

Nature Trails

Published by the Eugene Natural History Society

Volume Fifty-six, Number Three, March 2022



Pronghorn skull (*Antilocapra americana*). Photo from Museum of Natural and Cultural History collection.

Silver Linings from COVID Limitations:

Squirrel Origins and Carnivore Diets,
Two Undergraduate Theses I Mentored Over Zoom

Edward Davis

Department of Earth Sciences and Museum of Natural and Cultural History,
University of Oregon

Friday, 18 March 2022, 7:30 p.m.

The Eugene Natural History Society invites you to their March Zoom meeting. The Zoom session will open at 7:00. This allows everyone time to get connected and join in friendly conversation. Our meeting will begin at 7:30. Time: 18 March 2022, 07:00 p.m. Pacific Time (US and Canada). Join Zoom Meeting:

<https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUeJuU21wT20rdz09>

**We regret to announce that Herb Wisner died on 20 February 2022,
a month before his 100th birthday.**

The April *Nature Trails* will be a memorial issue, filled with your remembrances of Herb. If you have a memory to share, send it to jvernoncarter@comcast.net. If you prefer to give us a paper copy of your memory, send it to Eugene Natural History Society, P.O. Box 5494, Eugene, OR 97405



Edward Davis is an associate professor in the Department of Earth Sciences at the University of Oregon, and the Paleontological Collections Manager for the University's Museum of Natural and Cultural History

(MNCH). He is an expert in mass extinction, paleontology, climate change, conservation biology and the evolution of large mammals. Davis specializes in the way species respond to ongoing climate change. Most of his work is on terrestrial herbivores (plant eaters, like antelope), but his research also extends to whales and terrestrial carnivores.

Davis grew up in Memphis, Tennessee. He owes the direction his career has taken to the movie Jurassic Park, which he saw in 1993 when he was in high school. He had been interested in paleontology before seeing the movie, but it convinced him that he had a chance to become a paleontologist himself. Those dinosaurs in the movie inspired him to do what it took to get into a graduate program in paleontology. He volunteered in The Pink Palace, a museum in Memphis, Tennessee, and worked there while in high school. He began a geology major at the University of Tennessee in Knoxville in 1995. With that degree in hand, he was admitted to a graduate program at the University of California, Berkeley, where he got into fossil mammal research. After finishing his Ph.D., Davis was a postdoctoral fellow for two years at the University of California's Museum of Vertebrate Zoology. Following that he obtained his present position here at the U of O. He is now a world expert on fossil antelope, and he owes it all to a dinosaur movie.

In his talk to us, Davis will describe research projects of two undergraduate students whom he advised during the pandemic. He says, "The COVID pandemic has not stopped the curiosity of science students. Since the onset of the lockdown in Spring of 2020, I have worked with two undergraduate students to support their goals of completing

undergraduate research theses, with our mentoring meetings entirely over Zoom."

Anna Banks became interested in her research area from the flying squirrel fossils at the MNCH. She learned that flying squirrels had originated in



Flying squirrel (*Miopetaurista neogrivensis*). Image credit: O. Sanisidro

Asia, which led her to ask how they got to Oregon. Her work gradually expanded to the evolution of all squirrels. The evolutionary and biogeographic evidence she collected has enabled her to conclude that all squirrels originated in Asia, not North America, as had previously been thought.

John Clements collected data from the internet on hundreds of carnivore species across the evolutionary tree. He was able to get at how their various diets—vertebrate or non-vertebrate animals—affect their size, as well as aspects of reproduction such as timing of pregnancy and time spent nurturing.



Coyote (*Canis latrans*). Image credit: MNCH

Please join us at 7:30 p.m. on Friday, 18 March 2022, to hear Edward Davis's talk, Silver Linings from COVID Limitations: Squirrel Origins and Carnivore Diets, Two Undergraduate Theses I Mentored Over Zoom. The Zoom link for our meeting is on the cover page of the newsletter.

John Carter

A Giant Among Salamanders

by Tom A. Titus

The image is like an oil painting lacquered onto my memory by the complex sensory relationships of an ancient forest in autumn. On a morning two decades

past, my buddy and I were deep in an old-growth canyon in the Coast Range, sliding down a muddy trail after the onset of October rains. A sharp rightward bend in the trail brought us off the ridge to a place where muted creek roar rose from the canyon

floor. A bank of moss plumped and green from recent rains and adorned with half-dozen freshly sprouted golden chanterelles ascended near my right arm. Nestled within the moss and mushrooms was a very large salamander. About eight stocky inches of marbled caramel and mocha were exposed from the mouth of a rodent burrow, and the tail remained hidden. The salamander was frozen in time and space, bulging eyes unblinking and unconcerned. Smartphones hadn't been invented, and I carried no camera. All I have is a memory and words that seem insufficient for describing the multidimensional experience of that magnificent salamander, encountered during my favorite month in one of my favorite places on the planet.

