



PAR

ENVIRONMENTAL SERVICES, INC.



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Our mission is to maintain the highest standards of professional excellence, to provide quality cultural and environmental technical support, to be involved in the community, to maintain high scholarly standards of research, and to meet the needs of our clients in a timely and cost-effective manner.

CREATIVE OUTREACH: VIEWS FROM DUNLUCE AND NORMANDY *by Mary L. Maniery*

As professionals, we are always looking for inspiration and fresh ideas on how to conduct our studies and present our data to clients and the public. In California lately, “creative mitigation” has been the topic of much discussion. In general, creative mitigation encourages moving away from traditional programs of test excavation, data recovery, technical reports, and curation of artifacts (all very expensive ventures), and finding more innovative ways to allocate mitigation dollars, such as videos, web blogs, virtual exhibits of artifacts (returning the actual items back to the ground to eliminate curation), traveling exhibits, and other outreach products. Two places visited on our travels, Dunluce Castle in Northern Ireland and the

Normandy beaches in France, provided the opportunity to study and compare international approaches used to present archaeology to the public.

Dunluce Castle is perched on a high basalt cliff top at the northern edge of County Antrim in Northern Ireland, looking out across the Atlantic Ocean towards Scotland, a mere 28 miles away. Isolated on a cliff and accessible only by a bridge, the castle was a sound fortress. The Vikings are believed to have first used the cliff-top, perhaps as early as 900 AD, and the area around the castle was the alleged scene of a battle between the Vikings and the local Irish tribes in 1103. The 2nd Earl of Ulster, Richard Og de burgh, built the first castle here in the



13th century. The current castle was built by the McQuillan family (Scottish mercenaries who first came to Ireland circa 1300) around 1500 and was seized by the ambitious Sorely Boy McDonnell in the 1550s. The McDonnell family still retain ownership today.



The castle was occupied for nearly 200 years. In the 17th century it served as the seat of the County Antrim earls and a small town was established by 1608 to support the family. The unexpected shipwreck of a Spanish Armada was a windfall for Sorely Boy. He salvaged the wreck, selling cargo and moving the cannons to the castle. The money allowed for construction of a medieval-era wood hall with windows inside the castle. The town was razed to the ground in 1641 during the Irish uprising, although the castle was not damaged. The McDonnell family continued to live in the castle until 1690, when a lack of funding forced

them to leave and settle elsewhere. It has not been occupied since.

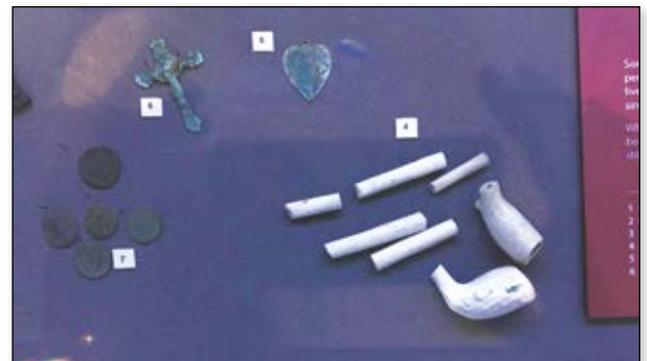
In 2011, the University of Ulster, under the direction of archaeologist Dr. Colin Breen, and the Northern Irish Environmental Agency (guardians of the site) collaborated on a five-year archaeological excavation project, focusing on the town located outside the castle walls. The project was advertised, and incorporated volunteer and apprenticeship programs each year. The studies indicated that town was laid out in a revolutionary, forward thinking manner for the time, with indoor toilets and a complex street network laid out in a grid. A large cobblestone thoroughfare connected the town center with the castle. A blacksmith forge (with anvil, chisel, and horseshoes still in place), a merchants home, and the streets were all discovered through archae-

ology. At the end of the five-year project, about five percent of the town had been explored.

Today, tourists visiting the on-site museum at the castle can explore the archaeology through a one-room exhibit. While many exhibits in California featuring archaeology focus on the history of a site, the artifacts recovered, and the stories they tell, the Dunluce Castle exhibit is more inclusive of the entire effort. The exhibit promotes the ideas

that archaeological resources are finite and excavation destroys sites. It cautions that excavations should be a last resort, and discusses the value of preservation in place. It provides insight into the research questions and topics that guided the excavation and explores the methods and techniques used by the archaeologists, including pedestrian, LiDAR and aerial photography surveys, metal detection, and finally excavation. Principles of stratigraphy, careful recordation of artifact provenience, and other scientific methods are presented through use of the archaeologists' field notes, drawings, and photographs. This holistic approach was refreshing and comprehensive and shared more of the archaeological process with the visiting public.

