

WORKSHOP REPORT: CALL OF THE WILD

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Harriet Ritvo, Arthur J. Conner Professor of History at MIT, and Sally Shuttleworth, Professor of English Literature at the University of Oxford, invited a wide-ranging group of scholars and scientists to participate in a cross-disciplinary conversation about what “wild” means from their diverse perspectives. Hosted at MIT on June 10-11, 2016, the workshop was funded by MIT International Science and Technology Initiatives (MISTI), and co-sponsored by the “Constructing Scientific Communities: Citizen Science in the 19th and 21st Centuries” Project, based at Oxford and supported by the UK Arts and Humanities Research Council.

The workshop was divided into six thematic panels:

- What Is Wild?
- Field, Museum, and Armchair
- Micro Scale
- Invasion/Impurity
- Stalking the Wild
- Wildness and Domestication

There was also an optional visit to Woods Hole, a small harbor community that is home to the Marine Biological Laboratory and the Woods Hole Oceanographic Institution, on Massachusetts’ Cape Cod. This report will synthesize each panel individually, review the conclusions—and questions—that participants reached through discussion, and conclude by using examples from the visit to Woods Hole to highlight the workshop’s major themes.

WELCOME & INTRODUCTION

Harriet Ritvo, Arthur J. Conner Professor of History, MIT

Lately, Harriet Ritvo announces, the “wild” has received attention from academics and popular authors alike. But even those who are critical of the term employ it frequently and are uncertain of its parameters. To paraphrase U.S. Supreme Court justice Potter Stewart, we know it when we see it (at least we think we do). “Wild” is often used alongside other words like wilderness, nature, pristine, and untouched, which imply a stability or stasis that is unsubstantiated once prodded. The goal of this workshop is to tease apart this multivalent term.

PANEL 1: WHAT IS WILD?

On Bewilderness (with Acknowledgment and Apologies to Bill Bailey)

John Durant, MIT Museum Director and Adjunct Professor in STS, MIT

From 'Nazi Cows' to 'Cosmopolitan Ecological Engineers': Specifying Rewilding through a History of Heck Cattle

Jamie Lorimer, Fellow and Tutor in Geography, Hertford College, University of Oxford

The Domestication of the Wave

Stefan Helmreich, Elting E. Morison Professor of Anthropology and Program Head, MIT

In the opening session, we heard from a historian of science, a geographer, and an anthropologist about how humans have attempted and often failed to control or create wildness. In his talk on “bewilderness,” John Durant juxtaposes 21st century ambivalence about how to manage the natural world with the general lack of anxiety about human impact that characterized mid-Victorian natural history practices. To illustrate this shift, Durant contrasts the acceptance of Alfred Russell Wallace’s large-scale collection of specimens (he shot sixteen orangutans himself) in 1856 with public outcry over the recent shooting of a single gorilla, Harambe, at the Cincinnati Zoo in order to retrieve a human child that had fallen into the ape’s enclosure. Why are these cases so different? While some of this is rooted in how attitudes toward animals have shifted since Wallace’s time, the acceptance of great apes as close relatives to humans, and dismay at conditions of confinement, Durant suggests the real difference in these disparate reactions is the result of a 21st century public well aware that nature as they know it is in retreat—and that this retreat is due in large part to human activity.

Jamie Lorimer uses the emergence of rewilding projects throughout the twentieth century to think about human relationships to nature and meanings of the wild in the European context. For German brothers Lutz and Heinz Heck, who began to back-breed domesticated cattle toward the extinct aurochs in the 1920s, wildness was related to claims of purity and autochthony. Sponsored by National Socialist elite, who viewed encounters with primitive beasts as a way to perform their supreme masculinity, Heck stock have been tainted by historical circumstance despite proving themselves hearty and suitable for back-breeding. (Scientists currently engaged in rewilding have dubbed recent breeds “TaurOs” cattle, pointing to Greek instead of German myth.) An ongoing rewilding project is the Dutch nature reserve of Oostvaardersplassen, a relatively unmanaged attempt to recover the Paleolithic environment of Europe. Heck cattle and other back-bred herbivores graze, reproduce, and die on this landscape with less intervention than former rewilding projects. Whereas the original Heck experiment created wildness for human ends, at Oostvaardersplassen wildness means (the appearance of) human absence.

