Third Nature

Divining the Scientific Archive

By

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ABSTRACT

The dichotomy between the science and art worldviews provides a gateway through which both artists and scientists can explore a personal and collective relationship with the world via the platform of the archive. Scientists (like me) and artists (like me) can leverage scientific collections—fossil compendia, field notebooks, nautical logs, herbaria sheets, genetic data and imagery, or the myriad other objects collected or created during scientific activities and expeditions—and archives of these collections can be viewed simultaneously as repositories of knowledge, ways to satisfy the desire for order and control, transmitters of wonder, and mirrors of ourselves, of the collector, and of culture and society.

For the past thirty years, I have participated in scientific expeditions to treeless, windswept islands of Alaska's Aleutian Island Archipelago and allied island groups. Landfall was made on a number of those same islands during the ill-fated 1741 Second Kamchatkan Expedition. This experience has provided me an unparalleled opportunity to place imagery emerging from archives generated via my own lived experience straddling the 20th and 21st centuries within the context of archived records and the lived experience of 18th century scientific explorers. My research tracks archives of the voyage of the packet boat, *St. Peter*, which carried Captain Commander Bering's crew from Kamchatka to southeast Alaska and, after many trials, including sickness and death of the Commander, back to Kamchatka, during 1741-1742. My own field research activities and archives—mostly materials from botanical expeditions conducted between 1988 and 2019—span much of that 18th century track, and I use in my art-making those archived science-made materials to explore the impact of scientific expeditions and subsequent colonial expansion on the species and indigenous people that occupied and continue to occupy these remote treeless islands. In an example of ArtScience, I leverage insight emerging from art-making, science-making and my own lived experience to formulate and test a new hypothesis to solve a mystery that has puzzled nine generations of biologists exploring these harsh but beautiful geographies: the species identity of an unknown animal called Steller's sea monkey.

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ACKNOWLEDGMENTS

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CHAPTER 1. Introduction

"Our idea of an objective world is a shared hypothesis."
(Grayson 12).

There is, for at least some of us, a collective desire, hope, belief, or certainty that we live in a knowable, factual and logically consistent world. I am a research scientist by vocation, practicing western scientific methodology within my professional life for over 40 years. One of the goals of western science[1] is to build knowledge and investigate, understand, and explain the natural world largely within this worldview, a worldview in which things that are currently unknown can become known, a worldview underpinning scientific research methodologies, a paradigm that is simultaneously enabling and constraining, a conceptual scaffolding, a null hypothesis that is rarely tested[2]. However, philosophers and critical theorists know the world to be subjective, contingent, and constructed (Crimp 200), a fabricated narrative (Foucault, "The History of Sexuality" 193). We can argue whether this worldview represents the null hypothesis within the world of art, but certainly it is a worldview to which we, as artists, are regularly exposed. Since I have occupied the world of art (via my avocation) for as long as I've occupied the world of science (via my vocation), I have straddled these two worldviews for most of my adult life. Obviously, this has the potential to leave me conflicted at times, and to engender a certain amount of compartmentalization in the way I feel about the acquisition, dissemination and archival of knowledge. Of certainty, however, is that worldviews are always subjective, even those that attempt to view the world objectively.

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[1]Unlike indigenous science, which does not distinguish between the sacred and the empirical (Nakashima and Roué 315), is generally more intuitive and holistic, and typically passes on knowledge orally from one generation to the next via elders, western science is considered positivist, materialist, supposedly objective and certainly quantitative, and is based on the transmission of academic literature (Mazzocchi 3). The entirety of my academic science training and subsequent vocational activities have been conducted solely within the western scientific worldview (until recently) but my pre-academic scientific learning benefitted from indigenous science approaches via the guidance by and input from family friends.

[2]Quantum physicists hypothesize multiple realities and continue to test that (for example, see Proietti et al., "Experimental Test of Local Observer Independence").

Artist Tiffany Shafran suggests that the dichotomy in these worldviews provides a gateway through which artists, like scientists, can explore a personal and collective relationship with the world via the platform of the archive (19). Scientists (like me) and artists (like me) can share the "modality of knowledge-making" (19) via the scientific collection—of fossil compendia, herbaria sheets, genetic data, or myriad other objects "of the most diverse forms" (Daston 2)—and archives of these collections can be viewed simultaneously as repositories of knowledge, ways to satisfy the desire for order and control, transmitters of wonder, and mirrors of ourselves, of the collector, and of culture and society. Science historian Lorraine Daston refers to the archives of science as the 'third nature'—that which endures from the 'second nature,' the "scientific work of hypothesizing, testing, explaining, and predicting" (1), winnowed by scientific empiricism from 'first nature,' the "teeming, tangled complexity of nature" (1). Scientific archives contain those things that endure after the stuff of second nature "slips from science present to science past" (1) and represent the scaffolding upon which scientific history has been written. Within the spheres of contemporary art and cultural theory, the significance of archives, including scientific archives, has steadily increased, and in his introduction to "The Archive," art historian Charles Merewether credits artists and cultural theorists with positing "some of the most searching questions…[about] what constitutes an archive and what authority it holds in relation to its subject" (10). Scientific archives can be re-examined, redefined and reinvented by artists; in this way, artists can redefine and rewrite scientific history.

But who decides what goes into scientific archives, what emerges from those archives, and when? Certainly, public institutions, such as universities, museums, government bureaucracies, and libraries represent a large proportion of these gatekeepers of archival knowledge. I have recently encountered a certain level of conflict associated with the archival of a two-decade corpus of scientific documents, images, and other data repositories that I've generated. A specific (but not the only) quarrel has been about the circumscription of required taxonomies of federal data managers who seek to impose more order and control over archives than can be credited to the research methodologies used in their genesis. This has led me to question how both deluges of data and gaps in scientific archives can obscure meanings or methodologies, and to think about how manifest memory can be ignored, or lost, or muddled, or altered. This conflict has spurred the most recent investigations in my artistic practice, which have been to make manifest through imagery my explorations of ignored, hidden or forgotten knowledge in scientific archives.

In some cases, this knowledge has been simply abandoned or lost: the research is inconclusive or changes trajectory, scientists leave positions (some to become artists) and abandon their research. Scientists can die before they can publish all their research results. Funding can be cut off before the work is done. Research institutions can be shuttered. Sometimes, archived knowledge is held in deep storage due to the specific classification structures assembled by public institutions that archive collections in the public's name, and yet selectively preserve and interpret those very materials in a way that determines what eventually becomes public knowledge. Opportunism and competition can lead scientists to assert ownership over their findings; Florence Hsia recounts how the heirs of Royal Astronomer James Bradley, considering them commodities, hoarded his observations for almost a century after his death in 1762 (34). Thus, I am interested in what is not obvious, what has *not* been made public, what is held outside the scientific canon of knowledge or the specific narrative told by the institutions. I am interested in what is omitted due to neglect, or forgetfulness, or to reinforce what Tiffany Shafran calls a "unified hegemonic narrative" (19) that serves to strip archived objects of any of the initial sense of wonder emanating from their creation or discovery.

My current art practice shares some commonalities with Susan Hiller's (Figure 1), Mark Dion's (Figures 2 and 3) and Tacita Dean's (Figure 4) appropriation of scientific methods of collecting, ordering and presenting objects. These artists leverage stochasticity[3] (or apparent stochasticity) in the juxtaposition of disparate objects in their discursive platform of the archive to examine the tension between knowing and feeling that emerges with the discovery or creation of 'scientific' objects. In some cases, I also recontextualize actual archival material, either duplicated, or discarded. Like them, I am interested in the connection between the archives and the transmission of a sense of wonder. How can the archive restore the world-as-wonder, or can it? Can "wonder and wonders still seize us" (Daston and Park 365), much less breach the dichotomy between art and science? Is the imperative to wonder as seen in the West truly imperative (Buckingham 55), or does it emerge from the same hierarchical ontologies wielded in the collection, ordering and archiving of objects by the institutions? Would flat ontologies (DeLanda 58) remove some critical essence, by transforming the wonders buried in scientific

[3] The word 'stochasticity,' which derives from the Greek word stókhos that means "pertaining to chance" (Parzen 7), refers to the lack of predictable order or plan. The word 'stochasticity' is often used as a synonym of the word 'randomness' but the word 'stochastic' is typically applied to analyses, processes and/or systems and the word 'random' is typically applied to a variable.

"Archives of Wonder[s]" (Shafran 19) into just more things among things, "Wonders Without Wonder" (Buckingham 54)? Are we even ever able to escape from the anthropocentrism that influences our worldviews and defines for us what we find full of wonder, wonder-ful; is there such a thing as an objective being in the world or, for that matter, in the universe?

Figure 1. Susan Hiller, *Homage to Joseph Beuys*. Series of felt-lined cabinets containing antique bottles of water collected by the artist around the world: ongoing from 1969. 43¼ x 75¼ inches. Figure removed due to copyright restrictions.

Figure 2. Mark Dion, *New England Cabinet of Marine Debris (Lyme Art Colony),* 2019. Cabinet; wood, glass, metal, assorted marine debris, plastic, rope, ceramics. 103 ½ x 50 5/8 x 25 3/8 inches. Used with permission, courtesy the artist and Tanya Bonakdar Gallery, New York/Los Angeles (file name: TBG 20353).

Figure 3. Mark Dion, *Brontosaurus*, 2016. Epoxy resin, tar, wood and various objects. 71 x 75 x 25 inches (overall); 24 x 60 x 24 inches (pedestal). Used with permission, courtesy the artist and Tanya Bonakdar Gallery, New York/Los Angeles (file name: TBG 17015).

https://art.daimler.com/artwork/tacita-dean-the-russian-ending-2001/

Figure 4. Tacita Dean, *The Russian Ending*, 2001. Photogravure, 20 parts (9 shown here), each 21 ¼ x 31 ¼ inches. Figure removed due to copyright restrictions.

My recent artistic process has centered on the archive or collection (or archived collections) as a medium for the transmission of wonder and the revelatory knowledge that emerges from a focus on things that are hidden, and the conflation of boundaries between the artistic and western scientific worldviews via the collection of objects that exist just outside the border between what is known, and what is unknown, between what is seen, and what is unseen. My science practice has provided me with access to many such archives, either through my own scientific activities, such as laboratory or fieldwork, scientific expeditions, and wildlife rehabilitation, or through similar activities of colleagues or historical figures. My work leverages both 2-D (drawing, painting, digital) and 3-D (various metal and concrete casting and assemblage) methods that typically incorporate materials cast off from scientific, industrial or natural processes or archived materials. Six artworks illustrate my most recent practice:

- *Abandoned Projects* (Figure 5) references the development of scientific research projects that are subsequently abandoned and left to gather dust.

Figure 5. Sandra Talbot, *Abandoned Projects*, 2018. Charwood, Styrofoam, concrete, glue, tape, clipboards and other found objects, plaster and gesso. 20 x 30 inches.

- *Book of Falling Angels* (Figures 6 and 7) transforms archived x-ray images of injured wild birds[4] admitted for care into a wildlife rehabilitation center—the Bird Treatment and Learning Center in Anchorage Alaska—where I volunteer as a clinician. The artwork, which was included in an exhibition[5] in June 2019, involved the alteration of x-ray imagery collected classically (via radiography) or digitally, transfer of the imagery to steel plates—grounds with much greater longevity than original films—with surfaces that were distressed using bleach, and assembly into an accordion book using steel hardware. In addition to exploring relationships between humans and non-humans and predator/prey relationships, the piece illumes the liminal space between life and death.

[4] I obtained most of the initial x-ray imagery from a colleague, Lisa Pajot, who also volunteers for the clinic; the birds are those she cares for and who in turn partner with her giving presentations in support of the clinic's education program. As the main bird in the piece, a bald eagle named Petra, died several years ago, I will be giving this piece to Lisa as a memorial to Petra. I recently purchased the book "Mark Dion: Misadventures of a 21st Century Naturalist" that, to my surprise, included an image of a lithograph by Dion of several x-rays of raptors, including one with a broken wing (Erickson, 52). Dion's lithographs were included in an exhibition, *Raptor*, held in 2000, at Mildred's Lane, Beach Lake, Pennsylvania; an example can be seen at https://serpentine-galleries.myshopify.com/products/mark-dion-raptor. I am unsure whether I should be disappointed that my use of the x-ray image of Lisa's raptors (owl, eagle, magpie), and the single wild goshawk in the Book, is unoriginal (Dion's lithographs, unknown to me, preceded the date of my work), or proud that I independently share similar approaches with such an accomplished artist, or accept (as has been suggested by wiser minds than mine) the existence of a collective unconscious.

[5] *Birds on the Edge*, International Gallery of Contemporary Art, Anchorage, Alaska, June 1-28 , 2019.

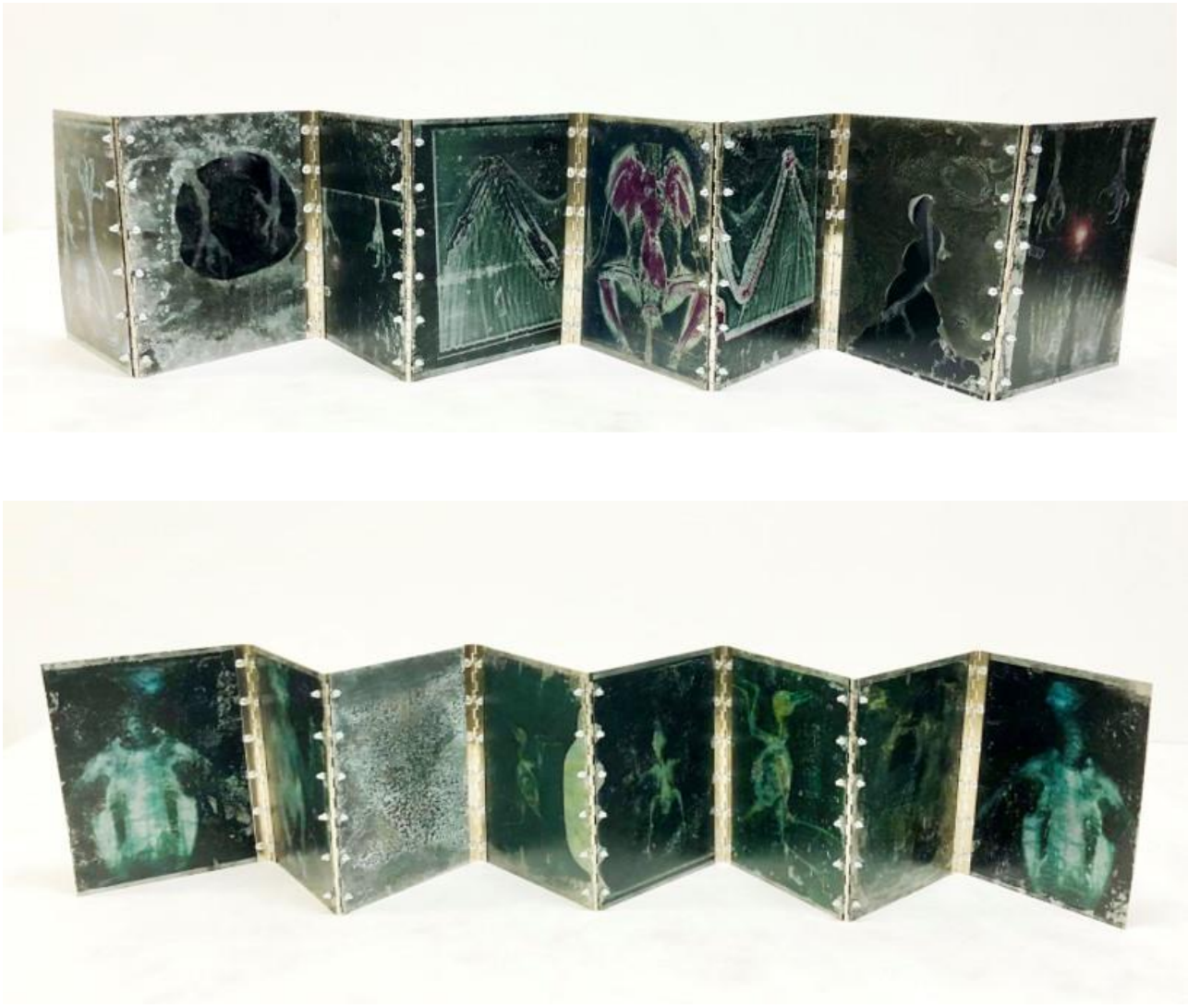

Figure 6. Sandra Talbot, *Book of Falling Angels,* 2019. Galvanized steel, digitally-altered x-ray images, acrylic, charcoal, stainless steel, zinc hardware. 12 x 42 inches. Each 'page' is 8 x 12 inches.

Figure 7. Sandra Talbot, *Book of Falling Angels*, 2019. Detail views.

- In *Burnt City Grid I* and *Burnt City Grid II* (Figures 8 and 9), I house an alien and enigmatic landscape within a recognizable museum archival presentation to engender an understanding of the potential of climate change-exacerbated wildfires to utterly destroy human habitations. Burnt City Grid uses charwood created during the volcanic-like process of casting aluminum into a wooden mold and incorporates stones collected from riverbeds in Alaska.

Figure 8. Sandra Talbot, *Burnt City Grid I,* and *Burnt City Grid II*, 2019. Charwood, stones, aluminum in museum archival boxes. Each is 17 x 24 x 2.5 inches.

Figure 9. Sandra Talbot *Burnt City Grid I* (left) and *Burnt City Grid II* (right), detail, 2019. Charwood, stones, aluminum in museum archival boxes. Each is 17 x 24 x 2.5 inches.

- *Situs Relictus* (Figure 10) and *Three Towers* (Figure 11) address the resilience of Nature after humans have retreated, incorporating into a collection of concrete or wood-cast aluminum 'buildings' *naturalia* (stones, broken branches and leaves) recovered and archived from 'real' wounded ecologies, and *artificialia* cast off from industrial processes and laboratory experiments, reference books, and archived charwood. The layers of concrete and leaves in *Situs Relictus* references the passage of time and the cyclic nature of ecological change. The addition of mosses, to the 'buildings' comprising *Three Towers* refer to the successional role that bryophytes play in the revegetation of blasted landscapes.

Figure 10. Sandra Talbot, *Situs Relictus*, 2019. Concrete, stones, charwood, reference books, birch leaves, burned spruce branches. 36 x 36 inches. This art incorporates remnants of prior sculptures destroyed during the November 2018 7.2 earthquake centered approximately 7 km northwest west of Anchorage.

Figure 11. Sandra Talbot, *Three Towers*, 2019. Wood cast aluminum, concrete, stones, charwood, *Hylocomium splendens* (moss). 18 x 26 inches overall.

- *This is Not Nature* (Figure 12) incorporates aluminum and bronze castings of dried plant materials from a co-worker's collection of dried fruit leftover from non-eaten lunches (as such, this represents a collection archived by a scientist, not a scientific archive *per se*). The cast pieces are arranged in a series of perhaps familiar, but not quite recognizable artifacts meant to represent the spoils of a far-off-future scientific expedition to discover what life on a distant past on Earth was like. Like other works, this piece functions

Figure 12. Sandra Talbot, *This is Not Nature*, 2018-2019. Cast aluminum, stones, acrylic blocks. Various sizes (1 x 3.5 inches to 2.5 x 2.5 inches), without (left top) or with (right top) vitrine cabinet; various used and alternative 'artifacts (bottom right and left).

as a parody of scientific archives, mocking the tendency of scientists (in this case, archaeologists, paleontologists and anthropologists) to erect entire cultures or ecosystems based on just a single or few artifacts.

