Archaeology and architecture: Spanish-era ruins along Bahía San Luis Gonzaga, Baja California

Eric W. Ritter
University of California

Modern visitors to Bahía San Luis Gonzaga have speculated about the rock foundations along the smaller Ensenada de San Francisquito (Figures 1 and 2). For instance, in Gerhard and Gulick's 1962 *Lower California Guidebook* (first printing in 1956) on page 84, they state:

> When explored by Jesuit Padre Fernando Consag in 1746, San Luis Gonzaga Bay was found uninhabited for lack of water, though frequently visited by Indians for fishing. In 1767, it became a supply point for the last Jesuit mission, Santa María, about 14 miles to the southwest. Ruins of a stone structure, likely a storehouse, dating from the mission period may still be seen near the shore of the bay.

During our expedition to this bay, local residents also suggested that the ruins, recorded as site Gonzaga 2, a location that had seen considerable relic collection and disturbances over the years, were from the Spanish era.

The full test of the ruin's age and function or functions lies with research into the Spanish chronicles, discussions with regional historians and historic archaeologists with interests in similar architecture from Spanish-Mexican times, consultations with long-term local inhabitants and visitors, research in various more recent documents, and archaeological excavations. Some of these efforts have been accomplished on a limited basis, including rather minimal archaeological excavations. More research could certainly be achieved, as well as more thorough testing of the ruins and associated deposits. Below is a discussion of what was achieved through the 2011 expedition (site documentation, site testing and surface collecting) and subsequent work and what can be proposed for the age and function of the foundation and associations.

Excavations

Site Gonzaga 2 lies on the southwestern shore of Ensenada de San Francisquito (Figure 1). The rectangular ruins measure 13.7 m in long and 8.6 m wide on the exterior. The 2011 interior dimensions, considering some wall collapse, are 10 m by 4 m. The wall height is 80 cm. A doorway lies on the eastern wall toward the south end, about 3 m wide, as seen in the accompanying figure (Figure 3). A review of a 1958 digital image of the ruins taken from a slide of Howard E. Gulick (University of California, San Diego, Special Collections MSS 91, Roll 17, Frame 13, Box 1, Folder 14) shows more complete stacked rock walls and a monument of rocks (topmost are whitewashed) on the center northern wall (Figure 4). It is likely that some of the rocks from the walls were utilized by the Mexican military, which built stone features and alignment nearby in the recent past, and that the original foundation was somewhat higher.

The archaeological excavations of the structure foundations during 2011 involved two test units, one in the north-central interior of the rectangular foundation (Unit 1) and the second along the inner eastern portion of the north wall (Unit 2) (Figures 3, 5). These units were purposively

Figure 1. Location map.

Figure 2. View of foundation, looking north.

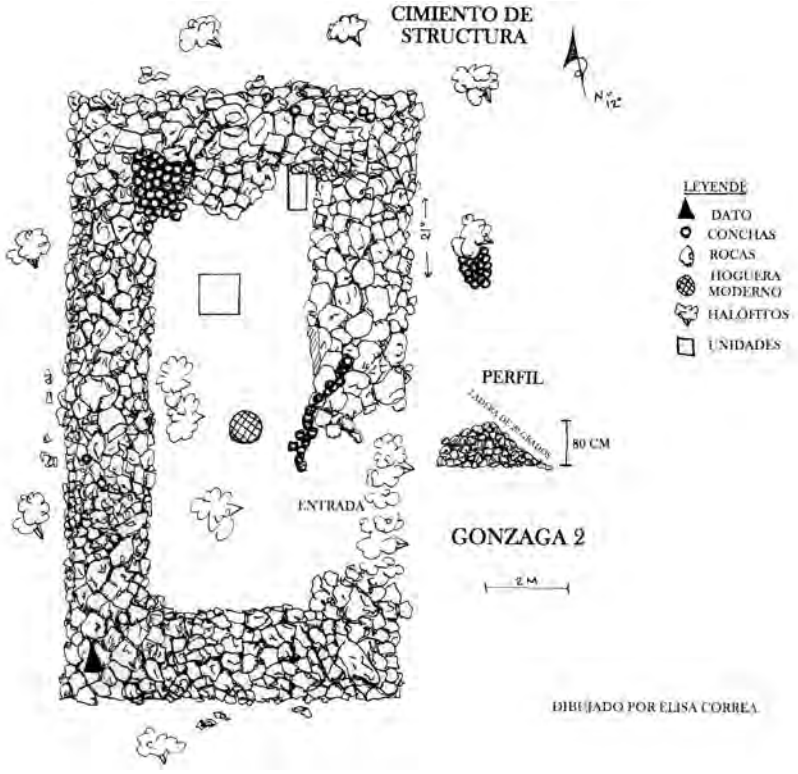

Figure 3. Plan view of foundation and excavation units.

Figure 4. Photo of ruins in 1958 by Howard Gulick.

Figure 5. Ruins under excavation.

Figure 6. Unit along northern wall ready for excavation.

placed to (1) examine the nature of the interior deposits, potential features and any associated cultural remains, and (2) assess the construction techniques of the foundation wall remnants.

The excavation units were oriented according to the alignment of the foundation (21° east of north), with metal pins set for string line corners (Figure 3). Excavation of Unit 1 followed the nearly flat ground contours, utilizing arbitrary 10-cm levels. There was a maximum of 4 cm difference in elevation between the highest and lowest corners. The unit was 1 x 1 m in size. Unit 2 was 1 x 0.5 m in size, with the length aligned similar to that of Unit 1 beginning at the top of the rubble wall and extending south onto the interior structure floor (Figure 3). This unit was excavated without arbitrary levels, to expose the wall-floor junction and determine foundation construction (Figures 6 and 7).

Unit excavation was undertaken with pointed trowels, small archaeology pick, whiskbrooms, plastic scoops and buckets. Removed materials were taken to a nearby $^{1}/_{8}$-inch (3-mm) screen over a plastic tarp for cultural items' recovery (Figure 5). For Unit 1, the 0-10-cm level sediments/soil were a gray (Munsell 10YR 6/1; dry), loose to slightly hard (crusty) gravelly sand. Recent trash, shellfish remains, and charcoal were found, with a few older cultural items discussed below.