The previous talks established how creatures are made “wild.” Stefan Helmreich emphasizes that the same social construction works on environments by examining how scientists measure ocean waves and seek to domesticate this watery energy that is animated but not organic. The wildest waves are those that are unpredictable: the “rogue wave,” a term that first appeared in 1962 and is defined as a statistically unexpected wave. And yet the wildness of this phenomenon emerges only because scientists had finally measured ocean behavior and

determined how the water was supposed to move. Helmreich agrees with his fellow panelists that wildness is historical. He suggests also that waves themselves are historical entities. Taken together these papers demonstrate that wildness is historically situated and politically embedded.

Discussion Highlights:

- Concepts of wildness and tamedness here all are defined in relationship to humans. Though anthropocentric, Dan Rubenstein reminds that sometimes these relationships are beneficial to non-human animals too. For some creatures, domestication is an advantageous partnership.
- Ellie Bors asks participants to think about language. Is rewilding a misnomer? If this is all done by humans for humans, should we find another word that reflects this relationship? Janet Browne proposes de-domesticating instead of rewilding.
- The keyword of this workshop was “wild,” but participants could not avoid another term of the moment: Anthropocene. John Durant suggests that popular awareness of anthropogenic climate change has inspired many to speak out about how human use and abuse nature. Sites of exhibition (like museums and zoos) are in the front line of critique and this is why the shooting of Harambe garnered such outrage. Still, there is no one response about how to manage or repair the planet. Thus Durant borrows the term *bewilderness* from British comedian Bill Bailey to capture “the compromises of the Anthropocene.” Helmreich too situated his wild waves in the Anthropocene noting that scientists have predicted that rogue waves will occur more frequently due to climate change. Playing on the historical concept of the “vengeful wave,” which Lorimer explained was understood in the religious imagination as a retributive phenomenon, Helmreich dubs the increasingly common rogues “the vengeful waves of the Anthropocene.”
- Is there an ideal type of wildness? Recalling George Orwell’s “Shooting an Elephant” (1936) Berris Charnley suggests that temporary wildness, like an elephant in musth, might be more acceptable than an always wild (i.e. unpredictable and dangerous) animal. And yet Orwell still was forced to kill the animal.
- Which animals get to be wild? Neither endangered status nor charisma will ensure tolerance of an animal’s wild behavior, nor does wildness always result in the killing of that animal. A few examples... Rubenstein explains that when an elephant kills a child in Kenya, the authorities will kill an elephant as retribution—though not necessarily *the* offending elephant. The community doesn’t really care which animal dies, but wants validation that human life is more important than non-human life. Durant suggests that the shooting of Harambe pushes back against Rubenstein’s example, since some have said that they would have preferred if the child were not rescued (though some of this outcry is embedded in the complex racial politics of the United States). Michaela Thompson points out that it is only the charismatic megafauna (and usually ones that are removed from their natural habitats) around whom these debates develop. For example, the orca whale Tillicum, involved in the deaths of three humans, is still alive. Rubenstein notes that the Harambe case is made more complicated because we impose human values and expectations on these closely related species, though scientists, if not the general public, know that great apes practice infanticide.
- Humans too go wild. Gowan Dawson returns to the politics of collection to make this

point. Naturalists preferred to ship collected animals back dead rather than alive. If dead from the start and preserved in spirits, the animal had a better chance of “surviving” the journey, whereas if it were alive there was a greater chance of it being mistreated, disfigured, or lost. The concern here is about the misbehavior of the human crew.

