Final Report on the Burial and Archaeological Data Recovery Program
Conducted on a Portion of an Early Bay Period Ohlone Indian Cemetery,
Loškowiš ’Awweš Táareštak [White Salt Man Site] (CA-SMA-267)
Located at 1416 Bay Road, East Palo Alto, San Mateo County, California

Report Prepared for
Sanitation District, City of East Palo Alto

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Muwekma Ohlone Tribe of the San Francisco Bay Area
Ohlone Families Consulting Services

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September 2014
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ACKNOWLEDGEMENTS

The following people contributed to the archaeological data and burial recovery program conducted at CA-SCL-267 and contributing to the final report. In 1986, the OFCS field crew consisted of Muwekma Chairwoman Rosemary Cambra, Norma Sanchez, Muwekma Tribal Administrator, Muwekma Tribal members Mary Louise Cruz Cline, OFCS Senior Staff Archaeologist, Alan Leventhal (served as Principal Investigator), Nancy Olsen (as Co-Principal), Dr. Les Field (Muwekma ethnohistorian) and Norma Wright (as field crew),

The team who conducted the analysis of the Loškowiš 'Awweš Tāareš [White Salt Man] Burial and associated grave artifacts were Rosemary Cambra, Emily McDaniel, Diane DiGiuseppe, Dave Grant, Melynda Atwood, Colin Jaramillo and Alan Leventhal. Dr. Eric Bartelink, Department of Anthropology, California State University at Chico conducted the study on the Paleodietary Analysis based on the results from the Stable Isotope study. The NSF-Arizona AMS Facility at the University of Arizona, Tucson, conducted the AMS dating of the burial. Archaeological illustrator, Orhan Kaya, drew the sketch of the Loškowiš 'Awweš Tāareš [White Salt Man] Burial that appears on the cover of this report.

Alan Leventhal and Rosemary Cambra report on the results of AMS dating of the burial. The Muwekma Tribal Council and Language Committee members Monica V. Arellano, Rosemary Cambra, Sheila Guzman Schmidt and Gloria Arellano Gomez along with Alan Leventhal wrote the Ethnohistory section.

The Muwekma Ohlone Tribe and Ohlone Families Consulting Services would also like to acknowledge the personnel from the East Palo Alto Sanitation District for providing the funding for the Phase I/field phase of the archaeological data and burial recovery/mitigation program.

Mr. Dennis Scherzer City of East Palo Alto Sanitary District provided the 1866 Map and other historical information. We also want to acknowledge the interested public from East Palo Alto and surrounding cities who signed out guest book and we want to thank them for their support. These interested community members include: Orian Julian and Tamina Windomd, Mildred & Roosevelt Simon, Craig and Sue Dremann, Rosalia Garcia, Pedro Garcia, Jason T. Berle, Kitty Urkow, Edward, Charlotte and Anjiero Becks, Marily, Dennis, Martha and Hannah Scherzer, Jeffrey Tabron, Sandi Tacang, Trevor Burrowes, Carolyn Ross, Ras-I-Kaya Ro-jah, Jake Makhaleyeh, “Sunchild,” Santiago, J. Baxter McFarlin Il, Frani-Steeng Jese, Simva, Alvin Duane Tibbs, Miguel Chacon, Carlos Rivera, Craig Young, Willow Miller-Young, Octavio Peña, Joseph H. and Vanessa Franco, Mars Miller, Cynthia Franco, Saul Chacon, Tony Chacon, Jose Angel Chacon, Ignacio Errera, Mary Johnson, and William Moore.

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Because funding from the East Palo Alto Sanitation District was restricted to only the burial recovery program, the skeletal analysis, Stable Isotope analysis and report writing, was conducted by OFCS staff and colleagues as a volunteer effort to produce this Final Archaeological Report.

We also want to offer acknowledgement to the enrolled members and elders of the Muwekma Ohlone Tribe for their support on this as well as other projects addressing their ancestral heritage sites.

We also want to dedicate this report to the memory of those Muwekma who had survived into the 20th Century and became the Federally Recognized Verona Band of Alameda County. Without them we would not have life today and continue the struggle to obtain justice for our people.

It is our hope that this report provides scientific, historical, cultural and educational information about our Tribe’s history and heritage and dispels many of the myths about our people.

Aho

A Reburial Honoring Ceremony could not be conducted due to the fact that to date no area has been provided for reburial within the City of East Palo Alto. Should a suitable area be identified close to the original cemetery, then a Reburial Honoring Ceremony will be held by the Muwekma Ohlone tribal leadership.
It is with great sadness that we announce the passing of Jenny A. Mora Galvan, Muwekma Ohlone Tribal Elder - Muwékma Miččiš. Jenny Galvan passed away peacefully on February 26, 2014 at the age of 78.

Born in Oakland on February 8, 1936, Jenny was a middle daughter of Muwekma Elder Mary Muñoz and Jose Mora. Her older and younger brothers and sisters include Joseph Mora, Lupe Mora Massiatt, Margaret Mora, Alice Mora, Frances Mora Smith, Virginia Mora Massiet, Louis E. Medina, Edward Medina and Jesse Ramos. Jenny had married Muwekma Elder Benjamin Michael F. Galvan (Ben) in the early 1950s and they lived in the Oakland area. Her five children are Theresa A. Laudani, Katherine J. Galvan, Ramona Robins, Michael F. Galvan Jr., and Albert B. Galvan.

When Jenny was growing up in the 1940s, she remembered visiting many of her Ohlone relations, including spending time with Madrina Maggie Piños Juarez in Newark. She also remembered going to Niles along Alameda Creek and playing in the water with other family and tribal members.
During the early 1960s, the Ohlone families gathered and worked under the principal efforts of their great-aunt Dolores Marine Alvarez Piscopo Galvan and Ben’s sister, Dottie Galvan Lameira, in order to protect the tribe’s Ohlone Indian Cemetery in Fremont from destruction. Jenny, her mom Mary Muñoz, and her extended family attended various meetings and barbecues that were held near Mission San Jose. She also worked cleaning up and weeding the cemetery. Jenny was also listed as a Member of the “Ohlone Chapter” of the “American Indian Historical Society” at both San Francisco and Mission San Jose.

By 1984, the Muwekma Ohlone Tribal leadership formed a formal Tribal government in order to articulate with Federal, State and local agencies about legal and cultural issues confronting the disenfranchised Muwekma Ohlone Tribal community. A few years later, Jenny’s son, Albert Galvan joined the Muwekma Tribal Council. As the Tribal Council developed policies and political strategies to deal with legal issues, Jenny and her family had been introduced to the effort by the Tribe to obtain Federal Recognition from the U.S. Government. Jenny’s niece JoAnn Brose and nephew Richard Massiatt are presently serving as Tribal Council members, while her older sister Lupe Mora Massiatt was on the Elders Council.

By the time the Tribe sent in its Letter of Intent to petition the Federal Government for Acknowledgement in 1989, Jenny’s family got involved with both archaeological issues and the Tribe’s efforts to attain Federal Recognition. Jenny participated as a Tribal Elder at Tribal Council meetings; Tribal sponsored events and educational workshops. During the Tribe’s response to the BIA’s negative proposed finding, Jenny’s mother along with several of Jenny’s siblings provided critical oral histories that helped reverse some of the negative findings and disprove some of the negative assumptions that the BIA had previously determined about the continuous existence of the Muwekma Ohlone Tribe.

Jenny Galvan, following in the footsteps of her mother Mary Muñoz Mora, continued to serve as a cultural bridge between two worlds – the post-transitional world of the neglected Federally Recognized Verona Band of Alameda County – to the incipient Ohlone Indian Tribe, Incorporated to which her husband Benjamin Galvan became the president of in 1971 – and the revitalized and organized Muwekma Ohlone Tribe to which she was indeed a Tribal Elder of distinction. Soft spoken, loving and caring mother, grandmother and great-grandmother she fully knew and understood her Ohlone Indian identity.

Jenny lived to see a potentially bright future for all of the Muwekma Ohlone families. She also saw history being made when the title of the Ohlone Indian Cemetery in Fremont passed from the Catholic Church to the American Indian Historical Society and then to her husband’s family whom made up the Board of Directors of Ohlone Indian Tribe, Inc. Jenny lived to see the Muwekma obtain a formal determination by the BIA of previous unambiguous Federal Recognition, a successful lawsuit against the Department of the Interior, and a positive determination that 100% of the enrolled membership is directly descended from members of the previously recognized Verona Band, which was also determined to be a historic tribe. Jenny also lived to see U.S. District Judge, Ricardo Urbina state:

“The Muwekma Tribe is a tribe of Ohlone Indians indigenous to the present-day San Francisco Bay area. In the early part of the Twentieth Century, the
Department of the Interior ("DOI") recognized the Muwekma tribe as an Indian tribe under the jurisdiction of the United States.”

Jenny represented the sixth generation of a line of Ohlone Indian women whose lives were disrupted by the expanding Hispanic Empire and the American Conquest of California. All of Jenny’s maternal Ohlone ancestors were missionized into the Mission San Jose. Jenny’s lineage is descended from her great-great-great-grandmother Efrena Quennatole who was born in 1797 and was of the Karkin Ohlone/Napian Tribe of the North Bay and her great-great-great-grandfather, Liberato Culpecse who was born in 1787 and baptized at Mission Dolores and who was of the Jalquin/Saclan Tribes of the East Bay. She was further descended from Liberato’s parents Faustino Poylemja who was born around 1764 from the Saclan Tribe (Walnut Creek/Concord/Lafayette area) and Obdulia Jobocme who was born around 1766 from the Jalquin Tribe from the greater San Lorenzo/San Leandro/Hayward region.

Efrena and Liberato’s daughter was Maria Efrena Yakilamne. She was born in 1832 and was baptized at Mission San Jose and buried at the Ohlone Cemetery. Maria Efrena married Panfilo Yakilamne (Ilamne Tribe) and their daughter was Avelina Cornates. Avelina was born in 1863. Avelina was baptized in 1864 at Mission San Jose and she died in 1904 and was buried at the Ohlone Cemetery. Avelina had married Rafael Marine and one of their daughters was Victoria Marine who was born on May 9, 1897 on the Pleasanton (Alisal) Rancheria and was baptized at Mission San Jose and also buried at the Ohlone Cemetery in 1922 at the young age of 25. Victoria had married John Muñoz and they had two surviving children, Mary who was born in 1910 and Flora who was born in 1917.

Following in the footsteps of her mother Mary Muñoz, grandmother Victoria Marine, great-grandmother Avelina Cornates, great-great-grandmother Maria Efrena, great-great-great grandmother Efrena Quennatole and her female Ohlone ancestors, Jenny carried herself with a quiet dignity and an upbeat and loving personality.

She is survived by her children, grandchildren, and great-grandchildren, and by her relations of the Marine lineage and Tribal members of the other lineages enrolled in the Muwekma Ohlone Tribe.

Jenny’s Ohlone Tribal ancestors and families have been waiting since 1906 for their rights to be recognized and honored by the United States Government. Jenny had been waiting her entire 78-year life span for full Federal rights to be accorded to her Tribe. In her own quiet way, Jenny had made major contributions towards the reaffirmation of the Muwekma Ohlone Tribe and she leaves that legacy for the future generations of the Tribe.

Jenny passed away within her Tribal ancestral territory. Go with peace and join your sisters, brothers, cousins, aunts, uncles, relations and ancestors and know that you made this world a better place for your Tribe.

Jenny Galvan’s Family Tree
Mission San Jose and Mission Dolores Records

Faustino Poylemja ------ Obdulia Jobocme
(b. ca. 1764/Chaclanes/Saclanes) (b. ca. 1766/Jalquin)

| Liberato Culpecse ---- Efrena Quennatole |
| (b. 1787/Jalquin/Saclar) | (b. 1797/Karkin/Jarquin/Napian) |

| Maria Efrena ---- Panfilo Yakilamne |
| (b. 1832) | (baptized 1835?, Ilamne Tribe) |

Avelina (Cornates) Marine – Rafael Marine
(b. 1863/d. 1904 buried at the Ohlone Cemetery)

Victoria Marine – John Munoz
(b. 5-9-1897/d. 11-27-1922)

Mary Munoz – Jose Mora
(b. 8-28-1910 d. 11-23-2002)

Jenny Mora – Benjamin M. Galvan
(b. 2-8-1936 d. 2-27-2014)

California Indians
Ohlone Indian (East Bay)
Plains Miwok (Sacramento Delta)

Figure TOC-2: Jenny Mora Galvan’s Ohlone Indian Genealogy

The authors would also like to dedicate this report to all of the Ohlone men, women and children who had perished as a result of the impacts of the European and American colonial systems the majority of whom have remained faceless and nameless. No monument yet stands to honor these aboriginal peoples who have resided in this area of California over the past 10,000 years. Aho!
Figure TOC-3: Ohlone Dancer (artist unknown)

Figure TOC-4: Indian Dancers at Mission Dolores in 1816 (Louis Choris artist)
INTRODUCTION: PROJECT OVERVIEW

This report presents the results of the burial and archaeological data recovery program conducted within a portion of an Early Bay Period Site located on Bay Road, City of East Palo Alto, San Mateo County, California (Maps 1-1 and 1-2). The burial locus is approximately 140 feet west of the intersection of Bay Road and Glen Avenue in front of the 1416 Bay Road residence (Figure 1-1). The owner of the residence at the time of the discovery was Ms. Mildred Simon.

The recovered burial was inadvertently discovered on June 12, 1986 during backhoe trenching operations conducted by the Sanitation District. A repair backhoe trench was excavated in front of the 1416 Bay Road residence driveway in order to locate a break and leak in the sewer line. Earlier in the year the street had been under construction where a crew excavated a trench in nearly the same location in order to lay down underground utility telephone lines.

The recent sewer line trench that was excavated by the Sanitation District had exposed some underground cables and portions of an ancestral Muwekma Ohlone primary inhumation. The East Palo Alto Police department was notified and they in turn contacted the San Mateo County Coroner’s Office. Assessing that the bones were of Native American origin and older than 100 years, a physical anthropologist Mr. Chuck Cecil was called in to verify their antiquity. As a result, the San Mateo County Coroner’s Office then contacted the State of California’s Native American Heritage Commission (NAHC) in Sacramento who then notified the Most Likely Descendant tribal group as prescribed under SB 297 and Public Resources Code 5097.98.