In the 10-20-cm level, the soil/sediment changed in color to a pale yellow (Munsell 5Y 8/3), still sandy but finer in texture, with a greater silt/clay content (Figure 8). The soil/sediments were slightly hard and somewhat compacted, with large exfoliating and decomposing cobbles

Figure 7. Excavated north or seaward wall foundation.

Figure 8. West wall profile of Unit 1.

Figure 9. Stone pavement floor.

becoming exposed toward the bottom of the level. There were still a few modern artifacts present, as well as local marine shell fragments and small pieces of charcoal. The presence of pre-modern artifacts is discussed below.

In the final level, 20-30 cm, the soil/sediment became almost clay-like, hard, and similar in color with a pavement of large flattish, rounded cobbles likely representing a floor (Figure 9). It seems probable that fine sediments (silty-clay-like), maybe mixed with water and ground/baked caliche, were used as floor grout. The soil/sediments within the upper excavation levels appear to be materials washed and blown into the interior of the structure after abandonment along with wall debris. Bioturbation also appears evident from the modern artifact displacement and rodent activity near the structure.

Unit 2 was excavated with a trowel, paintbrush, whiskbroom, and dustpan. The soil/sediments were brown in color (Munsell 7.5YR 5/4; dry), fine sandy/silt and loose to slightly hard or compact. Loose sediments occur within the higher area of the unit around the foundation remnants. There are more compact sediments (like in Unit 1) toward the floor or lower level of the unit. Approximately 20-40 cm of soil/sediment covered the wall-floor interface. Volcanic pebbles and cobbles were abundant throughout the wall matrix. Shellfish remains and modern trash are also scattered throughout the wall matrix (see Figure 7).

Feature 1

While only a small portion of the interior of the structure foundation was excavated, there was the appearance at about 20 cm in depth of the rounded, flattish cobblestones—likely from littoral wave-smoothed rocks—that are rhyolitic and appear to represent a floor or pavement. The interstices are filled with fine sediment, and possibly even a thin layer of packed sediment had been placed over the cobbles as a compacted surface (Figure 9). However, it would seem that the stones were exposed during use to serve as a sturdy platform for storage and walking, but a compacted sediment placed over the stone platform cannot be dismissed. If the walls/foundations were originally cobbles/boulders consolidated with lime mortar (as discussed below) that has since leached out from exposure to the occasional rains onto the floor and/or there was an adobe upper wall that has "melted" away onto the floor and exterior, then perhaps this is one explanation for portions of the cobble covering.

Feature 2

A feature designation was applied to a segment of the Gonzaga 2 structure foundation, based on the excavation results revealed in Unit 2. Specifically, the unit excavation was focused on the wall, or lower wall, construction at the foundation level. The unit revealed (see Figure 7) that small volcanic boulders were situated at the floor level, while smaller boulders, cobbles and rubble fill (small cobbles, pebbles and sand) comprised the remainder of the wall/foundation support. This fill was between and on top of the larger cobbles and small boulders. A more complete discussion of the foundation type and support for a superstructure and the possible structure use, age and associations and comparative information is discussed below.

Reconstruction

Obviously, in the apparent absence of original illustrations or plans for this structure and any written documentation, we must rely on other information. This includes an older photograph, an assessment of the ruins and its associations and comparative information from scholars, literature, and an examination of drawings and studies of Spanish architecture from their New World expansion and even the architecture of Baja California's mission-era descendants who live in ranches scattered throughout the central peninsula.

One of the early lime mortar and stone construction techniques employed by the Spanish in their world colonialism is *mampostería*, in which masons mortared together stone rubble walls. While there are many examples throughout the world, including ones from Mérida, Mexico (Grimsrud 2011), Guam (Cunningham 2011; Jones 1976) and Puerto Rico (Jopling 1992) to list a few, suffice it to say that the Bahía San Luis Gonzaga walls seem similarly constructed. Rock, sand and water were easily available in the immediate surroundings. However, what about the lime for the mortar? There is an easy answer. Just a few hundred meters distant on the adjoining hill, there is a sizeable concentration of caliche that has been quarried in modern times and likely earlier, and it is easily accessible; a trail leading from near the ruins up the hill to the quarry a few hundred meters or so (Figure 10). This calcium carbonate-rich rock would need to be fired at a temperature of 900-1200°C to form the lime for the mortar binder (Walter 2010:72), as was the case at a mission in Texas and evident through the ruins of a caliche-burning kiln seen by this writer at Mission San Borja in the central peninsula. This lime was also used for plaster and

Figure 10. Trail and caliche quarry in the upper right of the photo.

whitewashing walls. While no kiln or burning area was noted in an incomplete survey, modern mining could have destroyed such a feature. Mixing the lime with seawater to form the mortar to hold together the sand and rock rubble walls seems highly likely. Eventually the mortar would have been leached out, leaving the rubble wall remnants of today and the more complete wall lacking evidence of mortar on the exterior walls as seen in the 1958 Gulick image (Figure 4).

There is a clear entrance, perhaps one that was fitted with a thatch or wooden door. The superstructure is projected to have been palm logs and palm thatch roofing and sides, possibly even walls of *petates* or woven palm fronds or carrizo (*Arundo donax*) much like you see at modern or historic ranches in the central peninsula sierra (Crosby 1974: 63, 127, 1981:5, 79, 93, 139, 179). Split carrizo stems may have also been used in wall construction. Drawings of peninsula settlements by the Jesuit priest Ignacio Tirsch in the 1760s offer at least possibilities of thatched open or boxed roof construction on more permanent dwellings (Nunis 1972:41, 45, 47), as in the Crosby rancho photos. Another example of possible dwelling superstructure type is the conceptual reconstruction of a 1565 Spanish encampment of structures at Seloy in Florida (Enright 2013:15). Jack Williams (1997:Figure 7) has offered a conjectural reconstruction of a substantial warehouse at the presidio of San Diego that includes a stone foundation and boxed roof construction with tile shingles. Furthermore, Williams (1997:45) notes that a visitor in 1779 to the San Diego presidio observed two warehouses measuring 14 and 22 varas long, the shorter one close in length to the building at Bahía San Luis Gonzaga depending on what Spanish measuring standard Williams employed, perhaps more than coincidental in line with building conventions of the time. Both

McCown (1955) at the warehouse at the Alta California Temecula *asistencia* and Farris (1997) at Mission La Purísima Concepción near Lompoc, California discuss mission-related warehouses and granaries that were considerably more substantial than what we are dealing with here, since they were situated at long-term residential locations. These structures, according to Farris (1997:14), had foundation wall thicknesses generally from 1 to 1.5 m thick. These walls were narrower than the current Gonzaga wall, although the wall decomposition at Gonzaga and the Gulick image indicate an original thinner foundation probably in agreement with those discussed by Farris and McCown above.