The artifact displays are minimal and focus on personal use items, such as jewelry, smoking pipes, a tuning pin from a harp, bone combs, a thimble, gaming pieces, and clay tobacco pipes. The text notes that the artifacts suggest the importance of music, the cosmopolitan nature of the town (as coins were from Scotland, England, Poland, France, and other countries), and the importance of religion in the community as interpreted from the crosses and religious items found in the households. The clay tobacco pipes, recovered from a 17th century deposit, were espe-



Clay tobacco pipes and personal items from Dunluce

cially interesting, as they are the same composition, shape, and type as tobacco pipe fragments recovered in gold rush era deposits in Sacramento and Folsom, and many other places in California. These simple pipes, long stemmed with curved bowls, were used for centuries with little change in design. Many of the pipes recovered in California from 19th century sites were imported from England and are identical in appearance to those from Dunluce.



Entrance to underground German bunker with Omaha Beach in the background

One of the favorite displays in the exhibit for visiting tourists allowed for hands-on activities geared toward children. They could “dig,” analyze, and interpret their findings, applying what they learned in the exhibit. An average of 80,000 people from around the world visit Dunluce every year. It is gratifying that those who visit the small museum will walk away with a better appreciation of archaeology. Dunluce Castle exhibits combine the nuts and bolts of doing archaeology and the science behind the profession with the fun of finding artifacts and features and interpreting the stories. Hopefully, children who visit the site will be inspired to consider archaeology as a career choice.

Dunluce Castle is seeped in history and rich in centuries of tales, from ghosts in the castle to shipwrecks on the rocks, battles, and medieval life. The beaches of Normandy, on the other hand, are famous for a single event in recent history: the D-Day invasion at five Normandy

beaches on June 6, 1944, an effort that turned the tide of World War II. Walking through Dunluce Castle evokes images of family and community. It is easy to picture a gathering around the fireplace, listening to the harp music, talking about events of the day, and sharing a pipe or goblet of wine. It is an image of people living their lives in a stone castle near the sea. In contrast, visiting Normandy is a somber experience, with quiet reflection on the loss of lives, terror of active battle, and the courage it must have taken to storm a beach with little defense against massive guns and an enemy protected by foxholes, bunkers, and concrete fortifications.

PAR has been working on military bases since the late 1980s and has devoted many hours into understanding World War II and its effects on our home bases. Work on Mare Island has included researching the Navy’s wartime effort to build ships quickly, and examining temporary housing needed to accommodate the swelling numbers of sailors and marines who shipped out of Mare Island. We’ve researched building aircraft and the hasty development

of Airforce and Army bases in Sacramento, Marysville, the Bay Area, Riverside, San Diego, and Los Angeles. PAR crews have walked miles and recorded remnants of the desert training facilities in the Mohave and around Las Vegas; where over 1.5 million acres were used to prepare troops for fighting in North Africa and other desert environments invaded in World War II. Our work has detailed the homeland response to

the War effort, from civilian rationing to the massive buildup of bases in many states, and documented the temporary housing, base expansions, and training that sailors and soldiers went through before shipping out. We have studied the Meal Ready to Eat (MRE) kits

Dunluce Castle Fun Facts

- Dunluce Castle is rumored to be the inspiration for Cair Paravel in C.S. Lewis’ *Chronicles of Narnia* (1950-1954)
- Led Zeppelin included photos of the castle on the inner gatefold on the 1973 bestselling album *Houses of the Holy*
- The Irish Rovers sang “Dunluce Castle”, written in the 1990s by George Millar
- The *Medallion*, a 2003 movie starring Jackie Chan, used the castle for Snakehead’s Hideout “Raven’s Keep”
- The castle served as the film location of the Seat of House Greyjoy, the great castle of Pyke, in *Game of Thrones*. ❄️

and their contents and the P-38 can openers designed in 1942 to fit into pockets of soldiers so they could readily open rations. None of these studies prepared me for the reality of Normandy.

On D-day allies from the US, Canada, United Kingdom, and Australia landed around 156,000 troops in Normandy, the largest seaborne invasion in history. The American force totaled 73,000, with 23,250 on Utah Beach and 34,250 on Omaha Beach. The US also supplied 15,500 airborne troops. The US contingent was transported from England on Navy ships. The large carriers remained 10 miles out to sea. Smaller amphibious ships transported the troops over a stormy sea and Landing Craft, vehicle, personnel or LCVP (also known as Higgins boats) moved them to the shore. While the soldiers made their way to the beaches from the Higgins boats, the sailors who crewed the boats, ran to the beach, gathered the wounded and dead, loaded them onto the landing crafts, and returned to the ships off shore, making trip after trip. By the end of the day 6,603 American were killed, wounded, or missing in action; 2,400 of the total were killed on Omaha Beach.

Exploring the battle sites today is a moving experience. There are hundreds of visitors, but little talking. The landscape is pocked with craters from the bombs dropped by the air support troops. German guns face out to sea, with the gun turrets still in place. The underground



US Soldiers departing a Higgins boat and heading to Omaha Beach, June 6, 1944

tunnels and bunkers that allowed the German soldiers to move effectively through the area and remain protected are visible. Monuments on the beaches contain short explanations and lists of the dead. The remnants of temporary wharfs and docks are visible off the coast. And throughout the sites, the sound of Atlantic Ocean waves hitting the beach is ever present. The sea was calm the day we visited, but it is easy to imagine the stormy condi-



German guns pointing at the beach

tions, high swells, and turbulence experienced on D-Day.