On June 13, 1986, the NAHC contact Mrs. Rosemary Cambra, Chairwoman of the Muwekma Ohlone Tribe of the San Francisco Bay Area to serve as the Most Likely Descendant (MLD) and the legal representative for the Most Likely Descendant tribal group. Chairwoman Cambra went out to inspect the discovery site and met with Mr. Wobogo who was then the Manager of the East Palo Alto Sanitary District. After some deliberations it became clear that the trenching needed to be completed in order to address the break and stop the leak in the sewer line. Chairwoman Cambra then formally recommended to the Sanitation District that a several phased mitigation Burial and Archaeological Data recovery program be implemented through the Muwekma Ohlone Tribe’s Cultural Resources Management (CRM) firm Ohlone Families Consulting Services (OFCS). As a result the Sanitation Agency then entered into a contractual agreement with OFCS for purposes of mitigating the adverse impacts to the Tribe’s ancestral human remains. The site was formally recorded on June 16, 1986 and the East Palo Alto Sanitary District (EPASD) Board of Directors held a meeting on June 19, 1986 to consider payment to OFCS for the field recovery program, analysis and final report (Appendix A). The EPASD voted only to pay for the burial recovery and decided not to fund any analysis or report writing under CEQA. The EPASD also would not provide any alternative reburial location.
PROJECT LOCATION

CA-SMA-267 is located within T. 5S, R. 3W, within the unsectioned lands of the northeast portion of the Palo Alto 7.5’ Quadrangle (PR 1968), UTM Zone 10S, 575,715.40 mE/4,147,483.07 mN (based on Google Earth Map) at 23’ Above Mean Sea Level. The present closest fresh water drainage of San Francisquito Creek is located ¾ of a mile south of the site. Three major ancestral Ohlone cemetery sites are also located nearby. CA-SMA-77 (University Village) is located approximately 0.5 miles to the northeast of the site. The Hiller Mound (CA-SMA-160) is located approximately 0.6 miles north/northwest of CA-SMA-267. The Stanford Man I and Stanford Man II localities (CA-SCL-33) are located approximately 2.6 miles to the southwest beside the San Francisquito Creek drainage along with a cluster of other sites: CA-SCL-265, CA-SCL-269, CA-SCL-464, CA-SCL-609, CA-SCL-613, and CA-SCL-623 which are all located 2.5 to 3.0 miles to the southwest of CA-SCL-267. Additionally, CA-SCL-287 and CA-SMA-263 which is actually a single site is located approximately 3.8 miles to the southwest. (Map 1-2).

OVERVIEW OF THE BURIAL AND ARCHAEOLOGICAL DATA RECOVERY MITIGATION PROGRAM

As stated above, the Burial and Archaeological Data Recovery Program was conducted by the Muwekma Ohlone Tribe’s CRM firm, Ohlone Families Consulting Services (OFCS) on behalf of the Sanitation District, City of East Palo Alto. A several-phased excavation and recovery program was initiated by the OFCS field crew on June 14 and June 15, 1986 which included:

1) Review and assess the human remains discovered by Sanitation District construction crew on June 12, 1986 in order to assess the minimum number of individuals present and any remaining skeletal elements left in the trench at the 1416 Bay Road residence;
2) Conduct a hand excavation, burial recovery, that included documentation, and photography of the remaining in-situ skeletal elements from within the sewer line trench;
3) Conduct a screening recovery program of the excavation backdirt soils from the sewer line trench and recover any dislocated skeletal elements, faunal remains and artifacts;
4) Document, describe and draw soil profiles within the excavation unit and trench;
5) Conduct a complete skeletal inventory of the human skeletal remains, including age and sex of the individual, and identify any pathologies;
6) Catalog all associated artifacts and identify all faunal and shell fish remains;
7) Conduct radiocarbon dating on either suitable charcoal or if necessary, with permission from the Muwekma Tribal leadership on the human remains;
8) At a later date and with permission from the Muwekma Tribal leadership, sample and report upon the results of stable isotope and ancient DNA studies;
9) Write a final archaeological report on analysis of human remains and associated artifacts and ecofacts from CA-SMA-267;
10) Conduct an archival literature search and record the site with the Archaeological Northwest Information Center at Sonoma State University.
Map 1-1: San Francisco Bay Area and Project Location
Map 1-2: Location of Site CA-SMA-267 and Other Nearby Sites [Palo Alto 7.5’ Quad PR 1968]
ENVIRONMENTAL INFORMATION

During the implementation of the Burial and Archaeological Data Recovery Program, a member of the East Palo Alto Water Board provided the OFCS field crew with a copy of an 1857 U.S. Coast Survey San Francisco Bay Map (see Maps 1-3 [upper] and 1-4 [lower] below). This particular map provides an environmental “snapshot” of the sloughs, marshlands, wetlands and partially developed roads and settlements in the area where the City of East Palo Alto now stands. The approximate locations of sites CA-SMA-267 and CA-SMA-77 (University Village) were plotted onto this map and it appears that they were located within the lands that comprised the historic town of Ravenswood (see below).
In 2007 R. Scott Baxter, Rebecca Allen and Mark G. Hylkema prepared a cultural resources management inventory and assessment report for Kleinfelder, Inc. who in turn was conducting an Environmental Impact Report (EIR) for the City of East Palo Alto’s proposed Cooley Landing Park which is located approximately 1 mile to the east of site CA-SMA-267. In that report Mark Hylkema wrote an excellent background discussion on the “Native Landscape” and environmental information reflecting late 18th century European contact period:

“The Native Landscape

The diverse ecological characteristics of the south Bay and northern Santa Clara Valley region supported large populations of people who established their residential communities among three principal environmental zones. These zones included tidal marshland, grassland prairie, and oak woodland habitats. Riparian corridors meandered through the various ecological communities and enhanced what was an exceptionally productive environment.

Tidal Marshlands

The protected waters of the San Francisco Bay estuary provided habitat for a variety of fish, birds and sea mammals that the ancestral Ohlone procured through the use of tule balsa boats (Santa Maria [1775] 1971; Vancouver 1798:Vol. 2:23; Harrington 1942; Heizer and Massey 1953:285-312). An extensive network of sloughs and tidal mudflats characterized the southern San Francisco Bay where it intruded into the northern Santa Clara Valley. Freshwater from a multitude of rivers, streams, and rivulets met with saltwater creating what was formerly a vast, brackish tidal marshland. The marshland provided resources such as salt, waterfowl, eggs, meats, and tule reeds. Elk waded among the vast thickets of reeds that ringed the marshlands and interior fresh water marshes, while the reeds themselves were used for building structures, boats, rope, duck decoys, basketry, clothing, and matting (Harrington 1942). Pollen and roots from tule reeds were converted into food (Bocek 1984:240-245). The Ohlone instructed the priests at Mission San Jose how to gather salt from the south Bay marshlands (Sandoval 1988:4-5).

Shore birds including gulls, pelicans, cormorants, rails, egrets, great blue herons, and many others populated the Bay marshlands along with great numbers of migratory ducks and geese (Schoenherr 1992). Waterfowl were obtained through the use of decoys and nets (Crespi in Brown 1974:15).

“At low tide, the mud flats were teaming with shorebirds dining on snails, crabs, and other invertebrates. Within the sloughs, leopard sharks (Triakis semifasciata), Pacific herring (Clupea harengus), Pacific sardine (Sardinops sagax), sturgeon (Acipenser sp.), bat rays (Myliobatus californica), and a host of other estuarine fish formed a productive biological zone. Sea otters, sea lions, and harbor seals subsisted on the abundant fish and in turn became prey to the ancestral Ohlone. One historic account in 1877 recalled that the bay shore down to the Guadalupe River “seemed covered with black sheets” because of the dense numbers of sea otters (Brown 2005:12).
The California horn snail (*Cerithidea californica*) was particularly abundant and its presence along with bay mussel (*Mytilus edulis*), oyster (*Ostrea lurida*), and clams (*Macoma nasuta* and *Tivela stultorum*) at local prehistoric sites attests to the importance of this habitat for food (Gerow and Force 1968; Cartier et al. 1993:168-171).

Numerous archaeological sites cluster along the south Bay tidal marsh. Residential use over time has resulted in great accumulations of soil and dietary shell, which created topographic high points, or mounds. One of the earlier dated south bay tidal marsh sites, located in close proximity to the project location, was [CA-] SMA-77 (also known as the University Village site). … .

*Valley Grassland and Oak Woodlands*

Grassland prairie formerly surrounded the perimeter of the Bay marshland. A range of plant species within this zone provided food for the local inhabitants and browse for the game that they hunted. Large earthen mounds, both natural and anthropogenic (Leventhal 1993; Lightfoot 1997:129-141), provided dry ground during the winter when high tides, stream overflow, and ground saturation created a network of mires and vernal pools (Bolton 1933:353). Dense thickets of willows grew along the margin between the tidal marsh and grasslands where fresh water streams became lost in a maze of sloughs (Mayfield 1978:32; Brown 1974:35). Spanish explorers frequently commented on the seasonal wetlands of Santa Clara Valley and the difficulty they had crossing them (Bolton 1926:3:263; Bolton 1933:353-355; Stanger and Brown 1969:106).

The soil was black in color, and grasses were burned in late summer to increase seed productivity (Fages 1937; Mayfield 1978:84-94). Lewis (1973) has noted that aboriginal landscape management techniques utilizing fire enhanced grass seed harvests and improved the browse available for elk, deer, and pronghorn. Large herds of elk and pronghorn once existed on the Santa Clara Valley plains (Fages 1937) and wolves and coyotes were also present (Mayfield 1978:66).

The elevation of the grassland prairie zone rises progressively at greater distances from the Bay and vegetation communities graded into a wooded savanna setting that consisted of widely spaced, tall broad-leafed deciduous oak, laurel, and madrone trees, with an understory of bunch grasses, forbes and shrubs (Kuchler 1977). This community gave way to an extensive thicket of mixed hardwood, greasewood, toyon, chemise, and coyote brush that formed a belt along the lower foothills of Santa Clara Valley (Bolton 1926:3:263; 1930:1:410).

The valley oak woodland zone was particularly suitable for the development of an acorn dependent economy and the majority of sites recorded in the south Bay region occur here. The use of acorns as a dietary staple and various archaeological implications has been extensively described in the ethnographic literature (Gifford in Heizer and Whipple, 1971:301-305; Basgall 1987:21-52). The valley oak savanna was burned annually after the acorn harvest to prevent the accumulation of excessive wood fuel that would
otherwise burn too hot and destroy the acorn producing oaks. Burning had the added benefit of removing the lower shoots from the oaks thereby encouraging the tree to produce more acorns (Lewis 1973:19). European visitors commented on the "park like" appearance of the Santa Clara Valley and the presence of many extraordinarily large oak trees (Bolton 1926:423; Vancouver in Mayfield 1978:132).

Riparian Corridors

In the south Bay, numerous creeks and rivers cross through various ecological zones and have developed distinctive corridors of riparian habitat. Silt deposits from episodic stream overflow along the banks of the meandering streams of Santa Clara Valley created topographic high points that were attractive to prehistoric settlement. Schoenherr (1992:153) has summarized the biological qualities of riparian corridors and noted that they create an ecotonal edge effect in which the density and diversity of species are greater than in any other community in California. The characteristics of a given ecotonal edge changed as drainages cut across various environmental zones.

Larger creeks and rivers supported populations of Pacific pond turtles (*Clemmys marmorata*), brackish water crabs (*Rhithropanopeus harrisi*), fresh water clams and mussels (*Anodonta nuttalliana* and *Margaritifera margaritifera*) and, during the first seasonal rains, spawning runs of anadromous steelhead, or rainbow trout (*Salmo gairdneri*) (Bolton 1933:355; Baumhoff 1978). The remains of steelhead and other freshwater fish such as Sacramento sucker (*Catostomus occidentalis*), splittail, hitch, thicktail chub and other carps and minnows (*Cyprinidae*) have been identified in archaeological contexts, along with marine fishes from the saltwater estuaries at the Bay Shore end of riparian corridors (Gobalet 1992:72-84). …

While the value of hard seeds and acorns at sites in the Bay shore/valley setting has been discussed, a variety of other plant resources has been identified from archaeological contexts and should be mentioned. Bulbs like soaproot (*Chlorogalum pomeridianum*) were dietary staples requiring roasting in an earth oven for over thirty-six hours to render them edible (Bolton 1926:423; Heizer 1941:43-44; Harrington 1942). Such ovens used large numbers of fist-sized cobbles to distribute heat within them. Extensive layers of burned rocks have been reported for many Bay area sites, including SCL-178, SCL-690 and SCL-732, and are often in close proximity to cemeteries (Hall et al. 1988:45-47). As late as 1839, one large soaproot roasting oven in Mountain View, not far from the project site was used as a landmark (Brown in Bean 1994:37). It was called *horno de los Toroquis* (the oven of Soapweed- Toroquis was the native name for the plant).

Dietary shell

… Gifford (1916:24) studied the relationship of shell species in Bay Shore mounds and identified the horn snail, oyster, and bay mussel as the principal dietary shellfish found at south Bay sites of Santa Clara County. Sites along the west Bay shore of San Mateo County and east Bay shore of Alameda County record a greater emphasis on bay mussels, oyster and mud clams (*Macoma nasuta, Tivela stultorum*). …

1-8
East Bay sites with stratified components ranging from the Middle period to Middle/Late transitional period typically contain a deeper deposit of oysters that are overlain by layers of clams. In contrast, Early and Middle period sites along the west Bay Shore contain deeper deposits with oysters which are replaced in upper levels dating from the Middle/Late transition to Late period by horn snails (*Cerithidea californica*). Greengo noted that within three shell mounds along the east Bay (ALA-307 West Berkeley, CCO-295 Ellis Landing, and ALA-309 Emeryville) variations of the molluscan fauna "seem to reflect a shift from gravel-bottom species to a mud clam during the accumulation of refuse." He attributed this to progressive silting of the Bay Shore margin.

