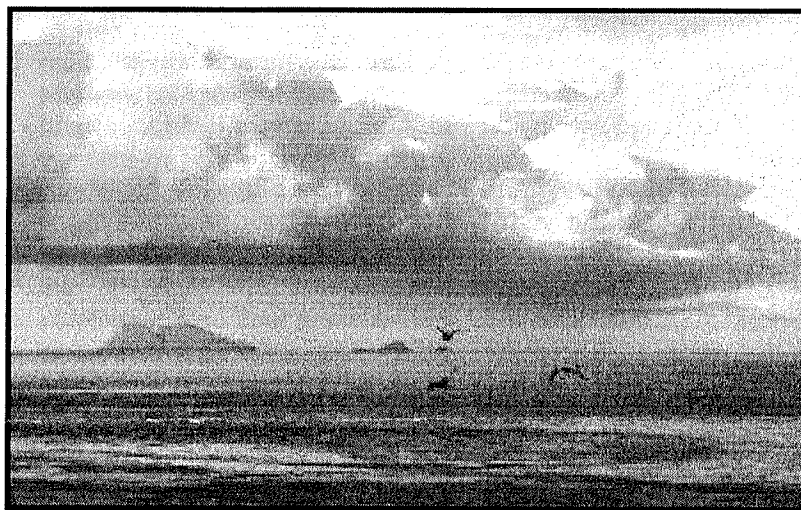


The EXPLORER

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Cabrillo National Monument and
Cabrillo National Monument Foundation*



The Great Cover-Up

Feel the chill in the air? Smell the rain? Is your hair blown to disastrous states by that wild, whipping wind? It's wintertime in San Diego, and we're all pulling out those hats and scarves and cozy sweaters for just a few days. In our excitement over adding layers and cozying up, we invite you to consider your own favorite coverings and to observe the coverings of the living things around you. What do different types of clothing signify? How does the clothing of our history reflect societal values? What is the function of feathers? How do colors help animals communicate or hide?

It's about fashion. What impressions are people, animals, and plants giving? It's also about function. What's the use of that peculiar exterior covering?

We hope you'll enjoy investigating "The Great Cover-Up!"

Patricia Heusner, Editor

Superintendent's Corner

by Terry DiMattio



This spring marks a milestone in the monument's history that is worthy of our attention and appreciation.

We are beginning to see early signs of spring around the park. Small white blossoms are appearing on the lemonadeberry, and new leaves are changing the *Encelia californica* from dormant gray-brown to bright green. Even though we have not received much rain this winter, the season is changing, bringing new life to the landscape. It is an exciting time of awakening and activity on Point Loma.

As we move into spring and summer, there will be a lot happening in the park. Next month, Hal Hays Construction will begin rehabilitating Sea Cove and Coast View parking areas on Gatchell Road. These are the two scenic overlooks closest to the wastewater treatment plant where visitors park their cars and enjoy the solitude and view of the ocean. These overlooks are being rehabilitated to improve access and egress, incorporate architectural elements and materials from the visitor center, such as tan-colored concrete walks with red brick edges, into their design, and soften their appearance when seen from the top of the peninsula. This project should take four to six weeks to complete. During that time the overlooks will be closed to the public, so parking for those who wish to visit the tidepools on busy weekends may be limited.

There is another project coming up that will affect our visitors for a short time, but when finished will make a big difference in our operation: construction of the office for the rangers in the Resource Management and Visitor Protection division. The Denver Service Center has designed this

addition to resemble the buildings in the visitor center complex. It will be located southeast of the administration building and will serve as a visitor contact station where we can treat injured visitors and meet with people who are requesting a permit to film in the park, get married, or hold a reenlistment or retirement ceremony. The addition will also provide us with the space we need to store evidence, weapons, and ammunition, living-history clothing and science equipment, hold meetings and conduct training using the TELNet satellite system we acquired last year. We will be using fees that have been collected at the entrance station to pay for this addition. We expect construction to begin in May or June and last for about four or five months. During that time the traffic circle will be closed to vehicles and we will have to route visitors safely around the job site to the Cabrillo statue and the walk to the lighthouse and whale overlook.

The last project I would like to mention that likewise will improve our operation and our visitors' enjoyment of the park is the replacement of the whale overlook. This one will also be paid for with entrance fees. We recently began working with the Denver Service Center and AJC Architects of Salt Lake City to design this new interpretive shelter. It will be sited about 25 yards northwest of the whale overlook, contain new exhibits, and provide more protected viewing area than the existing one while blending more harmoniously with its surroundings. AJC will present three alternative designs to us at

the end of February. Next month, Karl Pierce and I will participate in a value analysis to identify the design that meets our objectives and is the best value for the taxpayer's money. This is an exciting project, but one that will probably take three years to finish. We expect to complete the preliminary design this year, and, following review by the National Park Service Development Advisory Board and approval by the Department of the Interior, prepare the construction drawings and specifications in 2007 and build it in 2008.

This spring marks a milestone in the monument's history that is worthy of our attention and appreciation. In March 1956, former superintendent Donald Robinson and a dedicated group of far-sighted park supporters, created the Cabrillo Historical Association, which we know today

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1800 Cabrillo Memorial Drive
San Diego, CA 92106
(619) 222-4747 www.cnmfakaren@aol.com

as the Cabrillo National Monument Foundation. This not-for-profit, 501c3 cooperating association, is celebrating its 50th anniversary this year. Over that time, it has donated \$1.7 million to the interpretive, educational and scientific programs of the National Park Service at Cabrillo National Monument, and has helped other

national park areas through donations and no-interest loans. Through its generosity, and that of scores of selfless people who have donated their time and talents while serving as members of the board of directors or employees, it has enriched the lives of millions of people, providing the margin of excellence during their visit here.

To all of those who have been associated with the Foundation, as trustees, employees, or members, thank you for everything that you have done to make Cabrillo National Monument a better place and to preserve it for the edification and enjoyment of those who will visit us in the future. I appreciate it very much.

The cover of the wild

By Stephanie Glenn

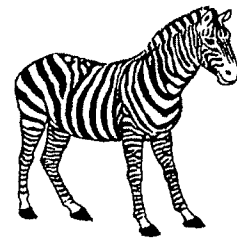
We all know the saying, "Don't judge a book by its cover." It reminds us to look deeper than just the surface, and not to be deceived by appearances. In nature, however, many organisms rely on being judged by their cover to ensure their survival. They depend on their deceptive coloration to avoid or deter predators or to attract potential prey.

