

Soundings



American Cetacean Society – Monterey Bay Chapter
PO Box H E, Pacific Grove, CA 93950

SEPTEMBER 2016

**MONTHLY MEETING AT HOPKINS MARINE STATION,
LECTURE HALL BOAT WORKS BUILDING
(ACROSS FROM THE AMERICAN TIN CANNERY OUTLET STORES)
MEETING IS OPEN TO THE PUBLIC**

MEETING DATE:

Thursday, September 29, 2016

Time: 7:30 PM

PLEASE JOIN US AT 7:00 FOR REFRESHMENTS

Speaker: Don Kohrs

Title: Edward F. Ricketts and Jack Calvin:

The Publishing of *Between Pacific Tides*, First Edition (1939)

There is a story behind Edward F. Ricketts and Jack Calvin's effort to have their seminal work, *Between Pacific Tides*, published. Upon being presented an outline of the manuscript, it took 10 years for Stanford University Press to publish the book. Was the publication slowed by then Director of Hopkins Marine Station Walter K. Fisher's critical review of the manuscript? Did Stanford University Press dislike the ecological approach that Ricketts and Calvin chose for the book? Was Ed Ricketts completely isolated from the scientific community of Hopkins Marine Station, as has often been suggested? How much original scientific research was involved with the effort? The discovery of numerous letters of correspondences between Ed Ricketts, Jack Calvin, Stanford University Press, and invertebrate specialists scattered around the world provide answers to these and other unanswered questions.



Donald Kohrs is Branch Library Specialist at the Miller Library of Stanford University's Hopkins Marine Station in Pacific Grove. Don has degrees in biology and library science and in addition to tonight's topic, his current efforts entail researching the history of the Pacific Grove's Chautauqua Program (1880-1926), the history of the Hopkins Seaside Laboratory (1892-1917) and the early years of the Hopkins Marine Station (1918-1950), and The Hamilton Family: John Steinbeck Maternal

Ancestors.

Please join us for refreshments before the program begins. More information is available on our website, www.acsmb.org.

Next month: Join us for our next meeting at 7:30 PM on Thursday, October 27, when Bill Standley will discuss the past, present, and future of the California Coastal National Monument, made up of 20,000 offshore rocks and islands.

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Photo of Ed Ricketts taken by Ralph Buchsbaum in July 1936.

Richard L. Ternullo

Richard Ternullo, beloved friend and colleague of whale and bird lovers around the world, left this life on August 24, at the age of 66. Richard was the President of the Monterey Bay Chapter of the American Cetacean Society and had served previously as President in the 1990s. Richard inspired and mentored many aspiring marine scientists and regularly attended conferences for ACS and international conferences for The Society for Marine Mammalogy.

Richard was born and raised in Monterey. He graduated from Monterey High School before attending San Diego State University, earning a Bachelor of Science in Microbiology. His family was involved in the Monterey fishing industry for generations, and his grandmother worked the sardine cannery lines. He was a fixture on Monterey's Fisherman's Wharf, and has been on boats since he was 10 years old; first fishing, then as a boat captain, and eventually becoming instrumental in local whale watching. He was an expert on land and sea birds as well as marine mammals, and had an impressive life list of sighted birds. He co-authored and researched several publications including the California Killer Whale Catalogue and most recently the publication of the paper *Humpback whales interfering when mammal-eating killer whales attack other species: Mobbing behavior and interspecific altruism?* He was co-owner and co-operator of Monterey Bay Whale Watch and Monterey Bay Boat Charters. A hands-on boat mechanic, he most recently brought the boat Blackfin into operation in the Monterey Bay, and was at the helm bringing the boat Sea Wolf to the Monterey Bay from Mexico.

Richard enjoyed life and travels! In 2013, he fulfilled a lifelong dream of visiting the Antarctic on the adventure of a lifetime. In 2001 and 2006, three generations of his family travelled to Italy together and created unforgettable memories.