… Horn snails do not exhibit the same distribution pattern as mussels. They are not present at sites farther south than the Santa Teresa Hills but have been reported in upland sites of the easterly Diablo Range. On the other hand, horn snails are not present at upland sites of the Santa Cruz Mountains, where ocean mussels points to an affinity with open coastal shellfish assemblages throughout the Middle and Late periods. Variation in horn snail distributions within Santa Clara Valley may be related to seasonal factors that affected shellfish availability (Schoenherr 1992:678). Horn snails are at their optimum availability during summer months when mussels are not safe to eat.

**Hunting**

Simons (1992:73-103) has demonstrated that during the Early and Middle periods, faunal assemblages from San Francisco Bay shore sites contain a high frequency of canid family bones (dog, wolf and coyote), elk and deer, mixed with lesser numbers of marine mammal remains (principally harbor seal and sea otter). Conversely, during the Late period, there is a substantial decline in canid and elk bones at Bay shore sites, which were replaced by a major increase in sea otter bones. The contribution of deer relative to elk is high during the Early period, declining during the Middle period and rising again during the Late period. This suggested to Simons (1992:88) that shifting of target species was likely caused by "interannual unpredictability due to short-term climatic events, and resource depression was resulting from over hunting of other marine (i.e. pinnipeds) and terrestrial (i.e. artiodactyls) mammal game species." He further proposed that increased human population pressure during the Late period may account for a greater focus on estuarine habitats around the Bay that necessitated a co-harvesting strategy emphasizing predation of sea otters and deer along with waterfowl and fish. Simons concluded that deer served as a secondary "backup" alternative to sea otters when the latter species became less available during brief episodes of depletion. However, examinations of the faunal assemblage from Late period site SCL-38 show that elk and deer continued to dominate the assemblage. Perhaps the Bay Shore communities succumbed to population pressure and suppression of *artiodactyl* availability, which accords with Simon's conclusions, while residents of Santa Clara Valley did not. (Hylkema 2007:16-18)
BACKGROUND HISTORY OF THE RAVENSWOOD AREA

The 2007 Cooley Landing Cultural Resource Inventory and Assessment report by Scott Baxter, Rebecca Allen and Mark G. Hylkema also provides detailed information about the history of Ravenswood and Cooley Landing which is excerpted below:

“1848-1867: Ravenswood

The current project area was once adjacent to the Pulgas Rancho. As a marsh, though, the area likely saw little use during the Mexican era. In 1848, Adams & Co., a San Francisco Bank, acquired 3673.76 acres of the rancho in trade for an unpaid loan. Isaiah Woods, one of the partners at the bank, convinced his partners to invest further in the land. The Pacific & Atlantic Railroad Company had laid out a proposed route directly through their new land, and Woods had visions of building a “new San Francisco” there.

In 1849, they built an elaborate wharf at the end of Bay Road that extended 75 feet out into 18 foot deep water. The partners had surveyed five subdivisions on either side of Bay Road and named their new community Ravenswood. Woods built himself a home here that he called “Woodside Mansion.” The Pacific & Atlantic line was never built and Woods’ partners soured on the endeavor. Two years later the Central Pacific Railroad began considering the same route.

Interest renewed and soon houses, hotels, saloons, and a store were erected on the subdivision. The Central Pacific plan never became reality and Adams & Co. lost heavily. In 1853, only an average of two ships a week visited Ravenswood Landing (Foss 1942:5, 69). In 1854, financial panic struck San Francisco, when the well respected banking institution Page Bacon suddenly closed its doors. …

1867-1930: Cooley Landing

Lester Phillip Cooley came to California in 1859. … In 1867, he decided to move his operation, and his family, down the peninsula. He sold his share in [a] dairy farm and purchased the 402.72 acre ranch (Ravenswood) from Joshua Leavitt for $32,273.60. This purchase included one-half of the rights to the old Ravenswood landing, which was located at the ranch. Cooley remodeled the house, built new barns, drilled a well, and made many improvements to the land. With his acquisition the landing became known as Cooley Landing. Leavitt had been overtaxed by the duties of the farm and had let the landing fall into a state of disrepair. Cooley rebuilt it in a V-shape to provide more shelter to vessels from the Bay’s rip tides, and better allow year round shipments of his farm’s products. In 1874, Cooley purchased the remaining interest in the landing and the franchise from John Doyle and John Hackett for $150, making Cooley the sole owner.

… In 1874, [Cooley] was elected Mayor of Menlo Park, a post he held until the town was unincorporated. … Cooley rebuilt the landing at that time, while Hunter and Schakleford temporarily used their own smaller landing to ship their products. Cooley had experienced several bouts of cancer, and he finally succumbed to the disease in 1882.” (Scott Baxter, Rebecca Allen and Mark G. Hylkema 2007:30-32)
MAP 1-4: 1857 U.S. Coast Survey Map Approximate Location of Site (lower portion)
This final report presents the following studies and chapters:

- **Chapter 2** by Alan Leventhal, Diane DiGiuseppe, Rosemary Cambra and Norma Sanchez presents information on the Project Background: Site Context, Discovery and Recovery of the Loškowiš ’Awweš Táareš [White Salt Man] Burial at CA-SMA-267,
- **Chapter 3** by Emily McDaniel, Diane DiGiuseppe, David Grant, Melynda Atwood, Colin Jaramillo and Alan Leventhal presents the Burial Description and Skeletal Biology: Inventory and Analysis of the Loškowiš ’Awweš Táareš Burial;
- **Chapter 4 - Stable Isotope Analysis and Paleodiet of an Ancestral Ohlone Human Burial from CA-SMA-267**, by Dr. Eric Bartelink (Department of Anthropology, California State University at Chico);
- **Chapter 5 - Analysis of Stone Artifacts, Fauna and Shellfish Remains Associated with the Loškowiš ’Awweš Táareš Burial** by Alan Leventhal, Rosemary Cambra and Diane DiGiuseppe;
- **Chapter 6** discusses the results from the AMS Dating and Chronological Placement of the Loškowiš ’Awweš Táareštak Burial by Alan Leventhal and Rosemary Cambra,
- **Chapter 7** presents An Ethnohistory of Santa Clara Valley and Adjacent Regions; Historic Ties of The Muwekma Ohlone Tribe of the San Francisco Bay Area and Tribal Involvement with the Loškowiš ’Awweš Táareštak [White Salt Man] Site Burial Recovery Program by Rosemary Cambra, Alan Leventhal, Monica V. Arellano, Shelia Guzman Schmidt, and Gloria Arellano Gomez.

Funding for the Burial and Archaeological Data Recovery Program [Field Work Phase I] was provided by the City of East Palo Alto Sanitation District, however both the Sanitation District and the City of East Palo Alto decided against any funding for laboratory analyses, skeletal inventory and analysis, Accelerator Mass Spectrometry (AMS/C14) dating, other specialized studies, final report writing, and reburial even though OFCS explained CEQA to them.

Years later, with a desire to complete a final report on the Loškowiš ’Awweš Táareštak [White Salt Man] Site (CA-SMA-267), a San Jose State University College of Social Sciences Research Foundation grant written by Alan Leventhal provided funding for the AMS dating of the burial at University of Arizona’s NSF - Accelerator Mass Spectrometry Laboratory at Tucson (see Chapter 6 for results)

As a result, this report was mostly written through the volunteer efforts of the Muwekma Ohlone Tribal members, and San Jose State University’s Department of Anthropology faculty, research associates and students enrolled in Leventhal’s Anthropology 195 class.

With permission from the Muwekma Tribal leadership and MLD (Chairwoman Rosemary Cambra) the various laboratory analysis phases of work included the following studies: 1) the skeletal biology analysis and inventory, 2) Accelerator Mass Spectrometry (AMS) dating, 3) description of ecofactual (faunal and shell fish) remains recovered in association with the burial, 4) Stable Isotope analysis, 5) rib fragments set aside for future Ancient DNA analysis, and 6) Final Report writing.
The Muwekma Ohlone Tribe has over the past 34 years been extremely active and interested in learning as much as possible about their ancestral heritage sites and fully supported the various studies presented in this Final Archaeological Report. The tribal leadership has also advocated for advanced bio-archaeological studies and requested of Dr. Brian Kemp and Dr. Cara Monroe from Washington State University at Pullman and Dr. Eric Bartelink from California State University at Chico to secure suitable samples from the Tribe’s ancestral burial in order to conduct studies on the ancient DNA (which will be published at a later date) and dietary implications (see Chapter 4) from the Loškowiš ’Awweš Tāareš [White Salt Man] Burial.

RESEARCH QUESTIONS:

Given the fact that there was only one burial locus that was partially hand excavated under less-than-ideal conditions, the Burial and Archaeological Data Recovery program conducted by Ohlone Families Consulting Services (OFCS) allowed for only a narrow-scope of interpretation of those data derived from these analyses. As a result, only a limited set of bio-archaeological, subsistence, chronological-related questions along with resultant interpretations can be considered and presented in this final report.

Furthermore, given the limitations placed on the scope of this work, the following research questions were initially formulated and specialized analyses were proposed in order to provide pathway answers to these questions.

Research Question # 1: What is the age and sex of the individual recovered from this site?

Analysis: - The proposed analysis that was employed to address this question included:
1) Cleaning and sorting the skeletal elements and identifying the minimum number of individuals represented within this recovered population;
2) Conducting a complete skeletal inventory of the recovered skeletal elements;
3) Taking and recording osteometric measurements on selected complete skeletal elements;
4) Scoring the detention for dental wear and identifying any pathologies and/or trauma; and,
5) Employing other criteria (e.g., pubis, articular surface, rib ends and etc.) in order to age and sex the individual(s).

We address this research question in Chapter 3: Burial Description and Skeletal Biology: Inventory and Analysis of the Loškowiš ’Awweš Tāareš [White Salt Man] Burial.

Research Question # 2: Based upon current trends in the field of Stable Isotope studies how does the dietary signature of this burial compare with other populations from other sites within the greater the San Francisco Bay region and Central California?

Analysis: Analysis will focus on the paleodietary implications derived from the Stable Isotope analyses discussed in Chapter 4 - Stable Isotope Analysis and Paleodiet of an Ancestral Ohlone Human Burial from CA-SMA-267, San Mateo County, California by Dr. Eric Bartelink.
Research Question # 3: How long ago did the Loškowiš ’Awweš Táareš person live? What temporal period can this burial and site be assigned to?

In Chapter 6: Dating and Chronological Placement of the Loškowiš ’Awweš Táareštak Burial Site will address the results of the AMS dating of the burial and its temporal placement.

Research Question # 4: Was this person biologically related to other ancestral Muwekma Ohlone people whose ancient DNA has been mapped?

Analysis: Submitting a bone/tooth sample from this burial to Drs. Brian Kemp and Cara Monroe from Washington State University in order to conduct Ancient Mitochondrial DNA studies will possibly address this question. It will be perhaps over a year before there are any results, therefore, a supplemental report will be written when the results are completed and will be published in the future.

THE NAMING OF SITE CA-SMA-267 BY THE MUWEKMA OHLONE TRIBAL LEADERSHIP AND LANGUAGE COMMITTEE TO THE LOŠKOWIŠ ’AWWEŠ TÁAREŠTAK [WHITE SALT MAN] SITE IN THE CHOCHÉÑO/TAMIEN OHLONE LANGUAGE

The Muwekma Ohlone Tribal leadership and Language Committee (which includes Monica V. Arellano, Sheila Guzman-Schmidt, Gloria E. Arellano-Gomez and Rosemary Cambra) decided to honor their deceased ancestors by naming the Loškowiš ’Awweš Táareš [White Salt Man] Burial in the Tribe’s aboriginal Ohlone Chocheño/Tamien language. This follows the Tribal tradition and decision to rename their ancestral sites has occurred at other pre-contact ancestral heritage sites including:

1) CA-SCL-732 which was renamed Kaphan Umux (Three Wolves) Site [corrected to Kaphan Húunikma] (Cambra et al. 1996);  
2) CA-SCL-38 was named Yukisma (“at the Oaks”) Site (Bellifemine 1997, Gardner 2013, Monroe 2014,);  
3) CA-SCL-867 was named Riipin Warééptak “(in the) Willows Area” Site (Leventhal et al 2007);  
4) CA-SCL-869 was named Katwáš Ketneyma Warééptak (The Four Matriarchs Site (Leventhal et al. 2009);  
5) CA-SCL-287/CA-SMA-263 was named Yuki Kutsuimi Šaatoš Inúxʷ [Sand Hill Road] Sites by the Tribe (Leventhal et al. 2010);  
6) CA-SCL-30/H was named Clareño Muwèkma Ya Túnnešte Nómmo [Where the Clareño Indians are Buried] Site (Leventhal et al. 2011);  
7) CA-SCL-895 [Blauer Ranch] was renamed Kiriṭ-smin ‘ayye Sokôte Tápporikmatka [Place of Yerba Buena and Laurel Trees Site] (McDaniel et al 2012); and  
8) CA-SCL-894 located in downtown San Jose was named by the Language Committee as Tupiun Táareštak [Place of the Fox Man Site] (Leventhal et al. 2012).

As a result of this present study site CA-SMA-267 was named and will at times be referred to as the Loškowiš ’Awweš Táareštak [White Salt Man] Site in this report.
Due to linguistic considerations and difficulties of translating words and concepts from English such as caliche (a calcium carbonate precipitate or a “salt”) into the Chocheño/Tamien Ohlone language, the name Loškowiš ’Awweš Táareš which literally translates as “White Salt Man” will be used interchangeably with “Caliche Man” and Burial 1 in this report.

By doing so, the Muwekma Ohlone Tribal leadership and Language Committee sought honor their ancestor by naming him Loškowiš ’Awweš Táareš [White Salt Man] in their aboriginal Ohlone language as part of their reclamation of their ancestral heritage site through this renaming process (Field et al 2013, Field et al 2014).