The emerging salamander did not know its human names. But these are worthy monikers. Coastal giant salamander. *Dicamptodon tenebrosus*. It is a giant among salamanders, reaching lengths up to 13 inches. It shares the honor of being the world's largest terrestrial salamander with two close relatives, the Pacific giant salamander (*Dicamptodon ensatus*) and the Idaho giant salamander (*Dicamptodon aterrimus*). Coastal giant salamanders live along the rain-washed belt west of the Cascade crest from southern British Columbia to northern California. According to Ellin Beltz, in her book *Scientific and Common Names of the Reptiles and Amphibians of North America—Explained*, the genus name *Dicamptodon* translates to doubly curved teeth, which are known to inflict a



Photo by Jeffrey Marsten

finger-bleeding bite. The specific epithet *tenebrosus* refers to dark or gloomy. We don't know whether herpetologists Spencer Fullerton Baird and Charles Frédéric Girard, who formally described the species in 1852, were referring to the forest habitat or the color of the salamander. Because they were describing U.S. Navy collections from the Wilkes expedition from within the comfortable confines of the Smithsonian Institution, they were likely referring to the color of a preserved specimen rather than the somber coniferous forests blanketing the mountains of western North America before large-scale logging.

Terrestrial coastal giant salamanders aren't as large or gloomy as their larval counterparts. The larvae are brown with subdued mottling, similar in color to the gravel and silt stream bottoms on which they live. External bottlebrush gills protrude from behind each side of their flattened head. Although the larval period for these salamanders is typically about two years, coastal giant salamanders carry the wisdom of flexibility in their genes—they can forgo metamorphosis to become sexually mature as larvae. Those that remain larval might grow even larger than their terrestrial counterparts, up to 14 inches in total length. Larvae are formidable aquatic predators and will eat anything that fits into their prodigious mouths. Crayfish and cutthroat trout beware! My students once placed a pair of coastal giant salamander larvae, one small and the other large, together in a water-filled bag. When we retrieved the bag from the quiet confines of a cooler, only one large and bulbous salamander remained. Terrestrial adults prey on various invertebrates such as banana slugs and vertebrates such as rodents, snakes, and other salamanders.

The specific epithet *tenebrosus* reminds me of “*tenacious*.” A female coastal giant salamander will tenaciously guard her clutch of 100–200 eggs beneath a rock or log in slow-moving water. An aspiring egg predator is likely to become lunch. But egg brooding is costly to the female. She cannot forage to replace the calories that were required to produce the clutch she now guards nor can she spend time acquiring energy for generating the next clutch. This is a classic life history energy trade-off, a conundrum resolved over millennia by natural selection that in this case favors intense female investment in egg survival.

“*Tenacious*” is related to “*persistence*.” The lifespan of individual coastal giant salamanders remains undocumented, but closely related spotted and tiger salamanders have lived 25 years in captivity. Regardless of individual lifespan, coastal giant salamanders and their relatives have been lumbering and undulating through western forests for a very long time. A fossil dubbed *Dicamptodon antiquus* was found in Paleocene sediments in Alberta dated to nearly 60 million years before the present. Fossil tracks from Paleocene mud in Montana were left by an ancient *Dicamptodon* twice the size of modern species (even I would have hesitated to pick that animal up!). Approximate dating based on accumulated changes in DNA sequences indicates that the genus *Dicamptodon* might be over 100 million years old, twice as ancient as the fossil record indicates. To put this in perspective, the genus *Homo* is at best 3 million years

old. *Dicamptodon* have persisted for roughly 40 times longer.

I bet that coastal giant salamanders will be lumbering through whatever remains of western North American forests long after humans are extinct. Of course, this depends on whether we take them out with us. Although coastal giant salamander larvae are resilient to increases in water temperature and removal of buffer zones after logging, siltation from clearcutting damages larval populations. Terrestrial populations aren't obviously dependent on stand age. However, radio telemetry shows that clearcuts restrict the movement of metamorphosed adults in both time and space, undoubtedly the result of a double whammy of increased sunlight and decreased moisture. Ironically, it is the terrestrial

adults who respond favorably to the maintenance of streamside buffer zones after clearcutting. If I'm right that coastal giant salamanders will outlast humans, they will not miss us when we are gone.