Deceptive coloration has many forms. Some organisms have evolved camouflage coloration to avoid detection by predators or remain invisible to prey. For example, when sitting motionless, the western fence lizard, *Sceloporus occidentalis*, blends in with the brown sandy soil or dormant vegetation making it virtually invisible to birds and other predators. Other organisms have evolved to look like objects in their environment, such as a stick or a leaf. Praying mantids are predatory invertebrates that have mastered this type of cryptic covering and are just about undetectable to prey as well as predators.

Disruptive coloration, such as stripes and spots, is another way many organisms confuse predators and blend into their surroundings. The black and white stripes of a zebra may stand out against brown grasslands, but

when viewed against the backdrop of the herd, a single individual zebra can be very hard for a predator to decipher.

While some animals try to blend into their surroundings, others use bright colors to warn predators that they are toxic or poisonous and would not be an agreeable meal. Here on Point Loma the ring-necked snake, *Diadophis punctatus*, coils up when disturbed and flashes its bright reddish-orange belly to warn the predator that it is an unpleasant meal. Some organisms copy or mimic the coloration of such unpalatable critters in hopes that predators will be deterred from eating a potentially ailing meal. When a mimic species is truly harmless to predators, it is called a **Batesian mimic**. For example, certain morphs of kingsnakes (*Lampropeltis* sp.) look very similar to the poisonous coral snake; both have black, red and pale yellow striping. Yet, while the kingsnake is non-poisonous, many predators will avoid it since the cost of being wrong could mean their death. On the other hand, some species that mimic each other are in fact both toxic, in which case it is called **Mullerian mimicry**. This type of mimicry benefits both species since predators are constantly reminded that such coloration means an



With disruptive coloration, such as stripes and spots, many organisms confuse predators and blend into their surroundings.



unpleasant if not fatal meal.

Deceptive façades are not only a way for organisms to avoid being eaten, but can also be a way to lure prey items to within striking distance, known as **aggressive mimicry**—a wolf in sheep's clothing, so to speak. Many organisms imitate a signal that will attract or deceive specific prey. For example, the female adult bolas spider will release female moth pheromone compounds, thus attracting male moths to their doom.

In nature, appearances can mean the difference between attracting attention or remaining invincible, between a tasty meal or going hungry, and ultimately between life or death. It is no wonder then that judging by their cover, those that are the most deceptive survive.

Covering the Cabrillo Expedition

by Bob Munson, CNM Historian

Clothes do not necessarily make the man, but naked people have little influence in society.

Clothes are status symbols, expressions of wealth and/or artistic taste, practical garments which advertise skills or a profession; sometimes just a desire to be warm, avoid sunburn, or provide physical protection.

Armor does all this.

Mention the word "Conquistador" and in most people an image immediately pops to mind: He wears a shining breastplate and a rather oddly shaped helmet, usually with plumes. His sleeves and trousers are puffed, padded and of gaudy color combinations, but he wears no-nonsense gauntlets and tall leather boots. At his side is a slender rapier and in his hands a fancy ax with a ten-foot handle known as a halbard. Some of the more romantic types see him as a Cesar Romero, Gilbert Roland, or Tyrone Power.

It's a dashing image, and except for the naked body underneath, it's also largely wrong.

The Conquistadors didn't even call themselves that; the word was coined a century later, long after the last one was dead.

It is true that the people we call Conquistadors were professional fighting men—hard bitten, tough, and flinty-eyed realists. However, they had just finished the longest civil war in history which had impoverished Spain, leaving it with only one national product: a standing army.

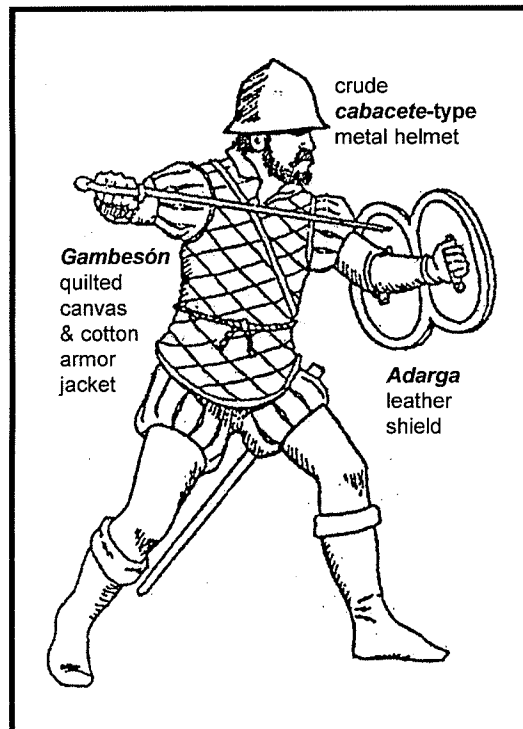
But this was not a nationally subsidized army. There was no such thing as a uniform, no two Spanish soldiers looked the same, nor did they want to. These were disciplined soldiers but they were also rugged individualists. Each man provided his own equipment and except for the nobility and the

horsemen, but in *Nueva España* many soldiers opted for simple shoes and often yucca fiber sandals.

Armor was expensive. Buying a full suit of armor was like buying a brand new BMW. Until the iron deposits at Durango were discovered, all armor had to be sent from Spain. Thus most men could not afford full armor. Bernal Diaz notes that when Cortés was preparing his expedition to Mexico most of the men did not have armor and Cortés ordered quilted cotton jackets made. These were the European *gambeson* and native American *esquipil* which were effectively identical. These and leather jackets (*cuera*) were destined to be the predominant body armor of the Conquest. They were inexpensive and, except for the southeastern Indians' long bow, effective against native weapons. However, for torso protection the Spanish soldier still preferred metal armor if he could get his hands on it. This tended to be the sleeveless chain mail vest (*jaqueta de mala*) or long

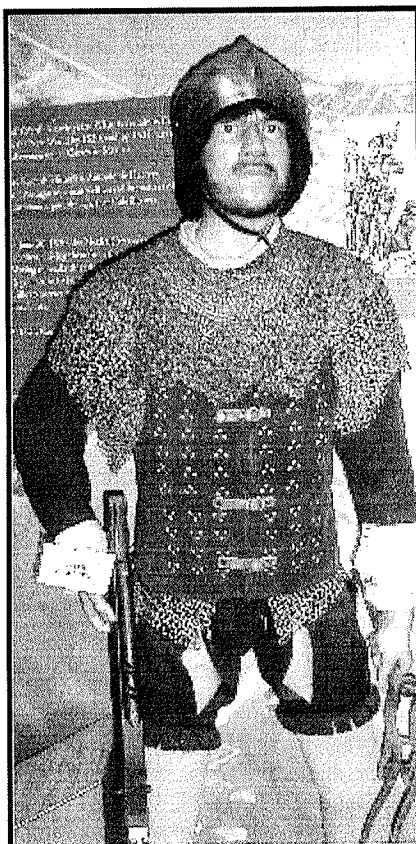
sleeveless shirt (*cota de mala*). Chain mail was much cheaper than plate metal. But the most crucial piece of armor to a Spanish soldier was his helmet and Cortés had to have simple helmets mass produced in Cuba.