**CEQA REGULATORY GUIDELINES AND COMPLIANCE**

This burial and archaeological recovery program conforms to the cultural resources requirements of the California Environmental Quality Act (CEQA) and County of San Mateo procedures and regulations. Under the cultural resources guidelines presented in Appendices G and K of CEQA, the permit granting lead agency is responsible for determining whether or not a particular project would have an adverse impact on significant cultural resources. When the burial was encountered the City of East Palo Alto Sanitation Agency retained the services of Ohlone Families Consulting Services in order to implement the CEQA compliance process through a controlled archaeological testing and burial recovery mitigation treatment plan.

CEQA (Appendix G) lists "significant effects" criteria that are also applicable to the proposed project. A significant effect on cultural resources was defined if the project would:

A. Disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group, or a paleontological site except as part of a scientific study; or

B. Conflict with established recreational, educational, religious, or scientific uses of the area.

Therefore, under CEQA, Native American Tribes are considered an ethnic and social group under Criterion A. Contemporary Native Americans (specifically in this case the documented and previously federally recognized Muwekma Ohlone Tribe of the San Francisco Bay Area) consider that disturbances and destruction to both of their prehistoric and historic sites adversely impact their traditional cultural and heritage values and beliefs. Although all sites are indeed important, village and cemetery sites are generally considered the most sensitive heritage resources to Native peoples.
Chapter 2:

Project Background: Site Context, Discovery and Archaeological Data and Burial Recovery Mitigation Program for the Loškowiš ’Awweš Táareš [White Salt Man] Burial

by

Alan Leventhal, Rosemary Cambra and Norma Sanchez

SITE CONTEXT: DISCOVERY OF THE LOŠKOWIŠ ’AWWEŠ TÁAREŠ BURIAL

The remains of a single primary inhumation of an ancestral Muwekma Ohlone Indian adult male was discovered on June 12, 1986 when a construction crew from the East Palo Alto Sanitary District was excavating a two foot-wide repair trench. The repair trench measured 2 meters long by 64 cm wide (6.5 feet by 2.1 feet) and was required in order to fix a broken or leaky sewer line below the street. The location of this grave was discovered on the southern edge of the street in front of the 1416 Bay Road residence in the City of East Palo Alto. [Figures 2-1 – 2-2]

Figure 2-1: Sewer Line Repair Trench (Trowel Points to Location of In Situ Remains
The ancestral Ohlone remains were encountered at a depth of 85 – 103 cm (approximately 3 feet) below [street] surface (BS). The original grave was situated within what appeared to be undisturbed native soils.

![Figure 2-2: Close Up of In Situ Remains of Loškowiš ’Awweš Táareš [White Salt Man]](image)

As mentioned in Chapter 1 after a preliminary assessment was made by the County Coroner’s Office, the Native American Heritage Commission’s (NAHC) identified Muwekma Chairwoman Rosemary Cambra as the Most Likely Descendant (MLD) for this project. Chairwoman Cambra issued specific recommendations that included a decision to implement a several-phased Archaeological Data and Burial Recovery mitigation program in order to address the impacts to this individual within the exposed portion of the site.
ARCHAEOLOGICAL DATA AND BURIAL RECOVERY PROGRAM

The Archaeological Data and Burial Recovery Program field work consisted of a two-phased approach:

**Phase I** – Focused on the screening of the back dirt from the backhoe trench and the recovery of all skeletal remains, faunal remains, shell fish remains (ecofacts), and artifacts. All backhoe excavated back dirt soils were passed through either ¼” or ⅛” mesh screens. All recovered bones, artifacts (cobbles, pebbles and burnt clays), and ecofacts (faunal and shellfish) were placed in labeled brown paper bags.

**Phase II** – Entailed the establishment of an adjacent Recovery Excavation Unit in order to come down onto the remaining burial, then expose, document, and remove the remaining skeletal elements left *in-situ* in the sidewall of the trench. The Sanitation Agency construction crew removed the blacktop asphalt with a jackhammer and also helped excavate out the roadbed gravel layer [*Stratum I*]. OFCS archaeologists and tribal field crew then established a 1 meter x 75 cm excavation recovery unit (designated *Recovery Excavation Unit I*) over the location of the remaining *in-situ* skeletal elements (see Figure 2-2 above). A datum point (at Street Level) was established at the southeast corner of Recovery Excavation Unit I. All hand excavated soils were passed through ¼” mesh screens and the soils surrounding the burial were passed through ⅛” mesh screens [*Figures 2-3 – 2-6*].

![Figure 2-3: Muwekma Tribal Members and OFCS Field Crew Screening Backdirt Pile](image-url)
Figure 2-4: Muwekma Tribal Members and OFCS Field Crew Screening Backdirt Pile

Figure 2-5: Muwekma Tribal Members Screening Soils From Burial Locus
STRATIGRAPHIC PROFILES

Soil samples from each stratum were taken and described using a Munsell Color Chart and Profile Description (Soil Survey Manual, Supplement to Agriculture Handbook No. 18, 1969). A total of six strata were defined within the East and South Wall Profiles of the Recovery Excavation Unit 1 (see Figures 2-7 and 2-8 – Stratigraphic Profiles below).

1. **Stratum I (Catalog Reference # 2)** – This stratum comprised the uppermost elevation consisting of street/black asphalt pavement [Historic Roadbed and Gravel] ranging in depth from 0 to 17 cm BS/BD. This stratum consisted of the historic tar road, roadbed, and gravel. No prehistoric or historic cultural materials were recovered from this level.

2. **Stratum II (Catalog Reference # 3)** - This stratum consisted of a Sub-Roadbed and Gravel layer of mixed disturbed soils ranging in depth from 17-32 cm BS/BD. Rounded to sub-rounded pebble and cobble fragments of sandstone were encountered at 26 – 30 cm BS/BD. Other than the pebble and cobble fragments, no prehistoric or historic cultural materials were recovered from this level. This disturbed level was determined to be a Silty Loam and identified as 10YR 2/2, Very Dark Brown (moist and dry) on the Munsell Color Chart.

3. **Stratum III (Catalog Reference #4)** – This stratum comprised a Transitional Zone that was immediately below Stratum II. This stratum had a depth ranging approximately from 32 – 44 cm BS/BD with transitional Munsell readings that went from 10YR 2/2 Very
Dark Brown (moist and dry) to 10YR 5/3 Brown (moist). The soil matrix was a Loamy Silt. Recovered prehistoric materials included burnt clay fragments, a few sandstone cobble and pebble fragments, and Cerithidea, Ostrea, and Penitella (boring clam) shellfish remains.

4. **Stratum IV (Catalog Reference #5)** – was considered to contain Undisturbed Native Soil and the top of the grave. This stratum was located above and around the upper area of the skull and ranged in a depth from approximately 45 – 85 cm, BS/BD. The Munsell reading was determined to be 10YR 5/3 Brown (moist) and the soil matrix was determined to be a Loamy Silt. Recovered prehistoric materials included: vitrified clay fragments, a few sandstone cobble and pebble fragments, California horn snail (*Cerithidea californica*), bay oyster (*Ostrea lurida*) and bay mussel (*Mytilus edulis*) shellfish remains mostly concentrated immediately above and surrounding the Loškowiš ’Awweš Táareš [White Salt Man] in-situ cranium and scapula.

5. **Stratum V (Loškowiš ’Awweš Táareš Burial) [Catalog References #1 and #6 combined]** – located from the top of the skull to well below the burial locus. Stratum V transitioned into the soils comprising the grave [Burial Zone] of the Loškowiš ’Awweš Táareš [White Salt Man] burial. The skeletal remains of the burial ranged from 85 – 103 cm BS/BD and the subsoil below the burial continued from a depth of 103 - 135 cm BS/BD. Stratum V soil transitioned from a Munsell Chart reading of 10YR 5/3 Brown (moist) to 10YR 3/2 Very Dark Grayish Brown (moist) and the soil matrix was determined to be Clayish Loam. Recovered prehistoric materials included a utilized flake of Red Franciscan chert, vitrified and baked clay fragments, many sandstone cobble and pebble fragments, faunal bone (rodent), California horn snail (*Cerithidea californica*), bay oyster (*Ostrea lurida*), and bay mussel (*Mytilus edulis*) shellfish remains, and a crab claw.

6. **Stratum VI (Catalog Reference # 7)** – Transitioned from Sub-Burial into Sterile soil at approximately 135 – 160 cm BS/BD to the bottom of the adjacent backhoe trench excavations, with a Munsell value of 10Y/R 3/2 Very Dark Grayish Brown (moist). Based upon the plasticity of the soil this stratum was considered “very plastic” and structure (size) was determined to be “very fine” with the soil matrix clay to clay loam.

Only one Red Franciscan chert utilized flake was found in direct association with the Loškowiš ’Awweš Táareš [White Salt Man] burial along with faunal and shell fish remains. Although some large pieces of charcoal were noted and recovered from within and around the cranium, there was no clear evidence of pre-internment pit fire or burnt offerings.

The other skeletal elements associated with the Loškowiš ’Awweš Táareš [White Salt Man] burial that were recovered from the backdirt trench soil pile were combined with the recovered in-situ remains and these along with the associated faunal and shell fish remains were issued Reference #1 for the final catalog. Reference #8 was issued to the cultural materials recovered from within the lower strata of the adjacent backhoe trench [see Figures 2-9 - 2-18].
Figure 2-7: Stratigraphic Profile of East Wall of Excavation Unit 1
Figure 2-8: Stratigraphic Profile of South Wall of Excavation Unit 1
Figure 2-9: East Wall Profile/Bottom of Stratum III - Backhoe Trench to the Left of Unit

Figure 2-10: East Wall Profile/Beginning of Stratum IV – Level of Burial
Figure 2-11: East Wall Profile/Bottom of Stratum IV – Level of Burial

Figure 2-12: Exposure of Cranium, Scapula and Upper Limb Elements @ 103 cm. BS
Figure 2-13: Close-up of Cranium, Scapula and Upper Limb Elements @ 103 cm BS

Figure 2-14: East Wall Profile/Below Burial 1 - Backhoe Trench to the Left of Unit
Figure 2-15: Below Burial 1 – Stratum V Trench and Sewer Pipe (View Looking West)

Figure 2-16: Excavating Stratum VI into Sterile Soils
Figure 2-17: Archaeologist Nancy Olsen Tagging the East Wall for Stratigraphic Profile
Figure 2-18: Close-up of East Wall Profile and Bottom of Stratum VI
CONCLUDING REMARKS AND RECOMMENDATIONS

It is not known if additional burials exist in the surrounding area within the street, even though construction of homes and utility lines has impacted this locality over the years. However, if human remains were indeed encountered in the past, they were never reported and/or formally recorded. Based upon pre-contact Ohlone Indian burial practices, cemeteries usually contain multiple burials therefore there is a high probability of encountering additional intact and/or preciously impacted human remains within the CA-SMA-267 site location. Should future subsurface construction activities and utility trenching occur, it is recommended that these projects be monitored by a qualified archaeologist and/or a BIA documented Ohlone monitor.
Chapter 3:
Burial Description and Skeletal Biology: Inventory and Analysis of the Loškowiš ’Awweš Táareš [White Salt Man] Burial
by
Emily McDaniel, Diane DiGiuseppe, David Grant, Melinda Atwood, Colin Jaramillo, and Alan Leventhal

LABORATORY METHODOLOGY

Curation and Inventory

Skeletal analysis of the Loškowiš ’Awweš Táareš [White Salt Man] Burial was conducted by Emily McDaniel, Diane DiGiuseppe, David Grant, Melinda Atwood, Colin Jaramillo, and Alan Leventhal. The skeletal elements were removed from the unit level bags and then cleaned with tap water and some of the adhering caliche was also removed with wooden skewers. Where necessary, skeletal elements were reconstructed using Elmer’s Glue, a water soluble adhesive, in case removal is necessary in the future.

The burial was then laid out in anatomical position, photographed, inventoried using the Ohlone Families Consulting Services (OFCS) skeletal inventory forms, analyzed for indicators of sex, age, stature, and pathology, and measured according to the Standards for Data Collection from Human Skeletal Remains, published by Buikstra and Ubelaker (1994). Measurements were taken using electronic sliding calipers, an osteometric board, and a goniometer. Photography was completed by Diane DiGiuseppe, David Grant, and Alan Leventhal. A second inventory form, drafted by the lead author, is also provided in Appendix B. While this secondary form covers roughly the same information as the OFCS inventory forms, it is provided to assess the benefits of a new inventory format, including form clarity, speed of inventory, and detailed literature referencing. Following the completion of inventory and analysis, the skeletal elements of the burial were separated according to anatomical location and placed into new plastic Ziploc bags labeled by element, with the site information, and the individual’s burial number.

Sex Determination

The biological sex of this individual was determined through the macroscopic examination of the sexually dimorphic features of the pelvis and robusticity of the cranium, as well as the metric assessment of various post-cranial elements. Where possible, a total of six pelvic indicators of biological sex were assessed, including three features of the pubis (Phenice, 1969), width of the sciatic notch (Walker, 2005), presence or absence of the pre-auricular sulcus (Buikstra and Ubelaker, 1994), and incidence of dorsal pitting of the pubis (Suchey et al., 1979). Level of robusticity was assessed in a total of five cranial features, defined by Buikstra and Ubelaker (1994), including the nuchal crest, mastoid process, supraorbital margin, supraorbital ridge/glabella, and mental eminence of the mandible.
Metric assessment of the femur, humerus, and glenoid fossa were used to determine sex from the post-cranial skeleton and include the maximum diameter of the femoral head, femoral bicondylar width, vertical diameter of the humeral head, humeral bicondylar width, and the height of the glenoid fossa (Dittrick and Suchey, 1986). These measurements were taken for their accuracy in assessing the sex of prehistoric Central Californian populations (Table 3-1). Perseveration permitting, the determination of biological sex is based upon multiple traits throughout the skeleton to provide the most accurate sex determine.