A devoted family man, Richard and Debbie were married for 40 years. Richard was the father of Leslie, Jennifer and Nicole, and grandfather to Cody and Richard. Just one month ago, Richard walked his daughter Jennifer down the aisle for her wedding. His youngest grandson, his namesake little Richie, brought great joy to the last few years of Richard's life.

A celebration of Richard's life will be held sometime in the future, with dates to be announced. Any donation in his memory can be made to the Monterey Bay Chapter of the American Cetacean Society, PO Box HE, Pacific Grove, CA 93950; or to any other wildlife or environmental organization.

American Cetacean Society
15th International Conference

Fifty Years of Whale Conservation: Reflections and Innovations November 11-13, 2016

ACS invites you to join a unique gathering of scientists, policy makers, and conservationists from all over the world. The amazing Saturday and Sunday program includes experts in cetacean Conservation, Research and Education. And don't forget the book signings, art show, silent auction, marine life photo contest, research poster contest, and Friday's pre-conference whale watching trip.

Full conference, single day, and half day registrations available.

Full conference registration tickets include Friday night reception, all plenary sessions, panels, poster sessions, book signings, silent auction, and lunch on both Saturday & Sunday.

Member, non-member, and student rates available.

Register at:

<http://www.eventbrite.com/e/american-cetacean-societys-15th-international-conference-november-11-13-2016-registration-25946461565?aff=ebapi>

This conference is being dedicated to Captain, Biologist, Naturalist, and eternal friend of the ACS Monterey Bay Chapter, Richard Ternullo.

Sep. 23-25: 12th Annual Monterey Birding Festival at the Watsonville Civic Plaza in Watsonville, CA. This festival will include lectures and field trips to Big Sur (Condors) and Pinnacles, one of America's newest National Parks. For more information go to montereybaybirding.com.

Sep. 23-25: Artist Dana Goforth is holding her Last Open Studio that will benefit ACSMB's efforts to save the Vaquita porpoise. Dana has held a benefit sale for the vaquita for the last three years, and is the designer of the Viva Vaquita logo. Stop by her gallery on Friday, 9/23 from 4-8 PM for a champagne reception, or on Saturday or Sunday from 11 AM to 5 PM to view her oil paintings and innovative pottery pieces, many of which were baked in the sand. A portion of all proceeds benefits the vaquita. Studio location: 504 19th Street, Pacific Grove. Follow the fairy lights down the stone path to the left of the house.

Oct. 3-7: 9th Annual California Islands Symposium at the Marriot Beach Hotel in Ventura, CA. This symposium will present the most recent scientific findings on the Channel Islands and islands off the west coast of Baja California. All day field trips will be scheduled to the Channel Islands with Island Packers in Ventura, CA. For more information go to www.mednsience.org/CaliforniaIslandsSymposia

Nov. 10-13: Western Society of Naturalists 97th Annual Meeting in Monterey, CA. The 100th Anniversary of the Society will be held at the Hyatt Regency Monterey Hotel and Spa. For more information go to www.wsn-online.org.

BOOK RECOMMENDATIONS

Cetacean Paleobiology, by Felix G. Marx, Oliver Lambert, and Mark D. Uhen. 2016 Wiley-Blackwell.

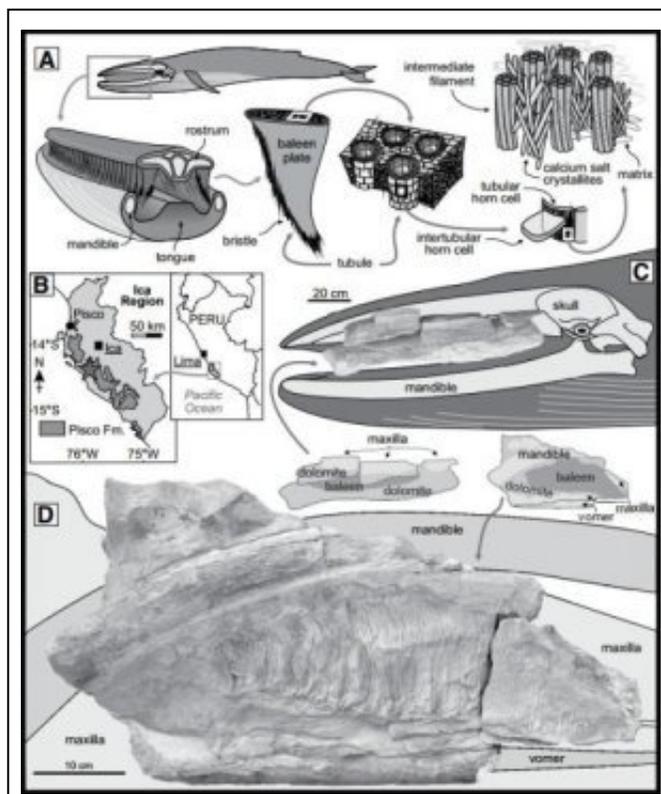
Island of the Blue Dolphins: The Complete Reader's Edition, by Sara L. Schwebel (Editor) and Scott O'Dell (Author). 2016 University of California Press.