Except for the nobility and very wealthy who could afford full plate, the equipment lists of Cabrillo's time indicate Spanish soldiers disliked the weight of



very wealthy it was usually a mixed bag of whatever the soldier could find and afford.

The basic clothing consisted of a *camisa* (long sleeved shirt), a doublet which could have sleeves or not, and a variety of coverings for the waist down but *not* the balloon-like "pumpkin" pants with strips of alternating colors of the Elizabethan age. Boots and leather gloves were essential for



The mannequin of the young crossbowman Cabrillo in our exhibit actually shows a surprisingly well-equipped man of the Cortés expedition.

armor on their arms, hands, or legs. Chain mail torso armor and metal helmets are quite common in the muster lists, as well as the occasional buffe—a plate or chain mail protection for the face and neck. They appear to have preferred to rely on their speed and skill to protect their limbs.

Much of the armor used in the New World appears to have been relatively obsolete by 1542, but even obsolete armor was better than none. Obsolete would also be cheaper; thus there was a ready market for it among poor adventurers, and in the New World. This is demonstrated by

the archaeological discovery of an archer's pot helmet (*capelina*) at San Gabriel del Yunque in New Mexico.

The mannequin of the young crossbowman Cabrillo in our exhibit actually shows a surprisingly well-equipped man of the Cortés expedition. He has both chain mail and a bergandine to protect his torso. The bergandine was a heavy cloth coat with numerous small metal plates sewn between the inner and outer layers of cloth. This armor perhaps reflects the fact that Cabrillo had come from Europe as a companion to a younger son of the wealthy Ortega family. His very well-made *celada*-style helmet would certainly bear this out.

The three-quarter plate armor of the middle aged Cabrillo mannequin definitely shows that Cabrillo had become a man of wealth and power by the 1530s.

Unfortunately, the equipment lists of the Cabrillo expedition have been misplaced so we do not know exactly what was being used. However, the list for the contemporary Francisco Vázquez de Coronado expedition has survived. Considering that the soldiers included in the two expeditions were drawn from the same pool of manpower, it seems likely the equipment was similar. The Coronado list is attached below, but a quick perusal reveals some appropriate statistics.

Although 42% of the force had some form of metal armor (mostly helmets and chain mail), this was a mixed bag of odd bits and pieces usually combined with quilted cotton torso armor. Only nine men (3%) out of 287 had complete plate harnesses. These nine men were obviously Coronado himself and the senior officers, usually wealthy noblemen. In contrast, 89% (250 men) had quilted cotton torso armor.

Although *marineros* (sailors) did not consider soldiering to be their job, the Crown stated that

every one of them had to be equipped to defend his ship from pirates and to defend himself when going ashore for food and water. Therefore, the *Reglamento* of 1522 stated that every sailor was required to have at least a weapon, a helmet, and a shield. If he did not provide this equipment he would not be paid. Like the soldiers, the sailors had to buy all their own equipment. They did not like having to spend their hard-earned money on items they did not want to use.

continued on page 6



The three-quarter plate armor of the middle-aged Cabrillo mannequin definitely shows that he had become a man of wealth and power by the 1530s.

Unfortunately, they could not claim their working knife as a weapon, as it was officially a tool. Thus, they were in the market for the cheapest equipment they could find. Simple, obsolete helmets, tools such as a boarding ax for the weapon, and a small parrying shield like the *rodello* were preferred. The boarding or quarter pike was popular because

it needed two hands to use, which meant a man did not have to buy a shield.

The high-ranking individuals would have had armor intended not only for protection but to impress the rulers they were expecting to meet. In contrast, for most of the soldiers and sailors armor was strictly utilitarian and underwhelming in appearance.



MORRIÓN

CORONADO MUSTER LIST, 1540

CAVALRY EQUIPMENT (225 horsemen)

- 5 full plate harnesses (including helmets), 4 of them Coronado's
- 4 full sets of plate horse armor, all Coronado's
- 7 corselets or $\frac{3}{4}$ plate (breast & back plates, collar, armor for arms, armor for upper legs, and an open helmet—the *borgoñata* was most popular)
- 8 cuirasses (breast & back plates)
- 55 *cotas de mala* (long chain mail shirt, all but one sleeveless)
- 2 *jaquetas de mala* (sleeveless chain mail vest)
- 3 sets of chain mail for the legs.
- 207 *gambesón/esquipil* quilted cotton jackets
- 65 leather jackets
- 20 *morrión*-style helmets
- 7 *borgoñata*-style helmets

- 23 buffe (plate or chain mail protection for face and neck)
- 2 gorgets (plate collar)
- 2 metal gauntlets (not a pair)
- 19 "armor for the head" (just what this refers to is not stated, but it is differentiated from helmets)
- 4 quilted cotton armor for the head

Weapons:

- Every man had a lance and a sword.
- 4 "arms of Castile"
- 3 crossbows
- 3 matchlock muskets
- 1 two handed sword
- 1 dagger
- 2 lances (Since these two were specifically noted, they presumably are the heavier impact- type weapon not normally carried in the field in *Nueva España*.)

INFANTRY EQUIPMENT (62 men, 5 of whom also had horses)

- 1 corselet/ $\frac{3}{4}$ plate
- 6 leather jackets
- 43 *gambesón/esquipil* quilted cotton jackets
- 1 set of chain mail sleeves.
- 21 metal knee plates (no man had two), usually worn on leading leg.)
- 2 *borgoñata*-type helmets

Weapons:

- 49 swords
- 1 two-handed sword
- 12 daggers
- 21 matchlock muskets
- 16 crossbows

The Hermit's New Clothes



Ted Washington

Scurry Scuttle
Imagine being unclad your plight
Purple dwarf olive, no, no
This one is already too tight
Hurry Hustle
Spacious for growth and neatly vacated
Blue-ring top snail, no, no
Castoff it is unsafe and overdecorated
Scurry Scuttle
Tidal pool expanses to roam
Checkered periwinkle, maybe, maybe
Duly inspected it fails as a home
Hurry Hustle
Procrastinate and become someone's dinner
Poulson rock snail, yes, yes
Thick and protective it is the winner

What color is an octopus?

