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SBnature Journal

SANTA BARBARA MUSEUM OF NATURAL HISTORY

**WELCOME
BACK TO THE
LIBRARY**



**TINY CLAMS HAVE
BIG PERSONALITIES**

**VOYAGE OF
INSPIRATION**
Volunteers Aboard
R/V Shearwater

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**BIG SNAILS AIM
TO MAKE MORE
LITTLE ONES**

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A NOTE FROM LUKE

President & CEO

Equally important but largely invisible is our behind-the-scenes work in collections and scientific research.

The Museum and the Sea Center have been cherished visitor destinations here on the Central Coast for decades. Many folks recount stories of family visits across generations, and family milestone moments spent at these beloved venues. The Museum and Sea Center is a truly foundational institution in the cultural life of our community.

Equally important—but largely invisible—is our behind-the-scenes work in collections and scientific research. Our curators are stewards of an ever-growing collection of natural history specimens and artifacts that document millenia of biodiversity and culture here on the Central Coast. More than 3.5 million specimens represent every area of the natural sciences. Many of our collecting areas are the finest assemblages in the nation.

Our Museum staff conduct and facilitate groundbreaking research. They routinely present papers at scientific conferences, publish their findings in leading peer-reviewed journals, and collaborate with colleagues globally. Many of our curatorial positions and programs are partially or fully endowed. Our newest is the John Johnson Chair of Anthropology, created in 2023.

It's rare for locals to see the Museum's true visibility in the global scientific community. And so, to help shine light on the important work that goes on behind the scenes in our Collections and Research Division, I am pleased to present this special issue of *SBnature*—a showcase of the remarkable talent and work that goes on here every day. It is work that expands our understanding of the natural world and our relationship to it.

Thank you,

Luke J. Swetland
President & CEO

WELCOME BACK TO THE LIBRARY

At long last, the Library has reopened after many months of significant infrastructure improvements and repairs! Built in 1929, the public part of the Library still retains the classic charm of an early-twentieth-century reading room. Librarian Terri Sheridan says, "I've had people come up to me and say, 'It's such a beautiful room, I hope you're not changing it too much.'" She's happy to tell them they won't notice a thing—all the changes have been out of sight, mostly in the areas used by staff to hold extensive collections.



Many Members know the Library as a cozy place for kids to read a nature story. The Library mainly houses research materials for staff, students, amateur naturalists, graduate students, and professionals.

The collection features titles dating to the sixteenth century, and covers natural history, zoology, Western and Pacific exploration, and Native American cultures. Archive collections highlight Santa Barbara's environmental history, local biological and cultural history, rock art, California Condor preservation history, Museum history, the 1969 Santa Barbara Oil Spill, and other topics of particular local significance.

Many of those research materials were carefully shifted in an epic process that started

in March 2023, preparing for construction in May 2023. The tile roof was meticulously replaced with seismically safe modern clay tiles, and large ceiling beams were reinforced. New climate systems for the basement provide humidity and temperature control, creating newly secure space to protect expanding archive collections. Museum Trustee Brad Willis and his partner Tony Pusathai helped to fund new archive-specific shelving. The historic reading room received air conditioning and improved heating.

Library Assistant Peggy Dahl welcomed the help of Deckers employees who volunteered at one of the most critical moments in the process, when boxed periodicals needed to be shifted from one floor to another. "The group created a 'bucket brigade' on the stairway, handing up 100 heavy boxes of books with cheer and efficiency. They were a delight!"

Sheridan greatly appreciates the patience shown by the public in the final stretch, as Library staff took the time to carefully rehome thousands

of periodicals that had been packed and moved to protect them from construction and make way for building new archive collection space. Those 100 heavy boxes—and many, many more—all had to be unpacked and shelved in another part of the Library. Library staff also prepared and transferred thousands of archived documents into the newly secure and climate-controlled collection rooms.

During these final shifts, the Library was open by appointment to researchers.

Now that the Library is back as a public learning resource for all again, Sheridan would like to be sure that everyone knows about it. Browsing the Library is included with Museum admission (Members are always free) and admission is not charged for Library research visits. Appointments are needed for access to rare book and archive collections. Contact tsheridan@sbnature2.org for more information.



Above: The historic reading room still looks just like you remember.



Top right: Climate controls protect a variety of media, including negatives and film in the Campbell Grant Collection. Above: Historic map of Santa Cruz Island among documents protected in new oversized shelving thanks to Willis and Pusathai





HOME ON THE RANGE IN THE DIBBLEE GEOLOGY CENTER

with Dibblee Curator of Earth Science
Jonathan Hoffman, Ph.D. and
Curatorial Assistant Liz Flint, J.D.

*Congratulations on renovating the
collection range!*

JH: Thank you. We're grateful for this huge improvement to our infrastructure. Thanks to generous donors, we replaced wooden cabinets with metal ones for better preservation. They have weight ratings and drawer widths for heavier items. The drawers have brakes to prevent accidents. These cabinets dramatically increase available space. Now we have room to grow with our own fieldwork collecting, and can receive material from developers mitigating fossil disturbance on construction sites.

*Moving thousands of fossils and
minerals was a huge job.*

JH: It took about half a year and many helping hands. Now our priority is establishing order.