With each of these artworks—even the satirical pieces—I sought to evoke a sense of wonder while placing the work within a traditional museum-archive, tableau, or scientific project management framework.

While the archive can be considered a repository of historical knowledge and memory (the Age of Discovery's "Knowledge of All Particulars" of Richard Hooke 6), the archive cannot reconstruct a complete knowledge or memory. That is, in addition to the subjective nature of archival construction and the archives' capture by the dominant culture, there will always be a 'memory-crisis' (Terdiman vii) regardless of the 'completeness' of an archive and an underlying desire to ensure future knowledge in the face of finitude (Derrida). Yet unanswered, at least for me, is whether this 'memory-crisis' can be leveraged within an image-making strategy to promote a sense of wonder, both in the unusual/uncanny/inexplicable, and in the mundane. As well, the archive cannot be considered as simply "sites of knowledge retrieval but [also] of knowledge production" (Stoler 87); archives are not things, but "epistemological experiments" (90). In their co-edited book "Beyond the Archive," Gesa Kirsch and Liz Rohan trace trajectories of research that extend 'beyond the archive' (1-9) as it is understood traditionally, encouraging the exposé of nonlinear and fragmentary foundations of the archive within the context of autobiography, and problematizing our notions of authorship, textuality and material of the archive. In "The Historical *a priori* and the Archive," Foucault refers to the power of archives to represent the past and determine the relationship among their contents; the archive determines what we know, regardless of the relationship between the "history that is given…[and] of things actually said" (127). Chuck Dyke, while acknowledging that our "familiarity with the turf will help turn up the artifacts" (105), cautions that that same familiarity is "one of the controlling contingencies…[w]e are no doubt predisposed to extract certain artifacts and ignore others" (105). As such, my familiarity with scientific archives may predispose me to select and reconceptualize archives that fit within my scientific worldview. That worldview, which pays so much attention to precise details, may also predispose me (as it has other scientists) to miss the larger impacts of more granular work; it also predisposes me to ignore the vantage point of other, non-human individuals.

Even more difficult than stepping out of a western scientific worldview is then stepping out of the human worldview. Many eminent scientists, including E. O. Wilson and Charles Darwin, attempt to (or, in Darwin's case attempted to): Wilson via concepts introduced in *Sociobiology: The New Synthesis*, and, later, *Biophilia*, and Darwin via his comparative evolutionary theories and tendency toward anthropomorphism. Behavioralist Samuel Barnett criticized Darwin's tendency to anthropomorphize animals (210), although of course care must be taken to avoid anachronistic thinking; Darwin worked and thought in the late 19th century, a very different world than the one inhabited by Barnett in the mid-20th century, and as a scientific naturalist, Darwin also lived in a completely different cognitive world, which makes his anthropomorphizing seem astonishing to modern scientist. Alternatively, Michael Ghiselin downplayed Darwin's anthropomorphizing, assigning Darwin's intent as metaphorical rather than literal. Darwin's tendency to regard non-human species on human terms may have seemed quaint or metaphorical, leading some to ignore it (as indigenous people's views about our relationship to non-human animals were long ignored), but Eileen Crist suggests that Darwin's intent was as a realistic appraisal of the evolutionary continuity of animal (including human animals) life (12). We cannot know what was in Darwin's mind, but I suspect that the ability to hold true multiple possibilities within the mind, simultaneously (and be comfortable with the ambiguity that engenders) is an ability of both great scientists, and great artists.

While guarding against these tendencies to view the world hierarchically from an anthropocentric viewpoint via the western scientific worldview, I continue to be drawn toward archives that are pertinent to my lived experience, even those archives that were constructed centuries ago. Scientific archives are not just about the memories of "our wild, discontinuous, ever-changing past…[but are also]…as much about future as about the past, laying up stores…for generations to come" (Daston 3). How do I use art to draw a trace between my current scientific life to the lives of scientists (or, perhaps, protoscientists) that sailed the same routes that I have?

My thesis research was guided first by explorations of archived scientific materials associated with those stored or recorded by myself or by other scientists (both acquaintances and historical) involved in scientific research on non-human species in Alaska. These have included museum archives—including a two-week internship at the Museum of Southwestern Biology in

November, 2019[6]—as well as publicly available US state and federal databases and other online archives, records/materials not yet formally archived, including laboratory or field notebooks, and translations of historical (18th century) journals and archived documents published in the late 19th and early 20th century. I have been particularly interested in materials archived as part of scientific expeditions. Among archives, I sought those that reference unexplained sightings or events, have the potential to shift the boundaries between the known and the unknown, or that subvert the 'order of nature' and that engender a sense of wonder, either through awe/astonishment, or "logical perplexity" (Bogost 121). My methodology sought to transform traditional scientific didacticism and ideological structure (such as hierarchical ontologies) to expose the granular nature of meaning-making that can arise from the presentation or juxtaposition of fragmentary material, documents imagery, or experiences. I explored imagery gathered from the viewpoint of experimental subjects (rather than solely the viewpoint of the scientist), or unexpected or inexplicable concurrences and marginal spaces that came to exist on the outermost limits of scientific investigation, including archives associated with cryptozoological sightings in the Pacific Northwest and Alaska, including records of Thunderbirds in Alaska, Sasquatch in the Pacific Northwest, and, ultimately, Georg Steller's 'Sea Ape' (Steller 82-83).

Although my artistic practice has been primarily in sculpture, I untethered myself from solely sculptural imagery, leveraging where possible or practical actual archival material or facsimiles. For example, my interim thesis exhibition involved printing photographic imagery from lost-then-found scientific archives onto bleached-distressed galvanized steel plates, construction of sealed boxes that housed the original archival material (scanning electron microscope [SEM] radiograph films) and audio files of archived, publicly available recordings of calls of crickets and katydid species closely related to the subjects depicted in the films (Figure 13).

[6] The Mammals Curator at the Museum of Southwestern Biology, Dr. Joseph Cook, was previously Curator of Mammals at the Museum of the North at the University of Alaska Fairbanks, hosted the internship.

Figure 13. Sandra Talbot, *cristae acustica*, 2019. Installation, mixed media (cardstock, bronze, clipboard, galvanized steel, acoustic files, ink, charcoal, polyacrylic. Plinth (left): 39 x 29 x 18 wide; boxes (left) 4.5 x 5.5 x 2.5 inches; steel plates (right) 12 x 12 inches each.

In that interim exhibition, the subject matter (SEM imagery of mechanoreceptors, or cristae acustica, associated with the tympana [hearing apparatus] of three groups of orthopteran [in this case, crickets] species) of the lost-then-found archival materials was not immediately apparent although I provided clues in the form of scientific nomenclature, the title of the exhibited work (*cristae acustica*) and the archived acoustic files. My own ability to fairly quickly determine the source of the imagery in these lost-then-found archives was due to my familiarity with biological taxonomic conventions and technologies associated with imagery processes (radiography) commonly used during the mid-to-late 1900s, yet the information I used to divine those archived materials was and remains available to the curious among us. Transmission of the lost archived knowledge via the imagery in *cristae acustica* was intentionally obscured to encourage the viewer to seek the hidden knowledge, if desired, using contemporary technology, such as QR codes and internet search engines.

Considering the concepts introduced here and via my ongoing artistic explorations, and within the context of my own lived experience as a participant in scientific expeditions and the subsequent archival materials already available to me, my graduate research has represented a

continued exploration of the idea that the archive is a representation of the fissure between the desire for a rational, ordered universe and the reality that the world is subjective, contingent and constructed. In an intersecting trajectory, I examined my own scientific explorations to delve into the idea that wonder is a liminal condition that can be explored within the discursive platform of the scientific archive. I explore these concepts by situating them within a specific geography that has been the target of my own field expeditions since 1988: treeless, windswept islands of southwestern Alaska, including Chirikof Island, the westernmost island of the Kodiak Island Archipelago; Simeonof Island, the southernmost island of the Shumagin Island group off the southern shoreline of the Alaska Peninsula; and various islands of the Aleutian Island Archipelago. I have participated in scientific expeditions to each of these islands during the late 20th and now early 21st centuries, and all were noted during the ill-fated 1741 Second Kamchatkan Expedition. This has provided me an unparalleled opportunity to place imagery emerging from archives generated via my own lived experience straddling the 20th and 21st centuries within the context of archived records and the lived experience of scientific explorers of the 18th century.

Here, I follow a map (Figure 14) that tracks the voyage of the packet boat, *St. Peter*, which carried Captain Commander Bering's crew from Kamchatka to southeast Alaska and, after many trials, including sickness and death of the Commander, back to Kamchatka during 1741-1742. My own field research activities and emerging archives—mostly materials from botanical expeditions conducted between 1988 and 2019—straddle much of that 18th century track, and I use in my art-making those archived science-made materials, to explore the impact of scientific expeditions on the species, including indigenous people, occupying the Aleutian Island Archipelago and allied island systems of Alaska.

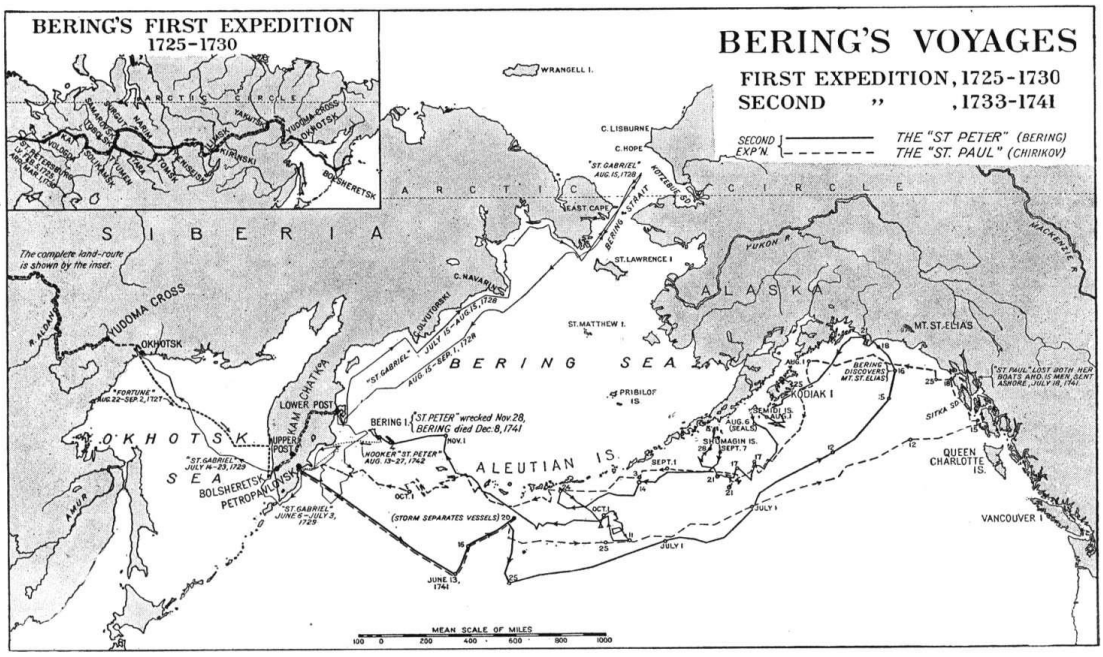

Figure 14. Tracks of the *St. Peter* and *St. Paul* of the Second Kamchatkan Expedition, from Kamchatka to southeastern Alaska, and back. This thesis addresses only the track of the *St. Peter*. Image 431270MAD676 used with permission of Clipart.com

CHAPTER 2. Chasing the Wind: The Second Kamchatkan Expedition of 1733-1741

> *"Years ago, when I was very young, I crossed the North Pacific from Vancouver to Japan; and one day, as our ship rounded the top of the great circle, I noticed a string of strange bare mountains rising out of the sea along the northern horizon. They resembled heaps of smoking slag; the sun, striking their sides, gave them a greenish cast like verdigris on copper. I asked a fellow passenger what they were. "Illusions," I thought he said, but now I realize he said they were the Aleutians."* (Ford 3).

The 'Illusion Island Archipelago'

To me, the Aleutian Islands remain as "illusory and unreal" (Ford 3) as they were to naturalist and historian Corey Ford, even after my thirty summers of botanical fieldwork on the Archipelago *sensu stricto*[7], on Simeonof Island in the Shumagin Island group, on Chirikof Island

[7] In reference herein to the Aleutian Archipelago, the term *sensu stricto* (Latin for 'in the strict sense') refers solely to the geography of the approximately 1,900 km-long island archipelago chain in that runs from Unimak Island immediately to the west of the Alaska Peninsula, through Attu Island, the farthest western island of the Near Island

west of the Kodiak Archipelago, and on the Pribilof Islands in Bering Sea. My field research has been conducted largely in terrestrial systems, and terrestrial systems in the Aleutians are found on Murray Morgan's 'islands of the smokey sea'—the wild oceans of the Arctic. The Bering Sea is located to the north of the Aleutian Archipelago, and the North Pacific Ocean to the south; it is here that the sea 'breaks its back' (Ford). It is also here that the lost thread of my childhood wonder—gathered up while wandering the boreal forests surrounding Fairbanks and the manzanita-oak scrublands comprising the foothills of California's Sierra Mountains but stretched, then unraveled, during my young adult years in the military and the university—was found again. For all those years I accompanied my husband, a U. S. Fish and Wildlife Service (USFWS) botanist who specializes in Aleutian flora and vegetation ecology. From 1988 to 2008, the late Professor of Science bryologist Dr. Wilf Schofield (University of British Columbia) represented the third core member of our expedition team. Thus, these expeditions were more than scientific expeditions, they were a part of a shared passion for wild places and species living there.

Most of our field seasons began and ended on Adak Island, in the middle of the Aleutian chain (in the Andreanof Island group), because the City of Adak, now comprised of approximately 150 individuals, was connected to Anchorage, where we live, via a regularly scheduled Alaska Airline jet. The current city of Adak was formerly a military installation (Adak Army Base and Adak Naval Operating Base) erected during and at the end of WWII and the subsequent Cold War; prior to that, indigenous people of the central Aleutians (Niiĝuĝis, or Andreanof Islanders, indigenous people who speak the Atkan dialect, or Aliguutax̂) lived in several villages in various locations around the island. At the end of each summer, we walk along what's locally called City Beach near Adak in advance of the arrival of the Alaska Airline 737 jet that will return us to our home in Anchorage. That walk is always burdened by a yearning to stay, just a little longer; Adak is the geographical Alpha and Omega of our work. At the Omega of each summer, I am terrified that I will lose that thread of wonder once again, should I go and not return to the Aleutians. The Aleutian Islands are not my home, but they have become the wild in my heart. If I could live in more than one place at once, one would be in the Aleutian Archipelago.

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group in North America, to the Commander Islands of the Russian Federation. It does not include the Shumagin Island group or other islands along the coast of the Alaska Peninsula, or the Pribilof Islands (St. George and St. Paul) of the Bering Sea, even though indigenous people occupying both the Shumagin Island group and the Pribilof Islands are counted among the Unangan (Aleut) people.

Aside from a brief stop in Adak to search for an endangered plant species and to board the R/V Tiglax̂[8] during the year after her maiden voyage of 1987, the first Aleutian Island I ever visited was Attu, where the Battle of Attu was fought in 1943. Attu is the westernmost island of the North American portion of the Aleutian Archipelago[9], part of the 'Near Island Group,' so named because the group was the nearest to Russia. I was 32 years old, had borne my three children, all safe that summer on my mother's farm in southern Oregon. In 1988, the U. S. Coast Guard still maintained a Loran Station on Attu (it was decommissioned in 2010, a victim of technological change), and access off the island for us was to be via a U. S. Coast Guard C130 plane, seemingly of WWII vintage, that resupplied the Loran Station every 2 weeks, weather permitting. Weather did *not* permit at the end of the first two weeks of that 1988 expedition. The 'coasties' were downcast since they didn't get their mail and therefore much anticipated communication from the outside world, but I remember being ecstatic that we were staying the extra two weeks. I can still feel the wonder in my heart as I:

- rode an ATV with my botanist husband up and down the old military roads on Massacre Bay, collecting plants (old friends now, after all these years);
- fell into old overgrown foxholes in beach rye-sea sandwort beach meadows;
- watched the thousands of whirling seabirds careening over our Achilles in Nevidiskov and Abraham bays;
- searched for sand dollars on Sarana Beach, where the rocks are dotted with *Polypodium* ferns and yellow *Potentilla* flowers;
- gaped in wonder as water in waterfalls fell horizontally in the tremendous winds;
- stood on the edge of a cliff, leaning, arms out, held in place only by that same wind;
- spied Steller's sea lions on Point Wrangell, the westernmost point of land on the North American continent (it's so far west, it's east);
- discovered strange plants *sans* chloroplasts (*Corallorhiza* orchids), or strange ferns bearing strange fruits (*Botrychium* species).

[8] Tiglax̂ (pronounced TEKH-lah) means 'eagle' in the Unangan (Aleut) language.The crew of the Tiglax̂ work for the USFWS Alaska Maritime National Wildlife Refuge, and the Tiglax̂ is the main research and transportation support vessel for biological work, management programs and village outreach and education.

[9] The Commander (or Komandorski) Island group, located some 207 miles northwest of Attu, is part of the Russian Federation. The Commander Island group is comprised of Bering and Medny islands and 15 smaller islets and rocks.

It was heady, that wonder, and in every summer after that first Aleutian field season, I sought wonder once again. And again. It is like a drug, but one that does no bodily harm. Except, perhaps, the yearning.

The word 'wonder' is a verb, and a noun; it can signify a passion, and an object. There is wonder, and there are wonders; there are wonders of wonders. In 1642, René Descartes defined admiration, one of the six 'primitive passions' (the others being love, hatred, desire, joy, sadness) that, in various combinations comprise what we call wonder, as "a sudden surprise of the soul when makes it tend to consider attentively those objects that seem rare and extraordinary…caused first by an imperfection in the brain that represents the object as rare, and consequently, worthy to be seriously considered" (39). To the medieval western mind, wonder was recognized as a "cognitive passion, as much as knowing as of feeling. To register wonder was to register a breached boundary, a classification subverted" (Daston and Park 14)[10]. The 'Order of Nature' (Daston and Park) constructed by Divine Will was reflected in the 'typical' form and function of natural phenomenon; anything that ruptured this order—the rare, the capricious, the uncanny 'sports,' the monstrous objects brought back by travelers in strange and exotic lands—filled *Wunderkammers*[11] and evoked curiosity and the spectacle of ecstasy, and collective terror in the medieval mind. These wonders evoked wonder.

In a world saturated with 'wonders' increasingly accessible in museums and natural history collections and electronic books that explain volcanoes and meteor showers and earthquakes and floods, and grocery store tabloids reporting alien abductions and sightings of Bigfoot and raptors (Thunderbirds?) with 20-foot wingspans in the temperate rainforests of the Pacific Northwest, these wonders (some considered 'respectable', some not) fail to disrupt the Order of Nature. Even mysteries and wonders that science cannot explain are still considered ultimately knowable. And yet, for me, there is a continuity between my response to the heady wonder I experienced (and described) in my encounters with the novel diversity on Attu Island, Corey Ford's response to the unsettling landscapes of the 'illusion islands,' and the medieval

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[10] Peter de Bolla (49) goes further, proposing that wonder is not just about knowing *and* feeling, but also about the feeling of knowing.

[11] *Wunderkammers*, or cabinets of curiosities, were early (generally 16th to 18th century) versions of modern collections of marvels, typically brought back from explorations of 'strange lands' "in which strange things replaced strange facts" (Daston and Park 253).

response to wonder evoked by the strange objects and strange tales brought back from strange, uncanny lands.