Table 3-1: Femoral and Humeral Metrics from the Late and Middle Periods (Dittrick and Suchey 1986)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Female Mean</th>
<th>S.D.</th>
<th>Sectioning</th>
<th>Male Mean</th>
<th>S.D.</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Diameter of the Femoral Head</td>
<td>41.9 mm</td>
<td>1.8 mm</td>
<td>44.285 mm</td>
<td>46.7 mm</td>
<td>2.3 mm</td>
<td>90.6%</td>
</tr>
<tr>
<td>Femoral Bicondylar Width</td>
<td>72.9 mm</td>
<td>3.0 mm</td>
<td>77.023 mm</td>
<td>81.4 mm</td>
<td>3.8 mm</td>
<td>89.0%</td>
</tr>
<tr>
<td>Vertical Diameter of the Humeral Head</td>
<td>41.4 mm</td>
<td>2.1 mm</td>
<td>43.928 mm</td>
<td>46.8 mm</td>
<td>2.3 mm</td>
<td>90.3%</td>
</tr>
<tr>
<td>Humeral Bicondylar Width</td>
<td>56.2 mm</td>
<td>3.4 mm</td>
<td>59.04 mm</td>
<td>62.1 mm</td>
<td>3.5 mm</td>
<td>85.3%</td>
</tr>
</tbody>
</table>

Age Estimation

Age-at-death is estimated in adult osteological remains through the macroscopic examination of the fusion stage exhibited in the late fusing ossification centers, dental eruption, and stage of osteological degeneration of select post-cranial features. Where possible, a total of eight indicators of age at death are assessed, most commonly including the state of fusion of the ectocrania (Buikstra and Ubelaker, 1994), medial clavicle, iliac crest, and S1/S2 of the sacrum (Schaefer, Black and Scheuer, 2009); eruption of the third molar (Ubelaker, 1989); and the assessment of degeneration in the pubic symphysis (Suchey and Brooks, 1990), auricular surface (Lovejoy, 1985), and sternal rib ends (Iscan and Loth, 1984a, b). As with biological sex determination, a multi-trait approach was utilized to provide the most accurate age estimation for each individual. Sub-adult aging will not be discussed, as no sub-adults were recovered from CA-SMA-267.
Stature

Living stature is estimated in this study using two different methods. The OFCS forms utilize Genoves’ (1967:73) criteria, while the forms employed by the lead author utilize the criteria delineated by Auerbach and Ruff (2010). Genoves’ method utilizes the application of maximum long bone length to regression formulas based upon Mestizo Mesoamerican skeletal assemblages (skeletal populations of mixed indigenous Central American and European ancestry). Alternatively, Auerbach and Ruff’s (2010) method utilizes the application of femoral bicondylar width and the maximum length of the tibia to regression formulas that are specific to indigenous populations residing in the “Temperate” regions of North America, which includes California. The sample studied by Auerbach and Ruff (2010) includes 11 Californian assemblages, with the majority recovered from sites in Central California and the Bay Area. This is an important distinction, as skeletal populations from around the world and even within North America alone, are highly variable in stature and body proportion and consequently require different stature equations. The regression equations delineated by Auerbach and Ruff (2010) produce the most accurate and precise stature estimations currently available for New World indigenous populations. In the presence of fragmentation, skeletal elements were reconstructed to facilitate stature estimation. Generally, individuals of indeterminate sex and immature age are excluded from stature estimations, as those exhibiting mechanical or pathological deformity.

BURIAL DESCRIPTION AND ANALYSIS

CA-SMA-267: Burial 1  Sex: Male  Age: 18-22  [Figures: 3-1 – 3-10]

Overview

Burial #1 was the sole individual recovered from site CA-SMA-267 and was recovered from Recovery Unit 1 at a depth ranging from 85 - 103 cm BS/BD. Based upon the remaining in-situ skeletal element as well as the size of the grave, it appears that the Loškowiš ’Awweš Táareš [White Salt Man] Burial was buried in a flexed position, with the top of the cranium pointed to the south [Figure 3-1]. This person was determined to be a male, age 18-22 year old at the time of death whose estimated height was approximately 163 cm (5’4”). Skeletal pathologies observed on Loškowiš ’Awweš Táareš Burial was mainly relegated to normal variation resulting from strenuous activity, including asymmetry of the lower thoracic bodies (T10 and T11) and the development of laminal spurs in T7-T11. Dental pathologies included occlusal attrition and the congenital absence of all 3rd molars.
Completeness and Preservation

The Loškowiš 'Awweš Táareš Burial is represented by 60% of its original elements, mainly missing the wrist, hand, ankle, and foot bones and the pelvic girdle [Figures 3-2 – 3-3]. Preservation of this individual is fair, with moderate erosion of the cortical bone and limited survival of cancellous bone and epiphyses. Damage to the cortical surface largely resulted from impacts from heavy excavation equipment and the deposition of caliche, a calcium precipitate/deposit that acts as a natural cement. Removal of the hardened caliche during the analysis phase had at times lifted portions of the cortical surface from the bone. To avoid destruction, areas of the most hardened caliche were not removed. Some elements remain cemented together with caliche and cannot be separated without bone destruction. This burial is highly fragmented, containing no intact long bones. As a result, reconstruction was performed on selected elements. Bone volume appears good but is indeterminate due to the presence of caliche deposits.
Figure 3-2: Loškowiš ‘Awweš Táareš Burial in Anatomical Position
Figure 3-3: Skeletal Schematic Form Showing Recovered Elements from Burial #1
Skull and Dentition

The cranium of Loškowiš ’Awweš Táareš is complete but fragmented, and is missing a small portion of the occipital and sphenoid. Previous researchers have reconstructed the skull [Figures 3-3 and 3-4]. The mandible is also complete but fragmented in two at the mental eminence. A total of 14 maxillary teeth and 11 mandibular teeth are present, with 24 of these present in-situ. A total of three teeth are missing postmortem, including the right maxillary first molar, third premolar, and central incisor. All third molars are congenitally absent from Loškowiš ’Awweš Táareš’ dentition [Figure 3-5]. Radiographs were taken which proves their absence from the crypts of the mandible and maxilla. Dental pathology will be discussed in the following section.

Figure 3-4: Frontal View of Reconstructed Skull of Loškowiš ’Awweš Táareš
(Deformation due to Depositional Pressure)
The axial skeleton is composed of the pectoral girdle, thorax, vertebrae, and pelvic girdle (*os coxae*). The pectoral girdle is represented by an incomplete, fragmented right clavicle; a complete, fragmented left clavicle; complete, fragmented right scapula; and an incomplete, fragmented left scapula. The thorax is represented by a highly fragmented rib cage and a complete, fragmented sternum body. The rib cage is composed 100+ fragments and only six identifiable rib heads on both sides, including two first ribs, one left second rib, five right ribs (3-10), and four left ribs (3-10). Four cervical vertebrae are present, including a fragmented C1, incomplete C2, and complete C6 and C7. All thoracic vertebrae are present except for T12. All present thoracic vertebrae are present but vary in level of fragmentation. T1 is cemented to the right scapula with caliche. Of the lumbar spine, only two body fragments are present, possibly those of L1 and L3. All elements of the pelvic girdle are absent, except for two incomplete fragments of the right ilium.

The appendicular skeleton is composed of the upper and lower limbs and hands and feet. All long bones of the appendicular skeleton are fragmented. The upper extremity is represented by two complete humeri, two complete radii, an incomplete right ulna, and complete left ulna. The right hand and wrist is composed of incomplete metacarpals 1-3, a scaphoid, lunate, trapezium, and capitate. The scaphoid and lunate have been cemented together by caliche. The left hand and wrist is composed of an incomplete MC1, a complete MC2, and trapezium. Three proximal and one medial hand phalanges are present. The lower extremity is represented by two complete, reconstructed femora, missing their proximal ends; two patellae; one complete, reconstructed right tibia; one incomplete left tibia; and two incomplete fibulae. The right foot and ankle is represented by a complete MT3, fragmentary MT4, and complete talus and navicular. The left foot and ankle is absent. Three proximal, one medial, and one distal foot phalanges are present.
Sex

Due to the absence of the os coxae from Loškowiš ’Awweš Táareš, biological sex was determined through the examination of the robusticity of the cranial features and the metric assessment of the postcranial skeleton. Loškowiš ’Awweš Táareš exhibited robust muscle markings on the nuchal crest (score of 4), large mastoid processes (score of 4), intermediate sharpness of the supraorbital margin (score of 3) (Buikstra and Ubelaker, 1994), and a flexed, vertical ascending ramus (Loth and Henneberg, 1996), all but one being definitively male traits. Scoring of the glabella and mental eminence was not possible due to the presence of caliche and postmortem damage, respectively. Metric assessment was possible for the glenoid fossa height (38.0 mm) and the vertical diameter of the humeral head (46.9 mm). Both of these measurements fall within the male ranges and are extremely close to the male means (Bass, 1995; Dittrick & Suchey, 1986). Based upon these criteria, Loškowiš ’Awweš Táareš was determined to be a male.

Age

Due to the post mortem absence of the auricular surface, pubis, identifiable fourth sternal rib end, and congenital absence of the third molar, age-at-death was estimated through the assessment of the late fusing ossification centers. Burial #1 was determined to be an adult, greater than 18 years of age due to the completion of the epiphyses of the long bones (Scheuer and Black, 2000). Although fusion is ossification of the long bones is complete, fusion lines are still visible on the tibia, indicating that long bone ossification was recently completed. Ossification of the ectocranial sutures scored a minimum score of 0, aging the individual below the age of 30. This is somewhat problematic however, as site #3, located along the sagittal suture, is obscured by caliche deposits. The upper limit for age estimation was assigned according to the partial fusion exhibited in the vertebral rib ends. According to Schaefer et al. (2009) partial fusion is exhibited in individuals ranging from the age of 17 to 22. Using these three age indicators, Loškowiš ’Awweš Táareš is estimated to have been between the ages of 18 and 22 at the time of death.

Stature

Only two elements were present for stature estimation. These include reconstructed right tibia and humerus. These elements measured 370 mm and 323 mm, respectively. Living stature of Loškowiš ’Awweš Táareš was estimated to have been approximately 164 cm (5'4”) [160cm – 165 cm, 5'3 – 5'5” including standard deviation], according to Genoves (1967) and Auerbach and Ruff (2010). While the two stature estimations agree well with one another, it is best practice to use those pertaining to a relevant skeletal population. In the case that preservation does not provide the metrics required by Auerbach and Ruff (2010) it is likely acceptable to use those presented by Genoves (1967), but comparison of the equations with a larger, more intact sample is necessary to confirm this speculation. The Loškowiš ’Awweš Táareš burial fits perfectly within the mean stature of 163.9 cm for males recovered from other prehistoric Californian sites (Auerbach and Ruff, 2010).
Skeletal Pathology

The observation of skeletal pathology was limited by the fragmentation of skeletal elements of this individual, as well as the adherence of caliche and the resulting damage to the cortical bone. Pathology exhibited in this individual was mainly related to activity. Two thoracic bodies (T10 and T11) exhibit a lateral sloping to the left of the anterior body, while the rest of the vertebral bodies exhibit roughly equal rounding on both sides (Figure 3-6). This difference is noted but is likely the result of normal variation in the skeleton, resulting from strenuous activity. Furthermore, development of slight spicules along the neural arches of T7-T11 was observed, with the most pronounced development observed in T8 (Figure 3-7). The development of these spicules, known as laminal spurs, is a normal variant of the spine, associated with increasing age or strenuous activity and is most readily found in the thoracic vertebrae (Mann and Hunt, 2005). Due to the young age of this individual, (18-22 years of age), the presence of laminal spurs is a possible indicator of strenuous activity during this individual’s lifetime. No signs of stress, infection, or trauma indicative of cause of death at such a young age were observed in this individual. This may be due to poor preservation of the skeletal elements or the result of an acute infection.

Figure 3-6: Thoracic Vertebrae: T9-T11 (Left to Right)
[T9 Exhibits Roughly Equal Roundedness of the Vertebral Body, T10 and T11 Display Anterior Diagonal Sloping on the Left Side of the Body (arrows)]
Dental Pathologies and other Observations

The Loškowiš ’Awweš Táareş burial was impacted by a covering of caliche which obscured parts of the dentition, making certain observations difficult. Both arches are present with 14 teeth in the maxilla and 12 of 14 in the mandible (Figures 3-8 and 3-9). The Loškowiš ’Awweš Táareş burial exhibits congenital absence of all third molars, maxillary and mandibular. This was confirmed by radiograph, showing the absence of unerupted third molars in the crypts of the maxilla and mandible. There is minimal wear present on the maxilla with the heaviest wear on the two central incisors (5’s) and the first molars (6 and 7) with minimal wear present on the rest of the dentition. All wear scores were determined based on using Smith’s (1984) attrition scale. Winging is present on the central incisors as well as being shovel shaped. There is the hint of a palatine torus obscured by caliche. No caries, abscesses, linear enamel hypoplasias, or antemortem tooth loss was observed in this individual. The lack of caries is not surprising in this population, as attrition of enamel surfaces restricts the formation of carious lesions (Jurmain, 1990).
The mandible has 12 teeth present with two lost post mortem (RI₁ and RPM₂) and the right first molar is damaged (RM₁) having been broken in half, most likely during excavation. Wear is similar on the mandible with 5’s on the incisors and 6’s on the molars with minimal wear on the premolars and canines. This mandible has been broken at the mental eminence and reconstructed with Klean® Clay. The bicondylar breadth is exceptionally wide, possibly because of plastic deformation of from excessive usage. The side views below show an exceptionally steep gonial angle (~ 100 degrees), wide ramus breadth, both minimum and maximum and height of the mandibular body (Figure 3-10).
There is the slightest hint of a groove beginning to form on the left central incisor (Grade 2), which is not supported by the opposing occlusion which is dead flat (Figure 3-11). This suggests that this individual may have been processing plant materials for cordage and/or nets, which were in universal usage among this group (Grant 2010; Anderson 2005).

Dental Summary

This is a very young individual aged about 25 years old. It is important to note what is not here. There is minimal wear, no evidence of caries, no evidence of periodontitis, or abscesses. There are no linear enamel hypoplasias present suggesting that this individual had a stress free childhood, free from famine, nutritional stress and serious illnesses. The maxilla and mandible are both very robust and strong.
Concluding Remarks

Based on the skeletal analysis of the Loškowiš ’Awweš Táareš burial the pathologies associated with this individual, a specific cause of death could not be discerned from the remains. Therefore, it is not possible to speculate what contributed to the death of this young ancestral Ohlone man.