LF: Our goal is to revitalize the Museum's 1920–1979 collection of local mammoth and mastodon fossils to encourage scientific research, new exhibit opportunities, and education. I'm conducting a comprehensive review of historic documents and published literature related to these fossils, and creating a digital database. I'm carefully reconnecting specimens with their data to improve the scientific value of the collection.

Above: Hoffman and Flint in the renovated range

Left: Flint holds an articulated foot of *Mammuthus exilis*. Her sleuthing linked it up with associated bones.

Right: *Mammuthus exilis* jaw



Our Earth Science exhibits (top left) are supported by collections behind the scenes.

*Data is what makes a
specimen scientifically
valuable in the first place.*

JH: Right. Liz's sleuthing is dramatically increasing the collection utility, already helping with publications in progress.

LF: The collection's paper records are confusing. The people who created them aren't here to explain anomalies like why a single catalog number was applied to over 100 specimens. Also, these paper records aren't archival, searchable, or sortable. However, we appreciate the work put into these records by prior Museum staff because we've been able to use this information to reassociate specimens that likely belong to the same individual mammoths and mastodons.

JH: That kind of reassociation is so useful to researchers. And we have a great opportunity to build on past work as we refine locality data. When we can figure out the precise locations of original dig sites, we can interpret specimens from those sites using what geologists know today. For instance, Dan Muhs of the USGS has illuminated the age of the layers of Quaternary rock and sediments on the Channel Islands. From this we can infer the age of fossils, and timing is critical to mammoth research. Understanding what happened as they evolved, as the Pleistocene ended and things warmed up, as humans arrived—it could have a lot to tell us about evolution and about climate change.

LF: Reviewing the literature, I've found that some of this early material was previously radiocarbon dated by Wallace Broecker, the grandfather of climate science, who coined the phrase global warming.

JH: Knowing which specimens have previously been sampled successfully—and therefore are likely to still have collagen—opens the door to learning more. Our collaborators around the continent can do stable isotope analysis and extract ancient DNA.

LF: We're encouraging more researchers to study this material, because it's a spectacular collection, and we're making it more accessible than ever.



The Dibblee Geology Center is funded by the Dibblee Endowment.

DIGITIZING A WHODUNNIT

Marine Mammal Necropsies

with Hearst Intern Lucy London



Top: Chad's baleen, for filtering thousands of pounds of krill each day
Circle: London at work

What's a necropsy, and why did we do them?

LL: It's an autopsy for non-human animals. Animals would wash up dead on the beach, and curators at the Museum would open them up and try to find out why they died. Sometimes they'd take specimens like a skull or a skin. Before everything was digital, curators would file away necropsy information on papers in a file cabinet, covering 1972 to 2014. The files reflect a lot of collaboration. You see all the correspondence with organizations and agencies like the Marine Mammal Center, CA Dept. of Fish & Game (now Wildlife), and NOAA. There's also correspondence with labs, who contribute more data like "this dolphin had bronchitis."

Fascinating. What have you been doing with these files?

LL: Thanks to the Hearst Scholar Program,* I'm digitizing them so they're easier for researchers to access. And any records related to a specimen we have, I attach them in our specimen databases for the Department of Vertebrate Zoology and the Department of Invertebrate Zoology. Some of these mammals had invertebrate parasites that wound up as specimens themselves.

Did you notice any mortality patterns?

LL: You can see patterns just by looking at the size of the folders. The years that have domoic acid events, the files are ginormous. In the 1980s, you see a fair amount of humans shooting sea otters. In the earlier days you also see cetaceans trapped as bycatch in gillnets.

This is before the dolphin-safe tuna movement.

LL: And then there's ship strikes. Speaking of which, I came across the 1980 records for Chad. Or I should say, the back half of Chad, since the Blue Whale on exhibit is a composite of a few individuals. That necropsy report is stained. Some of them have splatters of mysterious substances on them.

Researchers are going to be grateful for the digital records. They had to do that necropsy on the beach, not in a tidy lab.

LL: Yeah. There are some great photos showing how people got all up in there to do what they had to do.

How did this project build on your experience as a teen in the Quasars to Sea Stars work/study/volunteer program?

LL: As a quasar working in collections, I learned where everything is. That was helpful. As a Hearst intern, I can make more decisions and organize things the way I want.

What does this project do for you?

LL: I've learned a lot about what marine mammals live here, how their distribution changed. I could watch, as the years went on, how Bottlenose Dolphins started to show up in this area. Their range expanded north during an El Niño event in the early 1980s. I think it's really cool that there's so much information behind each of these necropsies. The overview it provides me is pretty unique.

**This endowment funded by the William Randolph Hearst Foundation supports local college and university student internships at the Museum.*

Left and right: Staff studying the dead body of a Blue Whale found at Vandenberg in 1980



Chuck Woodhouse supervising the recovery of Chad's original skull



To establish or support an endowment, contact LSwetland@sbnature2.org.



DANIEL GEIGER CAN DO ANYTHING NOW

Just shy of his 20-year anniversary with the Museum, Curator of Malacology Daniel L. Geiger, Ph.D., is taking off to be a full-time Renaissance man. True to form, when it was time to celebrate his new emeritus status, Dr. Geiger laid out a spread in the Department of Invertebrate Zoology and offered Museum staff and volunteers crêpes with all the trimmings. Everyone here knows him as a polymath who generously shares his wide-ranging accomplishments in a variety of forms. Sometimes it's homemade jam; sometimes it's a surprise baroque serenade with his viola d'amore during a Science Pub lecture on scientific naming.