Communication with colleagues

In seeking information and ideas from various colleagues and local explorers, photos and a location were provided. Diana Guerrero, historic architect in Mexícali (personal communication 2011) with the Instituto Nacional de Antropología e Historia, does not believe the missionaries would have built anything other than missions at such high latitudes.

The late esteemed Baja California historian Dr. Michael Mathes, in an e-mail communication to the author (August 9, 2011), offered comments that are presented here:

> I don't think the Jesuits built much of anything at San Luis Gonzaga—from what I have studied on Calamajué and Santa María, Arnés (Jesuit priest Victoriano Arnés, founder and missionary at Santa María 1765-1768) had so much trouble trying to survive that and build at those sites that they did not have an opportunity to construct anything there. Clearly, from Calamajué they went through San Borja and thus Bahía de los Ángeles. This means San Luis Gonzaga was barely good seven months (May 1767-Jan 1768). Since whatever they got from Loreto was immediately needed when they went to San Luis Gonzaga to pick up supplies they took them directly to Santa María. Of course Santa María produced absolutely nothing to send out, there would be no need for a storehouse on the coast. These are documented facts. OK—what is it you have there if it is Jesuit? I would doubt very much that the Franciscans from Velicatá would take the time to build something since they were concentrated on getting to Alta California and moved most of their supplies by land via Velicatá en route to San Diego. I would thus figure the structures to be, at earliest, Dominican, although they did not depend as much on Loreto for Velicatá as they did on the missions to the north at El Rosario and Santo Domingo that were very productive. A better bet would relate them to 19th century mining activity in the region—I know it's not very exciting, but there is simply no evidence to show that the Jesuits, in the short time they used the bay, built anything there. As to building materials in the region, Arnés speaks of adobe and stone foundations and palm log beams and palm frond roofing. Also, in the arroyo of Cataviña where there is an abundance of palms, he speaks of building of palm poles without walls or walls of horizontal trunks thatched with fronds and with frond roofing. (He complains that the palm fronds were thick with rattlers at night.) Apparently these poles were just driven into the ground and the buildings—called barracks in the sense of Caribbean sleeping quarters—had no foundations or floor other than tamped earth or cobble. The Jesuits were there such as short time, there was no time to quarry. This is what I have so far.

A Baja California explorer and amateur historian, David Kier (personal communication

2012; web site http://VivaBaja.com) has offered his opinion of the structure and its function:

> I believe the Gonzaga warehouse to be of Franciscan construction, not Jesuit (and continued to be used by the Dominicans?)…. The reason is that the Jesuits were not at Santa María for more than a few months. Also, the other trail west from Gonzaga is called by modern historians (like Harry Crosby [1974:158]) the 'Father Serra Cargo Trail' … and yes it does not use the El Camino Real route until it joins with it about 3 miles west of the Santa María mission. I also believe the warehouse was designed more for the new Franciscan mission of San Fernando Velicatá … and not so much Santa María (which was reduced to a *visita* in status shortly after San Fernando became a mission).
>
> Modern El Camino Real traveler Teddi Botham has ridden (on mules) the Cargo Trail and Camino Real between Rancho Santa Ynez, Mission Santa María, and Bahía San Luis Gonzaga. It (Cargo Trail) is in Arroyo Las Palmitas which flows into Arroyo Alfredo that flows to Gonzaga at El Faro….
>
> I have hiked the El Camino Real up from the Gonzaga side several miles. It follows Arroyo Santa María along the top of the canyon's ridge and not in the canyon itself…. Serra used the canyon trail in 1769 (see below) as had the Jesuits before him (was an Indian trail), and it was impossible to use for cargo (or nearly so). Serra ordered a better route for the mission's Camino Real as well as a new road for supplying San Fernando from Gonzaga Bay….

Crosby (1974:158) notes that Fray Junipero Serra used Santa María "as a base from which he reconnoitered for a trail to Bahía San Luis Gonzaga. When he had caused a road to be built, supplies brought by boat from Loreto flowed over it." One can only believe that a landing location and building facility for supplies existed on the bay.

In a more recent work by Crosby (2003:48-51) regarding the expedition of Serra and others (i.e., Capitán Fernando de Rivera, Fray Juan Crespí, etc.) from Velicatá to San Diego and beyond to Monterey, the author cites documents supporting Bahía San Luis Gonzaga as a port and staging area for supplies for the Spanish land expeditions to today's Alta California. Crosby (2003:48-49) states that Santa María remained vital to the Monterey effort despite the establishment of the Velicatá mission.

> Supplies and equipment had arrived and would continue to arrive at Bahía de San Luis Gonzaga. All had to be guarded and protected from the elements. The mission, fifteen miles from the port, could serve as a temporary shelter and way point for pack trains that would have moved material from the bay to Velicatá.

Among the items presumably shipped were "quantities of corn, wheat flour, tobacco, cigars, muskets, and trinkets to trade with Indians" (Crosby 2003:217). These and later (and earlier) shipments would likely need temporary storage in the vast open bay until bundled onto pack animals for the trip to the interior and beyond. The structure foundations in question when complete would have served such a purpose, with easy access to both routes to the interior. Figure 11 is a reconstruction of what this building may have looked like.