The Princeton Field Guide to Prehistoric Mammals, by Donald R. Prothero. 2016 University of California Press.

WHALES IN THE DESERT?

Aug. 24, 2016 — In Cerro Colorado, located in the Ica Desert of Peru, sedimentary sequences dating back nine million years have been found to host the fossil skeletons of hundreds of marine vertebrates. In 2008, remains of a giant raptorial sperm whale, *Livyatan melvillei*, were discovered at this site. In September 2014, the same international team of researchers, guided by Giovanni Bianucci from Pisa University (Italy), found a partial skeleton of a mysticete whale in a rock boulder.

Besides fossil bones of the skull and mandibles, the rock containing the skeleton showed perfect casts of the whale baleen. The exceptionality of the finding is that the casts provide details at the submillimetric scale, revealing under the microscope the subtle structure of the baleen bristles. Indeed, fossilized



A: Main baleen features of an extant rorqual, at different scales; tubule diameter ~0.5 mm (modified and redrawn from Szewciw et al., 2010). B: Location of Cerro Colorado, Peru (detailed map in Fig. DR1). C: Left baleen rack of the balaenopteroid specimen M1 as found in the field, with drawing showing the original position in the whale skull. D: Right baleen rack of specimen M1. (Credit: Anna Gioncada and Geology).

baleen bristles have been studied for the first time by chemical and mineralogical analyses. The data obtained allow researchers to compare the Miocene whale feeding habits to those of the extant sea whale, and strengthen the preservation potential of the Ica desert for the marine vertebrate fossil record.

<https://www.sciencedaily.com/releases/2016/08/160824110916.htm>

CRITICALLY ENDANGERED WHALES IN RUSSIA RECOVERING

Sep. 6, 2016 — The joint report by IUCN-International Union for Conservation for Nature, WWF and International Fund for Animal Welfare (IFAW) examines the results of the work of an IUCN-led independent panel of scientists, which has been advising Sakhalin Energy -- one of the largest companies operating in the area -- as part of an innovative loan deal. Over the last 12 years, Sakhalin Energy has made important efforts to limit the impact of its operations on whales and the fragile environment. During this period, the western gray whale population has grown 3-4% annually, from an estimated 115 animals in 2004 to 174 in 2015.

The western gray whale population is currently listed at Critically Endangered on the IUCN Red list of Threatened Species™.

"What started 12 years ago as a response to a growing conflict between environmentalists and the oil and gas industry over one critically endangered whale population has resulted in multiple benefits for conservation and business," says IUCN Director General Inger Andersen. "IUCN has shown that independent scientific panels are an effective mechanism to arrive at evidence-based and robust solutions to some of today's pressing environment and development challenges."

However, the report also warns that further cooperation and involvement of all companies and industries in the region -- including oil and gas operators and fisheries -- are crucial to ensure best practices and the long-term protection of the animals.

"The annual increase of Sakhalin whales is encouraging but their recovery in the long-term will depend on more companies in the region joining this effort," said Doug Nowacek, a well-known specialist in whale behaviour and a WGAP panellist. "Sakhalin Energy has demonstrated that it is possible for companies to mitigate their impacts and still operate effectively. But other companies in Sakhalin need to take similar measures to address the problem of cumulative impacts of industry on the marine environment."

