



Foreword

The present volume has a history spanning approximately 60 years. It began with James (Jim) Hamilton McLean's dissertation, commenced in the early 1960's and completed in 1966. Right from the beginning, Jim wanted to revise the entire gastropod fauna of the northeast Pacific. This initial dissertation proposal was tempered in scope by the experience of his advisor, none other than A. Myra Keen at Stanford University. The finished dissertation on the patelliform archaeogastropods and the abalone and scissurellids was the first component and catalyst for his life-long endeavor to complete a comprehensive faunal treatment that would be colloquially known as *The Book*.

At the Natural History Museum of Los Angeles County (LACM) Jim pursued this malacological focus as Curator of malacology from 1964 through 2001, an impressive 37-year tenure. He collected much of the material forming the LACM holdings himself and obtained many other specimens and collections from the numerous contacts he maintained. Despite a significant number of side projects, such as describing many of the first hydrothermal vent gastropods, he steadfastly continued on *The Book*. Jim was of the firm belief that every curator should have a geographic focus and a taxonomic focus, eventually leading to major publications in book form. Over the years, Jim's scrapbooks of species morphed into *The Binders*, the hard-copy version of the many manuscript files that accumulated on his computer.

As Curator, Jim also kept an eye on collections-relevant technical developments. He was the force behind LACM purchasing the first computer for electronic cataloging of its collections. With the subsequent advent of digital imaging, Jim recognized its power and encouraged the production of the very first digital plate of gastropod specimens (on *Trichotropis*) by his then graduate student Daniel Geiger, for a grant proposal to the Minerals Management Service. Although significant extramural funding for Jim's research never materialized, generous donations from his brother Hugh McLean, long term supporter Twila Bratcher, and some discretionary museum funds kept a number of imaging support staff busy (those being Michelle Schwengel, Brian Koehler, and Dan Gabai).

Unfortunately, Jim's physical health did not keep up with his continuous efforts to complete *The Book*. In 2015, he relinquished control of this endeavor to long-term friends and colleagues Pat LaFollette and Lindsey Groves. Jim passed away November 11th 2016.

After much deliberation, an approach was chosen that was intended to lead to a timely completion of Jim's unpublished work. Knowing that a single author would not be a viable option, components of *The Book* were planned to be published as an edited volume. The editors all have significant and long-term relationships or associations with Jim: Daniel L. Geiger was Jim's last student; Lindsey T. Groves has been collection's manager at LACM for several decades; and Jann Vendetti is the current Curator of malacology at LACM. We were committed to bringing Jim's vision to a fruitful conclusion. However, the monumental task could not be completed in a timely fashion even with experts around the globe taking on sections of the overall work.

Although the treatments of northeast Pacific gastropod fauna in this volume are not comprehensive, we felt an obligation to move ahead with a meaningful subset of taxonomic groups and to produce a thematic publication related to Jim's life-long endeavor. While highly incomplete, it is a step in the right direction.

Herein we include contributions from authors who worked through Jim's existing manuscripts, and lent their expert opinions. We also included the pelagic snails, taxa not originally treated by Jim, as they are frequently found in sediment samples. To further complement Jim's work, images of live animals have been added, many shell photographs were re-taken in full color, and a number of microgastropods are shown with scanning electron micrographs. Some contributing authors chose to name species initially proposed by Jim, after him in his honor. In this volume, three taxa are named for him, adding to the 37 previously described. These are a testament to the importance of Jim's work and his towering standing in the malacological community.

Initially, we envisioned publishing this volume through Jim's home institution, LACM, but we were informed that prior to the completion of these manuscripts, LACM would cease producing its in-house

journal. To our great relief, Zhi-Qiang Zhang enthusiastically embraced the prospect of publishing these manuscripts as a *Zoosymposia* volume. To make the contributions and Jim's work broadly available, this entire volume is available via open access.