Artifact associations

One of the sources to interpreting the structure's association, function, and age are the artifacts that occur in connection with it. This playa has seen activities for hundreds of years,

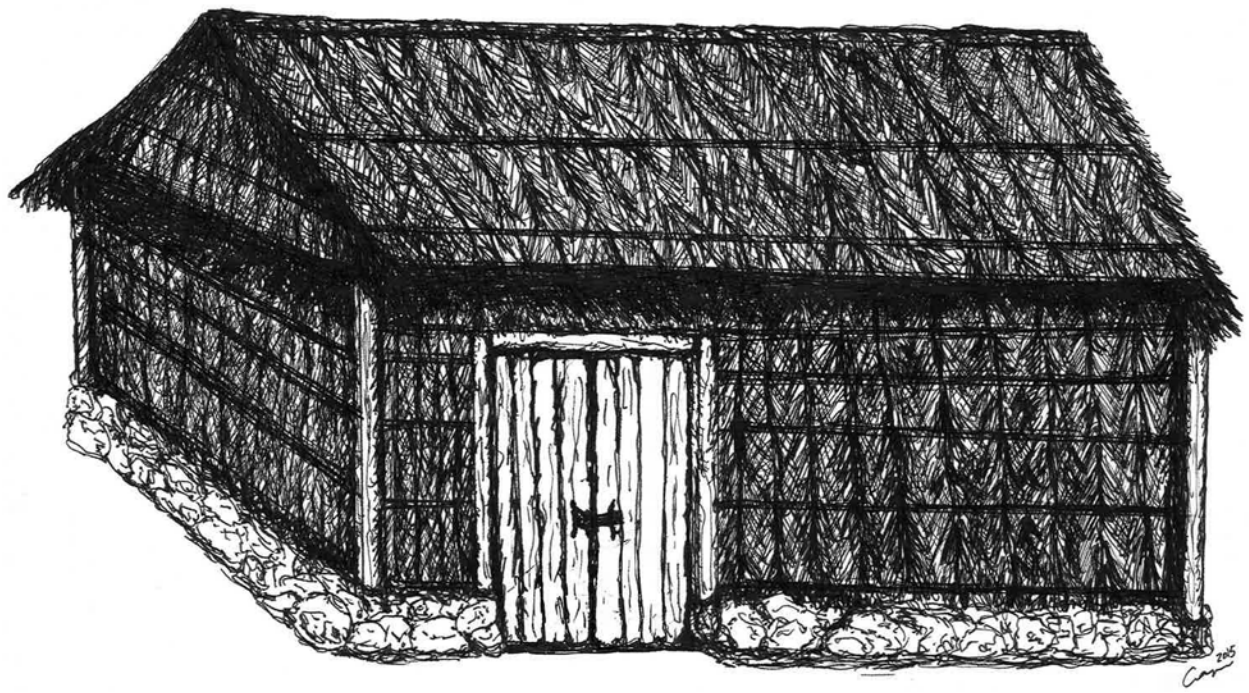

Figure 11. Reconstruction drawing of the building.

including a nearby prehistoric site that could include this structure location in its periphery. This has been a popular campsite and fishing station for years, attested by the current fish camp adjoining, tourists, and the cement foundations of a twentieth-century operation likely related to the fishing industry. Still, some of the artifacts in direct association were not found in an abbreviated inspection up the beach at the current fishing station nor on the prehistoric site's surface, especially pottery sherds.

Corroded nail or spike

This artifact was found in the center of the structure ruins in the 0-10-cm level of Unit 1. It was likely about 4-6 cm long, with a current corroded shank diameter of 8.29 mm and corroded head diameter of 11.8 mm. It was likely round in cross-section (Figure 12). The rapid deterioration of iron in this marine environment prevents a more accurate appraisal of the artifact in terms of hand-forged versus machine-made. Whether this was related to a superstructure or not is uncertain.

Sheet iron fragment

A corroded piece of ferrous sheet metal from the same unit and level as above is platy, exceeding 29.26 mm in length with a thickness of 5.06 mm. Its age and potential association are unknown without metallurgical analysis.

Basalt flakes

In all three excavation levels of Unit 1, there was recovered basalt flakes, three in the 0-10-cm level, five in the 10-20-cm level, and one beach cobble flake in the 20-30-cm level. The lengths of these flakes are 11.59, 11.9, 18.35, 25.37, 28.38, 28.57, 30.38, 32.47, and 34.73 mm respectively. All are hard-hammer percussion flakes from local cobbles, ranging from medium dark gray to dark gray in color (Munsell N3 to N4), irrespective of depth. Several appear very

Figure 12. Rusted ferrous spike or nail head and shank portion.

Figure 13. Green glass shard.

fresh, possibly modern, and several have beach cobble cortex remnants. It is possible that even in the foundation construction, some cobble/boulder trimming may have occurred, and it is conceivable that Indians involved in the construction and use manufactured or brought in flakes for use as well.

Green glass shard

A dark green glass sherd (16.74 x 15.42 x 1.96 mm) was recovered from the surface of the structure remnants. The curvature of the sherd suggests a vessel of 75.12 mm in diameter or possibly 3 in., as occurs among some modern wine bottles. The shard is pitted and weathered on all but one edge that has been recently broken (Figure 13). Without further analysis, this shard's connection to the ruins must remain uncertain.

Pottery Sherds

The most revealing artifacts are the 13 pottery sherds discovered around the periphery of the ruins. Discovering these mostly small sherds took careful scrutiny of the surface, sometimes on hands and knees. This location has likely been scavenged for artifacts for many years, including collection of larger pottery vessel sherds as well as other collectibles. Because of the generally small size of most of the sherds and weathering on some sherds, their characteristics (including overall surface color variability; paste, temper and inclusions; finishing; vessel type; size of vessel; construction technique; firing; thickness variability; rim configuration; etc.) are not always easily assessed. Attributes based on the sherds in hand are presented in the accompanying tables. Some

Figure 14. Plainware pottery sherds.

information, including results of thin section analysis and special studies such as those that augment the preliminary XRF results would add more detailed information to their character.

There are two principal groupings of sherds: glazed and non-glazed. Within these two groupings, there are likely types in the cultural and temporal sense discussed briefly below. None of the sherds exhibit signs of cooking/smudging, keeping in mind the caveats listed above. Eleven of the sherds fall into the non-glazed category (Figure 14) with characteristics listed on Tables 1 and 2. The exterior colors are quite variable including light brown, brown, reddish brown, light brownish gray to reddish orange, and red, as defined by Munsell soil color charts. Interior colors most often do not match the exterior colors, at least partially due to probable firing oxidation variations. These colors include light reddish brown and reddish brown, dark reddish gray and reddish gray, dark gray and pinkish gray, and red. The cores are gray to black, likely indicating open, low temperature firing in an oxidation environment (but see de Barros 2013:16).