The report, titled *Stories of Influence*, explores how the panel generated benefits for business and conservation. It is based on interviews with more than 20 experts and stakeholders engaged in the process. Over the past 12 years, the panel issued more than 539 recommendations to Sakhalin Energy and other parties, 90% of which have been implemented or superseded by subsequent advice. The process has included financial lenders and government officials as well as NGOs, serving as observers.

Among the achievements is a decision by Sakhalin Energy to alter the route of its pipeline to minimize the disruption and impact on the whales' feeding grounds. The panel has advocated innovative scientific research, including a satellite-tagging programme that has documented the longest one-way migration of any mammal -- a 10,880km journey from Sakhalin to its wintering calving grounds in Mexico's Baja California peninsula. In addition, the panel's work has also led to the development of one of the most comprehensive company Monitoring and Mitigation Plans for seismic surveys, which now serves as the industry's global guide.

IUCN first established what is now known as WGAP in 2004 in response to a growing concern over Sakhalin Energy's plans for expansion in the Sea of Okhotsk and the impact this could have on the critically endangered whales found off Sakhalin Island. An outcry from NGOs opposing those plans eventually persuaded lenders to tie a number of mitigating conditions to the loan agreement. These included a requirement for Sakhalin Energy to finance an independent panel managed by IUCN to provide recommendations on their operations.

"The Western Gray Whale Advisory Panel has reduced the impact of this oil and gas operation on one of the world's most threatened whales, a legacy the lenders to this project can be proud of," says Wendy Elliott, Deputy Global Wildlife Leader, WWF International. "We encourage other financial institutions to replicate this success by including similarly stringent conditions when granting loans to projects with potentially damaging impacts on threatened wildlife and their habitats."

Sakhalin Energy recognises that integrating science into the company's management and policies has had a positive impact on its operations, and this is now reflected in the company's vision.

During the report's launch, IUCN confirmed it intends to sign another five-year agreement with Sakhalin Energy to continue this work. Under the new agreement covering 2017-2021, WGAP will continue to provide independent scientific advice to

the company. Also, the panel has recently established a working group to explore how similar lending conditions to enhance conservation measures can be mainstreamed going forward.

Throughout the IUCN Congress from 1-10 September, a number of events will explore the management of oil and gas impacts on the marine environment, as well as examine the effectiveness of Independent Scientific Advisory Panels, such as WGAP, for resolving environmental conflicts on behalf of governments and business. In addition, building on the WGAP experience, IUCN has released a new guide developed to help industry design and carry out effective and responsible geophysical surveys.

<https://www.sciencedaily.com/releases/2016/09/160906103401.htm>

A NEW DOLPHIN SPECIES, LONG GONE, FOUND IN A DRAWER

By Nicholas Bakalar

Aug. 22, 2016 — Scientists have determined that a skull that had been sitting in a drawer at the Smithsonian National Museum of Natural History in Washington for more than 60 years belonged to a previously unknown species of extinct dolphin.