With the contributions in this volume we honor Jim McLean's *Northeast Pacific Shelled Gastropods* project. Many more gastropod groups in the region await treatment. Taxonomists interested in revising select groups should contact the editors to gain access to the manuscript material. Some authors elected to publish certain aspects of work related to Jim's, elsewhere. Below we list those that we know of:

- Brown, L. (2018) New species of Nystellidae and Epitoniidae (Mollusca: Gastropoda) from the northeastern Pacific. *Molluscan Research*, 39, 64–69.
<https://doi.org/10.1080/13235818.2018.1433956>
- Callomon, P. & Snyder, M. (2017) A new genus and nine new species in the Fasciolaridae (Gastropoda: Buccinoidea) from southern California and western Mexico. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 165, 55–80.
<https://doi.org/10.1635/053.165.0105>
- Geiger, D.L. (2017) Four new Vetigastropoda (Anatomidae, Seguenziidae) from the northeastern Pacific. *The Nautilus*, 131, 226–232.
- Tuskes, P.M. & Clark, R. (2018). A new species of *Otukaia* (Calliostomatidae) from Alaska. *The Festivus*, 50, 236–238.
- Valdés, Á., Cadien, D.B., & Gosliner, T.M. (2016) Philinidae, Laonidae, and Philinorbidae (Gastropoda: Cephalaspidea: Philinoidea) from the northeastern Pacific Ocean and the Beaufort Sea (Arctic Ocean). *Zootaxa*, 4147 501–537.
<https://doi.org/10.11646/zootaxa.4147.5.1>
- Valdés, A., Gosliner, T.M. & Warén, A. (2017) A new species of *Parvaplustrum* Powell, 1951 (Gastropoda, Heterobranchia: Aplustridae) from the northeastern Pacific. *The Nautilus*, 131, 97–100.

Lastly, Jim's surviving brothers, Hugh and Arthur, donated the residual of Jim's estate to the project, which was administered through the Santa Barbara Museum of Natural History. The editors and contributing authors are deeply grateful for their generosity.

Daniel L. Geiger
Lindsey T. Groves
Jann E. Vendetti

About the Authors

Axel Alf

I earned my first degree in biology at the University of Stuttgart. Subsequently, I worked as an independent consultant of fresh water ecology and completed a dissertation on beetles as ecological indicators at the University of Hohenheim. In 1995, I was appointed professor of hydrology and fresh water ecology at the University of Applied Sciences Weihenstephan-Triesdorf. Since 2014 I am retired. I have assembled a shell collection with more than 12,000 different species over the past 50 years, which I donated to the Zoologische Staatssammlung München. I have published more than 40 papers and four books on molluscs (in collaboration), the fifth book will be published this year.

Nina Bednaršek

Bednaršek studies the impact of multiple stressors on pelagic zooplankton. She specializes in ocean acidification and the impacts on pteropods. She used a variety of different systems to answer relevant questions how global climate changes affects pteropods, from large scale upwelling systems and high-latitude systems in the Antarctic and Arctic, to estuarine and coastal habitats along the US West coast. She is using large scale empirical observations, experimental manipulation and modelling to understand and better predict future distributions of pteropods. For that, she integrates taxonomic, phylogeny and physiological studies to determine to mitigate or exacerbate pteropod sensitivity or resiliency.

Leonard G. Brown

Lenny is an actuary with a benefit consulting firm in Connecticut. When not working, he spent much of his time on his area of research interest, the taxonomy of the living worldwide Epitoniidae.

Stephanie L. Bush

Stephanie was interested in studying marine molluscs by the time she was in middle school. Her first field experience involved tracking the development of courting and mating behaviors in Caribbean reef squids off the coast of Bonaire in 2003. Subsequently, she participated in a summer internship at the Monterey Bay Aquarium Research Institute exploring deep-sea squid defensive behaviors in the Northeastern Pacific. She expanded this into her graduate work at the University of California, Berkeley, finishing her PhD in 2009. She began her work on the Pteropoda as a post-doctoral fellow at the Smithsonian Institution's National Museum of Natural History in 2012, collecting material off Hawaii, Northern and Southern California, and in the Gulf of California, as well as in the Atlantic. She combines the use of morphological data and molecular techniques to explore pteropod species delimitations and phylogenetic relationships.