The thicknesses of these 11 sherds average just under 7 mm, with a range between 4.3 and 10.6 mm. Five exhibit burnishing, although weathered surfaces were present on some sherds. A few exhibit scraping and wiping marks. The paste appears to be fine to medium, with either sand included naturally in the clay or added for tempering. Visible inclusions include angular to sub-angular quartz and other minerals not identified (no mica is readily apparent), with about 5-30% of the core matrix including these visible grains. Most significant is the evidence of fiber tempering in 10 of the 11 sherds from voids in the surfaces and paste that appear to be plant remnant molds (see Figure 15). It is probable that utilitarian bowls, jars and ollas are represented by these sherds.

Previous studies by the author (Ritter 1994, 1995, 1997) and Stephen Williams (1995, 1997) to the south down the peninsula's gulf coast at Bahía de los Ángeles and Bahía las Ánimas, and from missions San Borja and San Fernando Velicatá to the west resulted in the discovery of similar pottery sherds from mission and Native American Indian sites (also see Tuohy and Strawn 1986, 1989). Many of these sherds appear to match those from the Bahía de los Ángeles locality discussed by Massey and Osborne (1961:343) and Davis (1968:184). Preliminary XRF studies by Lee Panich indicate that some of the Gonzaga sherds utilized the same clay as found evident in pottery sherds from Mission San Fernando Velicatá. Others from Gonzaga are not a match to Velicatá specimens (Figure 16).

Table 1. Sherd Colors.

Number	Exterior Color	Interior Color	Core Color
Gonzaga 2-1	5YR 4/3 reddish brown	5YR 5/2 reddish gray, 5YR 4/2 dark reddish gray	N2 grayish black
Gonzaga 2-2	5YR 4/4 reddish brown	5YR 5/2 reddish gray	N3 dark gray
Gonzaga 2-3	5YR 5/4 reddish brown	5YR 6/4 light reddish brown	N5 medium gray
Gonzaga 2-4	5YR 6/3 light reddish brown	5YR 7/2 pinkish gray	N2 grayish black
Gonzaga 2-5	7.5YR 6/4 brown	2.5YR 5/4 reddish brown	N4 medium dark gray
Gonzaga 2-6	2.5YR 4/6 red	2.5YR 4/8 red	N1 black
Gonzaga 2-7	7.5YR 5/2 brown	7.5YR N/4 dark gray	N4 medium dark gray
Gonzaga 2-8	10R 6/6 moderate reddish orange	10R 5/8 red	N2 grayish black, N1 black
Gonzaga 2-9	7.5YR 5/2 brown, 10YR 6/2 light brownish gray	7.5YR 5/4 brown	N2 grayish black
Gonzaga 2-10	2.5YR 5/6 red	5YR 5/4 reddish brown	N2 grayish black to 5YR 6/4 light reddish brown
Gonzaga 2-11	7.5YR 6/4 light brown	5YR 6/4 light reddish brown, N4 dark gray (smudging)	N2 grayish black
Gonzaga 2-12	5YR 2.5/2 dark reddish brown	5YR 3/2 dark reddish brown	N1 black on edges, 5YR 3/3 dark reddish brown center
Gonzaga 2-13	5YR 5/3 reddish brown	5YR 8/2 pinkish white, 5YR 8/4 pink	5YR 7/4 pink

Pottery evidence on the central gulf coast adds some credence to the proposition that prehistoric pottery as documented among the Paipai and Kiliwa ancestors (cf. Panich and Wilken-Robertson 2013) did not extend south into the peninsula below the region of El Rosario and the 30th parallel (Tuohy 1970:42). Rogers (1945) has suggested that during the late prehistoric Yuman III times (Patayan III, post A.D. 1500; Waters 1982a, 1982b, 1985c) ceramic use spread throughout the northern peninsula extending to an unnamed point south of Bahía de los Ángeles. Tuohy (1970:42) has remarked that there is scattered pottery below the 30th parallel, but its inspiration may be attributed to stimulus-diffusion from the brownware tradition to the north, Seri trans-gulf contacts, or Jesuit introduction (also see Tuohy and Strawn 1989). The key element in this comparison seems to be the use of fiber temper. In an early Spanish account, the explorer Francisco Ulloa in 1539 indicated that he observed no pottery at Indian sites at Bahía San Luis Gonzaga (Moriarty 1965:13) and only one small pottery bowl in Bahía de los Ángeles (Moriarty 1965:14).

Panich and Wilken-Robertson (2013:83) note strong continuities of ceramic manufacturing practice from prehistoric into historic times at Mission Santa Catalina among the Paipai, with no use of fiber temper. Porcayo (2013), in his discussion of prehistoric pottery in the northern part of the peninsula within the *municipio* of Mexicali, found no use of fiber temper. May (1973:59-60) notes that his Tizon Brown Ware, Mission Series, Santo Tomas Brown type was associated with Jesuit, Franciscan, and Dominican missions of Baja California. Williams' (1995) study of central peninsula sherds from mission and non-mission locations also concludes that the fiber-tempered sherds are a Mission Ware distinguished by the presence of fiber temper and wall thickness greater than 5 mm.

As this author noted in 1994, pottery vegetal temper appears to be a significant temporal and cultural trait in the peninsula, since over the greater Southwest its use seems to correlate with the Spanish *entrada*. Bowen (1976:59) assigns the cross-gulf Seri use of organic temper to the post-1700 period when Spanish contacts established the practice of tempering with horse dung. Fontana and others (1962:57) note that "Papago" pottery with a black core and pitted exterior from

Table 2. Sherd Characteristics.