I would miss the salamanders, though. Regardless of their motive, Baird and Girard chose the name *tenebrosus* appropriately; evolution has unified the all-encompassing dimness of big trees and big salamanders. Inside the gloomy limb reach of the old-growth forest above the Johnny Gunter place, an equally gloomy larval coastal giant salamander settles inconspicuously on a silt-bottom pool below the spring. In a world rife with human turmoil, the subdued light and motionless salamander calm me like a heavy quilt. For a few moments, I wish I could become so entwined, so still.

Place, Time and Crannogs by Reida Kimmel

Scotland's glorious, wild Outer Hebrides have a rich, multi-layered history and prehistory. Visit today and you will find a sparsely populated, nearly treeless archipelago. Two centuries ago, there were more trees and many more people. Then came the Highland Clearances, a dread time for Scots in the highlands and islands. The farmers did not own their land. The lords of the islands did, and when it became obvious that small farms were much less profitable than sheep, the crofters, their homes destroyed, fled to the most barren parts of the islands. Some were fortunate enough to migrate abroad, but most eked out a living, generally as fishers, or died of disease and starvation. The sheep ate what trees were not cut for profit, and heather and grass covered the land.

Outside of the town of Stornoway, on Lewis, there are only villages—no shops or cafes, though there are a few cozy hotels on all the islands. Scottish Gaelic is the first language for many. Religion is a powerful force. Except on cheerfully Catholic South Uist, the Sabbath is strictly observed. Machair, the Atlantic coastal vegetation, is rich pasture, fertilized by minerals from the sea and by the many hundreds of thousands of birds that nest there every year. The cries of the seabirds can't quite compete with the clatter of home looms on Lewis, where the famous Harris Tweed is woven before it is sent to neighboring Harris to be tailored and sold. The islands are dotted with lochs and sea lochs. Many sand beaches border cold waters deceptively as clear and turquoise as any in the tropics.

Once, the Hebrides were connected to mainland Scotland, and as the climate warmed after the Ice Ages ended, Mesolithic hunter-gatherers settled the Hebrides sometime after 8500 BCE. Centuries later, when land connections were permanently flooded by the sea, people came from the mainland in small hide-covered boats, bringing livestock, seeds, polished stone tools and new ways to live. What we call the Early and Mid-Neolithic period began. In North Uist, passage graves and cairns, all open for exploration, are dotted about a landscape covered with springy, wet heather. Most thrilling is Lewis's 5000-year-old Calanais Stone Circle, a large monument of Hebridean gneiss, one of the oldest and hardest stones on the planet, moved to the site and erected at a time when Stonehenge was still a timber structure, and the Egyptians were just beginning to construct pyramids.

Later periods of Hebridean pre-history are amply represented too, but metalworking technology developed slowly. Bronze Age artifacts and structures like South Uist's Cladh Hallan round houses date from 1600-1100 BCE (Cladh Hallan is the only archaeological site in Great Britain where prehistoric mummies have been found).

Bronze Age excavations recover fewer tools and more weapons, which could reflect hostilities arising from years of poor harvests following wetter, colder climatic conditions, especially after the eruption of Iceland's Mt. Hecla in 1159 BCE. All of northern Scotland saw a dramatic decline in population following that catastrophe. Iron Age brochs, a uniquely Scottish form of architecture, tell us of war and the importance of social hierarchies. We see this reflected in the Hebrides' brochs, combining

dwelling and fort, of which the best preserved is Carloway Broch on Lewis, built in the first century AD and used for centuries afterwards.

I trained in history. I love dates—wonderful ways to hang tags and give structure for thinking about how we came to be what we are. But I never tried to deal with the immensity of time until I read Henry Gee's *Deep Time*. He points out how very easy it is to put numbers on events, and in the blink of an eye, pass over and through millions, hundreds of millions, billions of years. Paleozoic, Mesozoic, now leap to the Holocene for descendants! The human mind cannot grasp the immensity of these huge time spans. We can imagine ourselves in a carboniferous forest or a Hebridean stone circle and guess what either could have been like, but to really comprehend how very far they are from us now is impossible. We abbreviate, and in so doing, we fall into traps, trivializing and cartooning the past. It's hard enough even to imagine the Clearances of the 1800s, though this horror is preserved in oral and written history.