PANEL 2: FIELD, MUSEUM, AND ARMCHAIR

Citizen Science: Generating Biodiversity Understanding and Connection with Nature in a Changing World

John Tweddle, Head of the Angela Marmont Centre for UK Biodiversity, Natural History Museum

Drawing Boundaries around the Wild: Botany and the Illustrated Victorian Periodical
Geoff Belknap, Postdoctoral Research Fellow, University of Leicester

Building Connections: Citizen Science and a Sense of Place
Chris Lintott, Professor of Astrophysics, University of Oxford

This panel about contemporary citizen science projects considers how scientists foster relationships between the general public and their environments. Within the UK, citizen science participation is founded on a long tradition of fieldwork by amateur naturalists. Without the observations of amateurs, scientists would lack the majority of their data. But the increasingly urbanized European lifestyle threatens to undermine public participation in these projects, since a perceived absence of nature in cities results in potential disinterest in natural history surveys. John Tweddle’s task is to prove to these urban-dwellers that the natural world is everywhere. He does this through projects like the OPAL Bugs Count, which requests 15-minute surveys in order to determine how urbanization and the structure of cities impacts invertebrate distribution, abundance, and functional diversity. The data is immediately beneficial to scientists and contributes to urban-dwellers’ investment in environmental health.

Geoff Belknap reflects on his citizen science (and humanities) project “Science Gossip,” which asks users to populate botanical images from 19th century journals and published illustrations with metadata to produce both historical and scientific data. Belknap contrasts how “Science Gossip” participants encounter images, removed from their original context and out of order, with how Victorian readers would have consumed them. In periodicals like those published by William Jackson Hooker, readers would first see a long textual description of the plant and the region from which it was extracted, before finding a black-and-white illustration of that plant, which had been copied from a dried specimen on an herbarium sheet. The context of this Victorian encounter is lost in the translation to “Science Gossip,” though the periodicals are extant and available for consultation.

Chris Lintott discusses what draws users of Zooniverse, a citizen science web portal that relies on amateur volunteers to process data, to participate in particular projects. Lintott has, at least anecdotally, noticed a homing instinct among the public. While people may be excited by the exotic, they are also interested in the familiar and he wants to play on this instinct to engage Zooniverse users. This hypothesis plays out in the Penguin Watch project. While users diligently

tally the birds, the message board reveals that they are most intrigued by the very familiar but out of place post office building. They want to know why this reminder of home is in what otherwise seems an entirely wild environment. But if we really want to know what wild means in the contemporary moment (to scientists, the public, legislators), Lintott argues that space exploration will yield answers.

Discussion Highlights:

- Is the universe wild? Lintott explains that there is already a protected region on Mars where photos suggest there are traces of briny water. (If there's life on Mars, it's here.) An international accord prohibits spacecraft from landing in this area so as not to contaminate this potentially significant landscape. John Durant has seen an online debate about turning the entire planet of Mars into a conservation area. Durant suggests that presently it makes no sense to turn Pluto into a protected area because contact isn't yet possible; however, once contact and human contamination is possible, conservation debates will begin. There is historical precedent for this preservation—moon exploration. Rovers can't drive within two miles of Apollo 11's Lunar Module *Eagle*. But is this historical preservation or scientific? Political? (The moon landing site is protected by the U.S. Congress whereas potential sites of alien life are protected by the United Nations.)
- The citizen science boom is tied into scientists' reliance on grants, which often require outreach. But most participants are blissfully unaware that this professional/amateur relationship is mandated by the funding structure of scientific research. But as Tweddle, Belknap, and Lintott observe, citizen science projects are entirely necessary to deal with the problem of too much data.
- Sally Shuttleworth brings up the changing scale of science within universities. Many disciplines no longer research whole animals. In these arenas, the expertise of amateur naturalists is no longer relevant.
- Caterina Scaramelli asks about the relationship between activist science and citizen science. Lintott responds that activists have an investment in science, even if it is for political ends. He is interested in enrolling people in citizen science projects who are science hostile or inattentive.
- And what about the exclusive term "citizen?" Participants agree that it is a problematic term, but on a practical level it would be difficult to change because "citizen science" is the term that government funding agencies recognize. Tweddle prefers participatory or collaborative science.