Gonzaga-2-	Thickness (mm)	Length (mm)	Finish	Paste/Temper	Inclusions	Comments
1	9.78; wall sherd	36.8	Burnished inside and out, wiped while wet	Medium to coarse	30% visible grains, quartz predominates	Coiled bowl or olla
2	9.32; wall sherd	24.64	Smooth interior, coarse exterior (weathered)	Fine with fiber temper	5-10% visible quartz grains and other minerals	Vug on interior
3	5.51; wall sherd	24.57	Exterior wiped, interior scraped/burnished	Fine with fiber temper	20% visible sand grains of quartz and other minerals	Weathered exterior
4	9.15-10.61; wall sherd	42.94	Wiped inside and out, undulating surface	Fine with fiber temper	20% visible sand grains of quartz and other minerals	Large olla-like vessel likely
5	2.8+; rim sherd	15.28	Wiped	Fine with possible fiber temper	20% visible sand grains of quartz and other minerals	Straight, tapered rim
6	5.0+; rim sherd	13.87	Wiped while wet, burnished	Medium with fiber temper	20-25% visible sand grains of quartz and other minerals	Straight. Slightly rounded rim
7	8.2; wall sherd	25.58	Scraped with tool, exterior burnished	Medium with fiber temper	30% visible sand grains of quartz and other minerals	--
8	5.66-6.57; wall sherd	27.84	Weathered surface	Fine with fiber temper	5-10% large sand grains visible including quartz and other minerals	--
9	6.21; wall sherd	17.36	Smoothed exterior and interior, wiped and burnished	Fine with fiber temper	20-30% visible sand grains of quartz and other minerals	Core banded with central portion black
10	5.18; wall sherd	19.49	Weathered surfaces	Fine with fiber temper and voids	10-15% visible sand grains including quartz and other minerals	--
11	4.28-5.18; wall sherd	18.66	Scraping tool and burnished exterior	Medium with fiber temper	15% visible sand grains including quartz and other minerals	Coiled with striations
12	7.05-9.44; wall sherd	53.49	Glazed, orange-peel (salt-glazed?)	Fine sand temper	Fine sand grains visible	Large vessel, vitreous surface, banded core, high temperature firing
13	15.47; wall sherd	49.01	Scraped with tool, interior finished with fingers, glazed exterior, interior fine mud slip with drip marks	Very fine sand temper?	No easily visible grains	Large coiled vessel, 2 sections attached

Figure 15. Example of indications of fiber temper use as seen in surface voids.

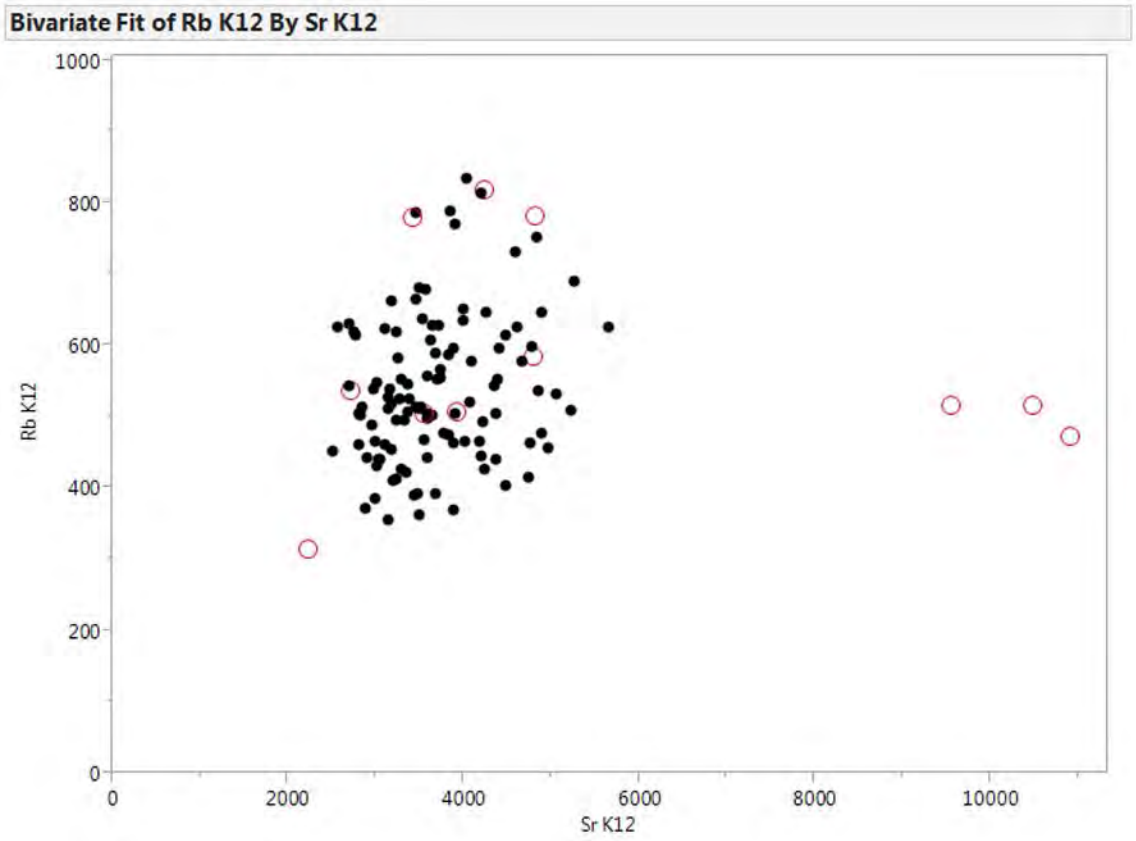

Figure 16. Comparison of select element concentrations from Gonzaga (red circles) and Velicatá (solid dots) sherds.

Figure 17. Glazed pottery sherds (above: exterior view; below: interior view).

vegetal tempering can be assigned to the post-contact era. Schaefer (2013:33) comments on the presence of fiber temper or heavy carbon streak indicative of brown wares produced at the Spanish missions.

Most of the non-glazed sherds could fall within the Tizon Brown Ware category as mentioned above. Based on an observation of this collection by northern Baja California/southern California ceramic expert Michelle Graham (personal communication 2014), one sherd might possibly be Topoc Buff, following the Waters' (1982a, 1982b, 1982c) discussions. In any case, the plainware sherds with their fiber temper point to a mission-period association for the presumed associated structure. (No ceramics were noted on the adjoining Native American Indian site). This association is even more evident when considering the glazed sherds discussed below. It seems most apparent that these sherds represent remnants from pottery brought into this location from mission locations within the central and southern peninsula and/or possibly from mainland Mexico sources (also see Peelo 2011:657-658).