Georg Wilhelm Steller and the Second Kamchatkan Expedition of 1733-1741

Corey Ford and Murray Morgan and my husband and I are not the only western scientists/botanists/naturalists to find wonder in the Aleutian Archipelago[12]. The summer of 2020 marks the 279th anniversary of the European discovery of the northwest coast of North America, including the Aleutian Islands Archipelago, via the ill-fated Russian-sponsored Second Kamchatkan Expedition (often called the Great Northern Expedition or the Bering Expedition, after the expedition's leader, Captain Commander Vitus Jonassen Bering)[13]. While other expedition members, including Lieutenant Sven Waxell and Fleet Master Sofron Khitrovo, kept daily journals, the expedition is most fully described in a journal kept by German naturalist Georg Wilhelm Steller (1709-1746)[14], who was trained in natural history[15] but accompanied Captain-Commander Bering aboard the *St. Peter* as his physician and mineralogist. Exhibits curator Dean Littlepage argues that the botanical, anthropological, and biological contributions included in the journal of Steller—one of the first among in a long list of European naturalists serving expeditions of discovery in the Pacific—were the most significant achievements of the expedition (206); Frank A. Golder writes that Steller's journal is "the most interesting of all the papers that

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[12] Indigenous scientists have probably also found wonder in their surroundings, and for centuries longer.

[13] The Bering Expedition was one of the largest exploration enterprises in history, conceived by Russian Emperor Peter I the Great [1672-1725] (but implemented by Russian Empress Anna [1693-1740], Peter's niece, and, after Anna's death, Empress Elizabeth Petrovna (1709-1762, Peter's daughter by his second wife, Catherine). The goal of the Expedition was to find and map the eastern borders of Siberia and the western shores of North America, and (by the way, while they were at it) find an Arctic sea passage (Littlepage 207). The final leg of that expedition, which started in 1733 from St. Petersburg, Russia, commenced in the summer of 1741 when the sister ships *St. Peter* and *St. Paul* left Avacha Bay on the east coast of Kamchatka and headed eastward into uncharted waters.

[14]Georg Wilhelm Steller was born Georg Wilhelm Stöller to cantor Johannes Jacob Stöhler (b. 1664) of Nurnberg, Germany, and Susanna Louysa Baumann, Würtenberg. Initially thought to have been stillborn, Steller took his first breath after being wrapped in hot blankets for several hours (Stejneger 3-4). The name Stöhler gradually assumed the spelling of Stöller after 1715, and George himself "under the influence of the Russian transliteration" (4) changed the spelling to Steller.

[15] Along with other 18th century naturalists, including Swedish botanist Carl Linnaeus and Daniel Gottleib Messerschmidt (whose widow, Brigitte, Steller married), Steller was one of the new wave of naturalists that treated scientific expeditions as serious scientific endeavors, not as a lark. Adopting burgeoning systems to describe and classify all life, they were almost evangelical in their mission as species hunters and species namers (Conniff 3).

have come down to us. The naval officers' logbooks contain the dry facts of the voyage, but Steller's journal gives the spirit of it, the 'inside' story, the moral forces at work" (1925; vii). For me, Steller's journal, which was held in the deep archives in St. Petersburg and unavailable to the English-speaking world until the early decades of the 20th century, reflected in his passion and sense of wonder as he described novel (for him) species, not the least of which was the description of an unidentified marine species in the waters somewhere between Alaska's Semidi Islands and the Shumagin Island group. After more than two and a half centuries since his journals describing his scientific explorations in Alaskan explorations—as limited as they were—were archived, Steller retains an almost cult-like following among western scientists working in Alaska.

Although many western scientists exploring the globe during the Age of Discovery were also competent to highly skilled artists, Steller was neither[16]. Indeed, archived documents demonstrate that one of Steller's conditions for participation in the Bering Expedition (something he wanted very much) was that he be accompanied by a competent artist (Stejneger 241); this single instance underlines the enormous contribution of artists to scientific expeditions (McAleer and Rigby 19), and science as a whole, in eras prior to the invention of photography in the 19th century. Unfortunately, many if not most drawings 'made' by Steller[17] during the Bering Expedition were lost somewhere and sometime between their creation and their archival following the termination of the Expedition (Stejneger 511-527). Thus, our interpretation or identification of the unknown marine species (that is, species not described elsewhere in western literature at the time) referenced by Steller in his writings are guesses informed by Steller's typically very detailed written descriptions, coupled with scientific knowledge (both western and indigenous) gleaned in subsequent centuries. Some of these guesses are probably accurate (for example, the fur seals, sea otters, and sea lions), and some remain uncertain (in particular, the 'sea monkey,' described below). Our interpretation is further muddled by opacity introduced via

[16] In his biography of Steller, Stejneger writes "[i]t may be asserted with the greatest confidence that Steller was utterly incapable of making recognizable drawings of the natural object, plants and animals which he observed or described…" (511).

[17]The drawings 'made' by Steller were presumably drawn by Friedrich Plenisner, who was Commander Bering's clerk assigned to illustrate Steller's observations.

translation errors and omissions. Until very recently[18], the only surviving copy of Steller's journal was a manuscript copy written in German (Steller's native language) and dated 1743[19] and some portions of Steller's writings, translated into French.

Even these imperfect copies of Steller's journal, particularly coupled with Steller's book "De Bestiis Marinis" ("The Beasts of the Sea"), which was written mostly during 1742 while he was shipwrecked on what was to become Bering Island in the Commander Islands, are source documents of incalculable historic and scientific importance[20] but, again, generally unaccompanied by graphic imagery that would serve to help visualize Steller's subjects. The journal also provides a narrative of bitter nationalistic rivalry[21] and conflict, overwhelming physical and psychological adversity, and eventual deliverance from death largely by the courage and ingenuity of Steller, Lieutenant Sven Waxell (who took over command following the death of Bering), and their surviving shipmates. As such, Steller's journal, which communicates tacitly, if not explicitly, the sense of wonder he obviously felt while describing the newly discovered land, tells a tale fitting to the beginning to the recorded history of colonial expansion in Alaska, whose

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[18] In 1990, Dr. Wieland Hintzsche of the Francke Foundation in Halle found most of Steller's original journals, which were long buried in the vast archives of St. Petersburg (Hintzsche 176). These journals include the period between December of 1741 to the departure from Bering Island on the rebuilt *St. Peter* in 1742.

[19] In his introduction to Steller (1988), Orcutt Frost suggested this copy was ordered by the naturalist P. S. Pallas after he received the original journal materials from Professor Johann Eberhard Fischer in 1769 (27). The fate of Steller's original journal remained obscure; Steller had given the journal to Fischer on August 10, 1746, entrusting him to transport it to St. Petersburg. Steller died about three months later, on November 14, 1746. Fischer took the journal with him to St. Petersburg, apparently holding on to it until 1769. Sometime prior to his own death in 1771, Fischer lent the journal to French historian Jean-Benoît Scherer, who had about half of the journal translated into French. Thus, several copies and translations of Steller's journal were circulated in the late 18th century. After receiving the original journal from Fischer in 1769 and ordering its copy, Pallas published his translation in 1781 (Steller's description of Bering Island), and 1793 (the remainder of the journal). The original journal, in total, has not yet been recovered, and so mistakes made by copyists or translators cannot be corrected. In 1917, Frank A. Golder located a manuscript copy of the journal in archives of the Russian Academy of Sciences at Petrograd (Golder 1925, vii); he writes that it may have represented a direct transcript of the original—and not the transcript ordered by Pallas—based on substantial differences from Pallas' translation, including certain editorial changes or corrections made by Pallas. Orcutt Frost who, along with Margritte Engle, made their translation from the 221 half-page negative photostats (7x6 inches) of the Fraktur (old German alphabet) manuscript , which were deposited by Golder into the archives of the Library of Congress in 1917 (Frost, in Steller 1988, 26-27).

[20]Stefano Mattioli compared a recently located, restored original version of "De Bestiis Marinis" with the version translated from a version by an anonymous editor, possibly Johann Georg Duvernoy (1691-1759) by Walter and Jennie Miller (Steller 1751), demonstrating that the anonymous editor dampened the tone of the original manuscript by removing Steller's criticisms of Russian Navy officers (Mattioli 65-66).

[21] Steller's journal recounts the bitter rivalry between him and Fleet Master Sofron Kitrovo. *Wunderkammer: Steller's Curse* (Figures 15 and 16 herein) includes, in the left upper quadrant, Khitrovo among the beasts and birds typically included in the Curse.

natural resources were subsequently exploited to such a degree that the impacts are still written in the genomes of certain marine species (for example, sea otters; Beichman et al. 2631) and whose indigenous people—the Unangan/Unangaŝ people of the Aleutian Island Archipelago—were decimated (Laughlin 120-130), all in the name of Russian imperialistic colonialism extended by capitalistic *promyshlenniki* (fur traders)[22]. It is ironic that the scientific discoveries of Steller[23]—champion of the indigenous people of Kamchatka[24] against misuse by Russians, and whose writings often reveal a rare (for the era) respect for the wild beasts of the Aleutian Island Archipelago—fueled the decimation of the marine resources in the years subsequent to the return of the diminished[25] crew of the diminished St. Peter, in 1742.

Steller's character is often criticized[26]; among other negative adjectives sufficiently numerous that I've lost track, he has been called self-serving (Black, "Russians in Alaska" 53), arrogant, intolerant and bad tempered (Michael, in Waxell 25), but few have questioned his capability as a scientist, even before the word 'scientist' came into regular usage[27]. Fewer still could argue he lacked passion and a sense of wonder upon discovery of never-before-described species. It is unfortunate that the loss or misplacement of archives and artistic records (Stejneger 511-527) of the discoveries during and subsequent to the Expedition served to obscure the

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[22] *Promyshlenniki* were Russian fur hunters and traders that decimated the marine mammals of the Aleutian Islands in years subsequent to the return of the survivors of the Bering Expedition.

[23] Although Steller had accumulated a large collection of plants, stuffed skins (even the stuffed skin of a young sea cow), and skeletons, he was forced to abandon them on Bering Island due to space considerations on the smaller rebuilt *St. Peter*. He salvaged all his manuscripts, dried seeds collected in America and on Bering Island, and a pair of horny palates of the sea cow (Stejneger 370). However, in thanks for his leadership on Bering Island, crewmates gave Steller dozens to hundreds of sea otter pelts on their return to Kamchatka.

[24] Stejneger writes extensively of Steller's solicitude for the welfare of the indigenous people of Kamchatka, "championing them against local oppressors." (432). In 1744, Steller wrote a letter to the Governing Senate of St. Petersburg, charging the ranking naval officer Vasilij Andreyevitch Khmetevski of ill-treating the indigenous people of Kamchatka (425). Khmetevski retaliated by accusing Steller of perpetuating much graver offences; that and subsequent fabricated charges resulted in an issuance of a warrant of arrest against Steller (425), although Steller was eventually exonerated.

[25] Forty-six of the 76 persons aboard the St. Peter survived; most of the 30 that died suffered from scurvy.

[26] In his introduction to Waxell's 1756 account of the Bering Expedition, M. A. Michael states that "Steller was what would to-day be called an 'intellectual.' He was very intelligent, very young, very intolerant and bad tempered, and he held ordinary mortals, naval officers in particular, in supreme contempt. He gave his opinion, unasked, on every situation…The 'intense' intellectual can be most irritating, and there is little doubt that Steller's companions on the St. Peter must have found him so" (Waxell 25-26).

[27] The term 'scientist' was coined by theologian and science historian William Whewell in 1833 (Lightman 342).

understanding of that biodiversity in the Aleutian Archipelago. Here, however, I am ultimately concerned with how via art making, bolstered by my western scientific knowledge and lived experience via scientific expeditions to the Aleutian Islands, I have (at the very least) erected a novel hypothesis and (at the most) solved one of the most enduring mysteries in North American marine biodiversity, presented in Steller's journal in the form of his encounter with what has become known as 'Steller's Sea Ape' or, alternatively, 'Steller's sea monkey.' As such, I demonstrate an instance in which the rapprochement of art and science generated new knowledge, not by using new technologies or concepts (Heylighten and Petrović 14), but rather by delving into scientific archives of an 18th century scientist and placing his lived experiences within the context of my own 20th and 21st century lived experiences and the wonder they evoked.

Tales of the Cryptid: Divining Steller's Sea Ape

In 1741, Britain still ruled the United States and the Lewis and Clark Expedition was still 60 years into the future, and the geography now known as Alaska was, to western explorers, *terra incognita*, a cipher, unknown and unmapped. Bering's expedition was able to explore only a few islands off the southern coast of southeast Alaska and in the Shumagin Island group, before the *St. Peter* was turned back toward Kamchatka by storms and scurvy. The *St. Peter*, one of two sister ships (the other was the *St. Paul*, captained by Alexei Chirikof)[28] was eventually shipwrecked on the island which now bears the Captain Commander's name, and upon which he and 25 other crewmembers died, almost all of scurvy[29]. Steller, who accompanied the *St. Peter* team that made first landfall[30] (July 20, 1741) on Kayak Island off the coast of southeast Alaska (Figure 14), was the first European naturalist to describe a number of species observed throughout the

[28] This thesis supporting document follows only the track of the St. Peter, but the fate of the *St. Paul* Captain Alexai Chirikof's men, who made landfall in southeast Alaska and disappeared (see notes in Golder 1922, p. 311) remains one of the enduring mysteries of the Bering Expedition.

[29] In 1991, a Russian-Danish expedition team exhumed Bering's remains, which were located using information in Steller's journal. Analysis of teeth and bones suggested Bering did not die from scurvy, and further analyses coupled with Steller's initial report suggested Bering likely died of heart failure (Frost 2003, 2). Interestingly, forensics reconstruction of the remains of also suggested that a portrait thought to represent Bering likely actually represented Bering's uncle, Vitus Pederson Bering, a Danish poet, historian, and Supreme Court Justice.

[30] Landfall is defined as an instance of sighting or reaching land after a sea or air voyage (Houghton Mifflin Company 675).

expedition—including during the nearly nine months while shipwrecked on Bering Island—and meticulously described, via the written word, in his journals. Many of these species now bear his name, and these are shown occupying the two 'shelves' in the mixed media painting *Wunderkammer: Steller's Curse* (Figure 15). These include the Steller's sea lion (*Eumetopias jubatus)*, Steller's jay *(Cyanocitta stelleri*), Steller's eider (*Polysticta stelleri*), Steller's sea eagle (*Haliaeetus pelagicus*), the Steller's spectacled cormorant (*Phalacrocorax perspicillatus*) and Steller's sea cow (*Hydrodamalis gigas*)[31]. Two of these species (the sea cow and the cormorant) are extinct, both decimated by Russian *promyshlenniki* within a few decades of their 'discovery' and description by Steller. Three of the species (sea lion, eider and eagle) are in serious decline, each likely or certainly impacted by anthropogenic stressors[32], and only one—the Steller's jay—has escaped what Chris Carrel and Lance Morgan called "Steller's Curse"[33] (*Wunderkammer: Steller's Curse*; Figures 15, 16).

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[31] Scientists refer to species using the Linnaean binomial taxonomic names, genus and species (for example, *Polystica stelleri*), which are standardized by various councils within groups (for example, the American Ornithological Union), with the intent to facilitate communication. Common names are often not standardized, even within localities and certainly not across cultures. For example, as a girl growing up in Fairbanks, I referred to a particular plant species (*Achillea borealis*) as yarrow, whereas a friend who grew up in Anchorage referred to the same plant as 'stinkweed.' Linnaeus's binomial taxonomic scheme was being devised during the middle of the 18th century, a decade or so after Steller participated in the Bering Expedition.

[32]Anthropogenic stressors are those caused by human actions.

[33] In a 2000 article in the *Seattle Times*, Chris Carrel and Lance Morgan pointed out that Steller's 'single-handed' saving of the Bering Expedition "set into motion a torrent of exploitation that would overshadow [his] scientific accomplishments and drive his most notable discoveries to extinction in mere decades" (1). According to Carrel and Morgan, Steller's life seemed cursed by bad luck in the form of the misfortunes of exploration, the lonely way he died, and his almost-forgotten legacy, and that legacy lives on in the animals named for him: the extinct Steller's sea cow and the Steller's spectacled cormorant (now called Pallas' spectacled cormorant, formally described by Pallas from Steller's descriptions), and the endangered Steller's eider, Steller sea lion, and Steller's sea eagle. Only the raucous Steller's jay seems to have escaped Steller's Curse. As well, a large number of other species Steller discovered and described are also declining, including the sea otter and the northern fur seal (Arndt, 1). In a rebuttal, Orcutt Frost (2000, 1) called the article by Carrel and Morgan 'misleading' (1) for multiple (valid) reasons: Steller was accomplished although he died young, he did not 'single-handedly' (Carrel and Morgan 1) save the Bering expedition, and he did not write "textbook descriptions" (Carrel and Morgan 1). Nevertheless, many of my colleagues still refer to the phenomenon as Steller's Curse.

While not included in the suite of species typically included in Steller Curse, the sea otter is also marked by its near-extinction that resulted in the fur trade that began within a year of Steller's return to Kamchatka and lasted until the early 20th century (Reidman and Estes). While population numbers of sea otters have slowly recovered, overall the number is still well below the species' ancestral size and the species' current distribution is a fraction of its pre-18th century range and the Aleutian sea otters survived only due to translocations in the 1960s and 1970s (Jameson et al. 100).

Like the medieval cabinets of curiosity, the mixed media *Wunderkammer: Steller's Curse* juxtaposes (on two 'shelves') rare (and novel, for Steller) and seemingly disparate species of birds and marine mammals, which hold in common their membership in Steller's Curse, within the background of more common invertebrate plant species observed by Steller during the Expedition, including (as interpreted from the archived journal) moon jellies (*Aurelia aurita*), scurvy grass (*Cochlearia groenlandica*), bull kelp (*Nereocystis luetkeana*) and rockweed (*Fucus gardneri*). The species listed under the Curse are rendered ghostly in charcoal and gesso, in black and white, on Masonite; only the Steller's Jay is obviously colored, signifying its relative health (the three jays represent the three large groups comprising the species complex, which includes jays that occupy habitats from coastal Alaska through Costa Rica; Figure 16). The species are connected via a network relationship depicted by straight lines and arcs. The frames used to hold up *Steller's Curse* are discarded damaged clamps used in genetic laboratories to make polyacrylamide gels used as a matrix to collect classical genetic fragment data.

Figure 15. Sandra Talbot, *Wunderkammer: Steller's Curse,* 2020. Charcoal, gesso, conte pencil and acrylic. 33 x 66 x 2 inches (photo credit, Mike Conti).

Figure 16. Sandra Talbot, *Wunderkammer: Steller's Curse,* 2020. Detail of painting while in progress.

The imagery in *Steller's Bestiary: The Promyshlenniki's Legacy* (Figures 17 and 18, see footnotes 22 and 33) illustrates the devastation of the sea otter (*Enhydra lutris*)—first described by Steller[34]—following the return of the Expedition and the subsequent actions of the *promyshlenniki* along the Aleutian chain, who overharvested both sea otters and the northern fur seal. In *The Promyshlenniki's Legacy,* I illustrate the impact of sea otter harvest by transferring and processing digital imagery extracted from archived 19th century photographs of sea otter skins taken as harvest in locales around Unalaska Island and elsewhere along the north Pacific coast of North America. Obviously, there are no photographs of sea otter harvest during the decades following the end of the Bering Expedition, but in his book "Empire of Extinction," associate

[34] It is important to understand that most if not all of the non-human vertebrate species shown *in Wunderkammer: Steller's Curse*, including the sea cow, as well as the sea otter, illustrated in *Steller's Bestiary: The Promyshlenniki's Legacy*, were known to indigenous people within each species' distributional range, and Steller's 'discovery' and subsequent description of them refers to their novelty to Europeans at the time.