Geiger managed to pursue many passions while productively publishing, cataloging, coordinating, and red-tape-wrangling during his two-decade tenure. Perhaps best known to Museum Members as the scanning electron microscopy (SEM) guy, he installed two SEMs over the years: the Museum's first in 2005, and a major upgrade in 2019. He made scientific contributions with SEM in fields as diverse as mollusk research, orchid systematics,

and medicine, providing images for a Cottage Health analysis of mask fibers during the early years of the COVID-19 pandemic. Geiger also used his SEM and microphotography techniques for art. His imagery has appeared in exhibits here in Maximus Gallery, a Smithsonian orchid exhibit at the National Museum of Natural History, and even an internationally-toured Tafelmusik Baroque orchestra multimedia concert.

Contributing to the professional development of other curatorial staff and volunteers has been an important, though less visible, role for Geiger. He described some of that work in a recent interview for the blog about spearheading the cataloging of the Museum's extensive collection of bryozoans—a group of colonial aquatic invertebrates that bear some resemblance to corals. He is proud to have helped launch the careers of promising students like Cara Fuller, Bianca Campagnari, Van Henderson, and Alexandria Gour (who started their journeys as quasars, interns, and curatorial assistants at the Museum), and to have promoted the mid-career training and

advancement of Jaya Nolt, Lucie Gimmel, and Associate Curator of Invertebrate Zoology Vanessa Delnavaz, M.A.

A workhorse when it came to organizing and digitizing collections, Geiger cataloged over 60,000 lots, more than anyone in the Invertebrate Zoology Collections database. His intimate familiarity with the library of life here supports his prodigious work in taxonomy. He has named over 100 new species, one of which—the snail *Depressizona exorum*—takes its name from his favorite band, The Ex. During his time at the Museum, he published two books and numerous papers on diverse organisms, edited two volumes of the journal *Zoosymposia*, and held editorial and advisory positions with various journals and agencies.

The coming years of freedom should offer Geiger—who is also a yoga instructor, by the way—even greater flexibility. He plans to focus on writing his next two books: a monograph of the orchid genus *Oberonia* and a guide to the marine snails of the northeast Pacific.



Right: *Phragmipedium x bessii* orchid
Photo by Daniel Geiger

Read more about Geiger's work on the bryozoan digitization project at sbnature.org/blog.

TINY CLAMS HAVE BIG PERSONALITIES

with Curator Emeritus of Malacology
Paul Valentich-Scott

Dozens of the newly discovered species crawling on the surface of a sea urchin
Photo by Charles Griffiths

Your recently published study* introduced the world to a new species of clam from South Africa. How did this collaboration come about in the first place?

PVS: Charles Griffiths, a marine biologist in South Africa and emeritus professor at University of Cape Town, emailed me a picture of a sea urchin with tiny little clams all over it, saying, "What is this?" I said, "If you send me some, I can tell you." He sent them to me, and I didn't even know the genus. But I could tell it was part of this understudied group, the galeommatids (gal-ee-oh-MAT-ids).

What's a galeommatid anyway?

PVS: They're tiny, very mobile clams in the superfamily Galeommatoida. Some are free-living, but many live on or in other animals, usually in commensal relationships, where the two organisms are associated together, and the clam derives some benefit, but doesn't harm the host.



The newly discovered species, *Brachiomya ducentiunus*, crawling on a sea urchin spine. Photo by Charles Griffiths

The specimens in the study were from South African kelp forests, right?

PVS: Yes. These kelp forests have many similarities to those off our Central Coast. Overall, this region of South Africa has so much in common with our region. It's a Mediterranean climate like ours. It's also a marine environment where there are warm and cold currents converging.

How did you determine this clam was new to science?

PVS: To rule out the previously described species, I contacted curators at various institutions and asked for photographs. On another front, I contacted the phylogeneticists Riqui Li and Jingchun Li at University of Colorado, Boulder. Jingchun, as part of her Ph.D. work, had created a huge genetic dataset of galeommatids.

She was perfectly situated to figure out where your clam might fit.

PVS: Yes, Jingchun quickly narrowed it down, and from there I could go into the literature and dive deeper. But even as we were refining the identity of the new species, finding the right genus for it, we found three more South African galeommatid clams that had been previously described, but never illustrated. The whole thing snowballed into a bigger project. When we did the final analysis with as much genetic data as we could from each species in the study, the relationships got much more complex. There's clearly a lot more to know, because they're small and most people overlook them.

How does this fit into your broader career, and how you spend your time now?

PVS: I've been interested in this group since my twenties—it's a fifty-year affair. The challenges are great, and that's why small animals like this have been pitched aside for centuries. But that's what I love, and why I keep interested after retirement. My goal is to generate more interest in these really cool animals and get the young folks out there thinking about them.

* Valentich-Scott et al., "Bivalves of superfamily Galeommatoida (Mollusca, Bivalvia) from western South Africa, with observations on commensal relationships and habitats" in *ZooKeys*, 1207 (2024): 301–232.