By Bonnie J. Becker, Marine Biologist

What color is an octopus? Well, that depends. Does the octopus want to blend in? Is it angry or relaxed or in the mood for love? Many species of cephalopod, the class in which the octopuses are classified, have an amazing ability to change their appearance. They can look like kelp, corals, sand, or a coconut. They can mimic other animals, gliding like a snail, recreating the stripes (and even the fins) of a poisonous lion fish or scanning the bottom in the distinctive shape of a stingray. They can mimic drifting kelp, dead leaves, or a rock. One diver reported an octopus turning the color of a rusty shipwreck in order to camouflage itself. Some can even glow in the dark!

The key to their aesthetic flexibility is called the chromatophore, a pigment cell that is made up of "bags" of different color pigments, including black, yellow, orange, red, and blue. Octopuses have millions of chromatophores in their skin, each of which is controlled by nerves and tiny muscles. Each chromatophore serves like a "pixel" on a computer screen. This system allows them to display a great diversity and subtlety of colors and change them very rapidly. You can actually see an octopus change color as it moves over differently colored surfaces so that the effect is flawless. In addition to chromatophores, octopuses have a number of other types of color cells that reflect light or produce a beautiful iridescent sheen. Deep sea octopuses can produce bioluminescence in cells called photophores, which can come in a variety of colors. In addition to changing their color and reflectiveness, some

octopuses can even change the texture of their skin using an elaborate system of muscles. They also change their shape and behaviors for a more convincing disguise.

Octopuses use their color for a variety of purposes. They can blend in with their surroundings to hide from predators or sneak up on their prey while hunting. In the deep sea, they can use subtle lighting cues to mask their own shadows or less subtle flashes to attract prey. Some poisonous octopuses are brightly colored to warn potential predators not to bother trying to hurt them. In some species, they use flashes of color to communicate a range of emotions. In one study, it was determined that an octopus turned white when it was fearful, red if it was angry, and brown if it was relaxed. If only humans could be so clear with their emotions!

When you think about it, humans have no protective covering, move slowly, and are not particularly strong, leaving us quite vulnerable to the elements and predators. Despite being an easy snack for faster and bigger animals, we have been successful in an evolutionary sense mostly by being smart, rather than with brute strength or body armor. In this way, we are not so different from the magnificent octopus. Although they have lost the protective outer shell of most mollusks, octopuses and other cephalopods are highly evolved members of the snail family. Instead of relying on hard structures, they have adapted to be very intelligent, mobile, and creative in their use of camouflage. By eliminating the need for a heavy and inflexible shell, they are able to swim very quickly, squeeze through holes as

small as their beaks and change the color of their skin as the situation warrants. Once again, brains win over brawn.

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Cephalopods: A World Guide by Mark Norman

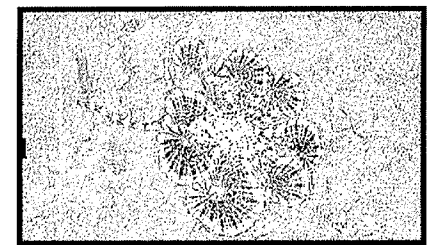
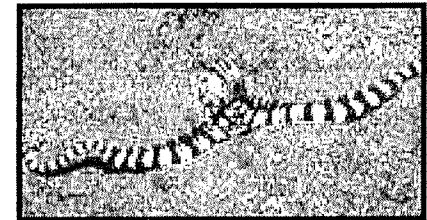
Invertebrates by Richard Brusca and Gary Brusca



Above: Poisonous sea snake.

Below: Octopus mimic of sea snake.

Source: <http://www.biology.leeds.ac.uk/staff/tbt/Research.htm#ceph>



Octopus imitating a sting ray

Source: http://uwpresse.com/SERVER/reportages/MARINE_LIFE/CAMOUFLAGE/ppages/ppage16.html



Octopus imitating a lion fish

Source: http://news.nationalgeographic.com/news/2001/09/0921_octopus5.html

Feathers: birds' unique coverings

By Claude G. Edwards, CNM Volunteer

People cover themselves with various forms and amounts of clothing, from scanty to lavish, composed of different kinds of materials, both natural and man-made. Most mammals are covered with hair—some more than others—from sparse to dense, depending on their lifestyles. Most fish are covered with scales, as are the majority of reptiles. Amphibians get by with being naked, although they come in so many textures and colors that we—and they—consider them well-attired. Insects are wrapped in a hardened skin, from soft and pliable to hard and rigid, sometimes decorated with spikes, spines, horns, quills, or plates.

Birds are unique in Nature by being covered with feathers—familiar, important, and valuable, yet utterly expendable. They are composed of a substance called “keratin,” the same material found in mammal hair, reptile scales, and your finger nails! Someone once determined that a typical-sized hummingbird was covered with nearly 1,500 feathers, and that a swan had well over 25,000. That’s amazing! As a whole, a bird’s feathers are known as its “plumage.”

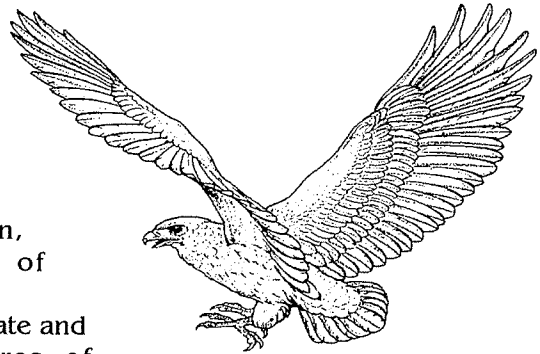
Feathers have distinct components in their structure with their own meanings. Typical feathers consist of a central shaft that can be either stiff or flexible. On either side of the feather shaft are the narrow and fragile portions called “vaness,” which comprise the visible and familiar portion we all know. The feather shaft is divided into two parts, the “calamus,” or quill, which inserts into the bird’s skin, and the “rachis” (ray-kis), from which the

feather vanes emerge. There are six main types of feathers, depending on their specific roles and uses. Most of us are aware of, and have seen, these different types of feathers.

Among the most delicate and least-noticeable features of feathers are those that keep them united and maintain their physical integrity. They are best seen under magnification. Their names can be confusing to remember—not the usual stuff of daily conversation! Nonetheless, the magic of what allows birds to care for and enjoy their feathers is based on how these delicate features work.

Feather vanes are made up of thousands of little branches called “barbs,” which emerge in a parallel fashion on either side of the rachis, or feather shaft. The barbs in turn have hundreds of tiny branches called “barbules” that project on either side. Each barbule has microscopic projections called “barbicels.” The tiny barbicels appear in two forms on most feathers, as small “hooklets,” and as “flanges” or grooves.