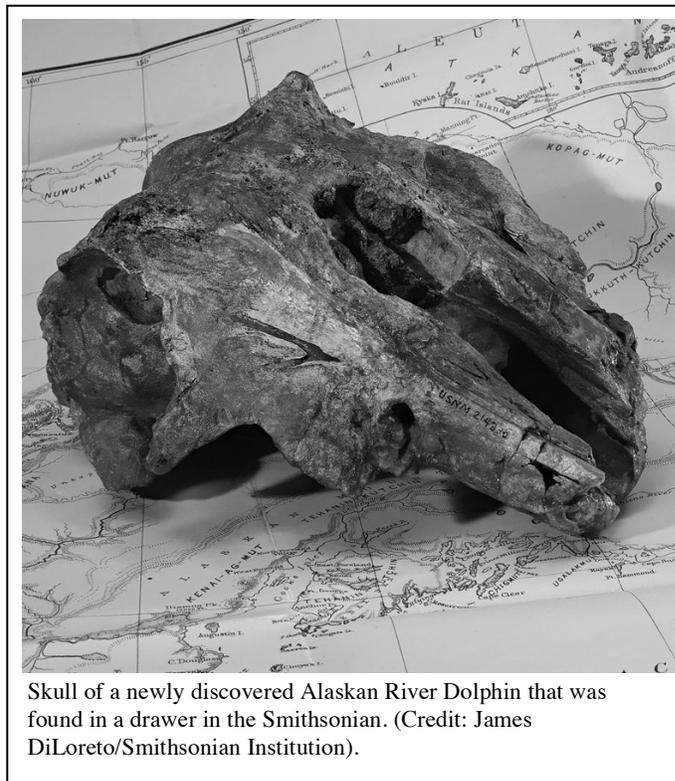
The animal, whose skull was found in Yakutat, Alaska, in 1951, has been given the name *Arktocara yakataga*, which can be loosely translated from the Greek as “the north face from Yakutat.” Its description is in the journal *PeerJ*.

There is one descendant of *Arktocara* still extant, the South Asian river dolphin, a freshwater animal that is itself on the edge of extinction. *Arktocara* was almost certainly an oceanic creature.

The dolphin’s discoverer, Alexandra T. Boersma, a researcher at the National Museum, said that judging only from the size of the skull, it was probably about seven and a half feet long. It had a flexible neck, unlike oceanic dolphins, whose necks are hardly distinguishable from their bodies. She estimates that it lived about 25 million years ago.

“One of the great things about the Smithsonian,” Ms. Boersma said, “is that the collections are so vast. We were just walking around to see if anything was interesting. And then, wow!”

<http://www.nytimes.com/2016/08/23/science/a-new-dolphin-species-long-gone-found-in-a-drawer.html>



Skull of a newly discovered Alaskan River Dolphin that was found in a drawer in the Smithsonian. (Credit: James DiLoreto/Smithsonian Institution).

KRILL ARE DISAPPEARING FROM ANTARCTIC WATERS

WHALES, SEALS AND PENGUINS COULD BE HURTING AS THIS TINY CREATURE-- FUNDAMENTAL TO THE FOOD WEB--DECLINES

By Andrea Thompson

Aug. 29, 2016 — They may be small, but krill—tiny, shrimp-like creatures—play a big role in the Antarctic food chain. As climate change warms the Southern Ocean and alters sea ice patterns, though, the area of Antarctic water suitable for krill to hatch and grow could drop precipitously, a new study finds.

Most Antarctic krill are found in an area from the Weddell Sea to the waters around the Antarctic Peninsula, the finger of land that juts up toward South America. They serve as an important source of food for various species of whales, seals and penguins. While those animals find other food sources during lean years, it is unclear if those alternate sources are sustainable long-term.

Over the past 40 years, populations of adult Antarctic krill have declined by 70 to 80 percent in those areas, though researchers debate whether that drop is due to the effects of climate change, a rebound in whale populations after the end of commercial whaling or some combination of those pressures.

Because of its key role in the regional food chain, scientists are concerned about the impacts that future climate change may have on the krill population and the larger Antarctic ecosystem.

In the new study published in the journal *Geophysical Research Letters*, Andrea Piñones and Alexey Fedorov examined how expected changes in ocean temperatures and sea ice coverage might affect krill during their earliest life stages when they are most vulnerable to environmental conditions.

Krill has a complex, regimented life cycle that requires a delicate balance of conditions. Female krill lay their eggs in the upper ocean during summer; those eggs then sink to where the water is in the right temperature range for them to hatch. Once they hatch, the krill larvae swim back to the surface waters where they must find food, in the form of phytoplankton, within 10 days or they will die.

The larvae must then eat enough food during the late summer and fall to fatten up before winter. To survive that winter, they also need sea ice to form by a certain time, as they use it for shelter, as well as feeding on the algae that dwells in the nooks and crannies of the ice.