The two glazed wall sherds are quite dissimilar in many characteristics (Tables 1 and 2; Figure 17), although both represent rather large vessels, perhaps for storage. One sherd is glazed on both interior and exterior surfaces, while the second sherd is only glazed on the exterior. The outer colors, dark reddish brown and reddish brown, are similar on both sherds, while the one sherd has a pink to pinkish white interior with a rather sloppy applied slip. It is suspected that these are thrown vessels as opposed to the hand-modeled pottery previously discussed. The first of these two sherds has an apparent fine sand temper while the second sherd has a silty paste with

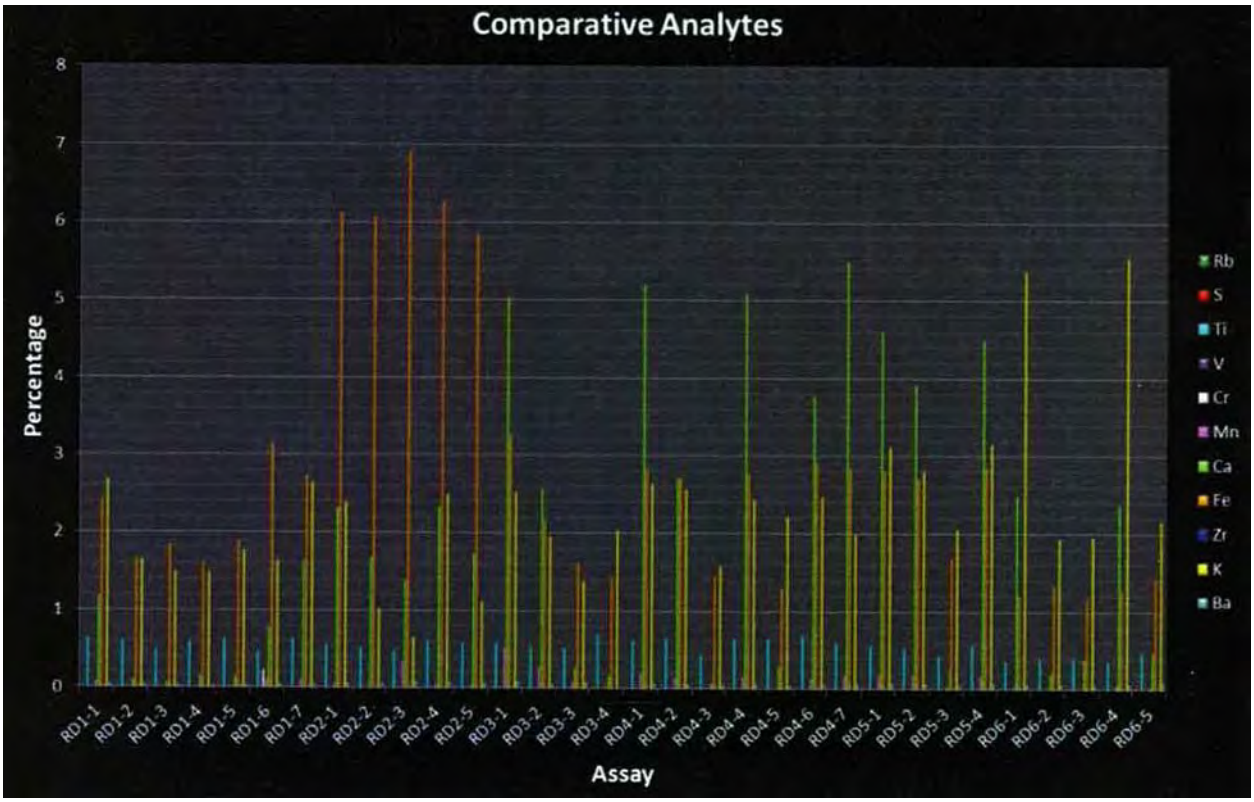

Figure 19. Comparison of 11 analytes with average concentrations greater than 0.01%. The two Gonzaga sherds are RD2 and RD6 (note spikes in Fe and K).

occasional visible sand grains of variable minerals. The core colors suggest they were fired at high temperatures, likely in a kiln due to their level of vitrification and absence of pores. Other characteristics are noted in Tables 1 and 2.

When Michelle Graham (as referenced above) looked at these two sherds, she thought they were definitely from the colonial period, possibly Galera Ware. This may be conceivable when considering the descriptions and illustrations of Fox and Ulrich (2008:50-56) for Galera, but these sherds also resemble their Red Brown and Dark Brown wares, all dating to the time of missionization in Texas (Fox and Ulrich (2008:39). As indicated by Fox and Ulrich (2008:50), Galera wares at Texas missions are thin, averaging 3 to 4 mm in thickness with an orange paste, not like the sherds from around the ruins. It is also possible that the fine-textured paste example (No. 13) could be a Rey Ware as discussed by Deagan (1987:51-52) for Spanish colonial sites in the Caribbean-Florida area. In any case, these two sherds strongly suggest a Spanish colonial association with the structure remnants, pottery most likely brought to the area originally from non-peninsular sources (also see Voss 2012:44-45). Preliminary pXRF analysis of the interior and exterior surfaces of these two sherds by Christian (2016) found no evidence of lead or tin-based glazing. Heterogeneous pastes and glazes are evident with a high iron content in the darker colored glaze and the lighter glaze has a high potassium reading common in a ceramic flux likely derived from wood ash (Figure 18).

The preponderance of evidence—structure construction methods, dimensions, location, artifact associations, local accounts, and historic documentation—suggest a Spanish mission-period association, almost certainly by Franciscan times into Dominican oversight. The function of this structure as a temporary warehouse also has strong support from the information presented

above. Clarification and more certainty will rest largely on further archaeological study and document search.

References Cited

Bowen, Thomas
1976 *Seri prehistory: the archaeology of the central coast of Sonora, Mexico*, Anthropological Papers of the University of Arizona 27, Tucson.

Christian, Terrance
2016 *Elemental characterization of six historic pottery sherds from archaeological contexts in northern California and Baja California using handheld XRF*, Bureau of Land Management, Redding, California.

Crosby, Harry
1974 *The King's Highway in Baja California: an adventure into the history and lore of a forgotten region*, Copley Press, Salt Lake City, Utah.
1981 *Last of the Californios*, Copley Press, Salt Lake City, Utah.
2003 *Gateway to Alta California*, Sunbelt Publications, San Diego.

Cunningham, Lawrence J.
2011 "Lime mortar and stone construction", *Guampedia: the encyclopedia of Guam*, http://www.guampedia.com/mamposteria/.

Davis, Emma Lou
1968 "An archaeological reconnaissance in the central desert of Baja California", *University of California, Los Angeles Archaeological Survey Annual Report* 10:176-208.

Deagan, Kathleen
1987 *Artifacts of the Spanish colonies of Florida and the Caribbean, 1500-1800, Volume I: ceramics, glassware, and beads*, Smithsonian Institution Press, Washington, D.C.