When birds care for and arrange their feathers, an activity known as preening, they remove dirt, parasites, loose feathers, and at the same time, restore the feather vanes by connecting the hooklets onto the flanges of the barbicels. This is rather like zipping up a jacket or a pair of jeans. However, this kind of repeated action is one of the reasons why feathers wear out and must be replaced from time to time, a process known as “molting.” Feathers are further maintained by the application of



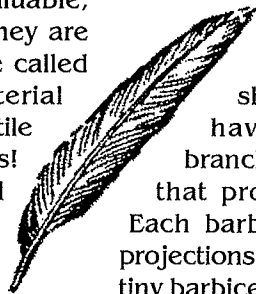
a special oil that is secreted by a gland above their tail.

The most abundant feathers worn by birds—the contour feathers—form the protective outer surface of the body. Contour feathers provide birds the greatest protection from the elements and are also the most visible and important aspect of their plumage. They display colors, patterns, and textures that serve to communicate between individual birds. They also serve to provide camouflage in their environments if needed.

Underneath the contour feathers are the fluffy and fragile down feathers. These are well known for their insulating capabilities, used in our pillows and winter coats. Down feathers are literally a bird’s underwear, tempering between cold and warm conditions.

Wing-feathers that are most often used in flight are called remiges (remi-jeez.) They consist of the strong outer wing feathers, or primaries, and the softer inner wing feathers called secondaries. Primary wing feathers help create the overall shape of a bird’s wing, from long and pointed like a falcon or a dove, to rounded like a quail, or with slots at their tips as in hawks.

Tail feathers, known as rectrices (rec-tri-seez), are also an essential part of birds’ flight, but are also used in territorial and courtship displays. They are



usually somewhat firm or stiff to the touch, but not so much as primary wing feathers. As a group, they help form the shape of a bird's tail, which may be squared, rounded, forked, notched, or fanned.

Semiplumes are midway between contour and down feathers. They add buoyancy in water to some birds and are used as ornamentation by others. Bristles are whisker-like feathers that appear around some birds' eyes and nostrils; in some bird families, such as flycatchers, they are found around the beak to help capture insects.

Feathers are basically white or gray to start with. Coloration in feathers is something we all relate to and very much enjoy when we think about and observe birds. Colors originate from two main sources: naturally occurring pigments and physical structures that affect light hitting them. Pigments are the basis for such colors as black, brown, reds, pinks, oranges and yellows—the same as in tree bark, leaves, and fruits. Structural features are primarily responsible for greens, blues, and purples. They are also the reason some birds have glossy, shiny, or iridescent feathers.

The feather patterns that we have seen in life or in illustrations come from varying arrangement of pigment and structural features that form spots, dots, stripes, streaks, dark or light tips, or that make the feathers glisten and glow.

In conclusion, activities and movements that are made possible by bird feathers include flying and soaring, humming and hovering, molting and preening, and inspiring awe inspiring—in us!

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Shade: at the tidepools?

By New Thanyachareon

Where can you find shade at the tidepools? Good question. Some of us, when we go to a park, look for a good tree to sit underneath. Especially on sunny and hot days, the trees provide shade and cover from the hot sun. Some places have picnic areas that have coverings to protect you from the weather. When you go to a park you will see people at different places. Some might be at the water's edge and some near the woods. Some are underneath the trees while others are out in the open.

Here at Cabrillo, there are not many trees for people to sit under while enjoying the park. There are definitely no trees at the tidepools, but there is shade and cover. Of course, I'm not talking about for us but for the various creatures that inhabit our tidepools. I'm talking about the rocks, boulders, seagrass, and other plants used by animals to keep the hot sun from drying them out. The rocks and boulders provide a stationary cover and shade for various animals. A small rock may have some limpets, snails, and even small sea stars underneath while the bigger rocks and boulders have lobsters, urchins, keyhole limpets, anemones, and bigger sea stars like the blue knobby. The rocks and boulders provide shelter from predators as well. Because they can hide under the rocks, the predators have a much harder time trying to extract their prey from the hiding places.

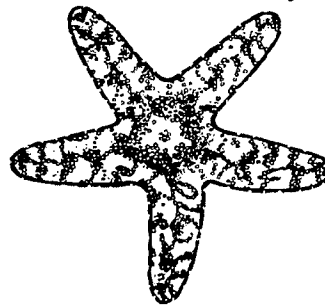
Vegetation like the surfgrass

and other plants provide temporary shelter for more mobile creatures. In a small and enclosed tidepool, sea hares, sea cucumbers and other animals hide underneath the grass to stay cool and covered. Good tidepool etiquette requires that you explore by lifting up rocks and moving grass to uncover hidden animals, but being careful to put the overturned rocks and grass back in place. If you don't, you could seriously injure or even kill the

animals and plants. On a single rock there may be several species of animals living attached to and underneath the rock. Turning the rock over temporarily and

putting it back is fine, but if you don't put it back, the animals and plants that are underside are now drying out and possibly dead while the topside could be drowning.

While some of the animals are hiding, others such as hermit crabs, limpets, and snails are out in the open. They carry on their bodies a protective shell covering, and thus can move around with their portable shade. They store water inside their shells to keep cool. Anemones glue tiny pieces of shells and grains of sand onto their bodies for protection. So, when you think of shade at the tidepools, think small. Always remember, practicing good tidepool etiquette helps preserve the tidepools of Cabrillo National Monument.



Victorian fashion at the Old Point Loma Lighthouse

by Nancy Walton

Clothes may have been developed to protect the body from the elements, but when a civilization rises above the subsistence level, prosperity affords a population many luxuries—one being fashion. Elegant or fancy clothing establishes status and an air of mystery between the classes and the sexes. It is this chameleon quality of human history that is both mirror and guide to our past.

For all our vaunted sexual freedom in the last four decades, we are starting to realize that our supposedly repressed Victorian ancestors were neither repressed nor naïve. They had an intense and much more refined understanding of sex appeal and its manipulation than has long been accepted as scholarly fact. A number of recent books have debunked the myth of Victorian prudery, citing various clothing forms as just one aspect of Victorian eroticism. The fact that the Victorians had the good taste to not blatantly broadcast their sexual activity as we do today with tabloids and R/X-rated movies and television, merely proves this delicate subtlety. To the Victorians, sexuality was a private, personal art form, not a meat market; its very mystique magnified its eroticism.

Nowhere is this more obvious than in the feminine fashion of the time. A fashion that preserved mystery, and at the same time kept a freshness by altering the focus virtually every year—the ultimate art of “keep ‘em guessing.” Imagination is one of the most powerful engines of sex appeal. It drives both the physical and the psychological elements of

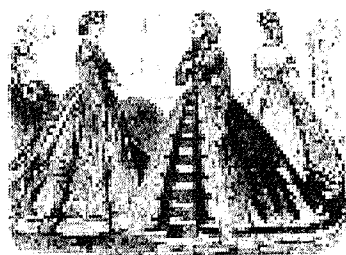
human interpersonal interaction.