Roger N. Clark

Roger began collecting shells and other marine invertebrates at a young age, by high school he became greatly interested in chitons and in mollusks of Alaska. He studied invertebrate zoology and paleontology at Southern Oregon University. In 1988 Dr. McLean hosted Roger for one week for the purpose arranging and working up the chitons collection at LACM. This was the beginning of a lifelong friendship, mentorship and collaboration. McLean and Roger shared a common interest in mollusks of Alaska and the eastern Pacific. He is presently an independent researcher, museum associate at the Natural History Museum of Los Angeles County, and a research associate at the Santa Barbara Museum of Natural History.

Eugene V. Coan

Coan received his AB from the University of California at Santa Barbara in 1964, and his PhD from Stanford University in 1969, where he first met McLean. For most of his career, he worked for the Sierra Club. He has held research associations with the California Academy of Sciences, the Santa Barbara Museum of Natural History, and the Natural History Museum of Los Angeles County. He was president of the Western Society of Malacologists in 1970–1971, and its editor from 1974 to 1979. He was president of the American Malacological Society from 1996 to 1997 and received an Honorary Life Membership in 2008. He has been coeditor of *Malacologia* from July 1988 to the present. He is a specialist on bivalves with two major regional monographs published and third in preparation. A second interest is in the history of malacology. He now lives on Summerland Key, Florida.

Rachel Collin

Rachel always wanted a dog. When her parents didn't provide one she took to collecting slugs and snails from the garden; keeping them as pets, and having snail races across her neighbor's patio. In this way she learned about the polymorphic shells of *Cepaea nemoralis* well before seeing it as an example in biology text books. She was first introduced to calyptraeids on an undergraduate field trip to Narragansett Bay. For her graduate work she studied the evolutionary causes and consequences of mode of development in calyptraeids. During that time, she had many memorable conversations with Jim McLean about the status of subgenera within the family and the identity of the rare deep-water species. She is now a staff scientist at the Smithsonian Tropical Research Institute (STRI) and directs STRI's Bocas del Toro Research Station on the Caribbean coast of Panama.

Marta J. deMaintenon

Marta had a love of seashells as a child and collected them on annual family trips to the shore. She parlayed that love into an undergraduate degree in marine biology, then studied molluscs as a PhD student at UC Berkeley with Carole Hickman and David Lindberg. She developed an interest in columbellid gastropods after finding many in south Florida that were difficult to identify due to their high degree of variability, so focused on their phylogeny for her doctoral dissertation and has kept working on them ever since. She is now professor of Marine Science at the University of Hawaii at Hilo.

Daniel L. Geiger

Geiger started to collect shells in high school and received his first degree from the University of Basel, Switzerland. He met McLean the first time at UNITAS Siena, Italy, in 1992 and eventually became his graduate student (co-advised with Russel Zimmer of the University of Southern California). He collaborated

with McLean formally and informally on a number of projects, including some concerning the northeast Pacific malacofauna. He shares McLean's early interests in the lower gastropods (abalone, little slit shells), but with a global perspective. He is now Curator of Malacology and Department Head of Invertebrate Zoology at the Santa Barbara Museum of Natural History.