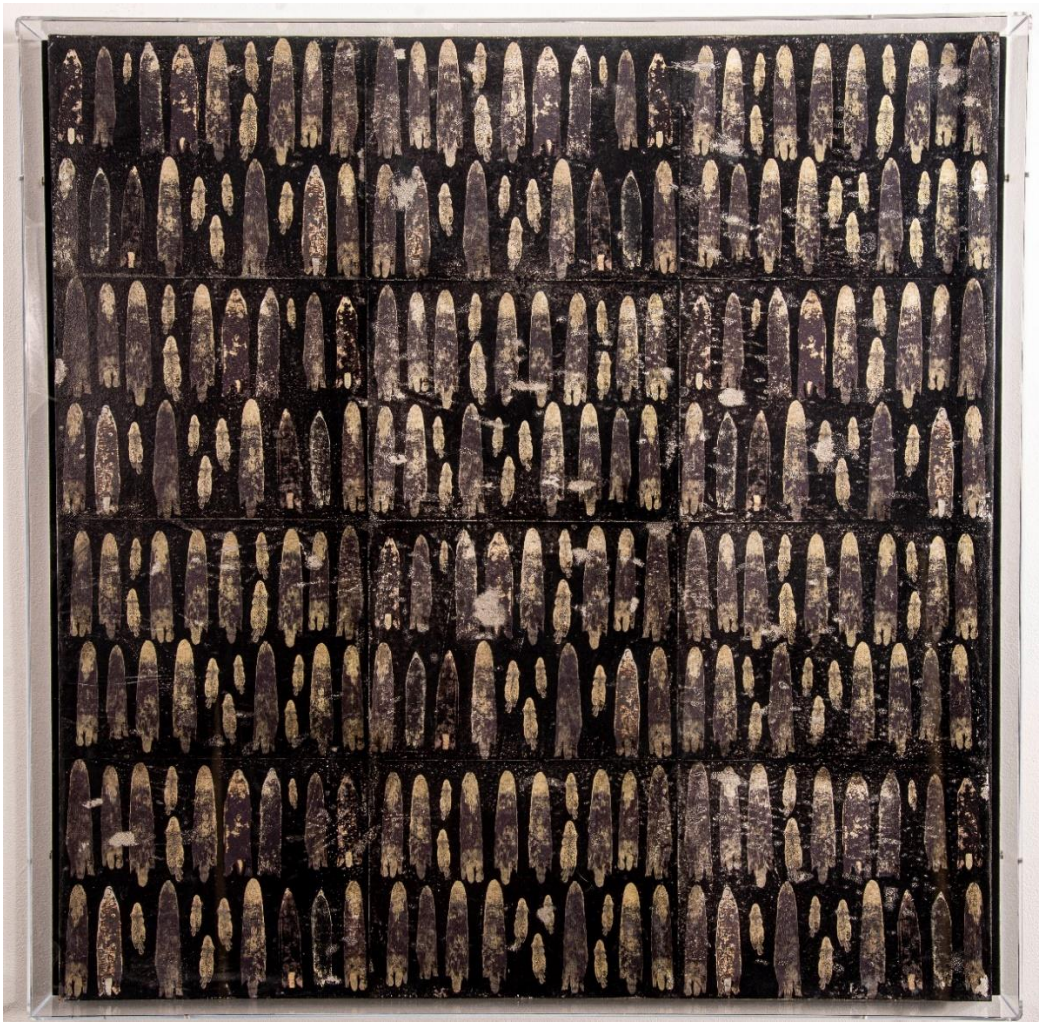


Figure 17. Sandra Talbot, *Steller's Bestiary: The Promyshlenniki's Legacy*, 2020. Gesso, acrylic and digital imagery on Masonite, museum case. 32 inches x 32 inches x 2 inches (photo credit: Mike Conti).

professor Ryan Tucker Jones (University of Oregon) collated archived harvest data of hunting expeditions conducted between 1742 to 1800 (247), and I leveraged those data in this piece.

The 'digital skins' were then used to represent harvest from 1745 to 1747, the years encompassing the first harvest in the North American portion of the Aleutian Archipelago. Seven hundred and forty-three sea otters were harvested from around

Figure 18. Sandra Talbot, *Steller's Bestiary: The Promyshlenniki's Legacy*, 2020. Gesso, acrylic and digital imagery on Masonite (detail while in progress).

islands of the Near Island group (Attu, Agattu and the Semichi islands) during those years, and harvest increased each year thereafter as the *promyshlenniki* moved eastward from the Near islands as sea otters disappeared locally. I used Ryan's harvest data from 1745 to 1747 to hand-number the transferred digital skins in *Steller's Bestiary: The Promyshlenniki's Legacy*, starting from 743 and scripting backward to the first sea otter situated in the upper left-hand corner. By incorporating 21st century processing techniques and materials on 19th century imagery to illustrate 18th century resource extraction, *The Promyshlenniki's Legacy* speaks to the *longue durée*[35] of interspecies exploitation in the Aleutian Archipelago and elsewhere in the north Pacific coast of North America. *Memento Domine Luter Mare* (Figure 19) extends that into the 21st century.

[35] The *longue durée* was used in the French Annales School of historical writing as an expression to describe an approach to historical research that prioritized the depiction of slowly evolving histories; the *longue durée* is used frequently to examine settler colonialism—typically land colonialism, not resource extraction—that has resulted in the devastation and destruction of indigenous peoples (see Barker). In this case, I apply the term within the context of the devastation and destruction of indigenous non-human species.

Figure 19. Sandra Talbot, *Memento Domine Luter Mare*, 2020. Digital imagery UV printed on glass, 21.6 x 28.6 x 0.5 inches. From archived imagery taken of sea otter skulls collected by federal scientists from beaches along the Alaskan coast during the 20th and 21st centuries, being prepared for archival into the Museum of the North. Original imagery: Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/sea-otter-skulls-being-prepared-archival

However, it is Steller's cryptid 'Sea Ape,' observed from the deck of the *St. Peter* while it tacked in the ocean west of the Semidi and east of the Shumagin islands, that has come to reflect the lingering sense of the uncanny that hovered over the expedition from the very beginning, and represents one of the most enduring mysteries hidden in the ocean depths. This encounter has stirred the imagination of more than nine generations of North American biologists since his description, first published by Pallas in 1793, was translated into English by Golder in 1925. Commentary about the identity of the unknown marine species has featured repeatedly in books and articles

written by biologists, including cryptobiologists[36] (see Nickell and references therein). The subject has been analyzed in meticulous detail in the biography of Steller written by the well-known specialist in marine species, the late Leonhard Stejneger (after whom the elusive Stejneger's whale is named). Despite these many attempts to determine the identity of this enigmatic animal, however, no satisfactory identification has emerged. Through the combination of my own lived experience in the Aleutian and Shumagin islands, archived documentation by colleagues recording sightings of seabirds and other species in the North Pacific, and a rare eureka moment of my own while making art, I formulate another hypothesis that I argue has greater support than previously promoted hypotheses. But unveiling that hypothesis will require substantial background information.

The Sea Ape, AKA the Sea Monkey

Among all the species described by Steller, the 'Sea Ape' or 'sea monkey' (as it is often called) is the only animal that has not been corroborated by physical evidence, or other witnesses, and is described in Steller's journal from a single sighting on August 10, 1741, in the open ocean southwest of the Semidi and southeast of the Shumagin islands (see the map of the expedition, Figure 20, and figure legend). Thus, it falls squarely within the auspices of cryptobiology[37]. Steller's account of the 'sea ape' or 'sea monkey,' which has for decades filled me (along with numerous other biologists working in the Aleutian Archipelago) with a sense of the uncanny that produces the type of curiosity that triggers further excavation of archives, follows:

> "*On August 10*[38] *we saw a very unusual and unknown sea animal, on which I am going to give a brief account since I observed it for two whole hours.—It was about two Russian ells in length; the head was like a dog's, with pointed, erect ears. From the upper and the lower lips on both sides whiskers hung down. The*

[36] Cryptobiologists study animals whose existence is unsubstantiated, such as the Yeti and Loch Ness monster. Many scientists consider cryptobiologists to be pseudoscientists.

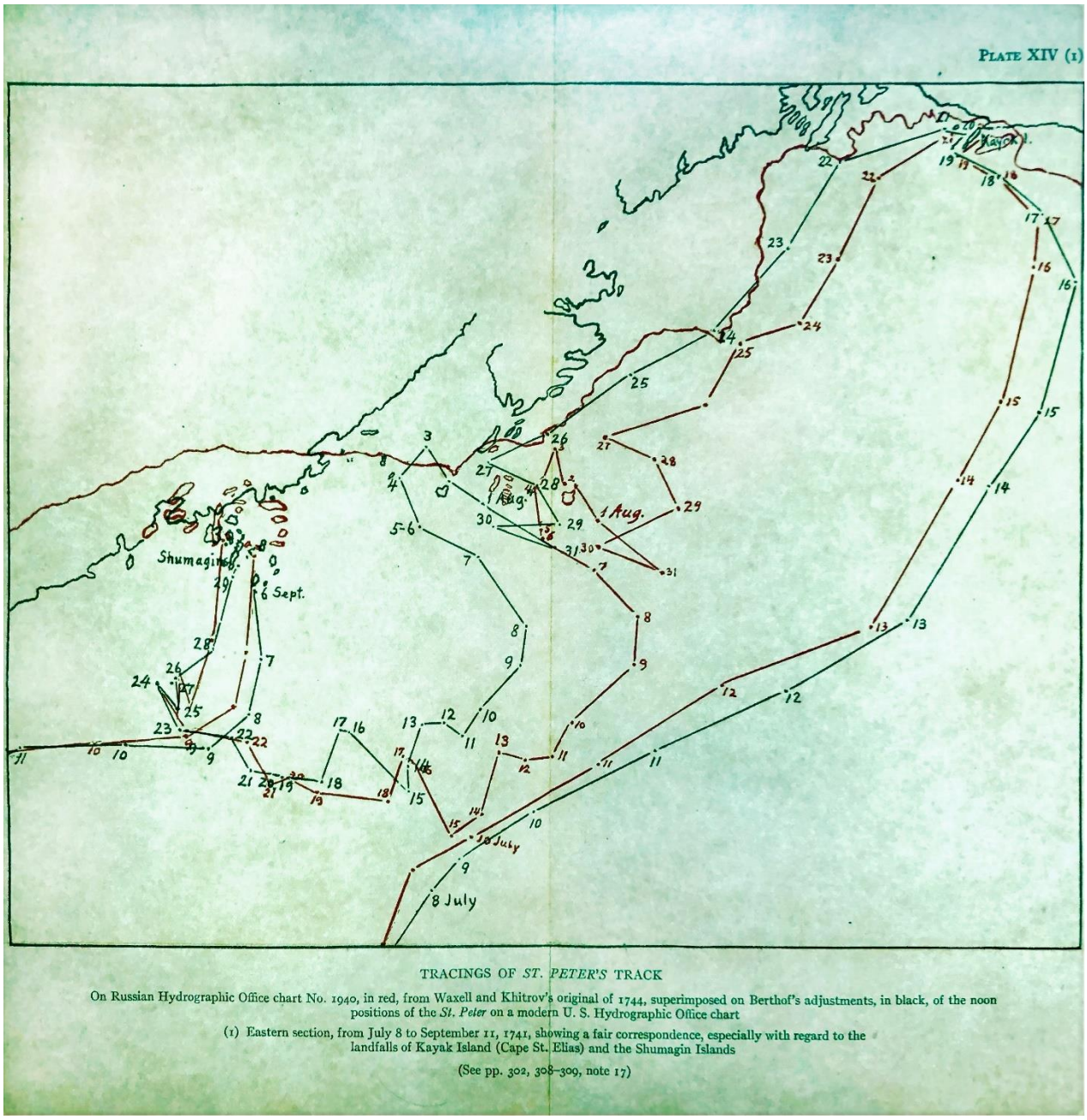
[37] Steller's journal has at least two initial translations of the sighting; the information presented herein is from the version in the initial MS used by Pallas, as reported by Golder (1925), although I've also pulled information from historian Orcutt Frost's interpretations (Steller 1988).

[38] Stejneger argues that the sighting occurred late in the evening, around 9 p.m., so lighting conditions were not ideal.

> *eyes were large; the body was long, rather thick and round, tapering gradually towards the tail. The skin seemed thickly covered with hair, of a gray color on the back, but reddish white on the belly; in the water, however, the whole animal appeared red, like a cow. The tail was divided into two fins, of which the upper, as in the case of roosters, was twice as large as the lower. Nothing struck me as more surprising than the fact that neither forefeet nor, in their stead, fins were to be seen. In default of a more detailed description, one can do no better than compare the shape of this animal with the picture which Gesner received from a friend and which he has published under the name of* Simia marina danica *in his book on animals. At any rate, our sea animal deserved this name because of its resemblance to Gesner's sea monkey as well as on account of its wonderful actions, jumps, and gracefulness. For over two hours it swam around our ship, looking, as with admiration, first at the one and then at the other of us. At times it came so near to the ship that it could have been touched with a pole, but as soon as anybody stirred it moved away a little farther. It could raise itself one-third of its length out of the water exactly like a man, and sometimes it remained in this position for several minutes. After it had observed us for about an hour, it shot like an arrow under our vessel and came up on the other side; shortly after, it dived again and reappeared in the old place; and in this way it dived perhaps thirty times. There drifted by a seaweed*[39]*, club shaped and hollow at one end like a bottle and gradually tapering a the other, towards which, as soon as it was sighted, the animal darted, seized it in its mouth, and swam with it to the ship, making such motions and monkey tricks that nothing more laughable can be imagined. After many funny jumps and motions it finally darted off to sea and did not appear again. It was seen later, however, several times at different places of the sea.*" (Steller, from Golder 1925, 64-65).

Daston and Park write that "wonders…need only be well imagined to give pleasure…we must only be able to see in the mind's eye the juggling automata of the romance, the two-headed goat of the broadside, or the Martian of the tabloids…" (366). We can see in Steller's enigmatic creature described in the pages of his archived journal, the 'regular irregularity', the thing out of place, the thing that perhaps doesn't belong, but do we all see the same thing? The list of species

[39] This seaweed was likely the mostly subtidal bull-kelp (*Nereocystis luetkeana*), a brown algae distributed from the eastern Aleutian Islands to San Luis Obispo County, California (O'Clair and Lindstom 58). Bull kelp has a long history of use by indigenous people of Alaska and father south; the Tlingit of southeastern Alaska used the species as a cure for a headache, and dried strips as fishing lines. O'Clair and Lindstrom write of the Tlingits of Sitka: "[t]he thin end of the stripe would be cut and inserted into one ear, while the pneumatocyst was placed on a hot rock. The steam that formed in the air bladder would then enter the ear and, allegedly, cure the headache" (58). This seaweed species is included in *Wunderkammer: Steller's Curse* (Figures 15 and 16) and *Steller's Bestiary: Simia marina* (Figure 41).



TRACINGS OF *ST. PETER'S* TRACK

On Russian Hydrographic Office chart No. 1940, in red, from Waxell and Khitrov's original of 1744, superimposed on Berthof's adjustments, in black, of the noon positions of the *St. Peter* on a modern U. S. Hydrographic Office chart

(1) Eastern section, from July 8 to September 11, 1741, showing a fair correspondence, especially with regard to the landfalls of Kayak Island (Cape St. Elias) and the Shumagin Islands

(See pp. 302, 308–309, note 17)

Figure 20. Digital image showing the tracings of *St. Peter's* track from July 8 to September 11, 1741, from Stejneger (302). Location 10 is where the sighting of the unknown animal (Steller's Sea Ape). The red line is the original estimated track calculated by Waxell and Khitrovo and presented in the logbook of the *St. Peter* (see Golder 1922, 50-227); the black track is a recalibration of the original estimate by the U. S. Hydrographic Office Chart. Image in the public domain.

hypotheses provided below suggests not; even Steller's reference to Gesner's (Konrad von Gessner's) *Simia marina*, is difficult for me to accept. The reference seems to be an error; examination of either of Gessner's wondrous strange sea monkey images (Figure 21) demonstrates they bear little resemblance to Steller's description. Stejneger speculates that Steller's comparison of the unknown creature to Gessner's *Simia marina* was "prompted more by its manners and motions than any particular description or picture by Gesner" (280). In his footnotes to Steller (1988), Frost suggests that Steller, who received the image of Gessner's sea monkey from Denmark (hence Steller's reference to Gessner's sea monkey as *Simia marina Danica*) seven years prior to writing his journal (199); presumably Frost considers the comparison a mistake of memory. Steller's comparison of his unknown creature to Gesner's image of his sea monkey may represent an 18th century instance of Terdiman's memory myth, or "memory as a problem" (vii), the memory-crisis—the sense of confusion that emerges during turbulent times, the crisis of representation—of the 19th century.

The late cryptobiologist Roy Mackal wrote "there is no known animal, in the sea or, for that matter, on land, that corresponds to Steller's description" (5). Nickell nevertheless urged researchers to look for a 'real creature,' presumably a mammal, and presumably a seal. The most common explanation, the *shared hypothesis for the Steller's Sea Ape*, formulated to explain the sighting is that the Steller's sea monkey was a young northern fur seal—young, because the size and coloring of adult northern fur seals are too different from Steller's description—for which the forelimbs are set far enough behind on the torso that they may have been obscured below the waterline (Stejneger 281). The hind flippers may have comprised the animal's hind flippers. Stejneger suggested that Steller's description of the tail as "divided in two parts" (280) could logically be explained if Steller mistook the two closely set hind legs with their flippers for a tail fin, particularly in the poor light of the evening of 10 August 1741. Stejneger wrote:

> *"Steller…failed to make out the fore legs…because of their position farther back than in any related animal with which he was then familiar…when moving at high speed through the water the fur-seal keeps the fore flippers pressed very close to the body so that they are practically invisible. When it raises its body straight up out of the water to satisfy its curiosity* [spy-hopping], *the forelegs are not exposed and it is only when the animal makes a turn or swims slowly that they are even noticeable; furthermore, the oncoming darkness probably prevented very distinct observations of the parts under water."* (281).

Figure 21. Gessner's *Simia marina*, sea monkey. In Conrad Gessner's *Historia Animalium*, published in 1558. Image from the so-called Gessner Albums, archived in the Special Collections Department of the University of Amsterdam. Image in the public domain.

However, the ears of a northern fur seal are not erect; they point backwards. Others, primarily cryptozoologists, hypothesize/speculate/guess it was one of the following: 1) a congenitally malformed fur seal (Coleman and Huyghe 64-65); 2) a vagrant Hawaiian monk seal

(*Monachus schauinslandi*; the size is correct, but the Hawaiian monk seal has no external pinnae and are rarely seen outside of the Hawaiian Islands); 3) a juvenile specimen of Bernard Huelvelmans' longneck seal[40], itself a cryptid without physical proof of existence (Eberhart 519); or 4) an unknown Arctic variety of the leopard seal (*Hydrurga leptonyx*) although leopard seals have no externa pinna (Mackal 205).