A woman entices by her movements, her natural grace, glances, expressions, and a hundred elements of body language. A nude woman is so blatantly physical it overwhelms these psychological appeals. This is where clothing comes in.

A fashionably dressed woman was a civilized woman, a respectable woman. The fashionable silhouette of the Victorians absolutely required the correct underpinnings to be worn: corset, chemise, hose, pantalets, petticoats and the like. To not use the undergarments made the dresses horribly ill-fitted and slovenly, and the wearer as uncivilized as if she were naked.

the daily conditions under which they performed these tasks. Some of these aspects can be appreciated by visiting the lighthouse and seeing the conditions of daily living, but without the people present, we do not see the living, breathing history before us. So let us ponder what it was like for the women of the Old Point Loma Lighthouse.

With the mass production of the sewing machine in the 1850s, elaborate fashions came within the reach of even the lower middle classes. People of the upper classes resented the fact that their social inferiors were suddenly able to mimic their fashions. The way to overcome this was to change



The hoop grew in popularity and volume until it was unwieldy in size and even the subject of ridicule.

The operational life span of the Old Point Loma Lighthouse was 1855 to 1891, which embraces the vast majority of the Victorian period. We often remember the keepers but often forget the wives that occupied our lighthouse. Two of our keepers' wives were official paid assistant keepers, but even the “regular” wives of the keepers were unsung and unpaid helpmates in a lighthouse. From our modern perspective, it is worth considering and contemplating

styles from year to year, sometimes even from season to season.

This developed into a trend with us even today: “What’s in, and what’s out.” The Victorians did this by taking one element of fashion, embellishing and enlarging it, pushing it to the point of collapse. This social engine drove the hoop skirt phenomenon which came into being in late 1855. Prior to that, skirts had grown larger and wider only with the addition of more and more



Maria Arcadia de Alipás Israel lived through both bustle periods at our lighthouse and all the fashions in between.

petticoats which became heavier and hotter. With the invention of the hoopskirt, or crinoline (which stiffened a single garment with horizontal bands of wire, cane, or whale baleen), came a new freedom of movement and comfort. The hoop grew in popularity and volume until it was unwieldy in size and even the subject of ridicule. It then began to flatten in the front, becoming elliptical, pushing the dome more to the back from 1865-1870.

The beginning of the 1870s saw this dome become the first bustle period, with great flounces and poufs of fabric over a cage or boned bustle. 1875 saw the bustle drop and soften to almost

a flowing water effect, captured so beautifully by the artist Tissot. By 1880, the bodice lengthened, and the bustle relinquished its volume for soft swags, bows, and drapery trailing on the floor. This Cuirasse look, so named for the armor that protected the torso, lasted until about 1883. By 1885, the bustle had fully revived in its second comeback, this time with a more tailored, formal look than its 1870 ancestor. The bodice was shortened again, but in a very tightly fitted, formal style. This is the fashion you will see on the "Living Historiennes" at the lighthouse—classic late 1880s second bustle period.

As the decade shifted to 1900 the fashion radically changed with it as well. The suit look became available for the first time to women, with a jacket, skirt, and vest, as well as the usual dress ensembles. The bustle vanished for the last time and the skirt profile

commenced to narrow. The sleeves began to cap ever so slightly, and in 1891 became more pronounced. This evolution of sleeve shape would continue on throughout the decade, well past the closing of our lighthouse. It is this repetitive cycle of alteration of fashion emphasis which kept the sex appeal aspect of Victorian fashion fresh by continually shifting the visual emphasis on the female form. It also is a priceless boon to historians with access to photographs: If a photograph shows a woman who appears to be at all fashionable, all these clothing details, her hat, and hair style can pin down the date even

to the year the photo was taken.

So the next time you climb the stairs of the Old Point Loma Lighthouse, think about the lighthouse wives moving about the building in their hoopskirts during the Civil War years. Or imagine them climbing into the lantern with their bustle (your author has many times) to clean and tend the lens and lantern room. Remember that Maria Arcadia de Alipás Israel lived through both bustle periods at our lighthouse and all the fashions in between. And through all its 36 years of operations, every wife was always on the ready for guests riding out from San Diego for a visit, maintaining her home and herself in the fashion expected of a proper and respectable Victorian lady.

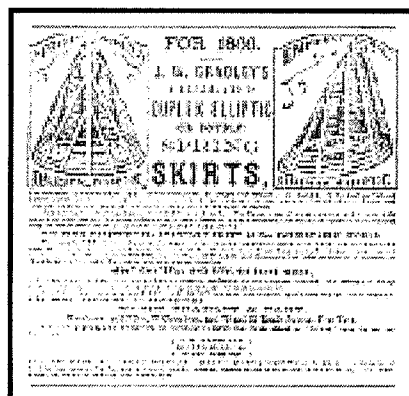
For further reading:

When Passion Reigned: Sex and the Victorians by Patricia Anderson
1995 Harper Collins New York, NY ISBN 0-465-08991-7

The Making Of Victorian Sexuality by Michael Mason
1994 Oxford University Press, Oxford ISBN 0-19-812247-0

Victorian Costume For Ladies 1860-1900 by Linda Setnik
2000 Schiffer Publishing, Atglen, PA ISBN 0-7643-1054-2

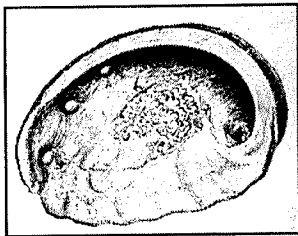
Dressed For The Photographer: Ordinary Americans & Fashion 1840-1900 by Joan Severa
1995 Kent State University Press, Kent, Ohio ISBN 0-87338-512-8



Coveted coverings

by Jim Nauman

Throughout history, humans have made use of the coverings of other species for shelter, clothing, tools, and utensils. Beyond simply providing such basic needs, however, many especially attractive furs, feathers, shells, and skins have been collected for use as ornaments, ceremonial objects, currency, and luxurious garments. Many highly prized items have been important in local and world commerce for centuries. Collecting these coveted coverings has, in many cases, resulted in significant declines of the species involved. There is no end to the examples in all parts of the world that could be cited, but we'll limit our discussion to just four that are found in the California coastal region.



green abalone *Haliotis fulgens*

Fossil records show that ancestors of today's abalones, *Haliotis* spp, were present on Point Loma in the Upper Cretaceous period, some 75 million years ago. Kitchen middens of early California Indians have yielded shells of abalones, indicating their use as a food source, and numerous artifacts made from their shells have been found. These include bowls, fish hooks, beads, and necklaces.