De Barros, Philip
2013 "Prehistoric and historic brown ware pottery from the Pala Road Bridge site", *Pacific Coast Archaeological Society Quarterly* 48 (1&2):1-24.

Enright, Kelly
2013 "Finding Menendez's Footprint", *American Archaeology* 17(3):12-24.

Farris, Glenn
1997 "Archaeological excavation of the "Old Warehouse" and granary at La Purísima Mission State Historic Park", *Pacific Coast Archaeological Society Quarterly* 33(4):1-28.

Fontana, Bernard L.
1962 *Papago Pottery*, University of Washington Press, Seattle.

Fox, Anne A. and Kristi M. Ulrich
2008 *A guide to ceramics from Spanish colonial sites in Texas*, Center for Archaeological Research Special Report 33, University of Texas, San Antonio.

Gerhard, Peter and Howard E Gulick
1962 *Lower California guidebook : a descriptive traveler's guide*, A.H. Clark, Glendale, California.

Grimsrud, John M.
2011 "Essay: mamposteria construction in Mérida", http://bingsbuzz.blogspot.com/2011/01/essay-mamposteria-construction-in.html.

Jones, Jack B.
1977 *National Register of Historic Places: Inarajan Village*, National Park Service, Washington D.C.
Jopling, Carol F.
1992 *Puerto Rican houses in sociohistorical perspective*, University of Tennessee Press, Knoxville.
Massey, William C., and Carolyn M. Osborne
1961 "A burial cave in Baja California: the Palmer collection, 1887", *Anthropological Records* 16:339-364, University of California, Berkeley.
May, Ronald V.
1973 "An archaeological survey of Mission Santo Tomás, Baja California", *Pacific Coast Archaeological Society Quarterly* 9(1):48-65.
McCown, B. E.
1955 *Temeku; a page from the history of the Luiseño Indians*, Archaeological Survey Association of Southern California Paper 3, Los Angeles.
Moriarty, James R.
1965 "The discovery & earliest explorations of Baja California", *Journal of San Diego History* 11(1).
Nunis, Doyce B., Jr.,
1972 *The drawings of Ignacio Tirsch, a Jesuit missionary in Baja California*, translated by Elsbeth Schulz-Bischof, Dawson's Book Shop, Los Angeles.
Panich, Lee and Michael Wilken-Robertson
2013 "Paipai pottery past and present: evolution of an indigenous ceramic tradition", *Pacific Coast Archaeological Society Quarterly* 48(1&2):75-96.
Peelo, Sarah
2011 "Pottery-making in Spanish California: creating multi-scalar social identity through daily practice", *American Antiquity* 76(4):642-666.
Porcayo Michelini, Antonio
2013 "Ceramics from northern Baja California", *Pacific Coast Archaeological Society Quarterly* 48(1&2):55-74.
Ritter, Eric W.
1994 *Investigaciones de ecología, social y cambios entre culturas prehistóricas en la región de Bahía de los Ángeles, Baja California (1993)*, Instituto Nacional de Antropología e Historia, Mexico City.
1995 *Investigaciones de ecología, social y cambios entre culturas prehistóricas en la región de Bahía de los Ángeles, Baja California (1994)*, Instituto Nacional de Antropología e Historia, Mexico City.
1997 *Investigaciones de ecología, social y cambios entre culturas prehistóricas en la region de Bahía de los Ángeles, Baja California (1995)*, Instituto Nacional de Antropología e Historia, Mexico City.
Rogers, Malcolm J.
1945 "An outline of Yuman prehistory", *Southwestern Journal of Anthropology* 1:167-198.
Schaefer, Jerry
2013 "Coastal brown ware ceramics from Camp Pendleton, San Diego County", *Pacific Coast Archaeological Society Quarterly* 48(1&2): 25-46.

Tuohy, Donald R.
1970 "The aboriginal containers of Baja California, Mexico: a search for origins", *Tebiwa* 13(2):41-51.
Tuohy, Donald R. and Mary B. Strawn
1986 "A comparative analysis of 36 thin section from plain brown pottery vessels found in the Desert West", in *Pottery of the Great Basin and adjoining areas*, Suzanne Griset, ed., pp. 85-95, University of Utah Anthropological Records 111, Salt Lake City.
1989 "Thin-section analysis of mission period pottery from Baja California, Mexico", *Nevada Archaeologist* 7(1):36-48.
Voss, Barbara L.
2012 "Status and ceramics in Spanish colonial archaeology", *Historical Archaeology* 46(2):39-54.
Walter, Tamra Lynn
2010 *Espiritu Santo de Zúñiga: a frontier mission in south Texas*, University of Texas Press, Austin.
Waters, Michael R.
1982a "The Lowland Patayan ceramic tradition", in *Hohokam and Patayan: prehistory of southwestern Arizona,* Randall H. McGuire and Michael B. Schiffer, eds., pp. 275-297, Academic Press, New York.
1982b "The Lowland Patayan ceramic typology", in *Hohokam and Patayan: prehistory of southwestern Arizona,* Randall H. McGuire and Michael B. Schiffer, eds., pp. 537-570, Academic Press, New York.
1982c "Ceramic data from Lowland Patayan sites", in *Hohokam and Patayan: prehistory of southwestern Arizona,* Randall H. McGuire and Michael B. Schiffer, eds., pp. 571-580, Academic Press, New York.
Williams, Jack S.
1997 "Adobe ramparts: archaeology and the evolution of the presidio of San Diego", *Pacific Coast Archaeological Society Quarterly* 33(4):29-56.
Williams, Stephen L.
1995 "Microanálisis de tepalcates procedentes del área de Bahía de los Ángeles y Misión San Fernando Velicatá, Baja California", in *Investigaciones de ecología, social y cambios entre culturas prehistóricas en la región de Bahía de los Ángeles, Baja California (1994)*, by Eric W. Ritter, Appendix 5, Instituto Nacional de Antropología e Historia, Mexico City.
1997 "Microanálisis de tepalcates del centro de Baja California, programa Baja California, 1995", in *Investigaciones de ecología, social y cambios entre culturas prehistóricas en la región de Bahía de los Ángeles, Baja California (1995),* by Eric W. Ritter, Appendix 7, Instituto Nacional de Antropología e Historia, Mexico City.