The archaeology of D-Day concerns Utah, Omaha, Gold, Juno, and Sword beaches, as well as the drop-zones for American and British airborne troops. Archaeologists study the remains of the battlefields, shell craters, ruins, drop zones, and temporary cemeteries and compare them with archival material and veteran testimonies. Preserving the war landscape is important and landscape analysis includes melding results of aerial photography, LiDAR and RADAR surveying, topographic mapping, and photographs to map the bomb and mine craters, underground tunnels, foxholes, and other physical features. The use of radar detection equipment and other digital methods has enabled the creation of a complete map of both surface and buried underground elements of the extensive battlefield, without destructive excavation.

The use of multiple techniques to map and assess a related landscape in a non-destructive manner is not unique to the D-Day mapping effort.

In recent years PAR has worked on several projects with the Redwood National Park in northwest California where LiDAR imaging has been paired with analysis of historical and current aerial photographs and USGS maps through time to reconstruct a changing landscape. At Hiouchi Flat along the Smith River, melding these techniques allowed a reconstruction of the houses, fencing, driveways, ditches, gardens,



Bomb craters at Normandy with Omaha Beach at far left

craft, airplanes, barges, and equipment rest on the ocean floor off of Normandy. Archaeologists have been working with veterans and military archivists to locate and identify individual wrecks. Multibeam sonar and LiDAR, and archaeology-trained divers have been conducting mapping of these wrecks. Today they have plotted and identified over 200 wrecks that lay 30 meters deep in a 450-square-kilometer zone off the beaches. Work continues, as funding allows, to map all of the wrecks.

It has not been forgotten that the battlefields around Normandy were also the homes of many civilians

who scrambled to find safe shelter as the world exploded around them and leveled their homes. The Saingt Quarry, huge underground caverns in and around the city of Caen, housed an estimated 20,000 civilians during the invasion. Studies at the quarry offer unique opportunities to examine the nature of social behavior in a confined space. The quarry contains surface artifacts, remnants of individual living spaces by family, and is now considered an archaeological preserve. Archaeologists have been using non-intrusive and non-destructive recording like 3-D scans and topographic mapping to create a virtual tour of the site, protecting the physical remains from looting or damage by the many visitors interested in experiencing the underground caverns.

While non-destructive efforts to record the war sites are important, numerous archaeological excavations have also occurred.

foundations, and other features of the small community in an area now heavily overgrown with blackberry, oak, and other vegetation. Similarly, LiDAR and aerial interpretations have been used by PAR and RNP at Camp Lincoln, an 1860s Army Post; and around Prairie Creek to define past logging harvest units, roads and skids, and other features of a logging landscape and overlay multiple images into a GIS system. It was interesting to compare the results of the Normandy mapping effort with our efforts and to realize that these methods are likely the wave of the future to collect detailed data on a large landscape basis with non-destructive methods of data collection.

Hand in hand with the terrestrial mapping effort, marine archaeologists working with the D-Day battlefield have been surveying the submerged wreckage from the battle. Some estimate that over 20,000 sunken wrecks of ships, landing

A Personal Journey

James “Jimmy” Manieri (aka Vincenzo Augustino Fimognari), father of PAR Principal Gary Manieri, was a sailor during the D-Day invasion. Born in the Calabria region of southern Italy in 1921, Jim came to America when he was 7 and settled in Rutland, Vermont. Jim and his brother, Joe, joined the Navy soon after Pearl Harbor, ready to defend their adopted homeland. Jim’s ship saw action in North Africa and southern Italy before playing a role in the invasion of Normandy on D-Day. While he didn’t talk much about his experiences during the War, Jim told us about transporting men in the Higgins boats to Omaha Beach, quickly pulling dead and wounded soldiers off the beach and out of the water, and returning to the carriers to transport more soldiers. He remembered lying on the beach with bullets from the strafing flying up both sides of his body and hitting so close to his face that the sand flew into his mouth. His stories and experiences made going to Normandy and Omaha a must-see for Gary, a personal journey. It is amazing that Jim survived uninjured. His main battleship was sunk during the battle; he narrowly escaped death many times that day. Our trip to Normandy and the recounting of it was done in tribute to this humble Italian immigrant, who gave his all for his adopted country one stormy day in June, 1944. Thanks Dad!. ✕



Gary at Omaha Beach, next to a rock that US medics took cover behind on D. Day.

American, Canadian, British, and German foxholes have been excavated, recovering small personal items, helmets, ammunition, cartridges, and even gun barrels. American MRE and mess kits identical to those we have recorded in the Desert Training facilities and on other military training sites of the same era in California are often recovered in these foxholes.