Because of the beautiful, iridescent, multicolored inner lining of

the shells, particularly that of the green abalone *Haliotis fulgens*, abalones have been collected for centuries. (The species name *fulgens* means "shining" in Latin.)

Abalone shells have been helpful in tracing the trade routes of early coastal Indians. At excavations of Anasazi sites such as Chaco Canyon in New Mexico dating back to around 1000 AD, shell jewelry has been found, suggesting contact with coastal people. Abalone shell is still widely used by Native American jewelry-makers in the Southwest.

Enterprising Chinese immigrants, who prized abalone primarily as a food source, were responsible for starting California's lucrative abalone industry in the mid-nineteenth century. Shells were in great demand for jewelry-making, and San Francisco merchants shipped large amounts to the eastern United States, Europe, and China.

An interesting use of abalone shell far from the Pacific coast is found in the Navajo Reservation. The Navajo people (Diné) believe that their Creator placed them on the land bordered by four sacred mountains representing each of the four directions. Each mountain is represented by a sacred shell or stone: the Sacred Mountain of the West (San Francisco Peaks in Arizona) is the Abalone Shell Mountain. The other Sacred Mountains and their representatives are Turquoise Mountain in the South (Mt. Taylor in New Mexico); Obsidian Mountain in the North (Mt. Hesperus in Colorado); and White Shell Mountain in the East (Blanca Peak, also in Colorado). The abalone shell also appears on both the flag and the Great Seal of the Navajo Nation.

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Few observers watching the winsome sea otter, *Enhydra lutris*, lolling or frolicking in the kelp beds off the rocky Pacific coast today are aware of the important role it played in the discovery and exploration of western North America. The dense, luxurious fur—"the most precious of all peltries," in the words of historian H.H. Bancroft—that insulates the sea otter from the icy Pacific waters attracted eager hunters from Russia, England, and America to the northwest coast in the 18th and 19th centuries.

The Russians, particularly after the 1741 expedition of Vitus Bering, were the first non-natives to exploit the sea otter. Utilizing the native Aleuts and adopting their techniques, they developed a thriving market in China, where the pelts were in great demand for the rich robes of the mandarins, bringing up to \$100 apiece.

Reports by English explorer Captain James Cook following his landing in Nootka Sound in 1778 made other nations aware of the lucrative market. His sailors found the natives ready to barter the valuable skins for a few glass beads or other trinkets. Boston ships soon followed, the skins purchased from the natives taken to China, sold, and the money reinvested in tea, silks, and ceramics which, in turn, brought high prices back home.

The destructive nature of the hunting—thousands of pelts taken each year—together with a low reproductive rate brought the sea otter nearly to extinction before hunting was banned in 1911.



It was reported that by the turn of the 20th Century more than 200,000 egrets were being killed each year by just one London millinery firm.

Egret plumes

The snowy egret, *Egretta thula*, and the great egret, *Ardea alba* are common sights along our coast and in its wetlands today, but one hundred years ago these species were rapidly heading toward extinction. The beautiful nuptial feathers of these egrets that appear during the breeding season—long filamentous plumes on the back, neck, and head—were at one time in great demand by the millinery trade in America and Europe. The snowy egret plumes were preferred over those of the great egret because they were softer and more pliable. In 1903 plume hunters were paid as much as \$32 an ounce for them. Killing egrets for their plumes—called “aigrettes” in the fashion industry—began in America in the 1840s; it was reported that by the turn of the 20th Century more than 200,000 egrets were being killed each year by just one London millinery firm. Thousands of people were employed by the aigrette industry. Not surprisingly, the egret population declined precipitously as a result, but began to recover in the early 1900s after the Audubon Society and other conservation organizations persuaded the government to protect the remaining rookeries. The success of the government’s action was implied in an article in the women’s pages of the Canadian periodical

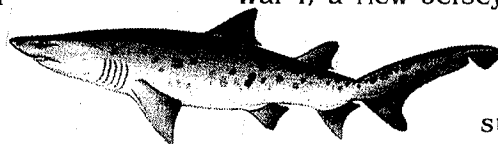
Saturday Night of February 26, 1910:

“The censor of fashions has been getting busy out in California and proving that not only is it forbidden for a woman to wear certain decorations on her hat, but also that there are hat trimmings so called which it is illegal to even have in her possession.”

Shark skin

The skin of sharks and rays is armored with a matrix of tiny, hard, curved, tooth-like structures called dermal denticles or placoid scales. These are grooved and point backwards; if you rub the skin from head to tail it feels smooth, but it feels like sandpaper if rubbed in the opposite direction. The streamlined shape of the denticles decreases the friction of water flowing over the shark’s body, enabling it to swim faster.

Sailors found a mundane application for the shark skin, drying it and using it to “holy stone” (sandpaper) the decks of their ships. But starting in the 18th century master leatherworkers in France treated the skins to produce an elegant ornamental leather known as “shagreen.” The denticles were ground down to re-



move their sharp points, leaving only rounded, pale protuberances at their base. Dye—usually a green vegetable dye—was applied to the reverse side, coloring the skin around the circular protuberances. This resulted in a pebbled leather that, to some, appeared to be studded with tiny pearls or other gems.

Shagreen has been used to fashion high-end book bindings, coverings for ornamental boxes and jewelry, wallets, and even tabletops. Especially interesting is its use to cover the handles of swords and daggers. Its rough, granular, waterproof surface was ideal for this purpose. Because of its cost, however, its use was largely limited to officers’ swords.

Shagreen has been made from the skin of rays as well as sharks, the only difference being that the protuberances are somewhat larger than those of the shark.

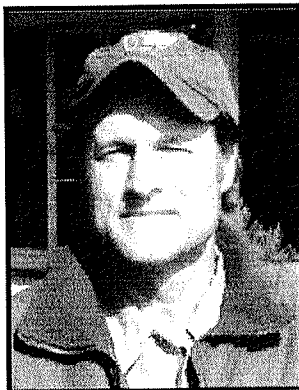
It took many years to find a chemical process for complete removal of the denticles while preserving the attractive grain of the leather. But shortly after World War I, a New Jersey Company, Ocean Leather, developed such a process, which re-

mains a trade secret. Shark leather has cross-weave of strong fibers running through the epidermis, giving it a tensile strength of 7,000 psi, compared with 5,000 psi of cattle leather. It is used in luxury items such as belts, wallets and purses, boots and shoes.

Fortunately, the use of sharks and rays for their skins does not appear to have resulted in significant reduction of their populations.