Years ago, I read a comment in a cryptozoology blog (which has long since vanished, and I have been unable to relocate the cache) that also proposed the Steller's sea monkey was an extinct sea mink, which is the only reference to the sea monkey being a mustelid (aside from proposing and dismissing the sea otter). Several authors, including Mackal (30), suggest the most parsimonious explanation of the event is that Steller saw a species of marine mammal that has subsequently gone extinct[41]. Given the fate of the Steller's sea cow, thought to have gone extinct by 1760 due to unsustainable harvest by the *promyshlenniki*, this idea is not far-fetched. Nevertheless, Aleut and Koyuk legends include descriptions of animals that clearly describe the sea cow, which was driven to extinction within 20 years of Steller's description, but no such convenient anthropogenic causes can be linked to the extinction of the 'sea monkey' and I failed to uncover[42] any obvious descriptions in Unangan and Koyuk legends or imagery fully consistent with Steller's description of the sea monkey. One recent hypothesis that is a substantial departure from the others is that by referencing the similarity of the unknown creature to the 'Danish' Sea Ape (when Gessner did not specify his *Simia marina* as a Danish sea monkey; but see Steller's description of the unknown creature on pages 36-37), Steller was poking fun of Captain

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[40] In his 1968 book "In the Wake of the Sea-Serpents," the French zoologist Bernard Heuvelmans attempted to place sightings of unknown sea 'serpents' into nine categories, with one being long-necked serpent, which morphed over time in the cryptozoological literature into a longneck seal.

[41] In an entry in his book *Misty Islands*, Miles Smeeton records an observation of an unidentified sea creature—"neither sea lion, seal, nor sea otter" (110)—that he and his crew encountered while sailing near Atka in the Aleutians Islands in 1969. The creature was "about the size of a sheep and had long pepper-and-salt hair like a cairn terrier, of a reddish-yellow colour…it made a slow, undulating dive and disappeared beneath the ship…the length of its hair [was] about four to five inches long…[and was] floating round the body like a weed growing on a half-submerged rock…the head was more like the head of a dog than of a seal, with the eyes close together, not set on the side of the head like a seal's…it had a face like a Tibetan terrier, with drooping Chinese whiskers" (109). Many months later, after he had read Steller's account as put forth in Corey Ford's book *Where the Sea Breaks its Back*, Smeeton remembered the observation and thought that they had seen the same creature.

[42] It must be noted that uncovering no evidence of a sea monkey motifs in Unangan and Koyuk legends or art is not the same as uncovering evidence of no sea monkey motifs in Unangan and Koyuk legends or art. They may exist and I did not uncover them.

Commander Bering who was the only Dane on board the *St. Peter* (Thaler). However, as pointed out by Nickell and obvious to anyone reading Steller's journal, and despite the leakage of his passion for scientific exploration between the pages of his journal, Steller did not seem to be the 'poking fun of' type of scientist. Steller failed to show a hint of satire in his writings; he was a sober, scrupulous scientist, among the early naturalists seemingly the least whimsical. Based on my own lived experiences in the Aleutian and Shumagin Islands, coupled with visual clues emerging from art-making, I consider it more likely that Steller observed a species of mammal that is still extant, but although somewhat but not quite familiar in its newness and unexpected place, it was rendered unrecognizable, preternatural, exceeding the boundaries of the classificatory system adopted by Steller. In all the newness of America, did Steller suffer a memory-crisis (Terdiman vii)? But presenting that hypothesis must wait until we go back to a beginning, to the St. Peter's landfalls on Chirikof Island and an island in the Shumagin Island group during August of 1741, and with my own participation in 20th and 21st century scientific expeditions to these invaded islands and the islands of the Aleutian Archipelago. Explorations of those landfalls provides sufficient evidence of the biases in worldviews that can interfere with scientific observations and therefore, their archival.

CHAPTER 3. Chirikof and Simeonof Islands: Invasion of Cattle and Daisies

The introduction of alien species can alter biotic and abiotic processes on islands if they become invasive (Towns et al. 56, Loope and Mueller-Dombois 257). The remote islands in Alaska have been the target of accidental and intentional introductions (Jones and Byrd 226, Ebbert and Byrd 102) beginning about 280 years ago, after the culmination of the ill-fated Bering Expedition[43].

[43] The first intentional introduction of terrestrial mammals occurred in the late 1740s on islands of the Aleutian Archipelago and involved the release by Russian fur trappers, the *promyshlenniki*, of Arctic foxes (*Vulpes lagopus*) and red foxes (*V. vulpes*) on several islands of the Aleutian Island Archipelago as part of fox farming and ranching industries. Eventually, fox trappers released rodents, such as ground squirrels (*Spermophilus parryii*), on various Aleutian islands to provide food for the foxes. Non-indigenous humans occupying Aleutian islands subsequent to the first European contact brought with them livestock, including cattle, sheep, horses, goats, reindeer, and bison and, following WWII, caribou (Ebbert and Byrd 102). Accidental introductions also occurred, with the earliest recorded introduction of a terrestrial mammal occurring prior to 1780 with the wreck of a Japanese vessel (Brooks 50) and the subsequent introduction of the invasive Norway rats (*Rattus norvegicus*) to Rat Island (now Hawadax).

The history and biotic impacts of introductions of terrestrial mammalian species onto Alaskan islands, and their eradication, are best known from management actions taken to remove foxes and rats from islands of the Aleutian Archipelago. Outside but close to the Aleutian Island Archipelago, biotic communities on the Bering Expedition's 'landfall' islands of Chirikof Island, the westernmost island of the Kodiak Island Archipelago, and Simeonof Island, the southernmost island of the Shumagin Island group at the base of the Alaska Peninsula, were also negatively impacted by introductions of terrestrial mammals—in these cases, domestic cattle (*Bos taurus*) introduced to the islands in the late 19th century (Reedy 1).

Chirikof Island: AKA Land of Vicious Feral Cattle

Chirikof Island (55°49'30"N, 155°37'19"W), the westernmost island in the Kodiak Archipelago, is a small (13,000 ha), isolated, treeless island located approximately 80 miles southwest of Kodiak Island in southcentral Alaska. The seas around the island are treacherous—resulting in a number of shipwrecks—but nevertheless, the island has been intermittently inhabited by humans[44], most recently by cattle ranchers who 'managed' cattle introduced at the end of the 19th century. Currently, the only mammalian inhabitants of the island are introduced Arctic foxes (*Vulpes lagopus*)—perhaps eradicated (West et al. 135; but see journal excerpt on page 49 herein) —feral cattle (West et al. 135), and ground squirrels (*Spermophilus parryii*, which may have been introduced by the Alutiiq or Unangan people, Cook et al. 1401). The cattle remain the subject of a controversy between the land managers and a small group of Kodiak cattle ranchers (D'Oro). Chirikof Island is considered by some to be 'cursed' or 'haunted' and the viciousness of the feral cattle have contributed to that belief[45].

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[44] Chirikof Island was first inhabited by Unangan and Alutiiq people from the Kodiak Archipelago, Kodiak Island, and the Aleutian Islands (at least from 5000 to 2300 years before present) (Saltonstall and Steffian 1-121, Workman 67), thereafter until the late 19th century in a subsistence village apparently populated by Alutiiq, Tlingit, Russian and western European people (Clark and Black, 2-13), and subsequently by fox traders and cattle ranchers (Fields 1-10, Clark 65), until just after 1980, when the island became part of the USFWS Alaska Maritime National Wildlife Refuge.

[45] The cattle, introduced in the late 1800s and variously augmented since, went feral and vicious beginning around the turn of the 20th century; an article in the *Journal of the Bizarre* calls the cattle "living ghosts of failed business enterprises" ("Haunted Alaska", January 09, 2018). In that article, under the heading of "The Mad Cows of Chirikof Island," the author recounts the story, archived (and available for a not-so-nominal fee) in The Montana Standard (January 30, 1938, p. 51), of an "ambitious West Virginia girl," Kay Barker, who visited Chirikof Island in the 1930s. The article quotes the journalist Lloyd Weir: "Mesha [an Aleut companion] and I had gone to the island to take pictures. We soon spotted a small herd but they ran as we approached. However, we found that they had gone for

Landfall, Chirikof Island, 1 August 1741: Bering Expedition

The *St. Peter* made landfall on Chirikof Island on 1 August 1741 and anchored there the next day[46]. Archived records highlighted the different foci of the crew of the *St. Peter*. Steller's journal records the island in reference largely to natural history observations—wild species observed and specimens taken, the observed vegetation of the island—and his desire to explore the island. Steller wrote:

> *"We found ourselves on the morning of August 2*[47] *only about three versts*[48] *distant from a rather large and wooded*[49] *island… Towards noon, a sea lion appeared near the ship and swam continuously round it for more than half an hour… Towards evening I caught with the hook two unknown fishes of the same genus as the so-called* Scorpii marini (Cottus)[50]*. I made at once a description of them and preserved them in spirits, but they, with other rare collections, were*

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the 'army', which advanced in charge of a big white bull…they got near and circled around us. Suddenly, as though through a signal of a big white bull, they charged…we ran to the shore where we had a boat waiting." According to the anonymous author of "Haunted Alaska," the feral cattle were sufficiently enraged that they "plunged into the water and began swimming in pursuit" (Weir, qtd in "Haunted Alaska").

In 2014, we once again visited Chirikof Island on a few day trips, on the way to Simeonof Island. During that trip, we were likewise chased by a herd of feral cattle, something that didn't happen during our extended expedition in 2013. However, unlike the experience of Ms. Barker and her companion, the cattle did not drive us into the ocean; still, it was a nerve-racking experience.

[46] Naval officers of the Bering Expedition named the island Tumannij Ostrov (Waxell 108), which means Foggy Island, reflecting the island's typically mild, damp, and foggy weather (Workman 37). The island was quickly renamed by Captain Commander Bering (Golder 1922, 111-112), who called the island Archdeacon Stephen's Island (as it was sighted on August 2, 1741 [Julian Calendar], Archdeacon Stephen's Day), then later renamed Chirikof in 1794 by explorer George Vancouver (Vancouver 87), to acknowledge Captain Alexei Chirikof's participation in the Second Kamchatkan Expedition (but who never saw the island).

[47] Dates in Steller's journal are based on the Julian (Old Style) rather than the Gregorian (New Style) calendar. The morning of 2 August 1741, recorded here, would have been 11 days later based on the Gregorian calendar (13 August 1741, although since the Bering Expedition did not take the International Date Line into account, it would have been 14 August 1741, by our current reckoning. According to Frost (in Steller, 1988, 36), Steller used civil time (midnight to midnight) and the log book of the St. Peter recorded astronomical time (from noon to noon).

[48] A verst is a Russian measure of length, approximately 0.66 miles (1.1 km)

[49] Stejneger (285) suggests this is a mistake, and I agree. The island cannot be said to be wooded; it is treeless, but there are fairly tall willow (*Salix*) shrubs on the island. The northern side of the island terminates in low hills.

[50] Stejneger (276) suggests the two sculpins were likely *Hemilepidotus* (Telesius) and *Megalocottus playtcephalus* (Pallas), for which taxonomic descriptions were not published until about 70 years had passed. Steller's descriptions played a role in the diagnoses of these species.

> *lost during the disastrous stranding of the vessel in November."* Georg Steller, in Golder (1925, 63).

However, entries in the logbook of the *St. Peter* (made by Fleet Master Sofron Khitrovo, Steller's *bête noir*) referred to weather, compass bearings, size of the island, and depth of the sea floor where anchored, and takes no notice of the wildlife:

> *"Light wind, fog, wet. Sighted land SE by E, but owning to darkness and mist, it was difficult to determine whether it was an island or a part of the mainland. Tacked to starboard, furled the sails, and dropped the small bower anchor in 18 fathoms. Tide was running from N to S…Decided it was an island, extending from E to W. It was about ¾ of a German mile in size and 1 mile from us. The W point of the island bore S½ E, the E point ESE; near it is a reef about ¾ mile long."* Golder (1922, 111).

Thus, the naturalist and the sailor on the same expedition are each observing within the context of their own hierarchical ontology, obviously "predisposed to extract certain [observations] and ignore others" (Dyke 105); this occurred over and over when comparing the few accounts of the Bering Expedition, including the report of the expedition by Lieutenant Sven Waxell relative to Steller's journal. In contemporary time, a crewmember of the *Tiglax̂* mentioned that, given the tendency of the island to shipwreck[51] vessels, it is fortunate that Steller was unable to take a small boat to the island, as he proposed to Commander Bering. I replied that if he had, and arrived safely there, he might have botanized, and perhaps encountered indigenous people who lived there.

Hence, we all see Chirikof Island through different eyes.

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[51] In 1898, Friedrich Trump, Donald Trump's grandfather, survived a shipwreck on Chirikof Island. According to New York Times journalist Jason Horowitz, Trump and others purchased a schooner and while attempting to sail it toward the Yukon River, ran it aground on Chirikof Island. They were rescued over a month later by a passing steam barkentine, having lived off of the schooner's provisions the entire whole time (Horowitz). It is difficult to refrain from speculating how differently the year 2020 would have been if that steam barkentine had not passed by the grounded schooner.

Landfall, Chirikof Island, July 13-21, 2013: Botanical Studies

Following are excerpts from my 2013 field journal. While our report of the Chirikof botanical work[52] is fairly 'sciency,' my journals are less so and include findings that did not make it into the report. As well, the archived materials, in this case, photographs, did not make it into the report.

July 13, 2013. Arrived via Tiglax̂ on Chirikof; Tiglax̂ crew helped set up camp.

July 14, 2013. Scouted beach, collected specimens. See datasheets and voucher specimens. Overcast. Found human skull (lichen growing on it)[53] *on refuse hill behind camp. Marked with sticks. Called in via radio.*

July 15, 2013 Mini-tempest on radio about skull. Meadow vegetation work. See datasheets and voucher specimens. Foggy.

July 17, 2013. Tempest about skull died down, probably ancient/indigenous, no guidance, left alone without disturbing.

This island is a mess. The vegetation is weird, not the normal communities. There are strange fields of purple lupine and yarrow, huge bushes. Cattle trails crisscross everywhere, even on the steep sides of the bluffs where the cattle trails make huge

[52] In a botanical expedition to Chirikof Island in 2013, I participated in a botanical reconnaissance of the southwestern portion of the island. Over 250 field collections, including vouchers from 17 vegetation plots, were made, and those collections were made into herbarium sheets and archived in herbaria (see digital imagery in Figure 23). Combining these collections with records of specimens collected during a 2-day trip in 1999, we document about 350 native species (about 210 vascular plants) and at least 16 non-native vascular plants, of which, at least 5 can be considered invasive on Chirikof Island. Invasive graminoids (perennial ryegrass, annual bluegrass and Kentucky bluegrass) were likely introduced through cattle feed, but also via footwear or gear. Most of the broadleaf non-natives (common sheep sorrel, common plantain, common chickweed, common dandelion and thymeleaf speedwell are found throughout Alaska. The hairy catsear is invasive, and as it is common to meadows and paddocks, it was likely introduced during cattle operations. Birdseye pearlwort is also invasive; in Canada, it has grown to monoculture mats and has displaced native vegetation. We noted shifts in the vegetation community composition relative to other islands of similar size but without cattle. There was severe erosion by cattle grazing, with large increases of yarrow and horsetail. We observed dominant swarths Nootka lupine, which is unpalatable to cattle and thus present in greater than expected frequency. As well, there was greater than expected cover of Bering's tufted hairgrass (*Deschampsia beringensis*), which increases in overgrazed habitats.

[53] I took four photographs of this skull and they are currently in my archived materials. Due to the sensitivity of this finding, these archived materials will likely be placed in deep storage.

switchbacks [see Figure 22]. *I imagine cows all in a row, nose to butt, marching up and down the switchbacks, chomping vegetation, like weird old bovine Pacmen. Chomp, chomp.*

Ugh. I can't get that image of bovine packmen out of my mind.

I admit, however, those trails make it a lot easier to hike up and down the mountain bluff vegetation. See datasheets and specimens. Foggy all day.

Figure 22. Cattle trail in bluff vegetation, southwestern Chirikof Island, 17 July 2013 Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/cattle-trail-through-meadow-chirikof-island-alaska

July 18, 2013. Beach vegetation work, see datasheets and specimens. Saw Arctic fox, who yelped at us. We followed her down the beach and found where she had hidden her pups, in a pile of driftwood. She stood on a rock and yelped at us. I went up on the bluff above her to watch for the pups, who came out eventually. I

taunted her ("I'm gonna get your babies!"). I started moving down the bluff toward the driftwood pile, and she started after me, almost like she understood my words. Good mom.

Not supposed to be foxes on the island anymore; need to tell Steve Ebbert.

Foggy all day. No wonder the sailors on the St. Peter called this Foggy Island.

Found skulls of cows on the beach on the way back from the fox fiasco. Maybe they should call this Skull Island.

July 19, 2013. Worked wetlands; see datasheets and specimens. Found Cypripedium, collected! [see Figure 23][54]. *Foggy all day.*

Figure 23. Digital images of herbarium sheets of specimens collected on Chirikof Island in 1999 and 2013. Left: *Hypochoeris radicata* L., coll. 7 September 1999 by S. S. Talbot, archived at the Alaska Museum of the North Herbarium (ALA). Middle: *Cypripedium guttatum* (Lady's Slipper), coll. 19 July 2019 by S. S. Talbot and S. L. Talbot, archived at the Monte L. Museum Herbarium (BRY). Right: *Lolium perenne*, coll. 7 September 1999 by S. S. Talbot, archived at the Alaska Museum of the North Herbarium (ALA). Of these species, only the *Cypripedium* is a native species. Images in the public domain.

[54] Specimens of this lady-slipper orchid are shown in Figure 23 (middle specimen). The other two specimens in these archived herbarium sheets are invasive species.

July 20, 2013. Day broke with blue sky. Woke up to the sound of cows lowing. A herd came right through our camp, a big bull. A bit scary, got the shotgun, but they ignored us. Glad they didn't step on our tent. Glad we didn't have to shoot them. Vegetation work on bluffs again, see datasheets and specimens.

July 21, 2013. Packing up camp.

July 22, 2013. Picked up by Tiglax̂; Strong winds, shore landing over a mile away. Andy helped to tote field gear and breakdown camp. Very rough seas.

Simeonof Island, Shumagin Island Group: Land of the Ox-eye Daisy

Landfall, Shumagin Island Group, 29 August 1741: Bering Expedition

The mountainous Shumagin Island group stretches some 100 km across and includes eight main islands—Unga, Popof, Korovin, Nagai, Chernabura, Big and Little Koniuji, and Simeonof Island—plus other small islands. The first written record of the Shumagin island group was in the logbook of the *St. Peter*, when it made landfall there on 29 August 1741 and went ashore to Nagai Island (Figure 24) the following day; landfall was made on Simeonof Island but like landfall on Chirikof Island, the crew of the *St. Peter* never set foot on Simeonof Island. The *St. Peter* weighed anchor near Nagai Island (Figure 24) mainly to replenish the decreasing stocks of fresh water; Steller, of course, wanted to go ashore and collect antiscorbutic plants to help cure the burgeoning frequency of scurvy aboard the vessel (Stejneger 292).