Crews who work on the excavations are always aware that many soldiers were never found and any excavation in the region may uncover a temporary grave site. In 2016, for example, the remains of a British soldier were found during an excavation of a medieval settlement site. Five German soldiers hastily buried in a pit were discovered in 2013 during excavations of a crater pit. The hasty nature of these war-time burials did not allow for careful preparation or removal of personal items. The dog tags, helmets, uniform patches and other personal items found with these soldiers often leads to their identification and provides closures to families back home.

In 1998, two American geologists examined the sand of Omaha

Beach with a microscope, identifying tiny steel and glass balls originating from the bombshell explosions. They estimated that these signs of battle would disappear by the middle of this century. Other elements of the D-Day beaches, such as the concrete bunkers are well preserved and provide silent testimony of the June 6 assault. Combined with on-going archaeology, passive signage that tells the tale of the beaches, and increasing digital images and virtual tours, they perpetuate the memory of a battle fought in the name of liberty and peace. This approach of letting the landscape tell the story with scattered panels to assist in interpretation is a much different interpretive approach than Dunluce Castle exhibits, but is very effective given the size and scale of the Normandy beaches. On a landscape full of visual reminders of war, the passive panels and small signs interpret-



Interpretive panel using archaeologist field notes and drawings at Dunluce Castle

ing the battlefield allows visitors to have a more private, personal experience and reflect on the events that occurred on the beaches in June of 1944 in their own way.

The beaches of Normandy are thought-provoking and emotionally draining. The stories and the visual reminders of the battle on the landscape will endure another 75 years. The year 2019 marked the 75th anniversary of D-Day and over 2,000,000 people visited the site to commemorate and remember. Some came to view history in the making; others came to honor lost family members. If they were like me, they left with a new perspective on a known event and an intimate understanding of the effort it took to claim those beaches. Today, a movement is underway to have the five beaches at Normandy and the related underwater wreck zone declared a UNESCO World Heritage Site. This status is long overdue. ✨



Visitors reading the archaeology interpretive panels at Omaha Beach

CULTURAL RESOURCES DEPARTMENT *by Mary L. Maniery and Andrea "Ellie" Maniery*

➤ PAR began a new partnership in 2019 with East Bay Municipal Utility District, assisting them in removal of select parcels from their FERC boundaries in Calaveras, San Joaquin, and Amador counties. The project involved survey of the parcels and Phase II testing of historical mining sites, where both hand and dredge mining occurred.

➤ In 2019, PAR was honored to be chosen as a cultural resources partner of Sacramento County, winning a 5-year on-call contract to assist them in cultural resources studies and CEQA compliance for all projects where they are the lead agency. The projects may involve survey, monitoring, mitigation, CEQA documents, Caltrans compliance, and if necessary, Phase II testing. We look forward to continuing our long-standing relationship with the County for the next five years.



Surveying Water Features in Butte County, CA

➤ Since early 2019, PAR has been assisting the Biggs-West Gridley Water District and the Richvale Irrigation District in their Section 106 compliance efforts. The PAR team recorded and evaluated water features criti-

cal to the agricultural well-being of these communities, researched the rice industry in Butte County, and recording the historic weirs, canals, bridges, pumps, and other elements. Both systems were evaluated in light of National Register of Historic Places criteria, with work reviewed by the Bureau of Reclamation.



Glenn County Excavation

➤ PAR assisted Far Western Anthropological Research Group with data recovery at a prehistoric site in Glenn County, CA prior to a bridge replacement. PAR archaeologists assisted in the preliminary geoarchaeological investigation conducted by Far Western and joined their crew for the excavation itself. PAR provided a peer review of the Phase II Evaluation Report and is working with Caltrans, Far Western, and NorthStar Engineering to prepare management documents for the project.

➤ In 2019, PAR's president Mary Maniery embarked on a research journey with Caltrans staff to update the Historical Context and Research Design (HARD) study for Agriculture in California. The update integrates

built environment and archaeological approaches to Agriculture and Ranching resources. The final product is intended to provide a framework and history for agriculture in the state, standardize approaches to recording both built environment and archaeological remnants of ranches, farms and homesteads, and includes suggested research directions for archaeologists who may encounter these types of resources. Ms. Maniery will continue her work with Caltrans on the project into 2020.

➤ PAR staff assisted the Folsom Historical Society in 2019 with planned work at the newly-acquired Chan House on Sutter Street. The Chan House is planned to serve as a cultural center focusing on Folsom's Chinese American community, while highlighting the Chan family, who came to Folsom in the mid nineteenth century. PAR has been studying the Chinese experience in and around Folsom over 30 years and we are excited to be included in this long needed permanent tribute to the Chinese immigrants who chose Sacramento County and Folsom as their new home in America. ✨



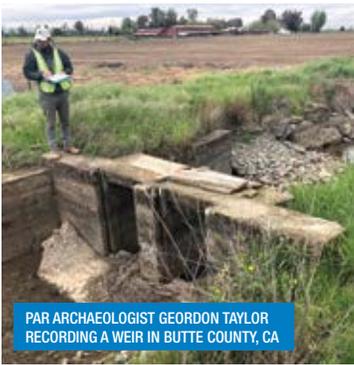
PAR president, Mary Maniery, emerging from the Chan House after recording the interior

ENVIRONMENTAL PLANNING DEPARTMENT *by James Gary Maniery*

In the last few years, we successfully completed two Roadway Safety Signing Audit (RSSA) projects in Nevada County with Kimley Horn. We've once again teamed with them to provide cultural resource support and environmental peer review on similar

projects in Stanislaus and Calaveras counties. Apart from preparing the cultural resources reviews, Gary Maniery will peer review the hazardous waste Initial Site Assessments and environmental screening documents.