Furthermore, although his passing, no doubt, represented a tragedy in the lives of this ancestral Ohlone Indian community, it appears that this man lived only to young adulthood, 18-22 years old. The overall good condition of the skeletal remains and lack of clearly identifiable pathologies on the elements suggests that this young man led a fairly normal lifestyle during his time period until his unfortunate passing and ultimate burial at the CA-SMA-267 location, approximately 4,084 years ago (2084 BC).
INTRODUCTION

Stable isotope analysis has been used by archaeologists since the 1970s to examine the diets of prehistoric humans. The old adage "you are what you eat" is the foundation for using stable isotopes for dietary reconstruction and refers to the relationship between the isotopic composition of an animal’s tissues and its diet (DeNiro and Epstein 1978; Fry 2006). Controlled feeding experiments on animals have clearly indicated that stable isotope ratios of bone record the isotopic composition of foods consumed during life, providing an average for the last 10-15 years of diet in human cortical bone. Studies generally focus on stable carbon ($^{13}$C/$^{12}$C) and nitrogen ($^{15}$N/$^{14}$N) isotopes.

In this chapter, I briefly review the theoretical basis of stable isotope analysis and provide parameters for human diets using isotopic values of flora and fauna from central California. Next, I provide a dietary reconstruction of an ancestral Ohlone burial (Burial 1) from CA-SMA-267, located at 1416 Bay Road, City of East Palo Alto, San Mateo County, California. Accelerator mass spectrometry (AMS) was conducted on human bone collagen by the National Science Foundation AMS Laboratory, University of Arizona, Tucson, and yielded a corrected date of 2115 ± 73 B.C. (2191 B.C. Calib 5.0). Burial 1, referred to as "Caliche Man" or Loškowiš 'Awweš Táareš in the Muwekma Tribe’s native language dates close in time with other Early Period burials from the west side of San Francisco Bay, such as Stanford Man II (2400 B.C. and 2450 B.C.), Sunnyvale Skeleton (2440 B.C. and 2520 B.C.), and CA-SCL-287 (Burial 04-14 2232 B.C.) from Stanford Campus (Leventhal et al. 2010, Buonasera, personal communication). These sites also date at least 500 years older than burials from the University Village site (CA-SMA-77) (Leventhal, personal communication; see Gerow and Force 1968).

STABLE ISOTOPES

Stable isotopes are atoms of the same element with the same number of protons and a different number of neutrons. Because stable isotopes do not undergo radioactive decay, they provide a record of in vivo chemical signatures of an organism. Although chemically similar, isotopes of the same element react at slightly different rates in chemical reactions due to slight differences in atomic mass. This results in the disproportionate enrichment of one isotope over another, a process known as isotopic fractionation (Fry 2006). Stable isotope values are expressed as the ratio of the “rare” (heavy) isotope to the “abundant” (light) isotope (e.g., $^{13}$C/$^{12}$C) compared to a known standard, expressed in permil (‰) or parts per thousand relative to the standard (Schoeller 1999). International laboratory standards are provided by the National Bureau of Standards and the International Atomic Energy Agency in Vienna. The delta notation symbol ($\delta$) is used to express the isotopic ratio of a sample relative to the standard. Isotopic composition is calculated as follows:
\[ \delta = \frac{(R_{\text{sample}} - R_{\text{standard}})}{R_{\text{standard}}} \times 1000 \]

Where \( R \) is equal to the ratio of the rare to the abundant isotope in the sample compared with that of the standard.

Stable carbon isotopes are expressed relative to PDB (Pee Dee belemnite), a Cretaceous fossil \((\text{Belemnitella americana})\) from the Pee Dee formation in South Carolina. PDB is assigned a value of 0‰ by definition and is enriched in \(^{13}\text{C}\) relative to organic carbon and most terrestrial carbonate materials. Thus, \( \delta^{13}\text{C} \) values for most living things are negative relative to the standard. Stable isotopes of nitrogen are expressed by the ratio of \( ^{15}\text{N}/^{14}\text{N} \) relative to the standard of atmospheric \( \text{N}_2 \) (AIR), also set at 0‰. Because air is more depleted in \(^{15}\text{N}\) than most living things, \( \delta^{15}\text{N} \) values in organisms are usually positive relative to the standard. Substances that have higher delta (\( \delta \)) values are more enriched in the “heavy” isotope (Fry 2006).

**STABLE CARBON AND NITROGEN ISOTOPE ANALYSIS**

Carbon isotopes \((^{13}\text{C}/^{12}\text{C})\) in bone reflect the consumption of \( \text{C}_3 \), \( \text{C}_4 \), and CAM plants and the animal consumers of these resources. During photosynthesis each type of plant utilizes a different carbon molecule to incorporate carbon into its tissues. \( \text{C}_3 \) plants use a 3-carbon molecule, referred to as Calvin-Benson photosynthesis, which discriminates more against the isotopically heavier \(^{13}\text{C}\) when incorporating atmospheric \( \text{CO}_2 \). These plants include trees, shrubs, legumes, and tubers typical of temperate regions. \( \text{C}_4 \) plants instead use a 4-carbon molecule (Hatch-Slack photosynthesis) that discriminates less against the isotopically heavier \(^{13}\text{C}\) compared to \( \text{C}_3 \) plants when incorporating atmospheric \( \text{CO}_2 \). \( \text{C}_4 \) plants include tropical grasses such as maize, millet, sorghum, and sugarcane that are typical of hot and arid climates. Due to these differences, \( \text{C}_4 \) plants average –12.5‰, while \( \text{C}_3 \) plants average –26.5‰ (Schwarcz and Schoeninger 1991). CAM plants include succulents and cacti and fall between the range of \( \text{C}_3 \) and \( \text{C}_4 \) plants depending on the degree of daytime photosynthesis. In marine environments, carbon is derived from dissolved bicarbonate, marine plants, and photosynthesizing phytoplankton. This typically results in carbon isotope values in organisms that are similar to \( \text{C}_4 \) plants, thus permitting discrimination of marine versus terrestrial diets in a consumer’s tissues in regions where \( \text{C}_4 \) plants are not consumed (Schoeninger et al. 1983; Schwarcz and Schoeninger 1991).

Nitrogen has two stable isotopes, \(^{15}\text{N} \) and \(^{14}\text{N} \), which are incorporated into plants from \( \text{N}_2 \) in the atmosphere and ocean water. Marine plants typically have more positive isotope values than terrestrial plants and these differences are reflected in animal consumers. Nitrogen isotopes differ from carbon in that there is a trophic level effect, with the tissues of its consumers enriched ~3‰ over food values at each level in the food web (Schwarcz and Schoeninger 1991). Nitrogen isotope values are typically higher in marine ecosystems than in terrestrial ecosystems due to longer food chains.

**DIETARY RECONSTRUCTION IN CENTRAL CALIFORNIA**

In the San Francisco Bay area, zooarchaeological studies have demonstrated a greater emphasis on large terrestrial fauna (e.g., elk, deer) and marine mammals early in time, followed by a shift toward smaller terrestrial fauna and shellfish later in time (Broughton 1999; Simons 1992).
Stable carbon and nitrogen isotope data of bone collagen indicate that Early Period (4950 to 2450 Before Present (BP) groups from the upper eastern bayshore derived most of their dietary protein from high trophic level marine resources, whereas Middle and Late Period (2450 to ca. 200 B.P.) groups from the lower eastern bayshore and south Bay Area consumed a wider variety of marine and terrestrial resources (Bartelink 2006, 2009a, b, 2010; Bartelink and Wright n.d.; Beasley 2008; Beasley et al. 2013). Compared with the Sacramento-San Joaquin Valley and Delta, prehistoric diets in the Bay Area showed a greater focus on marine resource consumption (Bartelink 2006; Bartelink and Wright n.d.; Bartelink et al. 2010). Stable carbon isotope analyses of bone apatite further indicate an increased emphasis on vegetal foods through time in the Bay Area (Bartelink 2006; 2009b).

MATERIALS AND METHODS

Sample preparation was conducted in the Stable Isotope Preparation Laboratory at California State University, Chico. Approximately 2-3 g of bone was sampled for stable isotope analysis. The “collagen” fraction was extracted using the hydrochloric acid chunk procedure and involved treating the sample with a 0.25 M hydrochloric acid solution until demineralized (Ambrose 1993; Schwarz and Schoeninger 1991). The collagen pseudomorph was soaked for 24 hours in a 0.125 M sodium hydroxide solution to remove humic contaminants. The sample was then solubilized in pH≈3 water and then freeze-dried in a glass scintillation vial. Collagen δ¹³C and δ¹⁵N was measured by continuous-flow mass spectrometry (PDZ Europa ANCA-GSL elemental analyzer interfaced to a PDZ Europa 20-20 isotope ratio mass spectrometer) at the Stable Isotope Facility, under the direction of Dr. Joy Matthews, in the Department of Plant Sciences at the University of California at Davis. The percent collagen yield and atomic C/N ratio fell within the range of well-preserved collagen (DeNiro 1985; van Klinken 1999).

The bone apatite sample was ground into a powder using a steel mortar and pestle, and then sieved through fine mesh screen (200 µm). The organic “collagen” was removed with a 48 hour treatment of 1.5 percent sodium hypochlorite solution, replaced once at 24 hours using a 0.04 ml solution/mg sample ratio (Koch et al. 1997). The powdered apatite sample was then treated with a 1.0 M acetate-buffered (pH≈4.5) acetic acid solution for 24 hours (replaced once at 12 hours) to remove soluble contaminants (using a 0.04 ml solution/mg sample ratio). The δ¹³C value was measured at the Stable Isotope Laboratory using a GVI Optima Stable Isotope Ratio Mass Spectrometer, under the direction of Dr. Howard Spero, Department of Geology, U.C., Davis.

RESULTS AND INTERPRETATION

General Comparisons: Stable Carbon and Nitrogen Isotopes of Bone Collagen

Table 4-1 presents the stable carbon and nitrogen isotope values for “White Salt Man” (Burial #1) from CA-SMA-267. The δ¹³C value was -18.8‰ and the δ¹⁵N value was 8.8‰, which overlaps with diets composed mainly of C₃ terrestrial proteins and freshwater fish. The δ¹³C value of -13.8‰ and Δ¹³Capat-coll value of 5.0 indicates that the source of the dietary protein was more depleted in ¹³C than the whole diet, consistent with consumption of C₃ terrestrial protein sources from plants and animals, and also freshwater fish. Marine foods appear have been a smaller component of the diet relative to terrestrial foods.
Table 4-1: Stable Isotope Values from CA-SMA-267

<table>
<thead>
<tr>
<th>Burial No.</th>
<th>Sex</th>
<th>Age-at-Death</th>
<th>$\delta^{13}$C_{apat} (‰)</th>
<th>$\Delta^{13}$C_{apat-coll} spacing (‰)</th>
<th>$\delta^{13}$C_{coll} (‰)</th>
<th>$\delta^{15}$N_{coll} (‰)</th>
<th>C/N ratio</th>
<th>Coll Yield (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>Adult</td>
<td>-13.8</td>
<td>5.0</td>
<td>-18.8</td>
<td>8.8</td>
<td>3.29</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Figure 4-1** plots stable isotope values for a number of economically important plant and animal resources from central California. The data for animals represent adjusted “meat values”, and account for published diet-to-tissue fractionation offsets between meat and bone collagen. The individual boxes represent minimum and maximum values for different food resources from central California based on archaeofaunal and modern faunal and floral data reported in Bartelink (2006). Because freshwater fish are poorly characterized for California, the box model represents variation identified from a number of regions. The modern plant and animal carbon isotope values are corrected by +1.5‰ for the “Suess Effect” (i.e., the depletion of atmospheric $\delta^{13}$C due to fossil fuel burning) to bring values in line with the prehistoric food web. The plot shows clear differences between marine and terrestrial resources and also demonstrates the stepwise increase in nitrogen isotope values along the food web. This model should be considered an approximation of the isotopic composition of available food resources due to limited sample representation of some key food resources.

For stable carbon isotopes, human collagen $\delta^{13}$C values should be ~5‰ higher than the source of dietary protein due to the fractionation offset between diet and bone collagen (**Figure 4-1**). This assumes that the $\delta^{13}$C of dietary protein is equal to that of the whole diet; thus, marine food consumers will have diet to collagen offsets higher than 5‰, slightly expanding the range of possible resources consumed. Adding 5‰ to the human collagen value, Burial 1 overlaps primarily with terrestrial herbivores, freshwater fish, and $C_3$ plants. For $\delta^{15}$N, human collagen values should be ~3‰ higher than the source of dietary protein due to the trophic level effect. Subtracting 3‰, Burial 1 again overlaps with terrestrial herbivores and freshwater fish (**Figure 4-1**). Resources, such as ducks and geese, may overlap with both terrestrial and marine foods, and may also have been important dietary resources.

**Regional Comparison**

**Figure 4-2** plots the stable carbon and nitrogen isotope value for the CA-SMA-267 “Caliche Man” burial with data from several late Holocene sites from the Santa Clara Valley, the eastern shore of San Francisco Bay, and the Sacramento-San Joaquin Delta of the Central Valley (Bartelink 2006, 2009a, b, 2010; Bartelink and Wright n.d.). The linear correlation of $\delta^{13}$C and $\delta^{15}$N values for San Francisco Bay Area sites indicates a high level of dietary variation in marine versus terrestrial resource consumption in the region, with dietary input coming from both ecosystems. The individuals in the upper right quadrant of the plot consumed diets focused mainly on marine protein, while those from other Bay Area sites consumed greater amounts of terrestrial protein.
Figure 4-1: Reconstructed Stable Carbon and Nitrogen Isotope Values for Dietary Resources in Central California (from Bartelink 2006, 2009b)

[Note: The red dot represents the adjusted diet-to-tissue range of δ¹³C and δ¹⁵N values for human bone collagen]

Figure 4-2: Stable Carbon and Nitrogen Isotope Values for the CA-SMA-267 Burial (large black circle) Compared with Other Late Holocene Humans from Central California
[see Bartelink 2006, 2009a, b]
The Loškowiš 'Awweš Táareš [White Salt Man] burial from CA-SMA-267 plots along the marine-terrestrial San Francisco Bay Area line, and overlaps with Middle to Late Period burials from sites along the lower eastern bayshore (CA-ALA-328: Patterson Mound, CA-ALA-329: Ryan Mound) [Figure 4-3]. The $\delta^{13}C$ and $\delta^{15}N$ values are substantially lower than Early Period and Middle/Late Period burials from upper east bay sites, such as CA-ALA-307 (West Berkeley Mound) and CA-ALA-309 (Emeryville Shellmound), where high trophic level marine proteins were consumed in much greater quantities (Bartelink 2006b, 2009). Similar to other sites from the San Francisco Bay Area, the isotope values do not overlap with the more terrestrially-focused diets found in the Sacramento-San Joaquin Delta. The fact that the CA-SCL-267 values plot on the marine-terrestrial line with other Bay Area sites suggests that some marine protein sources were consumed, consistent with low trophic resources such as shellfish, or small amounts of marine fish, and/or freshwater fish. This interpretation is based on the fact that the consumption of different combinations of isotopically distinct food resources can result in identical isotope values.

