed from mass graves, bodies were later interred in a private or newly established national cemetery (Faust ca. 2010s). Though there was a significant increase in the number of those buried, to date nearly half of the Civil War remains reinterred are unidentified. When buried at private cemeteries, bodies were often marked with the unit, campaign, and affiliation of the deceased service member. While the information on these markers is at times unreliable and not always easy to corroborate, it does have value as it is often the only source of tracking where military members settled after their tours were complete. Marking graves had the twofold effect of providing closure to the families of Civil War veterans, and helping a broken nation process the violence that had affected so many of its people.

DISCUSSION

Identification of Civil War remains helps to address the issue of a respectful burial for soldiers from that period; however, it does very little for the remains of service members who died in the years before the Civil War. Despite the need to identify these remains, there is little interest in the work needed to catalog and record these sites. This could be because of the lack of general public knowledge of the period or simply because it is not as romantic as the American Civil War that followed soon after. This is unfortunate; if the graves of the soldiers could be identified and documented, there are several programs through the Nation Cemetery Administration that would allow individuals to either be reinterred at a national cemetery or to have their graves appropriately marked.

With the cultural change in American treatment of military dead, the disparity between pre-Civil War graves and post-Civil War graves seems out of place. In little over a decade, there is a shift between soldiers dying unremembered on the frontier to efforts to identify and record as many soldiers as possible who died in service to the country. The temporal proximity of frontier burials to the Civil War is one possible explanation of why the soldiers buried on the Texas frontier were largely forgotten.

The life and death of soldiers on the frontier were overlooked because of the sheer violence of the Civil War a few short years later. This overshadowing was not the first, nor sadly last, time that such an event has happened. A strong argument could be made for the role of reporting and other media on the perception of these more well-known conflicts, as well as the differences in time devoted to education on the subjects. Even with differences in cultural impact however, finding the gravesites and documenting the experiences of individuals in less culturally impactful conflicts still holds value.

Uncovering burial locations of soldiers on the Texas frontier is an important task in better understanding frontier military life. Though these men were of low socio-economic class, and perhaps not valued during their lifetimes, they are still an important part of American history. Through their eyes, the American West was fought for and won, however poorly public opinion may look back on both the means and end. By making the effort to reconstruct their lives through the location of their graves, exhumation, and material culture analysis, important insights can be gained about their health, priorities, and beliefs.

Looking forward, modern record keeping is considerably better than that of the Texas Frontier and Civil War; however, if a large-scale war breaks out it is likely that the remains of many service members will be unidentified. The idea that it is possible to catalogue the deaths and the locations of remains for every person killed in action during a large-scale war is folly. While officers and important individuals who die during important battles will be studied, those of lesser standing and smaller battles will likely not be. This is especially true if they are from a race or socio-economic group that is not in favor or that is underrepresented in the nation. If this happens, these people will become the new lost and forgotten.

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