For assistance with RSSA or Caltrans local assistance projects contact J. G. Maniery either at (916)739-8356 ext. 15 or on LinkedIn. ✨



PAR ARCHAEOLOGIST GEORDON TAYLOR RECORDING A WEIR IN BUTTE COUNTY, CA



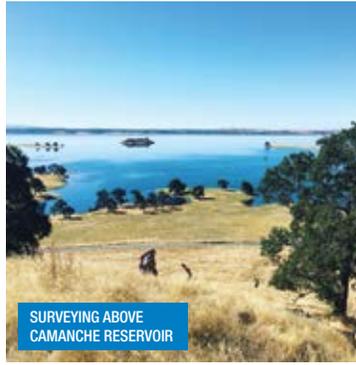
MAPPING A FEATURE IN A UNIT IN GLENN COUNTY



PAR SENIOR ARCHAEOLOGIST ELLIE MANIERY RECORDING WATER FEATURES IN BUTTE COUNTY



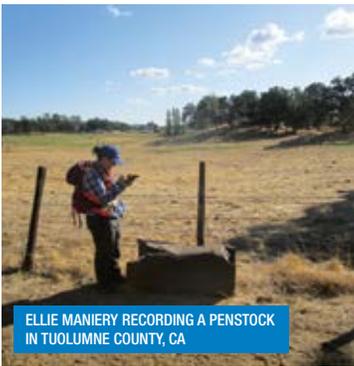
PAR PRINCIPALS AND DAVE MCCOLLOUGH AT WORK AT EBMUD PHASE II PROJECT



SURVEYING ABOVE CAMANCHE RESERVOIR



ELLIE MANIERY MAPPING MINING TAILINGS



ELLIE MANIERY RECORDING A PENSTOCK IN TUOLUMNE COUNTY, CA



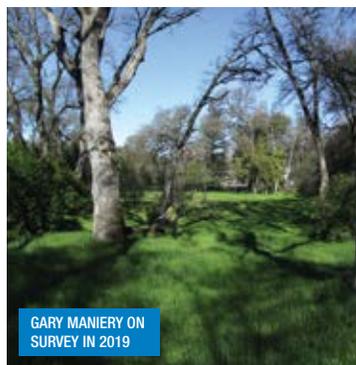
PAR PRESIDENT MARY MANIERY RECORDING OVERGROWN HISTORIC FEATURES IN TUOLUMNE COUNTY, CA



CONDUCTING GROUNDSTONE ANALYSIS IN PAR'S PREHISTORIC ARCHAEOLOGY LAB



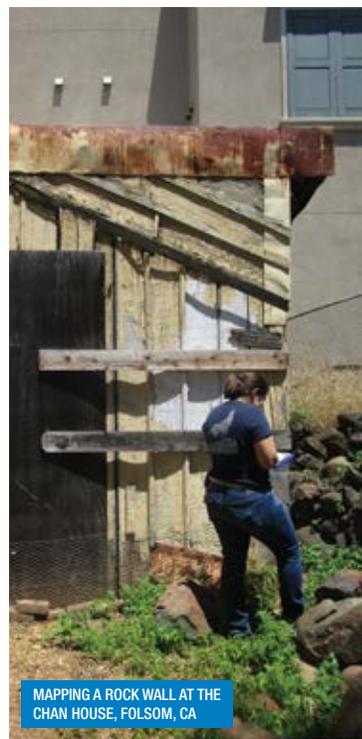
ELLIE, MARY, SARAH, AND JESSICA AT THE RACE AGAINST OVARIAN CANCER



GARY MANIERY ON SURVEY IN 2019



ORIGINAL GRANITE'S, EVALUATED BY PAR IN 2019



MAPPING A ROCK WALL AT THE CHAN HOUSE, FOLSOM, CA



SURVEY OF TRANSMISSION LINE TOWERS IN TRINITY COUNTY, CA



MINING CUT IN A HILLSLOPE IN CALAVERAS COUNTY

RESEARCH CORNER

Altered Landscapes: Stockton's Inland Port Empire

by Geordon Taylor

History comes in many shapes and sizes. Many times it isn't a flaked stone tool, railroad spike, or the local town legend; it is the altered landscape around us. An altered landscape is any visible feature of land that is changed by human action; from funny-shaped mounds of dirt and rocks to oddly square river channels cut straight through an island. These changes are sometimes not so subtle, but easily over-looked aspects of our culture that usually have an inter-

esting story and unique contribution to where we are today. Take, for example, the river channels cut straight through an island along the San Joaquin River. This altered landscape is a result of the Port of Stockton.