PANEL 3: MICRO SCALE

Small Beasts: Wildness in the Microbial World

Emily Zakem, Ph.D. Candidate, Department of Atmospheric Sciences, MIT and Noelle Held, Ph.D. Candidate, MIT-WHOI Joint Program in Oceanography

Domestications and Ecologies of Production: Notes on Farmstead Cheesemaking

Heather Paxson, William R. Kenan, Jr., Professor of Anthropology, MIT

Collecting the Wild: Scientific Practice and Nineteenth-Century Natural History Periodicals

Matthew Wale, Ph.D. Candidate in English, University of Leicester
Discussion Highlights:

Emily Zakem explains that the word “wild” is used frequently in microbial biology. For example, “wild type” to describe the typical phenotypes of an out-of-lab organism, or “wild” microbes in the sense that scientists have not yet figured out how to cultivate them in the lab. (Domesticated microbes are those that can be cultivated.) The significant majority of bacteria and archaea, which constitutes almost half of the earth’s biomass, is unmapped. Does this inability to know or control “the unseen majority” constitute a kind of wilderness? If so, how does this relate to the dominant conception of wilderness as a pristine environment? Remember that microbes, which are resilient and evolve rapidly, tend to degrade biodiversity—e.g. algal blooms—and therefore are seen to contaminate the natural world (of which they are, of course, a part). Antibiotic-resistant bugs are another kind of wild microorganisms. Though these microbes are wild in the sense that humans are unable to control them, they have evolved through direct or indirect human intervention. Recognizing these interconnections yields a new understanding of the planetary ecosystem with humans as an intermediary.

Heather Paxson’s anthropological assessment of artisanal cheesemakers offers a different take on the domestication of microbes. She argues that while her artisans cannot identify the majority of microorganisms present in the cheesemaking process, they still domesticate the microbial life of their cheese, i.e. they make the bacteria familiar and desirable. This multi-species domestication begins with the production of milk by pregnant female ruminants. The proximity of the cheese house to the working farm creates danger for the transmission of the wrong kind of bacteria to the cheeses, but this proximity to the goats, sheep, and cows is also part of what the artisans are selling. The artisans allow the cheese to age in the “cheese house.” There they control the growth of bacteria through “turning,” (a process that one cheesemaker likened to mowing the lawn) which promotes the growth of the right kind of bacteria. Paxson concludes that post-Pasteurian cheesemaking in no sense allows cheese to run wild.

Natural history is typically presented as a science predicated on fieldwork. But Matthew Wale explains that 19th-century periodicals and the penny post reshaped the practice while changing the relationship between naturalists and their specimens. Periodicals facilitated trade among naturalists, who could now “collect” specimens that they would never encounter in their particular natures. Publications that were printed year-round allowed naturalists to trade even in the winter season when weather prohibited active collecting. These affordable periodicals also allowed engagement with natural history across class boundaries. For example, a working class razor-grinder demonstrated his skill at identifying and breeding entomological specimens by publishing articles and inviting correspondence from other readers. Without such a network, this man’s engagement with the scientific community would have been much more limited. Thus, while the periodicals may create distance from the field, they brought the wild into the homes of a much larger community of naturalists.

Discussion Highlights:

- Geoff Belknap remarks that wildness is predicated on being able to see, or otherwise apprehend. In order to conceive of or limit what is wild/domesticated, we need tools to

measure these things (like telescopes big enough to see the universe). But seeing is accompanied by epistemology, reminds Stefan Helmreich. He recalls one of Paxson's interlocutors, a Benedictine nun who is also a microbiologist and cheesemaker. What the nun sees through the microscope is to her further evidence of God's Creation.