![Figure 4-3: Temporal Comparison of Stable Carbon and Nitrogen Isotope Values for the CA-SMA-267 Burial Compared with Other Late Holocene Humans from Central California](image)

[see Bartelink 2006, 2009a, b]

A more recent dietary model proposed by Kellner and Schoeninger (2007) plots separate regression lines for the correlation between collagen and apatite $\delta^{13}C$ for C3, C4, and marine-based diets. This model is based on modern fauna and the regression lines are not adjusted for the Suess Effect; thus, 1.5‰ was subtracted from the archaeological carbon isotope values to adjust to modern atmospheric conditions. An updated version of this model combines the C4 and marine lines due to overlap in these diets (see Froehle et al. 2010).
Figure 4-4 plots the stable carbon isotope values of apatite and collagen for the Loškowiš ’Awweš Táareš burial with data from several late Holocene sites from the Sacramento-San Joaquin Delta of the Central Valley and the eastern shoreline of San Francisco Bay. Comparison of the apatite and collagen δ^{13}C values with the two regression lines (C_{3} protein and C_{4}/marine) provides a more complete reconstruction of the diet. Humans that fall along the C_{3} line obtained their dietary protein from terrestrial animal resources and/or freshwater fish, while those who are shifted toward the marine line consumed significant amounts of marine protein. The stable carbon isotope values of collagen and apatite provide support for the consumption of a mixed diet of marine and terrestrial proteins, with terrestrial C_{3} plants comprising a large component of the diet (Note: The Loškowiš ’Awweš Táareš burial falls closest to the C_{3} terrestrial line). This indicates that the CA-SMA-267 burial is very distinctive from other Early Period burials from the upper east Bay Area (e.g., CA-ALA-307: West Berkeley Mound), but similar in diet with most of the burials from neighboring CA-SCL-287/CA-SMA-263 [Bartelink in Leventhal et al. 2010].

![Figure 4-4: Plot of the Apatite and Collagen Stable Carbon Isotope Values for the CA-SMA-267 Burial Compared with Other Late Holocene Humans from Central California](image)

**SUMMARY**

The stable isotope analysis of the Loškowiš ’Awweš Táareš burial from CA-SMA-267 indicates a diet composed of both terrestrial and marine protein sources. These values overlap with Middle and Late Period prehistoric humans from sites along the lower eastern shore of San Francisco Bay and the Santa Clara Valley, but are distinct from burials analyzed from the upper eastern shore of the bay and from the Sacramento-San Joaquin Valley. Stable carbon and nitrogen isotope data of bone collagen indicates that the individual mainly consumed terrestrial (e.g., herbivores, C_{3} plants) and/or freshwater fish resources, with some contribution of marine protein (e.g., shellfish such as Bay Oyster, California Horn Snail, Bay Mussel and marine fish).
ACKNOWLEDGEMENTS

I would like to acknowledge Rosemary Cambra, Chairwoman of the Muwekma Ohlone Indian Tribe of the San Francisco Bay Area and President of Ohlone Families Consulting Services and the Muwekma Ohlone Tribal Council for their permission to conduct this study. This important research could not have been conducted without their blessing and support. Special thanks are owed to Alan Leventhal of SJSU for his dedication and support of this research, as well as his valuable insights on California prehistory.
Chapter 5:
Analysis of Stone Artifacts, Faunal and Shellfish from CA-SMA-267
by
Alan Leventhal, Rosemary Cambra and Diane DiGiuseppe

INTRODUCTION

The recovery excavation at prehistoric site CA-SMA-267 yielded only a small assemblage of artifacts, vertebrate faunal, and shell fish remains. As a result of this limited recovered sample it is not suitable for any meaningful statistical analysis. However, the site did provide some species of significance in determining aspects of the local paleoenvironment. The faunal/shellfish remains were derived from four different contexts: 1) controlled excavation test units, 2) burial/grave locus, 3) monitoring of backhoe trench excavations, and 4) isolates (isolated finds from disturbed context). See Appendix C for Artifact Catalog.

ARTIFACTS: LITHICS, UNMODIFIED COBBLES AND BAKED CLAY

Flaked Stone

For purposes of this analysis, all flaked stone materials were individually reviewed under a Bausch and Lomb 10.5x - 45x variable stereoscopic microscope and a 150 watt incandescent lamp for any evidence of use/wear patterns and retouch modification. All materials were then weighed on an Ohaus triple-beam balance scale and measured with a Mitutoyo Digimatic metric caliper. All damaged and pristine edge angles were determined by using a Ward's Contact Goniometer.

Only one flaked stone artifact was recovered from the site and it was recovered just below the Loškowiš ʿAwweš Táareš burial at a depth of 109 cm Below Surface (BS). Specimen 6-14 is a utilized flake made in a flake of red Franciscan chert. This utilized flake exhibits two distinct Edge Units (EU’s). Edge Unit 1 (EU1) is straight to slightly concave that exhibits unifacial crushing and stepped-fractures located on the left lateral edge (ventral view). The Pristine Edge Angle (PEA) measured with a goniometer ranged from 34° to 39°. The Damaged Edge Angle (DEA) ranges from 67° to 78°. EU1 length measures 10.8 mm.

Edge Unit 2 (EU2) is straight and is located on the left lateral edge (dorsal view). EU2 exhibits unifacial retouch and slight nibbling and measures 10.2 mm. The PEA measures 37° to 42° and the DEA ranges from 84° to 85°. The bulbar length of utilized flake tool measures 20.1 x 25.0 x 4.2 mm and it weighs 2.2 grams.

Based upon the type of were patterns (unifacial crushing and stepped-fractures) EU1 was probably employed in a scraper-like fashion of somewhat resistant material such as wood, shell or even bone. EU2 was also probably employed in scraper-like fashion perhaps used in processing fibrous materials (Figure 5-1).
Unmodified Cobbles (Manuports)

Unmodified cobbles and cobble fragments were encountered within several of the strata. In **Stratum II Sub-Road Bed (17-32 cm BS)**, a total of nineteen (19) pebbles and cobble fragments were encountered from 26-30 cm BS. These pebbles and cobble fragments were of sandstone, rounded to sub rounded, with some split perpendicular to the longer axis (**Figure 5-2**). Some exhibited slight blackening from possible exposure to fire however they were not classified as fire cracked rocks. All were carefully reviewed and with the exception of two specimens (**Specimens 3-1**), they were discarded after analysis.
In **Stratum IV (44-85 cm BS)** a total of four (4) unmodified sandstone cobbles were recovered. None appeared to be either modified or affected by fire.

Within **Stratum V (85 -103 cm BS)** which we identify as the “Burial Zone” at least seventeen (17) rounded to sub-rounded sandstone cobbles and cobbles fragments and pebbles as well as and one (1) red Franciscan chert cobble were recovered (Specimens 1-7). These were reviewed and six were retained as burial associated. Although non-exhibited any deliberate modification, several did exhibit fire blackening (Figure 5-3).

![Figure 5-3: Sandstone and Chert (lower right) Cobbles Associated with Burial](image)

Below the Loškowiš ’Awweš Táareš burial **Stratum V** continued to a depth of 135 cm BS. A total of twenty (20) unmodified sandstone cobbles fragments and pebbles were recovered weighing 1732.6 grams and fifteen (15) retained (Specimens 6-8). None of these cobbles fragments exhibited any evidence of modification or exposure to fire.

From the backhoe backdirt pile 137 cobbles, cobbles fragments and pebbles were recovered weighing in excess of 2.5 kg (Specimens 8-2). Of these approximately 98% were of fine grained sandstone with only a small percentage exhibiting exposure to fire. 1.5% were of Franciscan chert and .5% quartzite. After carefully review in the lab all were de-accessioned.

**Baked and Vitrified Clay**

Baked and vitrified clay fragments were recovered from **Stratum III (32-44 cm BS)** [Specimens 4-1], **Stratum V 85-103 cm BS** (associated with the Loškowiš ’Awweš Táareš burial) [Specimens 1-6] and below the burial, also from **Stratum V (103-135 cm BS)** [Specimens 5-4, 5-5, 5-6, 5-7 and 5-13]. Five (5) additional pieces of baked clay were also recovered from the backhoe backdirt pile (Specimens 8-1) [see Figures 5-4 – 5-6].
Figure 5-4: (Specimens 4-1) Baked Clay from Stratum III (32-44 cm BS)

Figure 5-5: Specimens 1-6 Baked Clay Associated with the Burial

Figure 5-6: Specimen 6-5 Vitrified Clay from Stratum V below Burial (103-135 cm)
From the backhoe backdirt pile 5 large pieces of baked clay were recovered weighing 58.8 grams (Specimens 8-2).

FAUNAL AND SHELL FISH ANALYSIS

Methods

Faunal and shell fish remains were recovered using ¼ inch and at times ⅛” mesh screens. The remains were carefully bagged by location and level in the field and later washed, sorted and placed in labeled baggies at the San Jose State University Anthropology Lab. Each recovered element from each unit, level, trench and other discrete context, was issued a catalog reference and specimen number (e.g. Burial 1 Reference #1-1, 1-2, 1-3 and etc.).

Only two vertebrate faunal remains were recovered from all four contexts. Specimens 1-4 comprising two long bone fragments from a *Thomomys botta*, (Botta pocket gopher), *Sciurus griseus* (western grey squirrel), and *Sciurus niger* (fox squirrel) were recovered from within the Burial Zone (Figure 5-7). No further identification to either genus or species was attempted. Neither of these two specimens exhibited any signs of cut marks or exposure to fire.

![Figure 5-7: Long Bone Fragments from Rodenta](image)

**Figure 5-7: Long Bone Fragments from Rodenta**

Shellfish Species Identification [see Appendix C for counts and weights]

Shellfish was the most abundant ecofactual material recovered from this burial locus. Shellfish remains were encountered in the following Strata:
Stratum III (32-44 cm BS) yielded 340 + Ostrea lurida (Bay Oyster), 51 Cerithidea californica (California Horn Snail), and 1 Penitella pineta (Boring Clam) shells (Figures 5-8 - 5-10)

Figure 5-8: Sample of Ostrea lurida from Stratum III

Figure 5-9: Sample of Cerithidea californica from Stratum III
Stratum IV (44-85 cm BS) yielded 71 *Ostrea lurida* (Bay Oyster), 7 *Cerithidea californica* (California Horn Snail), 7 *Mytilus edulis* (Bay Mussel) and 1 *Penitella pineta* (Boring Clam) shells (Figures 5-11 - 5-14).
Figure 5-12: Sample of *Cerithidea californica* from Stratum IV

Figure 5-13: Sample of *Mytilus edulis* from Stratum IV
Stratum V (Burial Zone 85 – 103 cm BS) yielded 81 Ostrea lurida (Bay Oyster), 15 Cerithidea californica (California Horn Snail), and 4 Mytilus edulis (Bay Mussel) shells (Figures 5-15 - 5-17).
The lower portion of Stratum V (103-135 cm BS) immediately below the burial yielded twenty-nine (29) Ostrea lurida, four (4) Cerithidea californica, and one (1) crab claw (Cancer sp?) [Figure 6-18].
A total of ten (10) uniformly sized very small clam shells were recovered from the backhoe backdirt pile (Specimens 8-4), but these appear to be of recent deposition.

**Conclusion**

Shellfish Remains: Bay and Ocean Marine Shellfish Species from CA-SMA-267

The remains from several species of Bay shellfish were identified and recovered from the several archaeological recovery contexts at CA-SMA-267. All of the following species are considered as a food resource (non-ornamental shell) in order of prevalence: 1) *Ostrea lurida* (Bay Oyster), 2) *Cerithidea californica* (California Horn Snail), 3) *Mytilus edulis* (Bay Mussel), 4) *Penitella pineta* (Piddock/Boring Clam) and 5) *Cancer sp.?* (Crab claw).

Of these recovered shellfish species four of these 1) *Ostrea lurida* (Bay Oyster), 2) *Cerithidea californica* (California Horn Snail), 3) *Mytilus edulis* (Bay Mussel), and the crab (*Cancer sp.?*) were harvested from the San Francisco Bay waters and surrounding wetlands.

The *Penitella pineta* (Piddock/Boring Clam) was most likely harvested along the Pacific coastal waters.

The preserved shellfish remains indicates that shellfish comprised an important contribution to the Loškowiš *‘Awweš Táareš [White Salt Man’s]* diet during his life span over 4000 years ago when the San Francisco Bay had matured sufficiently to support a diversity of marine shellfish life.
INTRODUCTION

After the Burial and Archaeological Data Recovery Program was completed it was determined that no temporally diagnostic artifacts were recovered from the Loškowiš ’Awweš Táareštak [White Salt Man] Site, nor was there a sufficient amount of non-suspicious (possibly intrusive charcoal) available to submit for a radiometric assay. A decision was made by the Muwekma Ohlone Tribal leadership to select and submit a small amount of bone fragments for Accelerator Mass Spectrometry (AMS) dating in order to obtain information about approximately how long ago Loškowiš ’Awweš Táareš died, and therefore, date the age of his burial and the site.