The Great African Seaforest. Photo courtesy of Sea Change Project

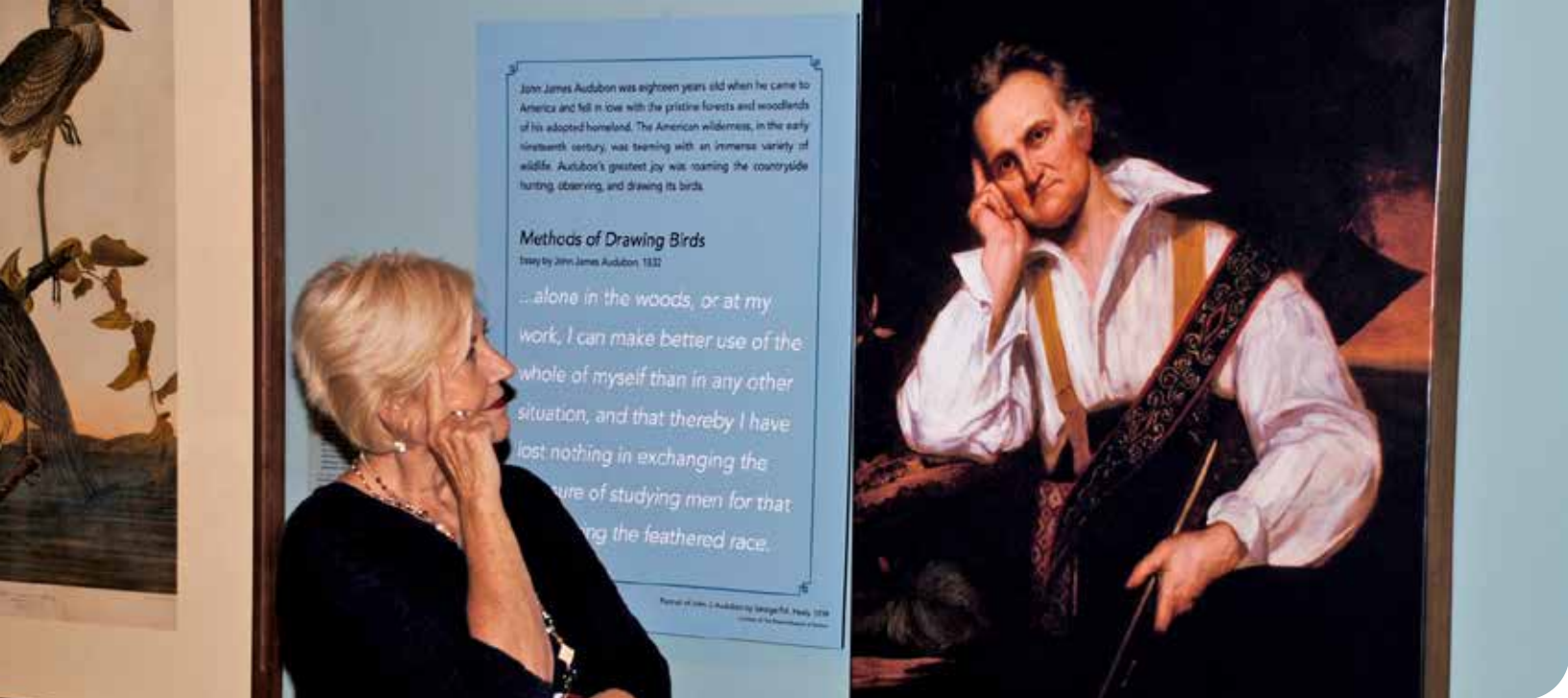


Read more at
sbnature.org/blog.



The Mona Lisa smile of a curator with a new species to announce





Maximus Gallery Curator Linda Miller and John James Audubon

A PASSION FOR PRINTS: THE ART OF NATURAL HISTORY

by Maximus Gallery Curator Linda Miller

Approaching the thirtieth anniversary of the gallery, I'm looking back on my own tenure in this unique space. I fell in love with early scientific illustrations while living in England, where I frequented the antiquarian book and print shops that are a European tradition. In the 1980s I opened Saville Fine Prints in Santa Barbara's historic El Paseo, specializing in antique botanical prints. It was there I became friends with Peggy Maximus, who later brought me to the Museum to catalog her print collection and recommended me as curator of the Maximus Gallery in 2001.

The focus of the collection is the extensive inventory of rare antique prints dating from the seventeenth to nineteenth centuries, when illustrations were an essential part of description as the sciences developed. One of the pleasures of my job is to grow the collection with donations and acquisitions. In my time it has doubled to over 4,000 engravings and lithographs, with nearly all the important illustrators of the past 300 years represented. It's been important to include the works of many remarkable early women artists such as Elizabeth Blackwell and Maria Sybilla Marian.

The collection is showcased in beautifully presented changing exhibits. From the spark of an idea to development and installation, it's a creative process. In the early years, Peggy was very involved. Visits to her home to discuss our plans over tea were often met with suggestions and adjustments and we learned not to go to her with an *idée fixe*. I really admired her strength of character. She left us an endowment to perpetuate her vision.

Over my 23 years, with the able assistance of three successive designers, the "Maximus aesthetic" developed. We take pride in attending to details: varying the wall color, design, displays, music, and labeling. Specimens and artifacts from our science collections add depth and interest.

Every exhibit expands and deepens my understanding of the subject. I love the research that lets me go deep into the lives of individual artists. It's wonderful to lift the veil behind these great publications. This task has

become easier in the past few years since the digitization of original manuscripts held in major libraries.