Lindsey T. Groves

A family trip to Hawai'i in August of 1970 stimulated his interest of shells ... especially the cowries. Lindsey was also interested in geology and fossil collecting so his fascination with fossil mollusks was a natural. After earning a B.S. in geology from Northern Arizona University in 1983 he entered grad school at California State University, Northridge under Dr. Richard L. Squires of the Geological Sciences Department. A thesis combining his two main academic interests, fossil mollusks and geology was the result in 1991. It was Richard who introduced Lindsey to Jim McLean at the May 1986 meeting of the Conchological Club of Southern California. Little did he know that barely two years later he would begin his career at the Natural History Museum of Los Angeles County, Malacology Department with Jim as his supervisor. Lindsey was promoted to Collection Manager in 1993 and has been serving in that capacity ever since.

Roland Houart

Roland is a former secretary in a medical center. As a self-taught man he started studying Muricidae in the early seventies. He built up a large and still growing reference collection, essential for his studies. He was president of the Royal Belgian Malacological Society from 1997 to 2010 and is now in charge of NOVAPEX, the scientific journal of the RBMS. He is a Research Associate at the Belgian Royal Institute of Natural History since 1983 and at the Muséum national d'Histoire naturelle in Paris since 2017. He has been working also on the material dredged by MNHN for many years. He has published 250 contributions on Muricidae either as sole author or with more than 60 co-authors in numerous international scientific journals. He corresponded with McLean since 1983 regarding loans of specimens, miscellaneous information and later in regards to the revision of northeast Pacific Mollusca. Their exchanges were always very cordial and fruitful.

Arie W. Janssen

From 1969 to early retirement in 1997 Janssen used to be a (non-academic) curator of the Palaeontology Department (Cainozoic Mollusca) of the National Museum of Geology and Mineralogy (nowadays incorporated in Naturalis Biodiversity Center) at Leiden, The Netherlands). From c. 1980 onward he specialized on mainly fossil holoplanktic Mollusca, concentrating on systematics and biostratigraphy on a global scale. After retirement he remained an associate researcher of the Naturalis museum until the present day. Larger papers on pteropods concern assemblages from the Dominican Republic, Jamaica, SE France (Aquitaine Basin), Italy, the eastern Mediterranean, Malta, the Philippines, Iran and Tanzania, frequently in cooperation with other authors. For many years he was managing editor of *Cainozoic Research*, and co-editor of *Scripta Geologica*. He met Jim McLean only once, during the Unitas Malacologica Congress 1992 in Siena, Italy and enjoyed talking with him on various topics.

María Moreno Alcántara

María started to develop an interest in mollusks when she first saw a sea slug while studying marine biology in La Paz, Mexico. She started working with holoplanktonic mollusks for her undergraduate thesis and then focused her master's and doctorate studies on the family Atlantidae. Currently she is a doctorate student at Instituto Politécnico Nacional – Centro Interdisciplinario de Ciencias Marinas in La Paz, Mexico, where her research focuses on the ecology of Atlantidae of the southern California Current.

Buzz Owen

Owen became interested in *Haliotis* in 1949 and during the past 70 years has amassed what is likely the world's most complete collection of the species, subspecies and forms of Family Haliotidae currently known. He met McLean in 1963 and worked with him on the first of many papers he has written on West Coast abalone hybrids (published by LACM in 1971). He spent eight years as a commercial abalone diver collecting data on hybridization, and 14 years in a hatchery working with multi-species crosses. He has written over 80 papers on *Haliotis* and described nine species and subspecies new to science. A perhaps unique culture experiment resulted in crossing two hybrids of dissimilar parentage creating a "four species hybrid". He is

currently working with Arjay Raffety curating the large amount of material that is housed in many shell cabinets and Riker mounts in his home.

Bret K. Raines

Raines interest in shells started as a teenager while visiting the tide pools at Half Moon Bay, California. The Air Force fueled his passion by sending him to Okinawa, Guam, Australia, Wake Atoll, and the Philippines. As a result he became focused on Pectinidae and micro-mollusks. He first met Jim McLean in 1998, after returning from a month long collecting trip on Easter Island. And although he did not have a formal degree in biology, McLean saw potential in him. He is now a Research Associate of the Malacology Department at the Natural History Museum of Los Angeles County.