When societies develop writing, we do find the past more accessible, calling it progress, civilization. Everything before this is pre-history, glossed over in spite of all the tremendous achievements of non-literate societies. Even without writing, knowledge, beliefs and traditions remain alive for millennia through the spoken word and customary practice. Over centuries, spiritual beliefs evolve, places and their meaning to society undergo changes. If they are no longer relevant, they will be abandoned. The changes we see best are physical, enriching a sacred spot like the Calanais Stones with graves, or changing a holy place to a dwelling. The spiritual persistence of the past is harder to realize. Take for instance Scotland's crannogs, beautifully described by Duncan Garrow and Fraser Sturt in 2019 in the journal *Antiquity*.

Crannogs are artificial islands built in lakes. They are found in Western Europe, but Scotland's are most numerous, especially in the Outer Hebrides. The islands were laboriously built with stones and timbers, creating a flat floor on the islet. Past excavations found ruins of Iron Age dwellings that were occupied for centuries, well into the Middle

Ages. In the 1980s, by analyzing pottery styles and radio-carbon dating timber structures, archeologists studying the islet Eilean Domhnuill, in Loch Olabhat, North Uist, discovered extensive Neolithic foundations and evidence of eleven phases of occupation dating from 3720 to 2600 BCE. This site was so big and so long occupied that it could have been a ritual site, but how to prove it, and were there any others? Local divers Chris Elliot and Mark Murray found extensive quantities of Hebridean Neolithic and Unstan pottery shards in the calm waters around Eilean Dumhnuill, and then searched around four islets on Lewis, where they found Neolithic pottery in remarkable condition. Often the bowls were charred. They had been used before deposition, but then submerged when still intact. Ritual offerings indeed! Were these tiny islets the symbols of community cohesion used for feasting or memorializing the dead? Of the four islets the team searched, three were not even on the National Historical Environmental Record and the other two were presumed to be much later. There must be so many more of these small islets used for spiritual practices and then repurposed to dwellings in later times. So much to learn! Did this ritual of offering things of value to the waters exist in other parts of Britain and Western Europe? Or persist? Remember, we still throw pennies into fountains!



Unstan vessel recovered from Loch Arnish in 2012. Photo by C. Murray.

Events of Interest in the Community

McKenzie River Trust <https://mckenzieriver.org/events/#event-listings> or 541-345-2799

Saturdays, 12 March and 9 April, 8 a.m. to 4 p.m. Living River Exploration Day at Green Island. Take a walk near the place the Willamette and the McKenzie Rivers meet. Observe 15 years of tree-planting work on Green Island, a habitat for beaver, river otter, and over 150 species of birds.

Saturday, 19 March, 9 a.m. to noon. Willamette Confluence Preserve Tour. The Willamette Confluence features extensive habitats that are endangered in the Willamette Valley and includes six miles of river corridor, floodplain forest, wetlands, upland oak woodlands and native prairie. Last year McKenzie River Trust and The Nature Conservancy reached an agreement

to transfer ownership of the Willamette Confluence Preserve from TNC to MRT, a transfer we expect to happen this spring. McKenzie River Trust will work with partners to steward this special site. During this walking tour, trained volunteers will lead you around the preserve, highlighting the conservation efforts, human history, and natural features. This walk is three to four miles long on mostly flat gravel roads with short optional side trips over uneven ground.

Lane County Audubon Society www.laneaudubon.org or 541-485-BIRD

Tuesday, 22 March, 7 p.m. Three Weeks in Southern Ecuador. Zoom Only. LCAS member Magnus Persmark will lead us on an adventure through the spectacularly bird-rich wild lands of Southern Ecuador. Check the LCAS website or Facebook page for the Zoom link.

Mt. Pisgah Arboretum <https://mountpisgaharboretum.com/festivals-events> or 541-747-3817

Tuesday, 15 March, 3:15 to 5:30 p.m. Arboretum Exploration Session 1. Explore Mt. Pisgah Tuesday afternoons. Learn about the many surprising and amazing animals and plants living right here with hikes, games, stories and journaling activities. Rolling drop off between 3:15 and 3:30. \$105 per session, but MPA members pay \$85. For youth ages 5 to 11, maximum 15 students. Masks required. Register at

<https://mountpisgaharboretum.org/registration-form/>

Friday, 18 March, 10 a.m. to noon. Slimy Creatures Family Walk. Slugs, snails, worms and more! On this walk for families, learn about the lives of our slimy friends here at the Arboretum. These greatly under-appreciated creatures are more fascinating than you've ever imagined. Finish the walk by creating some slime of your own to take home. Preregistration required. Max group size 15. **Free for members and kids under 4.** Non-members, \$5. Don't forget your parking pass! Sign up here: <https://www.signupgenius.com/go/60b044eacaf2aa6f49-winter1>

University of Oregon's Museum of Natural and Cultural History <https://mnch.uoregon.edu/museum-home>

Saturday, 5 March through Sunday, 13 March, 10 a.m. to 5 p.m. PhotoARK. Photographs by Joel Sartore. Come face to face with some of the world's most charismatic animals. Be inspired to care about and protect these incredible vanishing species. Go to <https://mnch.uoregon.edu/programs> or call 541-346-3024 to learn about the Museum's many programs.