On March 19, 2007, a small sample of bone was packaged up and sent to the University of Arizona’s NSF - Accelerator Mass Spectrometry Laboratory at Tucson for AMS dating. An uncorrected radiometric assay (AA7479) of $3713 \pm 51$ years BP (Before Present) was obtained on October 9, 2007 (Appendix D).

OFCS Staff Archaeologist Alan Leventhal entered the uncorrected date into the Calib 6.0.1 Radiocarbon Calibration dating correction program. As a result, the temporal placement, at the two Sigma level with a 95% probability, spans from 2212 BC to 1955 BC. The midpoint within this time range is calculated to 2084 BC.

Independently, Leventhal ran the online Cologne Radiocarbon Calibration and Paleoclimate Research Package (CalPal) which yield a corrected date of $2115 \pm 73$ BC (Calendric Age cal BP: $4065 \pm 73$) which places it very close to the midpoint of the time span result obtained through the Calib 6.0.1 program.

If we accept the Calib 6.0.1 corrected midpoint date of 2084 BC and we place this date within the Bennyhoff and Hughes (1987) Temporal Scheme B1, then this person died during the upper Windmiller A Phase within the Early Period. If we consider the 2212 BC to 1955 BC time span under Scheme B1, then this individual’s death occurred between the upper Windmiller A Phase within the Early Period and (lower) Windmiller B1 Phase within the Early Period (Figure 6-1).

If we place the 2084 BC date within the Temporal Scheme D proposed by Groza (2002) and Hughes and Milliken (2007), then Loškowiš ’Awwëš Táareš died most likely during the proposed L2 Bead Horizon Period (see Dating Schemes B1 and D below).

Regardless of which Temporal Scheme we employ, it is clear that Loškowiš ’Awwëš Táareš [White Salt Man] died towards the upper part of the Windmiller A Phase within the Early Period, around 2084 BC.
TEMPORAL PLACEMENT WITHIN GEROW’S PROPOSED EARLY BAY COMPLEX/CULTURE

Perhaps more accurately due to its location on the West Bay, the Loškowiš ’Awwé Táareš burial from CA-SMA-267 dates to what Gerow with Force (1968) identified as the Early Bay Complex/Culture (also see Moratto 1984). Gerow analyzed the skeletal remains and over 3000 artifacts associated with 35 of the graves from the University Village Site (CA-SMA-77) located approximately 6/10 of a mile to the northeast from CA-SMA-267. Gerow obtained a suite of uncorrected dates on charcoal and human bone that ranged from $3400 \pm 300$ to $2630 \pm 150$ Before Present (BP). Entering these dates into the Calib 6.0.1 program the resultant corrected dates span from $1744 \text{ BC}$ to $763 \text{ BC}$.

Based upon his skeletal analysis and radiocarbon dates Gerow questioned the then current use of the Central California Taxonomic System (CCTS) that was developed from sites located in the Sacramento and San Joaquin Delta region and then that system was projected onto the San Francisco Bay Area. Gerow noted in his study that the University Village burial population was older than the “Middle Horizon” sites identified in the Delta, and the older dates from CA-SMA-77 were contemporary with some of the “Early Horizon” sites defined under the CCTS. Furthermore, he argued that the University Village population were also physiological different from those burials derived from the Early Horizon Windmiller sites of the Delta. As a result of interpreting his comparative biological data Gerow proposed a regional temporal alternative to the CCTS that accommodated the distinctions between the Bay and the Delta regions. He argued that the University Village Complex belonged to a contemporaneous “Tradition” which he termed Early Bay Culture.

Furthermore, Gerow also forwarded his proposed model of biological and cultural “Convergence” between the Sacramento Delta and the San Francisco Bay regions. Gerow's Convergence Model was formulated from his archaeological findings at University Village Complex (CA-SMA-77), along the San Francisquito Creek in San Mateo County (also see Gerow 1974). In his study Gerow argued that:

… analysis of the data . . . led to the conclusion that the cultural assemblage at University Village was demonstrably earlier than any well-knit complex described in print for the Bay region. Equally important, these new data failed to harmonize in a number of fundamental points with current ideas of culture change, population change, and temporal relationships in Central California archaeology [Gerow with Force 1968:8].

In developing his Convergence Model Gerow suggested that:

Since 1948 or earlier the San Francisco Bay has been viewed as a local marginal and impoverished manifestation of cultural succession or development in the Sacramento-San Joaquin Delta region, with differences explainable in terms of local ecologic adjustments over a period of three to four thousand years [Heizer 1964]. The Central California Taxonomic System and its supporting typological criteria have gathered strength from this assumption.
The University Village complex is not explainable in terms of this assumption. Cultural and populational differences between the Bay and Delta regions were greater around 1500-1000 B.C. than later. Some of these differences extend beyond Central California and their interpretation requires a broader perspective than that provided by the stratified Windmiller site in the Delta region [Gerow with Force 1968:10].

Previous interpretations of culture and population change within Central California have employed a unilinear model of succession or development through time, with contemporaneous regional differences explainable in terms of local ecologic adjustments. We feel that a model of convergence is more compatible with the archaeological record.

In order to shed light on behavior patterns and cultural dynamics (stability and change), we have not hesitated to utilize the conclusions of ethnology, physical anthropology and linguistics. However, these are at a much higher level of abstraction and are not stressed in the present study. . . . our central thesis [is] of two cultural traditions and populations in Central California at a relatively early date. The principal contrasts which we are able to define at the present time are between a generalized food collecting, fishing and hunting tradition associated with a metrically smaller, lower vaulted population, and a specialized hunting tradition associated with a metrically larger, higher vaulted population. We believe that the former is older in California, and may reflect early Hokan speakers in contrast to the latter, who may have been Penutian speakers [Gerow with Force 1968:13].

In a somewhat alternate perspective Moratto in his California Archaeology he suggested that:

The position taken here is that the University Village Complex is an expression of the Sur Pattern [Pacific Coast/Monterey Bay Region] strongly influenced by the Berkeley Pattern. Thus, SMA-77 is seen as a relict Hokan settlement in contact with early Costanoan populations. The Berkeley Pattern then represents Utian [Miwok-Costanoan] cultural developments and geographic spread throughout the Bay and northern Central Coast regions (Moratto 1984:279).

Hylkema (2007) in the Cooley Landing EIR cultural resources study he summarized some distinctive aspects of these Early Bay Culture sites located in the South and West Bay region. The Cooley Landing project is located approximately 1.3 miles east of CA-SMA-267. Hylkema wrote:

Along the Bay Shore in close proximity to the project area [Cooley Landing], three finds stand out as intriguing clues to Middle Holocene times. The first find, from the City of Sunnyvale, consisted of the skeletal remains of a woman dated to 4460 + 95 BP (Bickel 1978). The second and third finds consist of two burials from the banks of San Francisquito Creek in the City of Palo Alto (SCL-33; Garaventa et al. 1983). These burials are popularly known as Stanford Man II and I. The Stanford Man II burial, dated to 4400 + 270 and 4350 + 125 BP (Gerow 1974a: 241), had in association three large side-notched points with distinctive apiculate tips and diamond-shaped bases; all were made from coastal Monterey chert. These point forms probably represent an earlier, as yet undefined cultural tradition [Hylkema 2007:12].
... Gerow (1968) observed conflicting patterns between Windmiller assemblages and what he came to call the "Early Bay" culture, which was coined on the basis of his findings at SMA-77, the University Village site on the southern San Francisco Bay Shore. This site contained a mortuary complex with grave associated artifacts that were contemporary with Heizer's Early horizon (Windmiller) of the Central Valley, but the burials were flexed instead of extended. ...

Comparative anthropometric studies lead Gerow to conclude that the people who occupied the Bay area had different physical characteristics and a different cultural tradition than people from the Delta-Central Valley. He proposed the recognition of an Early Bay pattern within the broadly defined "Early horizon." Further, he observed that his Early Bay pattern was similar to the early cultures of the southern California coast. Gerow (1974b) argued that the two opposing cultural traditions co-existed but became more similar later in time, and eventually converged. In retrospect, Gerow's conclusions about an Early Bay coastal affinity appear to have been correct, although the affinity was not as geographically distant as he had envisioned. Certainly the contracting-stemmed points from SMA-77, made from Monterey chert, are the archetype for Año Nuevo Long-stemmed points the dominant form at Middle Period coastal sites of San Mateo and Santa Cruz Counties (Hylkema 1991) [Hylkema 2007:20-21].

OTHER DATED EARLY BAY CULTURE SITES

Also located nearby the Loškowiš 'Awweš Táareštak [White Salt Man Site] (CA-SMA-267) are several other dated Early Bay Culture sites. These include as discussed above the Stanford Man I and Stanford Man II (CA-SCL-33) burial sites which yielded an uncorrected date of 5130 ± 70 BP (see Map 6-1). The Stanford Man I and II sites are located along San Francisquito Creek approximately 2.7 miles to the southwest of Loškowiš 'Awweš Táareštak (CA-SMA-267).

Another site that recently yielded an early date on a burial is Yuki Kutsuimi Šaatoš Inûx [Sand Hill Road] Sites CA-SCL-287 and CA-SMA-263 (Leventhal et al. 2010). Actually comprising a single site that crosses the Santa Clara/San Mateo County boundary, this complex is also located adjacent to San Francisquito Creek within the Stanford Golf Course area parallel to Sand Hill Road. The Yuki Kutsuimi Šaatoš Inûx site is located approximately 3.7 miles to the southwest of Loškowiš 'Awweš Táareštak [White Salt Man Site] (see Map 6-1 below).

A recent collagen date obtained by Buonasera (2011) on Burial 04-14 yielded an uncorrected collagen date of 3787 ± 53 BP. Employing the Calib 6.0.1 calibration program the corrected date at the 2 Sigma, ranges from 2351 BC – 2113 BC giving a midpoint date of 2232 BC (also see Leventhal et al 2010 on the AMS dating of the site).

CA-SCL-623 is a deeply buried cemetery (up to 11+ feet BS) was uncovered on Stanford Campus. Located between Stanford Man I and Stanford Man II sites along the south side of San Francisquito Creek, recent AMS dating on collagen date these burials from 1959 BC to 3172 BC.
MAP 6-1: Location of Some Early Bay Dated Sites Along the San Francisquito Creek
CA-SCL-354 located in Los Altos Hills was salvaged by Foothill College in the early 1970s. Located nine miles southwest of CA-SMA-267 along Adobe Creek and adjacent to O’Keefe Lane, Harry Nelson submitted a sample of human remains to UC Riverside for C14 dating. The resultant corrected date yielded a midpoint date of 1543 BC. More recently in August 2007 the Santa Clara County Water District conducting a clean-up the Adobe Creek drainage discovered a human femur in the side wall. A sample of bone was sent by OFCS to Arizona State University’s NSF Radiocarbon lab which yielded an uncorrected date of 3741±56 BP. This date was subjected to the Calib 5.0.1 correction program and it yielded a mid-point date of 2141 BC.

The Sunnyvale Red Burial (CA-SCL-832) located in downtown Sunnyvale is located at a distance of 9.7 miles to the southeast of CA-SMA-267. A date on charcoal below the burial yielded an AMS date of 4830 ± 40 BP. Cartier (2002) suggests that this date is “calibrated to 3670 – 3620 BC (5620-5570 cal BP), Early Period and Archaic, respectively” (Cartier 2002:51).

Another unrecorded Sunnyvale burial site was excavated and dated by Gerow (1981). The two uncorrected dates obtained on human collagen and charcoal was 2440 BC and 2510 BC.

CA-SMA-273 is a cemetery site located 12 feet below the present level of the bay. In 1987 the remains of a ten year-old child was dredged up from the Coyote Point Marina located approximately 13 miles to the northwest of CA-SMA-267. The Muwekma Tribe funded the C14 dating of this child and the mid-point of the corrected date dates to 2306 BC (Leventhal et al. 1987)

Based upon a review of available C14 dates from other sites within the west San Francisco Bay region, Loškowiś ’Awweš Táareš [White Salt Man] was probably living around the time when these other sites were either “occupied” as villages or served as cemeteries:

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Comparative Dates from Other Early West Bay Sites</th>
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<tr>
<td>CA-SCL-33 (Sta. Man II)</td>
<td>2400 BC (uncorrected) Collagen (Burial) UCLA Gerow 1974</td>
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<tr>
<td>CA-SCL-33 (Sta. Man II)</td>
<td>2450 BC (uncorrected) Collagen (Burial) UCLA Gerow 1974</td>
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<td>CA-SMA-263 (Burial 24)</td>
<td>3777±58 (corrected) Collagen (Burial) NSF Arizona Buonasera 2012</td>
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<td>1959 BC (corrected) Collagen (Burial) Beta Leventhal 2013</td>
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<td>CA-SCL-623 (Burial 9)</td>
<td>2739 BC (corrected) Collagen (Burial) Eckert &amp; Ziegler Eerkens 2013</td>
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<td>CA-SCL-623 (Burial 12b)</td>
<td>2635 BC (corrected) Collagen (Burial) Beta Leventhal 2013</td>
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<td>2288 BC (corrected) Collagen (Burial) Eckert &amp; Ziegler Eerkens 2013</td>
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<td>3172 BC (corrected) Collagen (Burial) Eckert &amp; Ziegler Eerkens 2013</td>
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<td>1543 BC (corrected) Collagen (Burial) UC Riverside Nelson 1976</td>
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<td>CA-SCL-354</td>
<td>2141 BC (corrected) Collagen (Burial) NSF Arizona Leventhal 2008</td>
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<td>CA-SCL-832 (Burial 1)</td>
<td>3645 BC Charcoal Beta Cartier 2002</td>
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<td>Sunnyvale (no Site #)</td>
<td>2440BC Collagen (Burial) UC Riverside Gerow nd</td>
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<td>Sunnyvale (no Site #)</td>
<td>2510BC Charcoal I-6977 Gerow 1981</td>
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<td>SOUTHERN CALIF.</td>
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<td>Phase 2</td>
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Figure 6-1: Bennyhoff and Hughes (1987) Dating Scheme B1 and Scheme D [after Groza (2002) and Hughes and Milliken (2009)]