Cabrillo People *by Patricia Heusner*

This winter we welcome Historic Preservationist Robert Orth to Cabrillo. Robert's duties include restoring historic structures such as the lighthouse and WWII military installations. The goal in restoration, explains Robert, is to make the finished structure look the



same as it was historically. Robert comes to us from Rocky Mountain National Park, where he worked as a restoration carpenter, maintaining historic 1930s log cabins. Previously, he worked at San Francisco Maritime Park, where he constructed new exhibits on the schooner *Baclutha*.

Originally from Burlington, Vermont, Robert enjoys fishing, canoeing, and automobile restoration, as well as music, especially jazz and classical. He played the saxophone while attending Bowdoin School for Fine Arts in Brunswick, Maine, and also enjoys drawing and painting landscapes. Robert's fondness for travel has taken him to south-east Asia, including Thailand, Malaysia, and Indonesia; he also spent a year in Australia.

in Three Rivers for many years, enjoying Sequoia and Kings Canyon National Parks.

Barbara met her husband Jason at Carlsbad Caverns where Jason worked as an interpretive ranger. They enjoy sailing, fishing, and reading (especially Clive Cussler adventures), and Barbara loves to cook all kinds of food. Barbara has three children: Ryan, 26, is apprenticing as a bricklayer; Jesse, 21, works in a restaurant and surfs whenever he can; and Amanda, 19, attends Palomar College.

ice fishing. She claims that her uncles could have been the inspiration for "Grumpy Old Men." Ask her how "tip-ups" work when you meet her and you'll learn a bit of Wisconsin culture. After a visit to her brother in Anaheim, she fell in love with California's mountains and ocean, and she moved west. She lived



We are also pleased to welcome **Barbara Richards**, who is our new Administrative Officer. Her duties at CNM include budget, property management, human resources, purchasing, and contracting. Barbara recently worked at Carlsbad Caverns National Park as a purchasing agent. She loved the warm weather of Southeast New Mexico, with its hot summers and mild winters.



Barbara was raised on Lake Okauchee, Wisconsin, where she grew to love water while swimming, boating, water skiing, ice skating, and

Anna much more time to spend with her four-year-old son Raymond and her husband Ray. As she says, "Once you have kids you just can't have enough hours in the day to spend with them practicing playing catch, working on letters, and playing superheroes." She and Raymond are enjoying tee-ball, soccer, swim lessons, Sea World,

This month we thank **Anna Stits** for 16 years of service to CNM.

Anna has moved from full time to intermittent schedule, working approximately four hours per week. She will focus on training Barbara and assisting with other administrative priorities. This transition will give

and playing with friends. The Stits family has more big news: in the next year they will be making plans to travel to Russia to adopt another child!

Anna began her work at Cabrillo National Monument in March 1990 as a clerk/typist, a job she maintained for one week (!) until she was promoted to budget analyst; a month later the Administrative Officer left for Arizona, and Anna was promoted to that position. About the same time, Terry Scherkenbach came to the monument as the Administrative Assistant, and her background in administration helped Anna get started. During her career, Anna enjoyed seeing the park ranger and administrative positions become permanent as the Ranger Careers and Administrative Careers programs

established benchmarks and appropriate compensation for the work people performed in these positions. She was glad to be involved in the creation of the Natural Resource Science division as the monument emphasized stewardship of coastal sage scrub and

intertidal habitats. Additionally Anna enjoyed establishing the computer network and internet for the monument. When she began working here, there were just a handful of computers, and her dial-up modem was the only internet connection!

Anna emphasized, "It has been such a joy to work with Terry DiMattio (Superintendent) and Terry Scherkenbach (Administrative Assistant) for 16 years and I felt so privileged to be a part of this incredible team." The National Park Service will always be dear to her heart and she will continue to support the National Park Service throughout her life. Thank you, Anna, for your service to Cabrillo National Monument!





Cabrillo National Monument Foundation

The Maritime Museum of San Diego has just published some of the papers from the 2004 conference "Spain's Legacy in the Pacific," which it sponsored with the assistance of Cabrillo National Monument and the Cabrillo National Monument Foundation. Published both as a double issue of the museum's journal, *Mains'l Haul* (Fall/Winter 2006) and under separate cover as *Spain's Legacy in the Pacific*, the book includes eleven of the papers read at the conference and a color insert of old maps of the Pacific world. The articles are illustrated with contemporary maps and artwork which both entertain and illuminate the articles.

The book opens with Carla Phillips's overview of Spain in the Pacific, which was delivered at the Cabrillo National Monument as the keynote speech to open the conference. Articles follow on how climate affected the Spanish empire in the Pacific, Spain's policies for its Pacific empire, and the interaction of the Spanish imperialists with native populations, especially in Tahiti, Alaska and Hawaii. Two papers illustrate Spain's participation in the Eighteenth-century Enlightenment. The final paper, which is an excellent research guide for a beginning investigator in the field, is about one of the scholars of Spain and the California coast.

The publication would be of interest to those who attended the conference and want a remembrance of it, to those who have a specific interest in Spain's presence in the Pacific World prior to the early nineteenth century, and to readers wanting to know about the Spanish background of Cabrillo National Monument's focus on Spanish explorations. It is available in the CNMF bookstore for \$11.95.

CABRILLO NATIONAL MONUMENT
FOUNDATION WOULD LIKE TO THANK THE
HELLER FOUNDATION OF SAN DIEGO FOR
THEIR GIFT OF \$5000.00. THEIR SUPPORT
OF THE PROGRAMS AT CABRILLO NATIONAL
MONUMENT IS GREATLY APPRECIATED.



Please visit our website:
www.CNMF.org

Calendar

Bird Walks with Claude Edwards
3rd Saturday of every month except
December
9:30 AM, CNM Visitor Center Area

March 2, 2006

Star Party with San Diego Astronomy
Association for CNMF members

New Members

We welcome the following new Cabrillo
National Monument Foundation members:

Ida Androwich
Jim Nabors
Joseph Barone
Robert Petruzzo
David Bavencoff
Jose Renzelli
Robert Chamberlain
Jan Rieger
Nuuhira Ching
Peter Schroeder
Ricardo DaRosa
Charles & Margaret Sevadjian
James DeBello
Doug Spence
Arturo and Victoria Elizondo
Stephen Waldman
Kim Fitzgerald
Joseph Wilson
Caroline Glasner
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Bob & Laura Kyle
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Make a Lasting Legacy

The CNMF Endowment Fund, established in 1997 with the San Diego Foundation, is another way you can support the endeavors of Cabrillo National Monument. Interested donors can contact us at (619) 222-4747 or by e-mail at CNMFKaren@aol.com



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