Still, opportunities to view original drawings and manuscripts have been highlights for me. It was particularly memorable to visit the print room at Windsor Castle to see Mark Catesby's original watercolors from his illustrated natural history on the flora and fauna of colonial America, purchased by King George III shortly after the artist's death.

Time spent at The Linnaean Library, Kew Gardens, and the Natural History Museum in London has made me realize how rare it is for a museum the size of ours to have such an important natural history print collection. Thanks to Peggy Maximus, many generations are learning about these rare historical works.



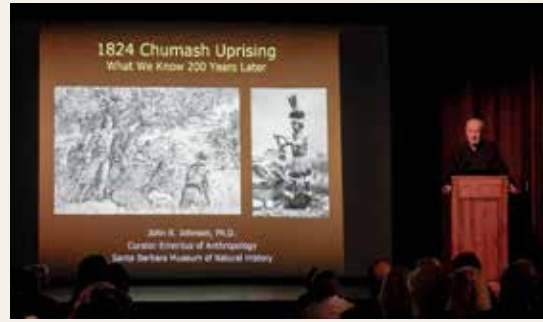
Right: Passenger Pigeon, *Birds of America* by John James Audubon, 1829, copperplate engraving

Below: Gray Fox, *Viviparous Quadrupeds of North America* by John James Audubon, 1845–1848, hand-colored lithograph

Lower right: Cacao, *Fleurs, Fruits et Feuillages choisis de l'île de Java*, by Bertha Hoolla van Nooten, 1863, chromolithograph



REFLECTING ON THE CHUMASH UPRISING



In February 1824, Chumash people at local missions took up arms, kicking off a regionwide struggle that took months to resolve and claimed at least 51 lives. Curator Emeritus of Anthropology John R. Johnson, Ph.D., has long studied the uprising. The bicentennial struck him as an apt time to deliver a public talk, presented at the Museum by Santa Barbara County Archaeological Society. Dr. Johnson shared varying accounts passed down to posterity by Chumash people, missionaries, soldiers, and government officials. “Perhaps there exist elements of truth to all,” Johnson acknowledged.

At the time of the uprising, conditions at local missions were worsening for Chumash people. Colonial supply ships no longer provisioned Alta California, so “the burden of supporting soldiers and their families fell upon the Indians at the missions,” reported Johnson. High mortality from epidemics devastated Chumash communities and left behind fewer people to bear the economic burden. Drought depleted the food supply. Mistreatment of Chumash people by certain soldiers is reported to have been the final straw.



Photo of Santa Ynez Chumash Chief Rafael Solares taken c. 1878 for Leon de Cessac. Archive of Musée du quai Branly, Paris

Larry Nimmer’s recording of Johnson’s talk—plus a Q&A with Johnson and interviews with Chumash community members in attendance—presents a detailed accounting of many points of view. Visit sbnature.org/youtube to watch.



Marianne Parra—who has Chumash ancestry from several groups—describes how she participates in an annual ceremony to honor the Chumash people killed during the uprising. “I don’t think our ancestors thought we would be honoring, remembering them, saying their names all these decades later.”

BACK BY POPULAR DEMAND

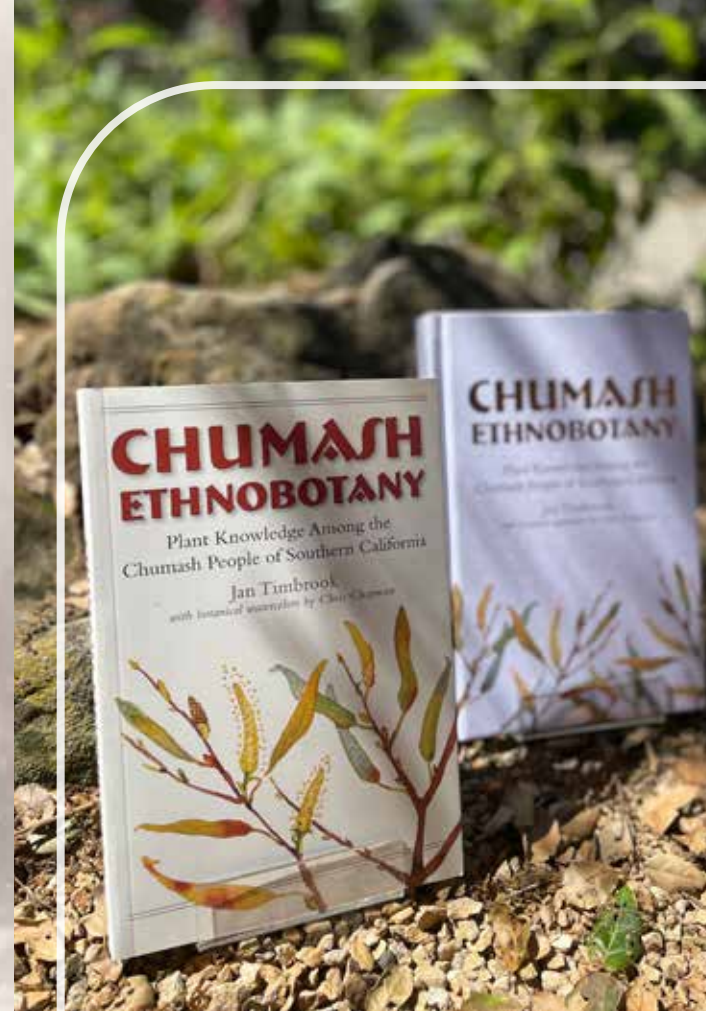
One of our favorite books is back in print! *Chumash Ethnobotany: Plant Knowledge Among the Chumash People of Southern California* by Curator Emeritus of Ethnography Jan Timbrook, Ph.D., is now available in a second edition.