The Port of Stockton is an impressive feat of human engineering. Yes, it may not look like much as you travel up and down I-5 on your daily commute, but did you know that in the 1930s the U.S. Army Corps of Engineers cut through numerous Delta islands and dredged the San Joaquin River to a depth of 35 feet for some 50 miles to allow

large ships to travel inland from the Pacific Ocean?

But more than the feat alone is the history this Port has been a part of. It helped transport food to the world during the Great Depression, provided the U.S. Military with a uniquely strategic location to build war ships during WWII, and has, is, and will be a viable economic boost to Stockton and the State of California, affecting countless numbers of people's lives. This is a brief example of humankind's footprint on our planet and the story it leaves behind. ✂



Port of Stockton East; View: East; Date: circa 1930; Courtesy: Port of Stockton



Port of Stockton East; View: East; Date: 2002; Courtesy: Port of Stockton

Editor's Corner by Andrea "Ellie" Maniery

This year brought change to PAR and reminded us again of the core values and mission statement we established last year. At PAR, business is personal. We are family owned and small, and caring is at the heart of everything we do. From the initial project kick-off meetings

to the fieldwork, and culminating in final submission to the info center and agencies, it is our mission to incorporate pride into the services we provide and the products we create. We work to ensure that every step of the process is smoothly executed and always strive to be "easy

to work with." Let us know if you need us. We'll be here for you and your clients to help you to navigate the sometimes-complex environmental process, and I can promise we'll give the project our all. Cheers from the PAR team! ✂

Research Spotlights

➡ *by Josh Allen* The Mesa landforms of the Mid-Columbia Plateau in Central Washington are unique and isolated features occupied by pre-contact peoples for nearly 4,000 years. The arguments for pre-contact use of the Mesas are based more on plausibility than empirical comparisons of archaeological assemblages. Initial research is focused on aggregate lithic analysis methods at three sites (45-GR-162, 45-GR-144, 45-GR-188) excavated by Dr. William Smith (1977) at Central Washington University from 1973-1975. For this project, lithic analysis results were compared against a mid-Columbia Plateau occupation site (45-DO-673) to test for variation in lithic technology and function between environments. Results indicate that distance to stone tool sources and possible trades influenced stone tool variability

between mesa sites and between mesa sites and 45DO673.



Josh Allen seated on mesa, 2019

➡ *by Andrea "Ellie" Maniery* In 2019 PAR's senior archaeologist, Ellie Maniery, was approached with the opportunity to study the lithic artifacts from the orphaned Yreka Chinatown collection in collaboration with Dr. Sarah Heffner at the Department of Water Resources and California State Parks. Analysis of these tools and chipped stone debitage was conducted as part of the study. The results of the lithic analysis conducted by Ellie Maniery, as well as results from the overall Yreka site, are available in the newest California State Parks publication (Vol. #36) titled "Archaeological Investigations of 委李架埠: Yreka's Chinese Community"! ✨



Mesa 12 site



Mesa 36 site

Lessons from Abroad

by Mary Maniery

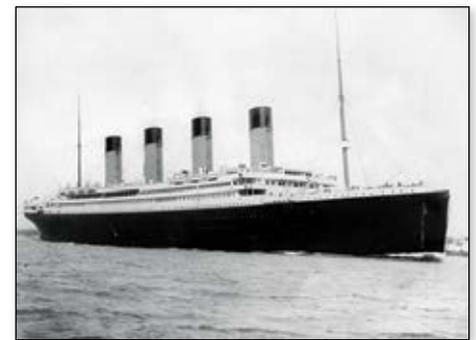
As a company that studies old buildings, historical events, and the material cultural of human activity (archaeology) we are always aware of circles of influence on decisions made by individuals, households, or companies, and the effects of regional, state, national, or international events have on the decision-making process. It is not often that we have

the opportunity to venture overseas to link events we research during projects to the wider world system. In July of 2019 we had a rare chance to explore connections, similarities, and differences between Ireland, France, and our projects in California.

Titanic

The Titanic, and its ill-fated journey, have been the focus of numerous books, movies, and artwork and it is rare to find someone who isn't familiar with the sad tale of a promising venture cut short by icebergs and death. Visiting the site where the Titanic was constructed in Belfast and the museum that chronicles the building of the Titanic and its sinking, was a must-see on our list of places to go while in Northern Ireland. While the majority of the visitors were fascinated with the exhibits showing the interior public areas and amenities of the ship, the disaster that led to its sinking, and the explanations of the aftermath, it was the actual construction of the ship that caught my interest.