Roger R. Seapy

Seapy became interested in marine gastropods while a Junior at Pomona College during a summer course in marine biology at the Kerckhoff Marine Laboratory in Newport Harbor. This inspiring experience led to graduate studies at USC and a MS on intertidal limpet ecology and a Ph.D. on diet and geographic distributional patterns of an open-ocean heteropod off California. McLean served as a key member and advisor on his doctoral committee; for which he has been eternally grateful. Seapy served as a Professor in the Biological Sciences Department at the California State University, Fullerton for 34 years. His interests in heteropod biology have continued, notably through web pages he created and updated for Tree of Life (tolweb.org).

Lynton D. Stephens

Lynton resides in Melbourne, Australia and graduated from Monash University in 2004. He has been interested in seashells since the age of about 10 or 11 and is a keen photographer and SCUBA diver. His primary focus is the taxonomy and diversity of temperate Australian gastropods and he has described several new species in the peer-reviewed literature. One of his current research interests – the Calliostomatidae – is a group for which Jim McLean make a significant research contribution, along with Carole Hickman.

Paul M. Tuskes

Paul grew up in Imperial Beach and Chula Vista, California and still has three shells that he picked up as a child. He always had an interest in insects, lizards, fish, shells and plants, and received multiple graduate degrees in Biology and completed postdoctoral work in Environmental Toxicology. He still has the first edition of *Marine Shells of Southern California*, although 50 years old and very tattered, it was signed by Jim and is a treasure. After returning to San Diego he began working and publishing on the biology of Southern California gastropods. Jim McLean often assisted him in shell identifications on several of Paul's projects. Paul dives weekly and he and his wife Ann often publish jointly.

Platon Vafiadis

Platon has a wide range of experience in scientific study, both as a health professional and as an amateur malacologist. Building on a lifelong interest in snails and shells, Platon was inspired to a deeper study of the literature and the Victorian fauna when he met local experts through the Field Naturalists Club of Victoria, and then the Malacological Society of Australasia, more than two decades ago. While pursuing his special interest in microgastropods, particularly the basal groups, he came to know and appreciate the work of James McLean. Platon is a volunteer in the marine invertebrate department at Museums Victoria, and continues to pursue his independent studies in malacology.

Ángel A. Valdés

Ángel grew up by the ocean in Northern Spain where he started collecting intertidal organisms at a young age. He attended the University of Oviedo for both his undergraduate and graduate degrees. After a visiting curator position at the Museum National d'Histoire Naturelle in Paris and a postdoc at the California Academy of Sciences, he became the assistant curator of Malacology at the Natural History Museum of Los Angeles County, effectively succeeding McLean in that job. Because McLean remained at the Museum as an Emeritus Curator they interacted closely and published a paper together. Ángel is currently a professor at the California State Polytechnic University in Pomona, California and his research focuses on heterobranch sea slugs.

Jann E. Vendetti

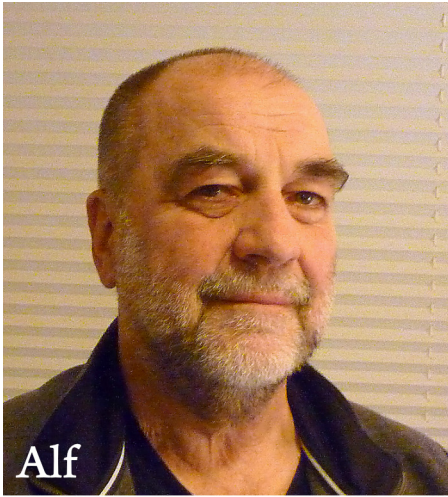
Jann became interested in marine invertebrates from a young age, and developed a fondness for the tide pool fauna along the rocky coast of southern Maine. For her graduate work she studied fossil and living buccinid gastropods at UC Berkeley with Carole Hickman, one of Jim McLean's collaborators and a fellow graduate student of A. Myra Keen. A postdoctoral fellowship brought her to Los Angeles, where her research interests include several gastropod groups found in the eastern Pacific. She is the Assistant Curator of Malacology at the Natural History Museum of Los Angeles County, where she shares Jim McLean's former office.