Archived records of the Bering Expedition's Nagai Island landfall once again highlighted the difference in focus among the crew members, albeit this time according the need to obtain water. Once again, the expedition naturalist and the sailor make records of the same events but that are from completely different viewpoints; the following discusses the collection of water to replenish the St. Peter's dwindling stores. Segueing from concerns about water to personal insults to natural history, Steller wrote:

> *"No sooner had I landed than I made efforts at once to locate a watering place and found several springs which had good and wholesome water. In the meantime the sailors had chosen the first and nearest stagnant puddle and already started operations. I found fault with this water because it was stagnant*

> *and alkaline…and must be brackish*[55]*. I therefore proposed that the springs found by me should be used for taking water…The answer was: Why, what is the matter with this water? The water is good, fill up with it?" As I was already accustomed to such treatment I paid no attention and began to reconnoiter the land…I met a black fox…[r]ed foxes,* yevrashkas*, or small marmots…the track of an entirely unknown animal…[that] resembled the track of a wolf but by their expanse and great size of the claws indicated that a different and larger animals, or a very big species of wolf, must live here. All sorts of water birds were seen, such as swans, two kinds of* urili *(Pelecani)…"* Georg Steller, in Golder (1925, 77-80).

Lieutenant Sven Waxell wrote:

> "*On our map we called these islands the Schumagin Islands, that being the name of the first of our men to die, whom we buried there*[56]*…The mate, Andreas Hesselberg, was at once sent to one of the largest islands*[57]*to fetch water; he returned, speedily bringing two samples of water which we did not find particularly good, for they had a faint flavor of salt water. However, we had no time to lose so we thought that such water was always better than nothing, for we could at any rate use it for cooking…We at once made arrangements to have as much water as possible brought on board with the help of the longboat, and we worked on that all through the night. Our ship was not lying at all safely…we wished to replenish our supplies of water in all haste, so that we might sail out back into the open sea"* (Waxell 108-109).

[55] Steller was (rightly) concerned that the salty and brackish water would increase in saltiness as it evaporated, rendering it less and less drinkable, and it would hasten the onset of scurvy, which was already showing up in crewmembers (Golder 1925, 77).

[56] Sailor Nikita Shumagin was the first crewmember who died of scurvy, and Steller's journal states that the island was named after him. The name is now given to the entire island group, and Steller's Shumagin island is now called Nagai (Golder 1925, 87 and in footnote 196 therein).

[57] Nagai Island

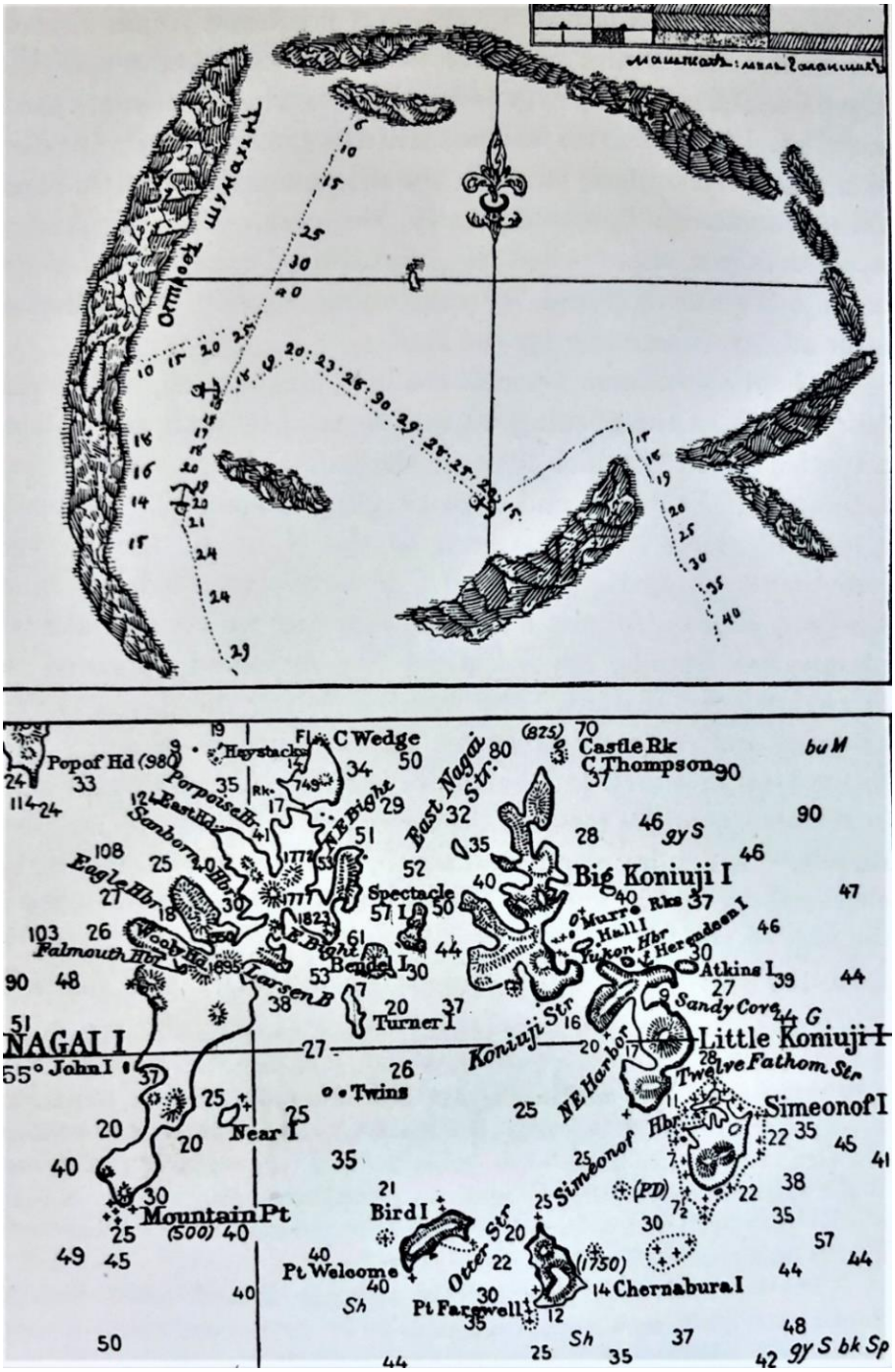

Figure 24. Top: Sofron Khitrovo's sketch[58] of the map of the Shumagin Island group. Archived imagery from the logbook of the *St. Peter*, at the end of the 5 September 1741 entry. Bottom, A map of the Shumagin Island group (section from the U. S. Coast and Geodetic Chart, no. 8802, scale 1:1050,000. (Golder 1925, 76). Image in the public domain.

[58] There is a certain irony that, during this century when scientists benefitted from also being skilled artists, it was Khitrovo, Steller's nemesis, who was the skilled draftsman, while Steller was not.

20th and 21st Century Landfall, Simeonof Island: Botanical Studies

Simeonof Island, the southernmost island of the Shumagin Island group, is irregular in shape and approximately 10 km long and wide[59]. As on Chirikof Island, cattle were introduced on Simeonof Island sometime during the late 19th century, and once again the cattle were allowed to exceed the carrying capacity of the island, resulting in the deterioration of certain vegetation communities and likely the decline of nesting seabirds. A vegetation survey conducted in 1981 documented accelerated erosion in coastal, sandy habitats, and the cattle were removed between 1983 and 1985.

I participated in scientific expeditions in 1996 and again in 2014 to monitor the trajectory of vegetation recovery. By 1996, the sandy beach communities appeared to have begun the process of recovery (Daniëls et al. 135). However, also by 1996, the distribution of several of nine introduced plant species noted during the initial 1981 field effort—in particular, velvetgrass (*Holcus lanatus*), broadleaf plantain (*Plantago major*), sheep sorrel (*Rumex acetocella*) and ox-eye daisy (*Leucanthemum vulgare*)—had begun to spread beyond the immediate environs of the rapidly decaying ranch house, where they are ubiquitous. These species are introduced directly by humans or coincidently with cattle and other livestock though feedstocks, and that can persist years after the removal of livestock (Bennett et al. 1086). As well, in 1996, seedlings of Sitka spruce (*Picea sitchensis*), unobserved in 1981 but documented in 1996, presumably the result of sexual reproduction between two mature introduced spruce trees planted in the ranch house yard (Daniëls et al. 136), were observed. By July and August 2014, over three decades since the removal of cattle, we found that some of introduced species (we now counted 13 species) persisted, and some, including the ox-eye daisy, thrive and are now expanding; they have crossed that liminal space between *introduced* and *invasive* (*Invaders Invading*; Figure 25).

[59] The island is composed of two separate main portions (called, informally, and unsurprisingly, the ‘north’ and ‘south’ islands) connected by a sandy isthmus at the head of Simeonof Harbor (see Figure 24). Unlike most of the mountains of the Shumagin Island group, whose steep slopes arise abruptly from the sea, the mountains of Simeonof Island arise from extensive lowlands dotted by numerous ponds and wetlands.

Figure 25. Sandra Talbot, *Invaders Invading*, 2020. Digital imagery UV printed on glass. 15.6 x 21.6 x 0.5 inches. From archived imagery taken from the inside of a tent during the 2014 expedition to Simeonof Island. Original imagery: Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/shadow-eye-daisies-tent-wall-simeonof-island-alaska

The ox-eye is a noxious, invasive weed native to Eurasia but invasive in North America that has recently expanded in many areas of western Canada (Clements et al. 343) and Alaska. It was likely introduced to Simeonof Island in hay seed or intentionally planted in a garden by the ranch house, but the daisy was likely kept from spreading prior to their removal by foraging and trampling behavior of cattle. Ox-eye daisy species has formed dense local aggregations expanding from a small area estimated to be 2–3 acres of more dispersed aggregation in 1981 to over 6 acres of dense aggregations in 2014 (as measured by the GPS, Global Positioning System) in the vicinity of the old ranch house (*First Nature, Becoming Second Nature, Daisy*; Figure 26) and encroaching upon the recently recovered sandy isthmus.

Figure 26. Sandra Talbot, *First Nature, Becoming Second Nature, Daisy*, 2020. Digital imagery from archived record of ox-eye daisy plots (here, Plot 9) on Simeonof Island, July 2014. Original imagery, Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/ox-eye-daisy-plot-simeonof-island-alaska

A wondrous find during the 2014 expedition was the presence in our plots of multiple daisies with deformed discs; these were documented via photography as they were processed for genetic studies (*The Pleasure of Natural Sports: Lusus naturae 3, Plot 9* series, Figures 27 and 28).

Lusus naturae literally means 'a sport of nature' but often also refers to a 'freak of nature.' Author Margaret Atwood implied the latter in her short story "Lusus Naturae," which tells the tale of a girl who turned monstrous at the age of six whose family rejects her because what they considered her freakish appearance. Daston and Park point out that, in contrast to the scholastic maxim that 'Nature does nothing in vain,' the wonders of cabinets of curiosities, or Wunderkammers, "glorified in superfluity, careless of function and the extravagant in expenditure

of labor and materials. It was precisely this pointless variety and studied uselessness that linked pure luxury and afunctional ornamentation to play…lusus naturae, like the luxury object, multiplied form without function" (277). The biologist, however, typically sees nothing of luxury

Figure 27. Sandra Talbot, *The Pleasure of Natural Sports: Lusus naturae 3, Plot 9, View 1,* 2020. Digital imagery UV printed on glass. 15.6 x 21.6 x 0.5 inches. From archived record of deformed ox-eye daisies collected on Simeonof Island, July 2014. Original imagery, Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/deformed-ox-eye-daisy

Figure 28. Sandra Talbot, *The Pleasure of Natural Sports: Lusus naturae 3, Plot 9, View 2*, 2020. Digital imagery UV printed on glass. 15.6 x 21.6 inches. From archived record of deformed ox-eye daisies collected on Simeonof Island, July 2014. Original imagery, Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/deformed-leucanthemum-vulgare-ox-eye-daisy

in lusus naturae, but rather curiosity (what is that?) and perhaps, depending on the situation, a frisson of fear (is it due to contaminants?), two characteristics attributed by some to facilitate the sense of wonder. The digital imagery shown in Figure 27 and 28 (*The Pleasure of Natural Sports: Lusus naturae 3, Plot 9*) was captured during the 2014 scientific expedition to Simeonof Island, while sorting through the disk and ray flowers of ox-eye daisies for archival associated with future genetic studies.

A second wondrous find was the colonization and spread of the ox-eye daisy along old cattle trails (*Daisy Trail*; Figure 29), which we suspect is being facilitated by river otters using old cattle trails. We observed river otters traversing the island via these old cattle trails on numerous

Figure 29. Sandra Talbot, *Daisy Trail*. 2020. Digital image. From archived imagery taken during the 2014 Simeonof Island botanical expedition. The daisies have apparently been spread down old cattle trails by river otters. Original imagery, Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/ox-eye-daisies-along-old-cattle-trail-simeonof-island-alaska

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Figure 30. Sandra Talbot, *Tracks*. 2020. Digital image. From archived imagery taken during the 2014 Simeonof Island botanical expedition. The deep tracks are made by river otters traversing evaporated pond beds. Original imagery, Sandra Talbot, U. S. Geological Survey, public domain: https://www.usgs.gov/media/images/river-otter-tracks-simeonof-island-alaska

occasions during the 2014 field effort. *Tracks* (Figure 30) shows tracks of river otters traversing a dried out lake bed[60]; it has not escaped my attention that the tracks that Steller saw on Nagai in 1741 (see page 50) may also have been tracks left by river otters.[61]. It may seem strange that river otters, typically thought of as terrestrial (after all, another common name is 'land otter'), can be found on Simeonof Island, which is located about 80 kilometers from mainland Alaska. However, river otters have been on Simeonof Island for at least two decades and likely longer. How did they get there?

I learned the answer to that during the 1996 expedition to Simeonof Island, I hiked alone along the ocean's edge around a cape on Simeonof Island and to my astonishment, almost ran into a romp[62] of river otters. They were as astonished as I was (they were probably surprised to see humans on Simeonof Island); otters bolted everywhere, racing every which way up then down the bluff, falling over each other in their attempt to escape. It was hilarious; it seemed like there were otters everywhere, but in fact there were no more than five in the romp. Again to my astonishment, they all plunged into the ocean swimming with sinuous grace for about 20 meters out then turning, water streaming off their vibrissae (sometimes called whiskers) so it looked like they were boasting a liquid mustache, and raising themselves upright, holding about a third of their upper body out of the water, staring at me. Spy-hopping. I could not see their forelimbs (Figure 31).

I had no idea that river otters swam in the ocean. To me, this was a wondrous thing.

[60] July and August of 2014 were exceedingly hot on Simeonof Island; we saw a stretch of about 2 weeks during which no rain fell (virtually unheard-of in this locality). The shallow ponds south of our camp dried up and we found these otter tracks along with tracks of various birds crisscrossing the mud.

[61] No wolves are documented in the literature from the Shumagin Islands (see MacDonald and Cook 160). The late USFWS Biologist Ed Bailey, who worked extensively in the Shumagin Island group, told Orcutt Frost (Steller 1988, 201-202, footnote 24) that he thought the footprint that Steller saw on Nagai Island was probably a river otter or a bear cub. One record of a river otter has been attributed to Nagai (MacDonald and Cook 200), but I observed numerous river otters on Simeonof Island during fieldwork there in 1996 and 2014.

[62] A group of otters is called a bevy, lodge, family or a romp. Given their behavior, I chose to use the word 'romp.'

Figure 31. River otters swimming in Simeonof Harbor, 2008. Note the spy-hopping behavior of the farther otter, shown here. Digital photograph taken on 1 August 2008, by Bob Webster and archived on http://xpda.com/minnow08/, shown here with permission.

CHAPTER 4. Murder Point and Massacre Bay on Attu: Invasion

It's called Massacre Bay.

It's one of four bays thus named in the world. One is in New Zealand[63] (recently renamed named Golden Bay), one is near A'asu[64], in American Samoa. One is in Washington State[65]. All were named after violent acts involving both immigrant (imperial colonialists) and/or indigenous people that occurred during the 17th, 18th and 19th centuries. But the Massacre Bay I visited in 1988, then again in 2004, then again in 2009—'my' Massacre Bay—is located off the southeastern shore of Attu Island, in the Near Island group of the Aleutian Island Archipelago. The Bering Expedition never made landfall on Attu Island, but Attu Island was among the first North American Aleutian islands to suffer from the consequences of the Bering Expedition.

When I first visited 'my' Massacre Bay as part of the 1988 botanical expedition, I assumed the bay was named after the carnage of the 1943 eighteen-day WWII Battle of Attu, the

[63] In 1642, Dutch explorer Abel Tasman anchored in what became Massacre Bay on the northern point of New Zealand, and his ship was rammed by Ngāti Tūmatakōkira and four Dutch seamen were killed by Māori; Tasman named the bay Murderer's Bay (Mitchell and Mitchell). The bay was later renamed Massacre Bay, apparently by French Explorer Jules Dumont d'Urville. Massacre Bay was officially changed to Golden Bay/Mohua, in 2014.

[64] In 1787, twelve European crewmembers in the French explorer Jean-Fracois de Galaup, Comte de La Pérouse's scientific expedition, landed on the near the village of A'asu, on Tutuila Island, Samoa, to take on water, and were killed for unknown provocation in the channel and beach near the village; 39 Samoans died in that incident. The bay was named Massacre Bay European historians. The incident, called the A'asu Massacre, is known only from the archived journals of La Pérouse, which were sent to Boundary Bay (Dunmore 537). A memorial near A'asu lists the names of the Europeans killed; there is no memorial to the Samoans.

[65] The name Massacre Bay, located at the head of West Sound, Orcas Island, in San Juan County in Washington State, first appeared in the British Admiralty Chart 2689, Richards, 1858-1859. It was named by these explorers who found extensive evidences of battles between indigenous people (Meany 161); in 1858, a raiding band of northern tribe members decimated a Lummi village there. These events are also reflected in the names of other geographies, including Victim Island and Skull Island.

Forgotten War, one of the deadliest battles in the Pacific Theatre and the only battle during WWII held on North American soil[66,67].

My assumptions about the source of the place name turned out to be incorrect (I failed to glean knowledge from the past): the Battle of Attu was merely a 20th century's reflection of the brutality of imperial colonialism of the 18th century. The name Massacre Bay arises from specific violent acts by crews of Russian *promyshlenniki* toward the Unangax̂ people who lived on Attu Island in the autumn of 1745, a mere three years into the aftermath of the Bering Expedition's culmination. Met and rebuffed by a group of 100 armed Unangax̂ living on (relatively nearby) Agattu Island, the *promyshlenniki* retreated to the less populated island of Attu and captured an elderly woman and young boy, keeping the boy as a translator. A few weeks later, a party of Russians attacked another Attuan settlement on what was eventually to become known as Murder Point[68] on Massacre Bay, killing 15 men and stealing women and changing the world of the Unangan people forever.

Murder Point, on Massacre Bay, was peaceful and a source of wonder when I took part in the botanical expeditions there during 1988, and again in 2004 (Figure 32)—crabs skittered up and down the strand, like the shorebirds tracking tides, shells and sand dollars and molted crab shells littered the beach, cormorants perched on rotted remains of piers—even as remnants of the WWII carnage and subsequent military presence were evident on the nearby beaches and uplands. Rusted rifle cartridges washed up on the beach, impressions of Quonset huts erected to house

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[66] Five hundred and forty-nine American soldiers, who were aided by Canadian reconnaissance and fighter-bomber support, died in that battle, along with over 2,300 Japanese Northern Army soldiers (the 'proto- or potential invaders' in this temporal/spatial context) who were variously killed by American soldiers, or, to avoid capture, by their own countrymen, or who committed suicide. One landing site of that battle was the beach on Massacre Bay. Disembarking on Murder Point, on Massacre Bay, in the middle of wind and fog and horizontal rain characterizing 'the birthplace of the winds,' the young American soldiers, recently trained in the hot dry deserts of California must have been shocked. Certainly, they were unprepared for conditions on Attu; the battle was grueling, the landscape rugged, and over 1200 American soldiers suffered from severe cold injuries and exposure (Cloe, 293). As the battle raged on, rations dwindled, and hunger ensued; resupply planes were often unable to locate the soldiers in the fog.