“During thousands of years of observation and practice, Chumash ancestors developed deep knowledge of the plants around them,” explains Dr. Timbrook. “Today, understanding the long-term relationships between people and the natural environment is more important than ever.”

The book shares the names for each plant in different Chumash languages, as well as English, Spanish, and botanical names followed by in-depth information about traditional uses. This rich index of knowledge weaves together a variety of sources with Timbrook’s original research. She deciphered thousands of pages of field notes by ethnographer J.P. Harrington, citing Chumash elders representing a wide range of ancestral lands, cultures, and languages.

Kaswa’ Chumash Elder Ernestine Ygnacio DeSoto—whose mother, grandmother, and great-grandmother provided information to Harrington—says: “Jan’s book has opened people’s eyes to what once was here. This book has been an inspiration to some of us.”

Chumash Elder Julie Tumamait-Stenslie—who has advised the Museum’s anthropologists for decades—encouraged Timbrook in her research and writing. “*Chumash Ethnobotany* will continue to guide people to the beautiful world of plants and the relationships that Chumash people continue to have with them,” she says. “It can also teach the non-Indigenous person to gain a richer and deeper knowledge and relationship to our natural world.”



Timbrook holds a Chumash tray woven from Basket Rush, the plant in the background.

Find the book at sbnature.org/store.

VOYAGE OF INSPIRATION

Volunteers Aboard R/V *Shearwater*

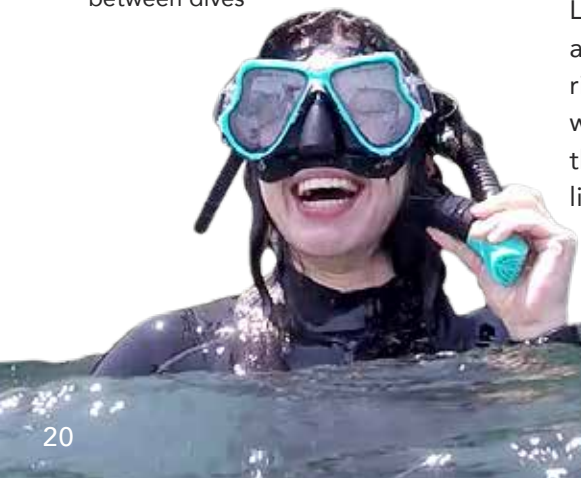


Sea Center volunteers at Prisoners Harbor. Below: Emerging from the Painted Cave



This summer, 18 Sea Center volunteers went for a fun-packed day trip to Santa Cruz Island aboard the National Oceanic and Atmospheric Administration (NOAA) research vessel *Shearwater*, an inspiration for the Sea Center's Wet Deck. They experienced the real research setting emulated by the exhibit space they interpret every day. Crossing the channel, they sighted many marine mammals, including Common Dolphins, Humpback Whales, and California Sea Lions. Captain Zac Montgomery and crew eased the vessel right into the Painted Cave, where volunteers marveled at the rainbow of colored rocks, lichens, and algae.

Mich taking a breath between dives



Stopping at Prisoners Harbor for lunch, free diving volunteers and staff explored the abundance of marine life around the rocky reef below the pier. Naturalist Havilah Abrego spotted a Warty Sea Cucumber and captured a video of the two-finger touch we teach at the Sea Center for gently interacting with some of our marine neighbors. (Look for this moment and other trip highlights in a video on our @sbnature Instagram account.)



Left: Naturalist Havilah Abrego demonstrating the Sea Center's two-finger-touch with a Warty Sea Cucumber. Photo by Havilah Abrego. Right: Happy staff along for the ride



Volunteer Interpreter Melow Mich noted that free diving in Channel Islands National Marine Sanctuary gave him "a lot of insight on the diversity of our local ecosystem. I was able to explore it myself and see just how healthy a protected environment is."

Firsthand experience of the habitats and concepts they interpret is valuable for volunteers and staff. "For a few of the volunteers, it was their first time ever being out to Channel Islands National Marine Sanctuary and National Park," said Sea Center Volunteer Coordinator Dylan Otte, who organized the grand day out. "For another volunteer, it was their very first time seeing a whale! Everyone who was on the

ship that day has expressed sincere gratitude for the opportunity. This experience was made possible by Channel Islands National Marine Sanctuary—we want to extend a huge thank you to them for putting this together for us."

The crew facilitated plankton tows to examine microscopic marine life under powerful microscopes. Volunteers enjoyed every step, from manipulating specialized nets through the water, to identifying the tiny critters wiggling around on the monitor. Crewmembers lowered a "drop cam" to look at life in the seagrass beds below, and volunteers crowded around to look for familiar fish flashing in the water.

"From speaking with the crew, I learned a lot about NOAA's local projects and impact in the region," Mich said. "The R/V *Shearwater's* expeditions are more diverse than I ever imagined. They partner with a variety of scientists and organizations to explore things such as underwater noise pollution, ocean floor mapping, shark and whale tagging, and much more. The crew even shared their stories of encounters with rare species such as Sperm Whales."