- Is wildlife changing? Historically, John Durant notes, the wild has signified flora and fauna. Will the definition of wildlife shift now that we are aware of the masses of microorganisms?
- Can we conceptualize wildness outside of the human experience? Belknap observes that all of these papers have shown how wildness is defined in relation to humans. Would a wildness be less muddled if we remove humans or would it be impossible to define? Similarly, Michaela Thompson points out the inherent value judgments related to wild things, like the probiotic bacteria in the human microbiome versus antibiotic resistant bacteria.
- Paxson notes that the hope and promise that surround "good" microbes are not necessarily attached to a wilderness or frontier discourse. There are other models for comprehending biotic possibility.
- Janet Browne wonders if this discussion is about a different sort of wild. Are we actually talking about life or biodiversity here? Dan Rubenstein agrees that the discussion has shifted, which he attributes to scale. At the macro level, we know the wild when we see it or when we have lost it, especially due to human action. At the microbial level, we don't recognize the boundaries and the implications of intervention—for example, treating domesticated animals with antibiotics and treating ourselves by drinking their milk, which ultimately changes our development.
- Berris Charnley asks if conservation movements would have happened without ambivalent boundary concepts of wildness. These ideas are useful to manipulate and mobilize. Harriet Ritvo comments that the danger of undue clarity may not be all that pressing. Articles in the Sierra Club magazine, for example, are careful not to describe places as pristine or virgin, but advertisements in that same magazine preserve this problematic language. Both the uncritical and the problematized meanings of wild can operate at the same time.
- The microbial world does not fit neatly into existing taxonomies (though nor does the organismic world). Janet Browne suggests that instead of imposing imperfect taxonomies, we take inspiration from the impossible-to-delimit microbial world to organize the organismic one. Zakem seconds this, explaining that scientists think of microbes in terms of function rather than taxonomy. They develop tools to study microbial systems, rather than individual microorganisms, as a way to bypass the domestication of culturing.
- Macro- and microorganisms are mobile. Matthew Wale's presentation helped us think about the mobility of natural history specimens. Jia Hui Lee connects this trade to present-day anxieties about the movement of microbes and dangerous organisms across state or national lines. The FDA's cheese regulations illustrate these fears. When the ontology of something is unclear and things are hard to classify, regulatory bodies get nervous.

PANEL 4: INVASION/IMPURITY

Rogues and Wild Relatives: Purity and Wildness in Early-Twentieth-Century Genetics

Workshop Report: Call of the Wild
June 2016

Berris Charnley, Postdoctoral Research Assistant, St. Anne's College, University of Oxford

Weeping in the Wild

Mary Kuhn, Mellon Postdoctoral Fellow in the Literature Section, MIT

Invasive Species, Shifting Geographic Distributions, and Genetic Legacies

Ellie Bors, Ph.D. Candidate, MIT-WHOI Joint Program in Oceanography

Berris Charnley charts a shift in the understanding of rogues from the Darwinian sense of ancestral influence to a genetic sense of impurity at the beginning of the twentieth century. He focuses on wheat varieties to unpack the wildness of these new types of rogues. By comprehending the role of gametes, carriers of genetic information, to the genetic identity of offspring, geneticists declared that they could ensure fixity of character and purity of strain. Still, there was a demand for plant variety. So geneticists collaborated with plant breeders and explorers to import new strains of wheat with desired traits. In advertisements, geneticists promoted these hybridized strains as fixed, in the sense that they were proof for their genetic theory and evidence that wild ancestry could be scientifically eliminated (though the biogeographical wildness of the imported plants remained). Charnley argues that the genetic revolution was underwritten by these imported collections, the communities that tended to them, and the colonial links that enabled their creation.

Grief is a wild state according to Mary Kuhn, who teases out its affective wildness in Cheryl Strayed's *Wild* (2012) and Helen Macdonald's *H is for Hawk* (2015). In both stories, the loss of a parent unmoors the author and an encounter with the natural world brings comfort and recalibration. Strayed hikes the Pacific Crest Trail with deliberate transformation in mind, hoping to return to the person she had been before her socially aberrant wild behavior. Before completing the PCT, Strayed's wildness was a negative characteristic. After the ordeal, she defines wildness positively as self-possession. Macdonald distinguishes between the wild and ideas about it, choosing to encounter wildness in the cultivated fields of Cambridgeshire by bringing the goshawk, Mabel, into her home. For humans, the hawk as hunting partner can reclaim wildness, power, and virility. But the hawk is just being a hawk. Wildness is always a projection. Kuhn encourages us to look beyond the personal memoir for the affective dimensions surrounding the wild.