[67] Corporal Dashielle Hammett, the author of "The Maltese Falcon", served on Adak Island in the Andreonof Island Group in the Aleutian Island Archipelago during WWII, wrote about the war in the Aleutians: "Modern armies had never fought before on any field that was like the Aleutians…We could borrow no knowledge from the past. We would have to learn as we went along, how to live and fight and win in this new land, the least-known part of our America" (Hammett and Colodney, 9).

[68] The Russians originally called the point 'Krasnoy Mys,' translated as 'Red Cape' (Sarichev map 26).

Figure 32. Sandra Talbot, collecting specimens on Murder Point, Massacre Bay, Attu, Alaska, in 2004 (photograph by Stephen Talbot, shown here with permission).

soldiers were evident in the bluejoint grass[69] meadows. We regularly stumbled and fell in foxholes hidden in beach ryegrass[70] beach meadows. Weathered wood planks and twisted rusty metal sheets were scattered everywhere; brick chimney sentinels guarded the remains of structures collapsed in years past. As already narrated in Chapter 2 (Chasing the Wind), Attu and the artifacts archived in the island's earth and strand rekindled the lost sense of wonder in me.

Once, on Engineer's Hill, I found a set of dog tags left, in a way I shrink from divining, by a soldier who battled on Attu during the war. I took photographs—since disappeared into some unmarked and still inaccessible digital mausoleum—and turned them over to the Coast Guard commander in charge of the Loran Station that year. I never learned whether the tags were returned to the soldier's family. The tags, made of aluminum, were remarkably shiny; perhaps some family member—a son or daughter, a grandchild—had returned them to Engineer Hill

[69] *Calamagrostis canadensis* or *Calamagrostis nootkatensis*

[70] *Leymus mollis*

sometime during the 75-year aftermath of the war. Perhaps by finding them, I disturbed their peace.

In 1987, a Japanese war memorial commemorating the over 2000 Japanese soldiers who died on Attu was erected on Engineer Hill; the inscription on the memorial reads:

> *"In memory of all those who sacrificed their lives in the islands and seas of the North Pacific during World War II and in dedication to world peace."*

The memorial, which is made of titanium and looks like an exploding mortar (Figure 33) was damaged in a storm in 2003, although restored in 2003. In 2011, I made my own memorial (*A Deeper Peace*; Figure 34), which was intended to look a little more peaceful than the representation of an exploding mortar. I'm not sure which of the memorials is more fitting. There is no memorial to the Attuans who died in 1745 at the hands of Russian fur traders, or the Unangans that were forced to leave their homes, put into camps or residence schools, who have sickened, or have died, in all the years since 1745[71].

[71] The effects of contact and Russian colonialism (1745-1867) and events of the American Era (1867-1942) and beyond were devastating to the Unangan people; senior history lecturer Ryan Tucker Jones' "Empire of Extinction" is one of several tomes that provides an overview of the interrelated impacts of colonialism. Prior to contact, the population Unangan people is estimated to have been approximately 25,000. Within a few years of Russian colonialism, the Unangan population from Attu to the Fox Island group in the eastern Aleutian chain declined greatly due to disease and hardship of forced labor for the Russians. Unangans from many islands were moved between islands and resettled, including the Commander Islands, where Bering died, and to the Pribilof Islands. Christianity in the form of the Russian Orthodox Church was introduced, and local indigenous culture greatly modified. Conditions did not greatly improve following the sale of Alaska to the United States in 1867, and children were taken from their homes and put into resident schools where their culture and language was further eroded. The 1910 U. S. Census counted only 1,083 Aleuts (Bureau of the Census, 574). During WWII, Unangans from Attu were interred as prisoners of war on Hokkaido, and, as a result, the United States government evacuated hundreds of Unangans to southeast Alaska, where many died due to infectious diseases and many others were mistreated or neglected. Military presence remained in the Aleutian Islands following WWII through the Cold War, and this resulted in the increase in population size of Unangans, who live mostly in the city of Sand Point in the Shumagin Island group, Unalaska and Dutch Harbor, in the Fox Island group in the eastern Aleutian Island chain, Atka, in the Andreanof Island group, the Pribilof Islands (St. George and St. Paul), all in the United States, and in the Commander Islands (Bering, Copper) in Russia. The 2000 U. S. Census identified just under 12,000 people as Unangans, and approximately 17,000 identified as having partial Unangan ancestry (Ogunwole 11). Perhaps 150 people in the United States speak dialects of the language of the Aleutian Island indigenous people (Berge 578). In 1988, the Aleut Restitution Act of Congress attempted to compensate survivors of the southeastern Alaskan internment, and in 2017, the US. Government formally apologized to the Unangan people for their treatment in the internment camps.

Figure 33. Japanese peace memorial at the top of Engineer Hill, where the Battle of Attu ended on May 29th, 1943 (photo credit: L. Hupp/USFWS). Image is in the public domain: https://medium.com/@AlaskaUSFWS/refuge-and-remembrance-c8e2e96bec6c

Figure 34. Sandra Talbot, *A Deeper Peace*, 2011. 20 x 12 x 5 inches. Wood cast aluminum, stones, rusted iron salvaged from Attu Island, copper, walnut (photo credit, Mike Conti).

It was during the botanical expedition of 2009 that I felt a change, an inchoate niggling, a persistently fleeting sense of haunting sadness. The sense of wonder I felt during prior years had undergone a shift. As before, we trekked for miles along the steadily disappearing tracts, scaled hanging garden cliffs, searched for wondrous new species to add to our archives, but that trip was not quite as joyous as before, but rather heavy, dragging, oddly yearning. The bird calls seemed somewhat muted; the glorious wildflowers seemed a little less glorious. Something was coming; I could feel it. We could feel it. Our field companion of 15 years, bryologist Dr. Wilf Schofield (UBC), had died eight months earlier and we felt, deeply, his absence. The Loran Station, the last remnants of Navy Town on Massacre Bay, was closing, a victim of technological change in the form of GPS; the 20 or so humans (young coasties manning the station, most of which hated the tour and were glad to see the station shutter) would leave the following year. After 2010, no humans would make their homes on Attu Island, ending a continuous 5000-year history of inhabitation. But that wasn't the source of our disquiet; the island could not talk to those humans anyway, although sometimes I imagined it talked to me through the plants I learned to know and love. But the change coming was bigger, if not less irreversible; the climate was changing, even here on this wild, remote island, and that was changing the ecosystem of Attu forever.

In remembrance of that 2009 memory, I started working on a relief sculpture, *The Strand on Massacre Bay* (Figure 35). *The Strand* currently incorporates and immortalizes artifacts (rusted rifle cartridges, shells collected on the strand, planks of wood charred in the Japanese style) filed in the earth and strand on Massacre Bay, extracted (collected) during my botanical expeditions to Attu and other Aleutian Islands and archived in my personal corpus of sculpture materials for over a decade. Making *The Strand* also used molted crab epidermises as molds for casting. With this piece, I hoped to immobilize time, to arrest the disquiet that began during that 2009 expedition, to freeze the wonder that I have felt during all prior field excursions to Attu, and that I feel during my typically annual expeditions to various islands in the Aleutian Island Archipelago.

I have as yet been unable to finish the sculpture, as the COVID-19 pandemic locked down my sculpture studio, and the half-finished piece remains inaccessible. It is frozen, its completion will have to wait until the pandemic has swept through.

Figure 35. Sandra Talbot, *The Strand at Massacre Bay*, in progress. Cast aluminum, rusted rifle cartridges, artifacts found on the strand, charwood.

CHAPTER 5. Island Hopping: Adak. Ox-eye Daisies on Adak Island, August 2018

My field expeditions in August, 2018, included a two-day trip to Kasatochi Island to conduct post-eruption revegetation research, and a small amount of invasive species research on Adak Island[72]. One legacy of the U. S. military, which shuttered its installation on Adak in 2004, and indeed on many Aleutian islands, is the presence and persistence of a number of introduced plant species, some of which have become invasive. These include perennial beauty (*Bellis perennis*), which dots the yards throughout Adak proper and is marching down the gravel roads in a way reminiscent of the ox-eye daisy trails on Simeonof Island. Not surprisingly, another of those invasive species spreading on Adak Island is the ox-eye daisy. Fields of daisies, similar to what we saw on Simeonof Island, surround the abandoned Naval Security Group Activity (NSGA) site near Clam Lagoon (*Daisy Fields*, Figure 36). The more the abandoned military structures rust, the wider the expanse of daisy fields there. By human hands, whether by accident,

[72] The *St. Peter* apparently made landfall, on 24 September 1741 (without going ashore) on Adak and Atka islands, in what became known as the Andreanof Island group. Steller's journal states: "the weather was gloomy almost the whole day. Towards evening to our great dismay we saw land ahead of us in latitude 51°, and many islands seemed to lie only three or four miles from us." (Golder 1925, 112). By the time the St. Peter made landfall in the Andreanof Island group, there were at least 13 sailors on the sick list, ill with scurvy (Golder 1922, 164-167).

or by design, the daisy fields have seeded, and by natural means, expanded, in the shadow of an abandoned military complex; like Agnes Denes' 1982 *Wheatfield*, planted (although for completely different purposes) on a landfill in the shadow of the Twin Towers, the daisy field occupies that fragile liminal space between reckless human endeavor and the earth's serene resilience. Above the soil, the daisy fields are beautiful, just like they are on Simeonof Island, but I know that beneath the soil they are advancing via a network of thick rhizomes that choke and oust native species. Unfortunately, they are likely to continue displacing native species; they are biological invaders; effective intervention is unlikely. But, when I see the daisies swaying in the wind (*Dreams of Conquest*, Figure 37), my mind slots them simultaneously into Lovelock's *Daisyworld* [73] and the religious training of my childhood:

Consider the daisies of the field…they toil not, neither do they sow[74].

[73] In 1983, James Lovelock and Andrew Watson created *Daisyworld* (Watson and Lovelock), a computer simulation that 'seeds' two varieties of daisy—those with black petals, and those with white petals—to mimic certain elements of the Earth-Sun system and to test Lovelock's Gaia Hypothesis (Lovelock) which hypothesizes that the Earth is a self-regulating system. The virtual white daisies reflect light, while the black daisies absorb light. *Daisyworld* tracks the two populations and the surface temperature of the simulated world with an ever-increasing strength of the sun's rays. The simulation showed that the surface temperature of the world remained in equilibrium—due to different frequencies of each type, depending on local and global simulated conditions—across various temperatures (that is, until the temperatures exceeded each daisy type's physiological tolerances). The initial simulations, which were upheld following testing that modeled more biodiverse and complex virtual worlds (Wood et al.), suggested that the biosphere responds (up to a point) with resilience to perturbations, supporting Lovelock's Gaia Hypothesis.

[74] "Consider the lilies of the field, how they grow; they toil not, neither do they spin" (The Authorized King James Bible, Matt. 6:28).

Figure 36. Sandra Talbot, *Daisy Fields, Abandoned NSGA Site, Adak, I* (top) and *II* (bottom), 2020. Digital imagery UV printed on glass. 15.6 x 21.6 x 0.5 inches each.

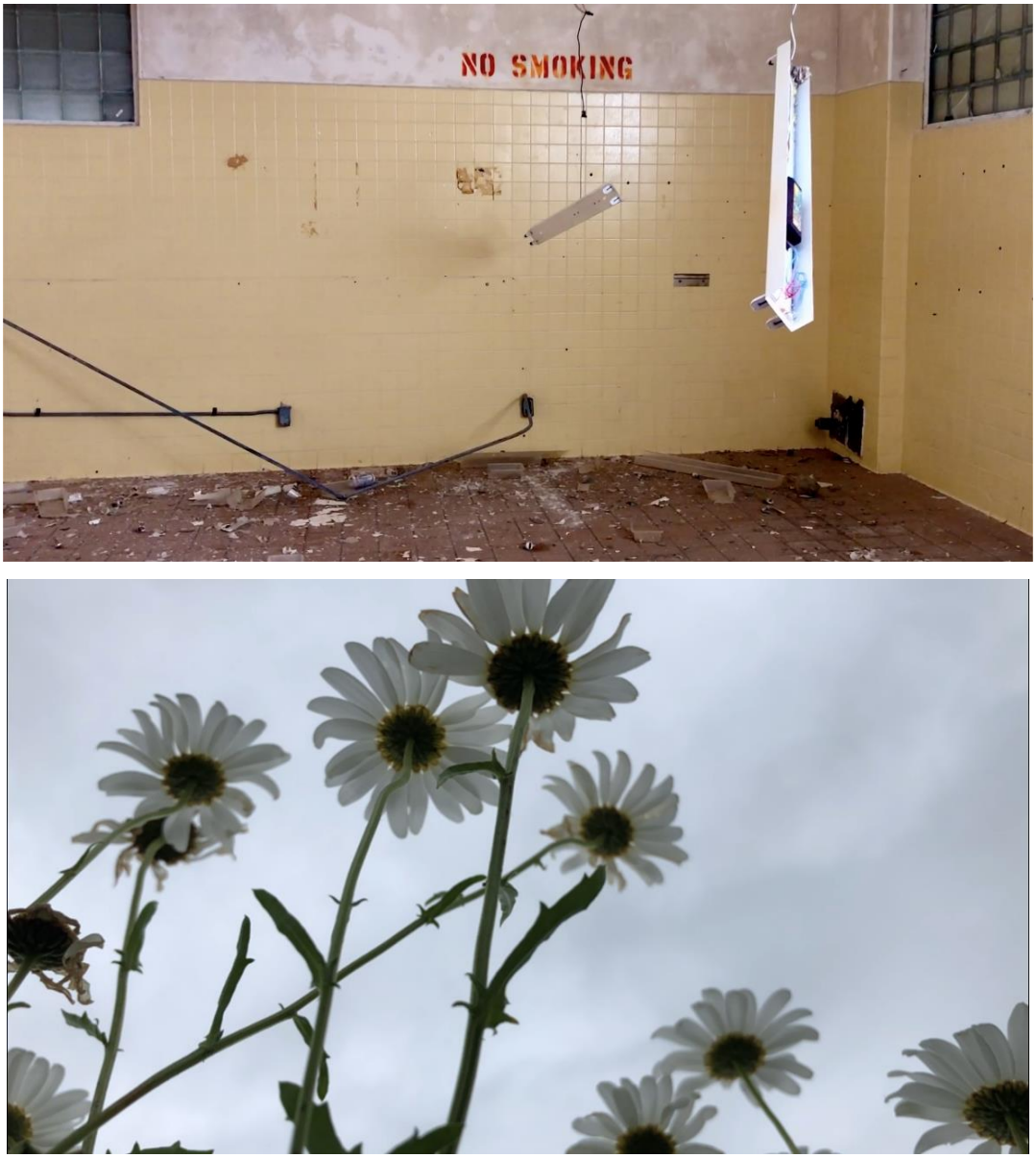

Figure 37. Sandra Talbot, still frames from video *Dreams of Conquest*, 2020. 7:47 minutes. Video is archived at https://vimeo.com/442803496

In the video *Dreams of Conquest*, the silent waving of the above-ground daisy corpuses is presaged by the silent, slow motion oscillation of light fixtures that are apparently blowing in slight breezes that gust through a room in one of the abandoned NSGA site buildings. The video imagery of the daisies—an invasive species that expanded following the retraction of military control of Adak Island—was taken at a locale just outside the doorway of that building built by

what others might call an invasive species. The purpose of that specific building is unknown, but certainly no smoking was allowed (Figure 37, top).

Author, naturalist, scientist, philosopher and conservationist Aldo Leopold's "land aesthetic" (Callicott 105) emerged from his consideration that detailed information about a particular locale within a broader ecological and evolutionary history of a region[75]. Leopold strongly opposed the introduction of non-native species on those grounds, which led him to adopt the view that introduced species are aesthetically unpleasing (they did not belong to a particular ecosystem and were therefore visually and ecologically jarring). Leopold's land aesthetic (initially called the 'land ethic') was an extension of proto-ecological thought into aesthetic judgement that greatly impacted landscape architecture of the late 19th century forward. In 1882, Charles Sprague Sargent, Harvard botanist and Director of the Arnold Arboretum, clashed with the landscape architect Fredrick Law Olmsted over the aesthetic value of using exotics to rehabilitate the shores of the Muddy River in Massachusetts (Zaizevsky); Sargent opposed the practice, Olmsted prevaricated[76], waxing rapturous about, for example, ivy (Olmsted 419).

Because of their tendency to homogenize biotas, which contributes to what ecologist and evolutionary biologist Daniel Simberloff calls "a pervasive biocultural homogenization fostered by urbanization and globalization" (33), biologists now tend to view invasive species with antipathy, through a dark and negative filter, but without necessarily acknowledging aesthetic considerations. Some researchers, nevertheless, consider this antipathy to be riddled with xenophobia. For example, historian Philip Pauly, referencing the Progressive Era[77], writes that "attitudes towards foreign pests merged with ethnic prejudices: the gypsy moth and the oriental chestnut blight both took on and contributed to characteristics ascribed to their presumed human compatriots" (54). He goes on to state that "it should be clear that attitudes about foreign and

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[75] Aldo Leopold's "A Sand County Almanac," which introduces his ideas about his land ethic, is a seminal transformative text within the field of conservation.

[76] Sargent wrote "[i]t is not easy to explain why certain plants look distinctly in place in certain situations and why other plants look as distinctly out of place…inevitably produc[ing] disharmonious results" (266). In an editorial response in the pages of the journal *Garden and Forest*, Olmsted conceded that using nonindigenous species in his gardens "inevitably far-fetched trees with little discrimination had led to deplorable results" (418) but would still consider the use of certain exotics in certain places to give "a touch of grace, delicacy and fineness…not supplied by our native trees" (419).

[77] The Progressive Era was a period of widespread social activism and political reform across the United States that spanned from the 1890s to the 1920s, with the goals of addressing issues emerging from immigration, urbanization, industrialization, and political corruption.

native organisms were intimately linked, through both everyday experiences and analogies of policy, to views on 'alien' and 'native' humans" (70). Notwithstanding these myriad, era-spanning viewpoints, non-native species that become invasive when introduced to a geography arrive there through active or passive human agency, and indeed, there is an argument that humans can or should be considered invasive species (Zielinski). As such, whether we view invasive species through an aesthetic or ecological or evolutionary lens, we still judge them from within our anthropocentric world view, perpetuating hierarchical view of non-native species that displace others: invasive species are terrible, we yank them out by their roots, never mind we share certain characteristics with invasive non-human species.

Decades ago, in another Graduate Student World, I took a course in evolution from paleoecologist and artist R. Dale Guthrie, author of the book "The Nature of Paleolithic Art." I took issue with some of what Guthrie said in that course (e.g. once he stated that only animals with good memories get ulcers, which is difficult to determine empirically, but see Sapolsky 213), suspicious of his discipline's tendency to connect a few artifact/dots to create edges of an entire culture when those dots could have as easily traced alternative edges. That tendency bothered my hypothetical-deductive scientific sensibilities. I am still not sure how much of what he proposed in that course was intended to spark a conversation; if much of it was (and I expect it was; he is not only a brilliant paleoecologist, he was a brilliant pedagogue), he succeeded. Nevertheless, the tendency to look at a few artifacts and recreate entire cultures, while easy to parody (*This Is Not Nature*, Figure 12; *Strange Taxonomies*, Figure 38), seems very dangerous to me.