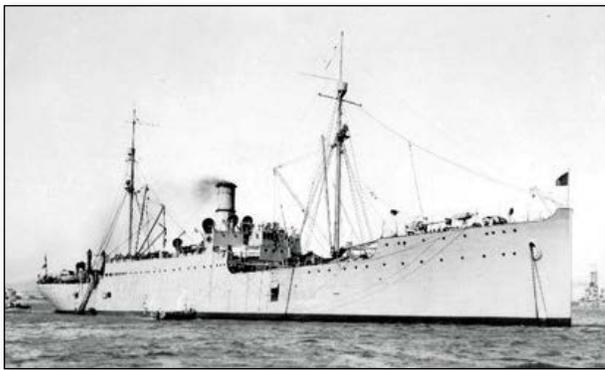
For over 20 years PAR has worked on Mare Island, the former site of the west coast Naval Shipyard. Founded in 1854, Mare Island was the primary ship repair facility in the west throughout the second half of the nineteenth century and began building ships for



Titanic on launch day, 1912

RESEARCH CORNER

the Navy around 1900. Through the years we have documented and recorded the Island's dry docks, marine railway, berths, machine shops, and housing. We've exposed and investigated refuse deposits associated with workers and sailors. We have also encountered parts of ships, crew's nests, underground cisterns, and water and oil storage features. As we entered the Titanic exhibit, one goal was to see if the design of the Titanic, the largest commercial ship built at the time, was influenced by United States Naval ship design. Conversely, was the Navy inspired by the Titanic?



Mare Island's USS PROMETHEUS in 1914

The first Naval ship built completely at Mare Island, the Prometheus, was launched on December 5, 1908 and was the largest built at the Mare Island Naval Yard at that time. A steel collier, the ship measured 466 feet long, 60 feet wide at the beam, and had a maximum speed of 16 knots. The Prometheus had one funnel and two masts and was sheathed in steel. The Naval yards in New York and along the east coast were not bound by a narrow strait like Mare Island was and were able to build and launch larger ships. The USS Washington, a Tennessee class carrier, was an armored cruiser that launched in 1905. The Washington was 504 feet long, 72 feet wide at



USS Washington near Seattle, 1908

the beam, and could reach 22 knots. The Washington had four funnels and was built with numerous watertight bulkheads, similar to the Titanic. The Washington had riveted steel armour, a technique that the Titanic also used.

The Titanic, while built using standard Naval architecture of the time, set records for its size, construction detail, and equipment. At 883 feet in length, it was almost double the size of the Prometheus and 380 feet longer than the Washington. It was also wider, measuring 92.5 feet across the beam. Given its size and bulk, it moved slower than the Washington, reaching 21 knots. Titanic had two engines that drove the two wing propellers (each over 20 feet in diameter) and a turbine engine for the central propeller. This combination of the engines was innovative in 1912, and was a recent development in shipbuilding technology that improved efficiency.

All three ships used coal to keep the

boilers going. The big difference was in the amount needed and storage capacity. The USS Washington, for example, carried 900 tons of coal to keep her boilers going; the Titanic carried 6,641 tons of coal on her maiden voyage, and burned 600 tons per day to fuel her 29 boilers. While the Titanic's size was impressive and the effort extraordinary, the actual construction methods and techniques reflected an industry standard that was used by the Royal Navy, US Navy, and other shipbuilders around the world.

The exhibit included stoneware water and ale bottles, tobacco tins, and small tools used by the workers. These items were near identical to artifacts recovered in the early 1900s shipbuilding areas at Mare Island. Like at Mare Island, the stoneware water vessel was tall and cylindrical with a handle, and the ginger beer bottle was duo-toned; cream on the bottom and brown on the top half. Both are common artifacts found in deposits from the late 1800s and early 1900s at Mare Island and appear to have been common international import items in the 19th and early 20th centuries. ✂



Duo-toned ginger beer bottle from the Titanic exhibit, Belfast



Water bottle used by Titanic construction workers

PAR Technical Reports Still Available:

Test Excavations at CA-MEN-2138, Redwood Valley, California.

PAR Environmental Services, Inc.
Technical Report No. 1, 1994

*By James Gary Maniery
Cost: Free*

The Natoma Site, Archaeological Test Excavations at CA-SAC-166.

PAR Environmental Services, Inc.
Technical Report No. 2, 1996

*By James Gary Maniery
Cost: Free*

A Study of the California Red-Legged Frog (*Rana aurora dratonii*) of Butte County, California.

PAR Environmental Services, Inc.
Technical Report No. 3, 1999

*By Sean Berry
Cost: Free*

PAR 2019 UPDATE

EDITOR:

Andrea "Ellie" Maniery

DESIGN:

Heather Rose Design, Manhattan Beach

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NEWS FLASH ITEMS

PAR has always believed in giving back to our various professions, whether through committing to presenting at annual or local meetings, volunteering to serve on committees, or serving as mentors for students, as highlighted below.

➤ PAR continued participation with the Society for California in the fall of 2019 and 2020. In October, Mary co-authored a presentation with Sarah Heffner (Independent consultant) and Rebecca Allen (United Auburn Indian Community) titled Finding Hidden Voices of the Chinese Railroad Worker: An Archaeological and Historical Sleuthing for the SCA Data Sharing held in Truckee, CA. Mary is also participating in a three-minute session at the upcoming SCA Annual Meeting in Riverside, providing a quick insight into mustard containers through time.