“Even if there is a lot of a sea ice, if the sea ice is not there at the time that they need, they don’t survive,” said Piñones, who has dual appointments at the Center for Advanced Studies in Arid Zones and the High Latitude Marine Ecosystem Dynamic Center in Chile.

Piñones and Fedorov, who works at Yale University, took a krill growth model and plugged in expected ocean temperature rise from climate models, projections of how sea ice area and the timing of its growth and melt might change, and possible changes in phytoplankton to see how those changes impacted the krill during its early life stages.

“We see a scenario that is not very favorable for

krill,” Piñones said.

While warmer ocean temperatures help the krill hatch faster, declines in sea ice area, delayed sea ice formation, and a drop in phytoplankton populations meant that overall, the habitat suitable for young krill could decline by up to 80 percent, they found.

“This paper is a significant step forward to predict the consequences of climate change (temperature and sea ice dynamics) on circumpolar krill population,” So Kawaguchi, a krill biologist with the Australian Antarctic Division, said in an email. He was not involved in the new study.

There are significant uncertainties, though. For one, the changes in sea ice projected by models vary widely. While sea ice increased in some areas and decreased in others, in general the biggest declines were in the area where most krill today are found.

Whether phytoplankton populations will increase or decrease with warming is another unknown. If they do decline, the bigger that decline is, the more it will curtail krill habitat, the study showed.

The only scenario from the model that showed an increase in krill was one in which phytoplankton increased and climate models also showed an increase in sea ice.

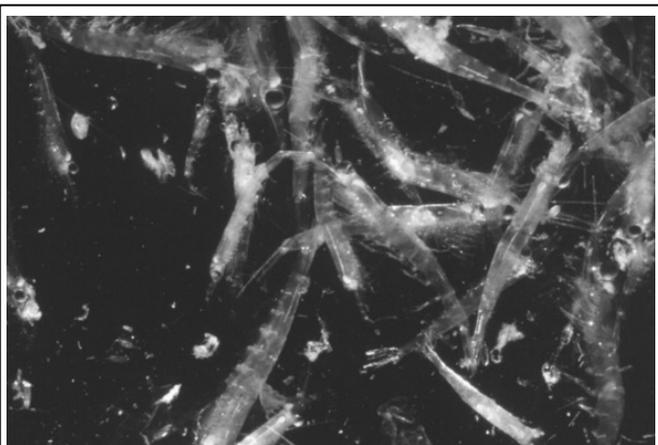
The study also left out the effects of ocean acidification, which are expected to be particularly pronounced in polar regions as cold water absorbs carbon dioxide more readily. A 2013 *Nature Climate Change* paper by Kawaguchi looked at the potential effects of acidification on hatching rates and found declines in much of the same krill habitat as the new study.

The combination of acidification with the factors examined in the new study “could be catastrophic” for krill, Piñones said.

Both Piñones and Kawaguchi say that a lot more research needs to be done to better understand the future of Antarctic krill. In particular, more observations of krill during the winter when they are sheltering under sea ice are needed.

“We still don’t have a full grasp of how krill interact with ice and how this changes as krill grow, and this interaction could further change as the environment changes,” Kawaguchi said.

“There is enormous uncertainty in our knowledge regarding the ecosystem interaction and how it responds to changing climate,” he said. “The important message here is that we need to get a better handle on the ecosystem processes through well designed observation and experimentation to improve and better tune the ecosystem model to reduce the uncertainties in our prediction.”



Credit: Jamie Hall, NOAA.

<http://www.scientificamerican.com/article/krill-are-disappearing-from-antarctic-waters>

WHALES' ULTRASONIC HEARING HAS SURPRISINGLY ANCIENT HISTORY, FOSSILIZED EAR SHOWS

Aug. 4, 2016 — All living toothed whales rely upon echoes of their own calls to navigate and hunt underwater, a skill that works best in conjunction with high-frequency hearing. Now, researchers reporting in the Cell Press journal *Current Biology* on August 4 who studied one of the best-preserved ears of any ancient whale ever discovered find that whales' high-frequency hearing abilities arose earlier than anticipated.