Nevertheless, one of Guthrie's statements has stayed with me for decades: he (obviously of European ancestry) called European man "The Colonizer Morph." The Invader. The history of the Aleutian Islands supports that statement, whether we look at ox-eye daisies, or Norway rats, or ourselves. The definition of a biological invasion, and indeed, an invasive species, is freighted with imprecision, due in no large part to lack of clarity in Charles Elton's seminal book in invasion ecology, "The Ecology of Invasions by Animals and Plants." Elton did not propose a definition of invasiveness, and as a result, the term 'invasive' is conflated with at least the following terms: alien, non-indigenous, introduced, imported, non-native, colonizer, immigrant, naturalized (Colautti and MacIsaac 135-141). Ecologist Loïc Valerey, of the Département d'Ecologie et de Gestion de la Biodiversité Muséum National d'Histoire Naturelle, along with his

Figure 38. Sandra Talbot, *Strange Taxonomies*, 2020. Wood cast aluminum, mummified cast citrus bronze, stones, Styrofoam, insect pins, vitrine case with velvet base. 22 x 12 x 5 inches.

coauthors, adopt an ontological approach to the notion of biological invasions that would facilitate a return to basic principles when formulating a more precise definition of biological invasions. Within the context of their model, which incorporates, broadly, geographic and impact criteria, they define a biological invasion as follows (quoted for precision's sake):

> *"A biological invasion consists of a species' acquiring a competitive advantage following the disappearance of natural obstacles to its proliferation, which allows it to spread rapidly and to conquer novel areas within recipient ecosystems in which it becomes a dominant population"* (Valerey et al. 1349).

With a few changes, that definition can quite easily be applied to the invasion of the Aleutians islands, and Unangan culture, by the *promyshlenniki* in the mid 1700s. Certainly, the ox-eye daisies on Simeonof and Adak islands are spreading; they have become invasive. In the end, though, I cannot hate them, anymore than can I hate ourselves. That is not a solution to the problem of invasiveness, it's just an observation that hate should not play a role when we look at other species, invasive or not, any more than when we look at ourselves.

Nevertheless, after I used my iPhone to collect video imagery from a set of daisies to get a daisy's eye view (*Dreams of Conquest*, Figure 37), I collected some to use as specimens for incorporation into my art-making (*The Invasion of Adak*, Figure 39).

I admit, I ripped them out by the roots.

Figure 39. Sandra Talbot, *The Invasion of Adak*, 2020. Bleach and rust-distressed galvanized metal, steel cabinet hinges, digital imagery, acrylic, pressed herbarium specimens. The images on the upper left and lower right shows single plate among 32 total images included in the 'book' which was comprised of 40 total 'pages.' Each plate: 8 x 12 inches.

Pages of the *Invasion of Adak* (Figure 39) use processes described in *Book of Falling Angels* (Figures 6 and 7) in addition to the further distressing of the galvanized steel plates using hydrogen peroxide, white vinegar and salt, with rusting hastened using rusted iron gears collected on Adak Island to ground the imagery in its geographic origin. The work incorporates imagery of collapsing structures and furnishings and fading signage found on the abandoned NSGA site on Clam Lagoon, Adak, pressed herbarium specimens collected from the site and archived, and remnants of letters from colleagues. Transferring the digital imagery onto distressed and rusted

galvanized steel and incorporating dried, archived herbarium specimens imbues the sense of decomposition of military structures on Adak Island following the withdrawal of military support, including financial support, reflecting the abandoned and disintegrating human environment that is nevertheless still impacted by invading species deposited there through human agency, whether intentional or accidental.

CHAPTER 6. A Segue (Divining Steller's Sea Ape, Continued)

In late August 2009, at the end of our field season, and returning to Adak from sailing on the Tiglax̂ from Attu, Buldir, Kiska, and Kasatochi, we took our usual end-of-season walk on City Beach on Adak Island while awaiting the arrival of the jet that would take us back to Anchorage. I bent down to pick up a piece of driftwood, noting its sinuous shape, which reminded me of some sort of sea mammal. I stuffed the driftwood in my backpack and forgot about it until that autumn, when I decided to work with the piece of driftwood to make a birthday present for my mother. A frustrated marine biologist, my mother loved seals, whales and dolphins; I hoped to carve the driftwood into a sculpture of seal. However, as my hands worked with the piece of driftwood, another creature emerged from the wood. The face seemed to look more like a dog's face than a seal's face (Figure 40). The ears emerging from the wood were large and pointed, although laid back. The shape of the driftwood required the forelimbs to emerge much farther down than a seal's might, and the limbs had to wrap around rthe body, retaining the streamlined form. While carving, my mind wandered to Steller's descriptions of the sea monkey, but as the creature in the wood emerged, it began to look more and more like a river otter.

And I knew that river otters swam in the ocean, at least in the Shumagin Islands.

As I looked at the carving in my hand, I was holding in my mind, simultaneously, the account of Steller's Sea Ape and the memory of the 1996 ocean- river otters swimming and spy-hopping in the ocean off the shores of Simeonof Island, near where Steller saw his 'sea monkey.' In the kind of slotting of evidence and a flash that happens much more rarely in science than supposed, I knew in my heart what Steller saw. This was a wonder emerging from both a

cognitive passion and a boundary breached by artmaking, "as much about knowing as of feeling" (Daston and Park 14).

Figure 40. Sandra Talbot, *Steller's Sea Monkey*? 2009. Two views. 11 x 5 x 1.5 inches. Carved driftwood, glass, cherry, brass.

But I needed evidence.

A New Hypothesis

I concede that the identity of the "sea ape" is unknown at present and barring time travel, will remain unknown for all time. However, that does not preclude the formulation of hypotheses and testing of those hypotheses. Again, the most common explanation for the sighting is that it was a young northern fur seal, for which the forelimbs are set far enough behind on the torso that they may have been obscured below the waterline, even given Steller's report of spy-hopping, a known behavior of whales and known in Northern fur seals (Stejneger 280). All these comments are reasonable, given the imperfect situation surrounding the observation, but next Stejneger writes:

> *"…it must not be overlooked that Steller, at the time he made his observation, had never seen a fur-seal, dead or alive…he made his*

> *acquaintance with this animal [fur seals] on the rookeries of Bering Island…" (281).*

It is Stejneger's latter quote, along with the fact that fur seal ears cannot be considered 'erect,' that fails to convince me, and the former is strictly due to a misreading of the archived translations of Steller's journal, which reports observations of "large numbers of hair seals, sea otters, fur seals, sea lions (*Phoca ursina*[78] and *leonina*), dolphins, and storm fishes" (Golder 1925, 63) during the days prior to the observation of the 'sea monkey.' It is unclear why Stejneger's 1936 biography of Steller fails to include the sightings of the fur seals as presented in Golder (1925, 63), since Stejneger is listed as the translator and partial annotator of Golder's account. Stejneger does dismiss the possibility that the 'sea monkey' was a sea otter, stating that Steller had seen many sea otters prior to sighting the 'sea monkey' (Golder 1925, 65, footnote 142) and was therefore familiar with them. Obviously, the same argument, based on Steller's journal, can be made for the fur seal, and I make it here.

No illustration of the 'sea monkey' has yet been uncovered. According to his journal, Steller, and/or his companion Thoma (the various translations of the manuscript differ who the gun-wielder was), attempted to shoot the animal, but missed. It is notable that the logbook of the St. Peter did not recount the sea ape encounter; neither was it reported in Waxell's 1756 account of that portion of the expedition (Waxell 108); clearly, the sighting was of interest to Steller but not to the crew also documenting the Expedition. However, the encounter was not mentioned in Steller's 1742 governmental report, nor did Steller include description of the creature in "De Bestiis Marinis," although he did reference the observation and stated that he "insert[ed] a sketch of a sea ape" (11), which was apparently lost along with other illustrations from the Steller's materials when they were transported along with the original journal to St. Petersburg (Stejneger 511-526).

Based on the evidence against the northern fur seal and prior arguments presented in other chapters for other possible explanations, and in support of my intuitive leap based on art-making, I'm convinced that Steller's Sea Ape was a river otter. Supporting evidence for this hypothesis

[78] The currently accepted name for the northern fur seal is *Callorhinus ursinus*.

comes in the form of distributional[79], morphological[80], behavioral[81] and oceanic[82] data. The congruence of these pieces of scientific evidence supports the hypothesis that Steller's Sea Ape (AKA Steller's sea monkey) was an ocean-swimming river otter (*Steller's Bestiary: Simia marina*, Figure 41), a hypothesis that derived from art-making; less support is given to alternative hypotheses. Western scientific evidence cannot be provided to support or reject the hypothesis that the Steller's sea monkey was a previously—and currently—undescribed creature (that mythago[83]), never documented before, and never documented since; such instances are outside the scope of the scientific method. Yet, none of the prior explanations erected by biologists, including cryptobiologists, even considered the river otter as a target for investigation. Thus, in this instance, art-making conducted against a background of scientific facts and lived experience

[79]River otters have been observed on at least two islands in the Shumagin Island group [Nagai Island (MacDonald and Cook 200); Simeonof Island, as recounted herein], are known to inhabit Kodiak Island (MacDonald and Cook 200), and have been observed in the ocean between Kodiak and the Shumagin islands (Dragoo 11). Steller saw tracks of an unknown animal that was more likely a river otter than a wolf or a bear. Archived US federal records presenting results of a seabird, fish and marine mammal oceanographic transect near the Semidi Islands, located between Kodiak Island and the Shumagin Island Group, reported a river otter swimming in the open ocean between Chirikof Island and Chowiet Island, in 2001 (Dragoo 12), close to where the 'sea monkey' was sighted in 1741.

[80]Figure 31 shows how the large vibrissae of river otters droop down, rather like a Fu Manchu beard, when the otters are wet, consistent with Steller's description. The size of river otters in Alaska (40-60 inches) is consistent with the size estimate of two Russian ells (or arshin; one arshin is approximately English 2.3 feet). Pelage of river otters in Alaska are variously reddish brown to black on the dorsal side and lighter on the ventral side, and the forelimbs are set far enough behind on their torso, so that they could have been obscured below the waterline, and the 'shark-like' or 'rooster-like' tail of the creature may have been a visual conflation of the animal's hind feet and long tail. Photographic images of wet river otters often show how their more rounded ears appear to be pointed, depending upon the angle of observation (for example, see Figure 31).

[81]Steller wrote that the unknown sea creature rose its front end out of the water to observe the ship; that is, it displayed 'spy-hopping'—a synchronized swimming movement executed by marine or euryhalic species (a species able to tolerate a wide range of salinity) that allows the animal to rise up high in the water and look over their immediate surroundings—and engaged in an amusing juggling behavior with what Stejneger interpreted to be the bladder of bull kelp. River otters, particularly the immature, are well-known for their sense of play (Larivière and Walton 5). Figure 31 documents spy-hopping by river otters swimming in Simeonof Lagoon.

[82] Oceanographers Phyllis Stabeno and Albert Hermann compared currents generated via an eddy-resolving model compared with current meters and satellite-tracked drifting buoys from Shelikof Strait, Alaska, where rapid oceanic currents flow through the Shelikof Strait on the northern side of Kodiak Island. Their results (1159) show that buoys follow currents leading directly toward where the St. Peter was on 10 August 1741. This suggests that a river otter living on coastal areas of Kodiak Island could be swept out to sea via strong ocean currents and travel to the vicinity of Steller's sighting of the 'sea monkey.' Gene flow studies of Kodiak and Simeonof river otters may be able to determine whether there is a signal of asymmetrical gene flow that corresponds with the direction ocean current flow in the region; those studies are ongoing.

[83] The word 'mythago' was apparently coined by Richard Holdstock, who used the word as the title of his book "Mythago Wood." It appears to be a conflation of the words 'myth' and 'imago' (an unconscious, idealized mental image of something, or someone, that influences a person's behavior). So, a mythago is the image of an idealized form of a mythical creature, such as Heuvelmans' longnecked-serpent-seal.

was generative, facilitating the re-examination, redefinition and reinvention of mysterious scientific archives (or at least a scientific mystery hidden in the archives), if not scientific history.

It is perhaps a small thing, adding this trivial speck of information—this tiny diminishing of biodiversity when we seek to increase it—to the canon of scientific knowledge. Against the backdrop of climate change and ongoing or predicted ills, including pandemics, societal collapse, hunger and privation, political upheavals, peaceful protests and opportunistic riots, it seems indeed a very small thing. But solving a 280 year-old scientific mystery via art-making followed by science-making is not a trivial thing; it lends credence to the hopeful idea that art and science, those twin pinnacles of human achievement, those two seemingly opposite Dionysian and Apollonian impulses driving humankind, can approach mysteries with consilience, a unity of knowledge that hopefully does not subsume art under science (Wilson, "Consilience" 235) or vice versa. That is, this is a small instance of ArtScience, a consilience that is not what I call Art in the Service of Science, or Science in the Service of Art (see Heylighten and Petrović 2-3), but rather a new way of understanding nature and more specifically ourselves via a "synthesis of artistic and scientific modes of exploration and expression" (Root-Bernstein et al. 192). Deviating from examples of ArtScience provided by Heylighten and Petrović (14), this instance relied not on the rapprochement of new science and art technologies, but rather artmaking using centuries old methods of making art, old-fashioned scientific observation and reinterpretation of centuries-old archives. *Steller's Bestiary: Simia marina* (Figure 41) adds the river otter to the list of species observed by Steller during the Bering Expedition, remarkably describing rare behavioral and distributional data of that species which were only documented in western scientific literature several centuries hence.

Figure 41. Sandra Talbot, *Steller's Bestiary: Simia marina, 2020.* Charcoal, gesso, acrylic. 30 x 48 inches x 2 inches (photo credit, Mike Conti**).**

CHAPTER 7. Coda: What Does a Sea Monkey Have to Do with a Field of Daisies?

"There is a strange power in the joining of unlike things."

(Beacham et al.)

All unknowing, Steller probably encountered traces of the 'sea monkey' while ashore on Nagai Island in July 1741, in the form of "the track of an entirely unknown animal…[that] resembled the track of a wolf but by their expanse and great size of the claws indicated that a different and larger animal…" (Steller, in Golder 1925, 80). Given that my hypothesis of the species identity of the 'sea monkey' is true *and* reflects objective reality (or, perhaps, a "real object" (Harman, 9)), we can say that the relatives of Steller's sea monkey, perhaps even its direct descendants, are alive and well on Simeonof Island, eating, sleeping, breeding, swimming in the ocean, gamboling down the old cattle trails, spreading invasive daisies across the island wilderness.

At least they were as recently as 2014.

And what of those who want the mysteries to stay mysteries, those who don't want to know that that sea monkey, that cryptid, that sometimes mythago, is really just a mundane terrestrial mustelid[84] swimming in an unexpected place, those who would rather believe there is something else out there, something mysterious, but something that can never be solved? Perhaps

[84] The river (or 'land') otter was known to the Unangan people; in her paper "Animal World of the Aleuts," anthropologist Lydia Black wrote "The Aleuts distinguished the amphibians by species, overriding the postulated distinction between land and sea 'warm-blooded animals.' They included in the class of amphibians the land otter and the beaver" (130). Contemporary western science uses the term 'amphibian' differently: within that scientific culture the term is used to describe a certain taxonomic class of vertebrates that includes the frogs and toads, newts and salamanders, and cecaelians, and would refer to beavers and land otters (and other species) as 'amphibious' and not as an 'amphibian.' Black attributes the term 'amphibian' to Father Ionna Veniaminov (1840) whose data "suggest[ed] that the [Aleut] class of animals was… subdivided conceptually into land animals and 'amphibians'; my data suggest that such sub classes were "unnamed categories" (Black 128). Amphibians (in the western science sense) occur on mainland Alaska, but there are no amphibians in the Shumagin or Aleutian islands and likely they would not have been known to the Unangan or Alutiiq people. I suspect that the noun 'amphibian' as attributed by Veniaminov really meant the adjective 'amphibious' (simplistically, able to function or live on both land and in water) and this single example points out the importance of defining terms used differentially across cultures, time and space, to facilitate communication.

they can be satisfied that there are plenty of other wondrous mysteries left in the world. After all, delving into mysteries is one of the things art and science have in common.

Scientists and artists both make sense of the phenomena that surround us by looking behind and beyond appearances to create novel representations of objects, generate novel concepts, and sometimes, as suggested by Heylighten and Petrović (5) develop novel languages. These processes help us to critically examine our accepted assumptions and explanations and search for deeper insight though an ongoing process of experimentation, exploration, trial-and-error, assembly and comparison of disparate objects and materials, and "by using make-believe" (5) while still and always interacting with physical materials or processes. The latter methodology distinguishes both artists and scientists from philosophers, who search for understanding largely or solely via thought processes (5). Artists and scientists rely on feedback mechanisms to 'correct' ideas that initially fail or are inefficient, although the feedback mechanisms often differ. Heylighten and Petrović suggest that the methodologies of artistic and scientific creativity rely on *stigmergy*, a self-organizing coordination between actions that was originally described in social insects (for example, termites) in which certain actions depend on feedback associated with prior actions (Theraulaz and Bonabeau 97).

But what (and why) is it that artists and scientists create? Do scientists create in order to search for truth, and artists create in order to find beauty (both terms that are, admittedly, subjective), or do they both ultimately create while searching for understanding? Both science and art, wielded independently or together, can inform our personal life, or create universal models (or both), directly or indirectly by uncovering unexpected or unsuspected relationships. What are the underlying patterns that give a target subject structure and meaning, and what/where are their interrelations with other target subjects?

The comparison of Steller's archived descriptions of the 18th century Bering Expedition and my own 20th and 21st century scientific archives from quasi-parallel expeditions unravel the underlying motifs of resource extraction, colonial expansion, invasion and ecological deterioration that recur in different instances, times and places in the islands of the Aleutian Archipelago and allied island groups. This unravelling took decades after Steller's archived writings first piqued my curiosity via the wonder they generated. My concentration on archives from certain islands—those characterized by modern-day biological invasions—perhaps biases the presentation of this unravelling and of these motifs. Still, these motifs (invasion, colonialism,

imperial expansion, habitat degradation and wounded ecologies, exploitation of indigenous human and non-human people on one hand, exploration and accompanying wonder and sense of the uncanny, human and non-human species diversity and resilience on the other) are repeated elsewhere, and often. The 'reveal' of the river otter as Steller's sea monkey is of itself not a discipline-disrupting concept; the universe will not tilt because we know what Steller saw. However, it relied on artmaking that strung together disparate archived experiences—the parallel experiences of 18th, 20th and 21st century scientists experiencing the same landscapes at disparate times and ways, stochasticity and serendipity in the observation of unusual species distributions, the connection between a mundane terrestrial mustelid's behavior and its relationship to invasiveness, and the interpretation of archives within the context of a hypothesis that stemmed from artistic intuition—rather than the careful sifting of granular scientific facts that followed. As such, the 'reveal' required *stigmergy* and stands as a powerful example of how we, as artists, can leverage the products and processes of iterative exploration and experimentation and wondering and wonderment—including the collection and archiving and reimagining of scientific objects and experiences, the nuances of intuitive artmaking, and the patient weaving together myriad threads of seemingly disparate interrelationships that are often sufficiently subtle that they remain otherwise buried deep in the sands of scientific specificity—to generate new knowledge that leads to a better understanding of the processes that have shaped our world.

> There is, indeed, a strange power in the joining of unlike things.

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