In the first half of the year, Sea Center volunteers gave over 2,700 hours inspiring the next generation of ocean stewards. "That's a lot of time to give," said Otte. "This trip is one of the ways we show our appreciation for their generosity."

Visit sbnature.org/volunteer to join our crew.



Prying abalone from rock slabs to weigh them as the Two-spot Octopus looks on

BIG SNAILS AIM TO MAKE MORE LITTLE ONES

At the crack of dawn, Senior Aquarist Maxwell Rudelic trotted out the “Sea Center Stallions” for a synchronized spawning. These nine adult marine snails in the White Abalone Captive Breeding Program range from four-inch youngsters to seven-inch spawning veterans. They belong to a larger broodstock population distributed across eight facilities, and the fate of their species rests on their crusty, rounded shells.

By the late twentieth century, White Abalone were overfished to the brink of extinction. In 2001, the species became the first marine invertebrate federally listed as endangered. The first year of the breeding program resulted in a bonanza of embryos. Making progress from there has been a rollercoaster ride

and a learning experience. Researchers carefully monitor for withering syndrome, a naturally occurring disease that affects both wild and captive animals. Currently producing tens of thousands of one-year-old animals every year, the program’s goal is to increase the animals produced by another order of magnitude. Since fall 2019, periodic outplanting has propelled restoration into the next phase, with over 14,000 captive-bred animals placed in wild habitats.



Left to right: Rudelic, Dylan Otte, Lopez-Villalta, and Dr. Frederick with four Sea Center stallions



A VIP from headquarters joined us this time: White Abalone Captive Breeding Program Director Alyssa R. Frederick, Ph.D. Visiting from the UC Davis Bodega Marine Lab—where Sea Center alumna Nora Frank is now husbandry and data manager for the program—Dr. Frederick helped current Sea Center staff build spawning proficiency. Aquarist Saul Lopez-Villalta assisted: “It’s my first time doing this, so it’s very interesting,” he said. “Four other institutes are doing it at the same time: UC Santa Barbara, Aquarium of the Pacific, California Science Center, and Cabrillo Marine Aquarium. We’re all basically on the same timeframe.”

The protocol started at 6:00 AM. After carefully prying the marine snails from their habitat, the team assessed each animal’s health and readiness. Lopez-Villalta mixed a “love potion” of diluted hydrogen peroxide to trigger the release of gametes. “We put them in their love potions and we wait,” explained Frederick. “If we get eggs and sperm at different locations, we have couriers ready to ferry those around.”

On this occasion, the team at the Sea Center watched the snails closely for over three hours before calling it a day. Only one animal spawned that day: a male at Aquarium of the Pacific. Frederick helped the team manage their disappointment. “It’s really common to have spawning attempts where we don’t produce any embryos.” What’s important, she says, is the practice and team-building that comes from five facilities working in sync for the cause.

“One spawn doesn’t save a species. Building capacity and partnership saves a species. The animals just decided it wasn’t their day. The next time, when it is their day, we’ll be ready.”

“My personal hope for the species would be to see abalone in their natural habitat,” at the levels of abundance we read about in the history books, says Rudelic. “It’s really rewarding doing something to help future generations achieve that.”



Snails in their love potion

Learn more at sbnature.org/seacenter.



MCLS Dinner 2024. Circle: New Member Anabel Ford. Photos by Baron Spafford



CELEBRATING OUR MISSION CREEK LEGACY SOCIETY

by Philanthropy Officer of Legacy Giving Andrea McFarling

Over the past decade, estate gifts totaling over \$11 million have greatly benefitted our institution. These contributions have enriched our planetarium experiences, advanced crucial research, and preserved our collections for future generations. Legacy giving has been instrumental in supporting all our programs and departments, notably enhancing our collections through donated specimens. Legacy gifts sometimes arrive unexpectedly, but many come from donors who share their plans with us. The Mission Creek Legacy Society

celebrates those who include the Museum in their estate plans, helping us prepare for the future and connect with a dedicated community of supporters. In August, during National Make-A-Will Month, we held a special gathering for Mission Creek Legacy Society Members. Director of Education Rosina Garcia, M.A., gave an engaging presentation on our Astronomy Programs. The evening included a dinner and tributes to those we lost this year: Hebe Bartz, Lee Buckmaster, Richard Nordli, Joy Podger, Richard Ross, and Paul Russell.

We also welcomed our new 2024 Members: Anabel Ford and Michael Glassow, Jeff Grange, Anthony Kirk, Mimi Michaelis, Sam Spaulding, Diane and Mike Wondolowski, Penelope Wong and S. Timothy Kochis, and Cynthia Woo, alongside three anonymous donors. Our heartfelt thanks go to the Mission Creek Legacy Society for their unwavering generosity, commitment, and lasting impact. If you have any questions or would like to join the Mission Creek Legacy Society, please reach out at 805-682-4711 ext. 179 or amcfarling@sbnature2.org.

Learn more at sbnature.org/legacygiving.

YOUR CURATOR CONNECTION

by Philanthropy Officer of Leadership Circles Diane Devine



As a Member of the Leadership Circles of Giving, in recognition of their exceptional generosity, Members not only enjoy all the regular benefits of membership, but a variety of exclusive benefits including invitations to special events, amazing travel opportunities, and behind-the-scenes Science Salons.