"Our study suggests that high-frequency hearing may have preceded the emergence of echolocation," says Morgan Churchill of New York Institute of Technology in Old Westbury, New York.

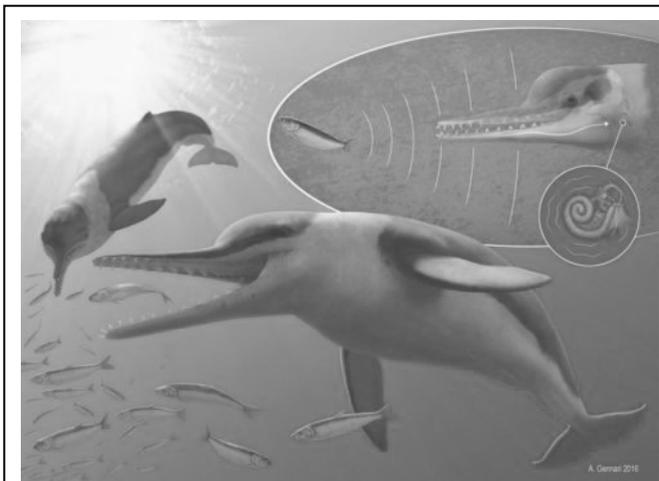
Churchill and his colleagues made their discovery in studies of a new fossil whale species (*Echovenator sandersi*) found in a drainage ditch in South Carolina. The researchers CT scanned the ancient whale's remarkably complete fossilized ear and compared it to those of two hippos and 23 fossil and living whales. Those analyses uncovered many features found today in dolphins, which can hear at ultrasonic frequencies.

The anatomy of *Echovenator*'s ear suggests that high-frequency hearing evolved early in whale evolution, about 27 million years ago and that traits associated with this ability actually predate the emergence of toothed whales. It also suggests that the evolutionary ancestors of toothed whales could hear at higher frequencies than their relatives on land.

Churchill says that the inner ear of *Echovenator* is surprisingly similar to that of modern whales. In fact, only one trait of the ancient whale's ear was more similar to primitive whales than to modern whales, suggesting a very rapid evolution of hearing abilities in early whales.

Echovenator is remarkable in other ways too, Churchill notes. For instance, the ancient whale was remarkably small compared to its ancestors, suggesting a drastic change in body size early in toothed whale evolution that most likely influenced a range of variables, from brain size to ecology.

Echovenator is just one of many fossil whales from South Carolina that Churchill and colleagues are in the process of studying. Those fossils represent some of the earliest known ancestors of toothed whales. And that means there's much more to come on



Sound is produced by Echovenator, which bounces off prey to create echoes. This illustration shows how these echoes are detected via conduction of vibrations through the mandible and received by the inner ear. (Credit: A. Gennari 2016).

the evolution of intelligence, body size, foraging ecology, and diversity in modern whales.

<https://www.sciencedaily.com/releases/2016/08/160804135903.htm>

SIGHTINGS

Sightings are compiled by Monterey Bay Whale Watch. For complete listing and updates see <http://www.montereybaywhalewatch.com/slstcurr.htm>

Date	#	Type of Animal(s)
8/31 9 am	17	Humpback Whales
	6	Blue Whales
	30	Risso's Dolphins
8/31 8 am	22	Humpback Whales
	1	Blue Whale
	10	Risso's Dolphins
	8	Common Dolphins
	3	Harbor Porpoise
	1	Black-footed Albatross
8/30 10 am	14	Humpback Whales
	8	Blue Whales
8/30 9 am	15	Humpback Whales
	10	Blue Whales
	100	Long-beaked Common Dolphins
	60	Risso's Dolphins
8/30 8 am	21	Humpback Whales
	4	Blue Whales
	1	Fin Whales
	16	Risso's Dolphins
8/29 12:30 pm	10	Humpback Whales
	10	Blue Whales
	3	Fin Whales
8/29 9 am	11	Humpback Whales
	4	Blue Whales
	1	Fin Whale
	5	Dall's Porpoise
8/29 8 am	11	Humpback Whales
	6	Blue Whales

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