Geerart J. Vermeij

Vermeij began to collect shells seriously at the age of ten, shortly after he and his family emigrated to the United States from the Netherlands. He met James H. McLean for the first time sometime in the 1980s, probably at the Smithsonian. Although he never published with McLean, the two were on excellent terms, and McLean was very helpful to Vermeij when Vermeij visited the museum in Los Angeles. Vermeij is Distinguished Professor of Earth and Planetary Sciences at the University of California, Davis.

Shawn G. Wiedrick

Shawn began collecting at the age of five and grew up in southern California, with a parallel interest in the arts. He graduated from California State University of Long Beach in Art Education. His collection of worldwide Mollusca has a particular emphasis on the family Muricidae and conoidean members. Shawn was mentored by McLean in his Emeritus years at the museum and substantially contributed to the refinement of Shawn's first manuscripts. Shawn earned his master's degree from California State University Fullerton studying *Paciocinebrina* spp. and currently is an Assistant Collections Manager at LACM Invertebrate Paleontology.



Alf



Bednaršek



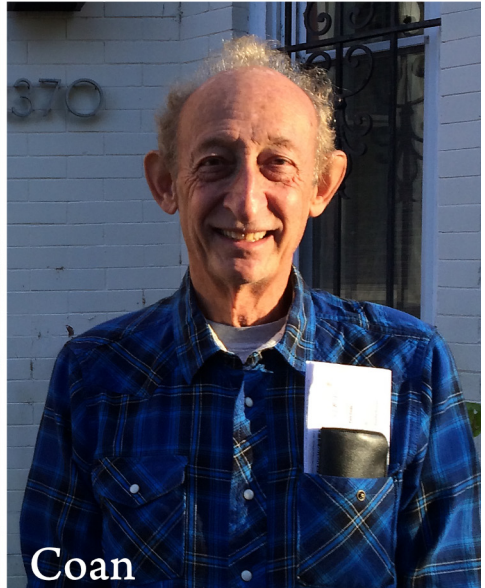
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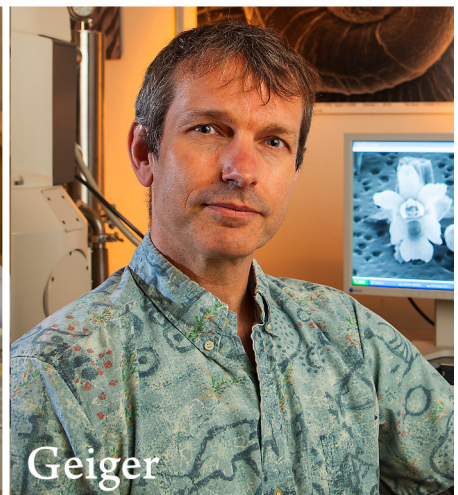
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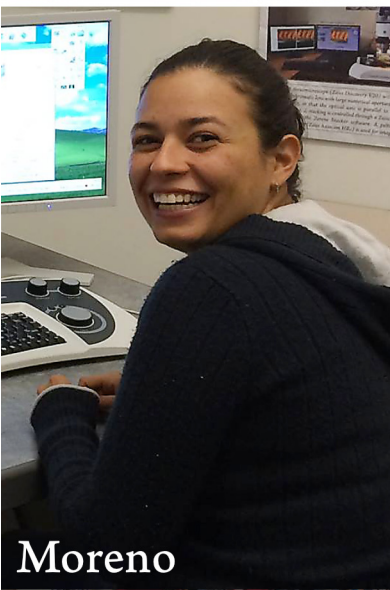
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