Native Plant Society of Oregon, Emerald Chapter <https://emerald.npsoregon.org/>

Monday, 21 March, 7 to 9 p.m. The Oregon Dunes, a Vanishing Landscape. Presenter: Dina Pavlis. Oregon is home to the world's tallest coastal dunes, with some reaching as high as 500 feet above sea level and spanning 180 feet in length! About 45% of Oregon's coastline consists of coastal dunes that are home to many delightful native plants and animals. The Oregon dunes ecosystem relies on sand movement to survive; it is assaulted almost daily by strong coastal winds, resulting in the creation of stunning formations that move and change. Unfortunately, Oregon's coastal sand dunes have been rapidly disappearing over the last 100 years beneath a blanket of plants. Scientists estimate that we are losing one to five feet of open sand per year. What has changed and can Oregon's coastal dunes be saved? A Zoom link will be posted on the website closer to the date of the program.

Nearby Nature <https://www.nearbynature.org/> or 541-687-9699

Mondays, 4 to 25 April, 2:30 to 5:30 p.m. Natural Neighbors Monday After School: Winged Wonders Session Starts!

This month our program theme will be Winged Wonders! Discover what's fine about feathers and what's marvelous about migration! From herons as tall as toddlers to raptors who rule the sky up high, learn about the fascinating lives of local birds. Build nests, peek at beaks, check out feathers, and look for bird babies. Mondays at our Learnscape in Alton Baker Park, 622 Day Island Road, rain or shine, kids 6-10 years old. Flexible drop off from 2:30 to 3:30 pm and pick up between 5 and 5:30 pm. \$95-110. [Online enrollment](#) is on-going. Simply pay the \$35 deposit and we will prorate your final fees due according to when you join the group. Note this program has sessions on both Monday and Friday. Children are welcome to attend just one day a week or both days. Activities will be different on these days.

Friends of Buford Park and Mt. Pisgah <https://www.bufordpark.org/> or 541-344-8450

Because people and nature need each other, the Park is OPEN during the COVID-19 pandemic. Please refer to [Lane County](#) for instructions about the park and updates.

WREN (Willamette Resources and Educational Network)

Nothing this month.

NABA (North American Butterfly Association), Eugene-Springfield Chapter.

Tuesday, 22 March, 6 p.m. Favorite Plants of Western Cascade Butterflies, With Tanya Harvey. Join the Middle Fork Willamette Watershed Council and the Eugene-Springfield Chapter of NABA for a virtual talk by Tanya Harvey, local graphic designer, artist, and native plant expert. Register online at middleforkwillamette.org/events.

ENHS welcomes new members! To join, fill out the form below. Membership payments allow us to give modest honoraria to our speakers and pay for the publication and mailing of *Nature Trails*. Our Web address: <http://eugenenaturalhistorysociety.org/>

MEMBERSHIP FORM

Name _____
Address _____
City _____ State & Zip _____ Phone _____
E-mail (if you want to receive announcements) _____
I (we) prefer electronic copies of *NT* rather than paper copies. ___ Yes ___ No
If yes, email address (if different from the one above): _____

ANNUAL DUES: Family \$25.00
 Individual 15.00
 Life Membership 300.00
 Contribution _____

Annual dues for renewing members are payable in September. Memberships run from September to September. Generosity is encouraged and appreciated.

Make checks payable to:
Eugene Natural History Society
P.O. Box 5494, Eugene, OR 97405



Herb Wisner and bird.

Tim Godsil took this photo at Herb's 90th birthday party.

The Steller's jay had somehow got into Herb and Ruth's house, and Herb caught it! Here he's letting it go.

ENHS Officers and Board Members 2021–2022

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2021-2022 Speakers and Topics

18 Mar. **Edward Davis**

**Silver Linings from COVID Limitations: Squirrel Origins and Carnivore Diets,
Two Undergraduate Theses I Mentored Over Zoom**

15 Apr. **Lauren Ponisio**

Bees and Wildfire

20 May **Lauren Hallett**

**Siskiyou Plant Communities (cosponsored with the Emerald Chapter of the
Native Plant Society of Oregon)**