➤ Mary Maniery was asked to participate as an instructor in a three-day Geoarchaeology training class for Caltrans taught by Far Western staff. Ms. Maniery taught a section on historical archaeology, focusing on the processes that bury sites and responses to natural catastrophic events after 1850. Her talk brought in buried ships in San Francisco, raising the streets of Sacramento, clean up after earthquakes and floods, and effects of reclamation and levee building on sites. She also discussed application of the Harris Matrix, a staple in historical archaeology, and guided hands-on exercises for students to learn this stratigraphic technique. Two sessions have been held in Oakland and Bishop, California. The third and final session occurred in early March in San Bernardino.

➤ In April of 2019 Amber Rankin attended the Alaska Robotics Comics Camp and Mini-Con, a week long adventure in Juneau, Alaska. She joined other comic creators, artists, and illustrators to meet other artists, discuss working as an artist, and share her work and tips with the Juneau community. Amber spoke as a visiting artist to high school art students in Juneau about developing a varied creative career and juggling a full-time job as Graphic Artist with PAR with working as an independent illustrator and animator on short films.

➤ This year, Amber Rankin will be credited on her second short film release. "Let's Eat", a short film that follows an immigrant mother and her daughter through their journey of growing up and apart. The film will be released to film festivals in early 2020. Amber contributed 2D animation and concept art for film, working collaboratively with over 100 volunteer artists from across the globe for nearly two years.

➤ Mary Maniery continued in her role as Co-Publications Associate on the Society for Historical Archaeology editorial board. In 2019 Mary prepared promotional material for a volume titled Archaeology of Vernacular Watercraft, edited by Amanda Evans and co-published by the SHA and University Press of Florida.

ANNOUNCEMENTS

➤ PAR said goodbye to Cindy Baker and Sarah Heffner in 2019. Cindy retired after 25 years of serving as PAR's historian and architectural historian. Her work during her time at PAR was always professional, and her public interpretation efforts were outstanding and successful. Cindy spearheaded numerous museum exhibits, authored booklets and three-folds on the Marines at Mare Island, oil fields in Kern County, and squatter's camps in the desert, and created numerous exhibits on Chinese American life. We wish her well in her new ventures.

➤ Sarah Heffner, PAR's senior historical archaeologist, ended her five-year run with our company to join the staff at the California Department of Water Resources. We know she will excel in her new position and thank her for her many years of dedicated professionalism while at PAR.

LOCAL CHARITIES & NON-PROFIT ORGANIZATIONS

- Plumas County Charities
- David Feherty Troops First Foundation
- Sacramento Archaeological Society
- Sacramento Historical Society
- Society for California Archaeology
- Asian American Comparative Collection (University of Idaho, Moscow)

Renewed Outreach Efforts *by Amber Rankin*

At the beginning of 2019, PAR put together a small but dedicated marketing team to increase outreach and spearhead the search for opportunities in the new year. The team, led by Amber Rankin, began the year by developing an updated 3-fold brochure to distribute at the 2019 SCA. The brochure highlighted PAR's work, with a map of our recent projects and updated mission statement. The team also revived PAR's LinkedIn page in order to highlight new research, publications, travel, and community outreach. We will continue to produce fresh content and updates about the exciting academic and community work in 2020.

For continued updates please follow PAR's LinkedIn page:
<https://www.linkedin.com/company/par-environmental-services/>



PAR is a woman-owned business that originated in 1982. From its beginnings as a small firm consisting of two enterprising and dedicated archaeologists, PAR has grown into a full service organization. Our staff provides professional expertise in environmental planning and cultural resources investigations. We take great pride in producing high quality, clear and concise reports based upon thorough and objective analysis. We have acquired a well-earned reputation for completing projects on time, within budget and with meticulous attention to detail. The firm's principals have a strong background in the natural and cultural planning issues of California and the West.

PAR'S ARREST EXPERIENCE IN



PAR IN THE COMMUNITY

Dirt Dogs for Kim – Honoring Far Western President, Kim Carpenter

by Amber Rankin

PAR organized and collaborated with Far Western, to create the 'Dirt Dogs for Kim' team for the 5k Race Against Ovarian Cancer in honor of our long-time friend and colleague, Far Western President Kim

Carpenter, who lost her battle with ovarian cancer in July 2019. On the day of the race, 40 Dirt Dogs runners participated or donated in honor of Kim, including supporters from Far Western, PAR, Stantec, ECORP, PG&E, SCA, and the Susanville Indian Rancheria, along with colleagues, friends, coworkers, and family of Kim. Combined, our

runners and supporters raised over \$800 for ovarian cancer research. This event was a great show of support and love from friends, family and colleagues across disciplines to honor Kim's memory. PAR intends to participate in the 2020 Race Against Ovarian Cancer. ✨



Dirt Dogs for Kim team at the Race Against Ovarian Cancer, wearing team shirts designed by Kim's daughter

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