These unique activities have something in common—an opportunity to get to know our amazing curators. In January, we host the annual Leadership Circles Dinner. The evening is a celebration and thank you to our Leadership Circles Members, and a Museum curator hosts each table.

This is a great opportunity for guests to interact with their table hosts, hear more about their diverse work, and share their own interests as well.

Explorations! (the Leadership Circles field trip program) invites Members to join us to unique natural history sites, museums, and gardens—all in the company of a Museum curator. Being able to spend a day or two interacting with our Museum and Sea Center scientists is a rare opportunity to engage and learn more about these individuals and the work and research Members support throughout the year.

Leadership Circles Science Salons are another fascinating way to connect with our curators. Members go behind the scenes and engage

one-on-one with a curator to learn more about their research, collections, and acquisitions. These small group gatherings open the window to the work of our curators and allow for real hands-on interaction and questions.

Along with these unique benefits, Leadership Circles Members play a vital role in shaping the future of our Museum and Sea Center, ensuring that they remain beacons of inspiration, education, and cultural enrichment.

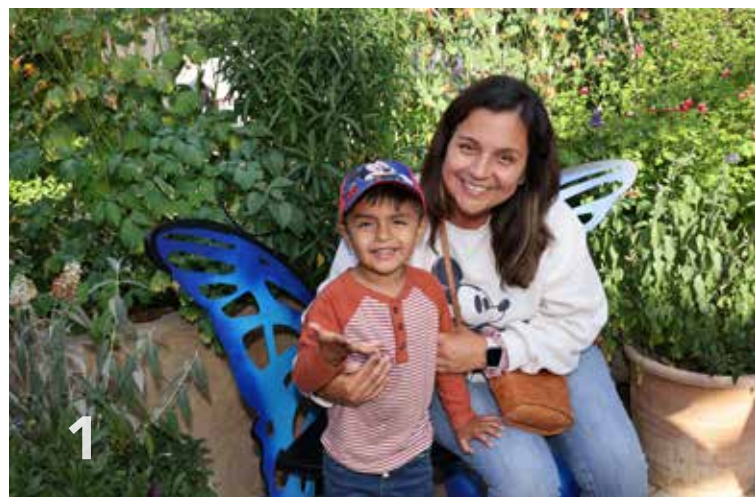
For more information or to join the Leadership Circles, contact me at ddevine@sbnature2.org or 805-682-4711 ext. 124.



Science Salon in the Anthropology Department with Brian Barbier (above) and Explorations! in the Anza-Borrego Desert

Learn more at sbnature.org/leadership-circles.

MUSEUM LIFE



1. Members enjoying *Butterflies Alive!* at the Members' Party
2. Watercoloring reproductions of Audubon prints during an education workshop
3. Santa Barbara Audubon Society Eyes in the Sky Volunteer Bernard Unterman treating campers to a visit with Max the Great Horned Owl
4. Santa Barbara Wine + Food Festival® Sponsor Farmers & Merchants Bank represented by Nolan Nicholson and his wife Karen and their friends
5. Gala was a new restaurant in the festival this year and promises to be back in 2025.
6. Artists from The Artist's Table with Chair Diane Waterhouse helped raise \$100,000 for the Museum.
7. Butterfly Pavilion Volunteer Marlene Maes Mills visited by a Blue Morpho during a thank-you brunch. Photo by Rebecca Coulter
8. Teens in the Quasars to Sea Stars Program applying field biology methods in the Eastern Sierra
9. US Bank volunteers joining forces with Sea Center to clean up East Beach
10. Featured Artist Ray Hunter, Trustees Greg Fuss and Hiroko Benko, and President Luke J. Swetland along with guests at The Artist's Table Soiree.
11. Guests pleased to meet Toothy the Shark during World Oceans Day with free admission at the Sea Center
12. Enjoying the Wet Deck's interactive exhibits on the same festive day

Photos 1, 4, 5, 6, and 11 by Baron Spafford

SANTA BARBARA
MUSEUM
of
NATURAL
HISTORY

2559 Puesta del Sol
Santa Barbara, CA 93105

SBnature Journal is a publication of the Santa Barbara Museum of Natural History. As a Member benefit, issues provide a look at the Museum's exhibits, collections, research, and events. The Santa Barbara Museum of Natural History is a private, non-profit, charitable organization (tax ID no. 95-1643378). Our mission is to inspire a thirst for discovery and a passion for the natural world.

For information about how to support the Museum, contact Director of Philanthropy Caroline Baker at 805-682-4711 ext. 109 or cbaker@sbnature2.org.



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Cover photo: An 1847 volume of James Hall's *Natural History of New York* preserved in the Museum Library's rare book room

SAVE THE DATE

Members Only

Winter Family Festival

SATURDAY, DECEMBER 14
AT THE MUSEUM

Members Only

Astronomy After Hours

FRIDAY, DECEMBER 20
AT THE MUSEUM

Underwater Parks Day

SATURDAY, JANUARY 18
AT THE SEA CENTER



For more information on upcoming events, visit sbnature.org/calendar.

**FASHION
FATALE**

THE HUMAN
OBSESSION WITH
FEATHERS
OPEN NOVEMBER 15