Ellie Bors introduces "invasive" as another problem word akin to "wild." Typically, it is situated at the negative end of a spectrum from native (long established), to non-native (introduced), to invasive (ecologically destructive). Bors offers the lionfish, "perfect invaders" that reproduce year-round and have no predators in invaded areas, as an example of an invasive species that produces ecological explosion. Now densely populating the Caribbean, lionfish are generally accepted as an invasive species. But value judgments are obviously embedded in the labeling and charismatic species tend to avoid the designation. Bors points to Ken Thompson's *Where Do Camels Belong?* (2014), which provocatively challenges these labels by arguing that camels too are invasive. What then are the appropriate temporal and spatial scales for defining invasive species?

Discussion Highlights:

- Are humans an invasive species? Bors sometimes jokes that humans became invasive once they expanded out of Africa but didn't want to sincerely make that claim. Harriet Ritvo says she wouldn't hesitate to label humans as the first invasive species, especially because the domesticated plants and animals that they introduce radically transform ecosystems.
- These papers underscore the anthropocentric nature of wildness and its pejorative synonyms. As an undergraduate suggested to Bors (in response to a question about the temporality of invasiveness), "When everyone who was alive when the species invaded is dead, then the species should no longer be considered invasive."
- What is invasive in one place, may be charismatically wild in another. For example, camels are culled in Australia, while exhibited in the United States. The working definition of invasive species among scientists is animals moved by human agency that cause severe damage to an ecology, though acceptance of anthropogenic change destabilizes this definition.
- What is the benefit of purity? For Strayed, Kuhn explains, it relates to her need to get clean. She hikes through these landscapes, littered by the rubbish that other hikers have left behind, but somehow achieves purity and a return to an imagined Edenic state by traversing an obviously ruined Eden. At the literary and spiritual level, this works. Bors wonders why purity is desirous among scientists. She explains that it is strange to seek a uniculture when it is biodiversity is better for an organism's and environment's long-term health.
- Janet Browne highlights recently published works about humans attempting to become nonhuman. See Charles Foster's *Being a Beast* (2016) and Thomas Thwaites' *GoatMan* (2016). The wild is both a place where we can situate our humanity and find ourselves (as Kuhn's examples demonstrate) and a place where we can escape ourselves through the act of living as another animal.

PANEL 5: STALKING THE WILD

Rewilding Citizens Not Landscapes: Democratizing Science and Why It Matters
Daniel Rubenstein, Class of 1877 Professor of Zoology, Department of Ecology and Evolutionary Biology, Princeton University

Stalking the Serengeti: Using the Power of the Crowd to Study the Natural World
Ali Swanson, Junior Research Fellow, Wolfson College, University of Oxford

Biting the Hands That Feed
Michaela Thompson, Ph.D. Candidate, History, Anthropology, and STS, MIT

Rewilding projects transform "managed" landscapes into "wild" areas by reintroducing species closely related in form and function to extinct animals. The goal is to create functional ecosystems that operate without further human management. But there are unintended consequences, Dan Rubenstein warns, such as the production of novel ecosystems and ethical issues related to the creation of new human-animal relationships. Instead, he proposes rewilding the public, i.e. creating a relationship between humans and existing environments. Rubenstein

describes a successful “rewilding” project at Nairobi National Park, which has had trouble attracting visitors because of its proximity to the city. (Park visitors didn’t want skyscrapers in their wildlife panoramas.) The park enrolled the public in a census of its zebras. Visitors, including many locals, took photographs of animals; photo recognition software prevented double-counting any individuals. The project simultaneously created public enthusiasm about this conservation area and generated valuable scientific data about the park’s zebra population that will aid conservation efforts.

Ali Swanson considers the Zooniverse citizen science project “Snapshot Serengeti” as a case study of the intersection of technology and conservation. Typical tracking technologies like radio collars are invasive and can impact survival statistics. The 225 camera traps Swanson has installed in Serengeti National Park are not invisible, but they do capture photos that would otherwise never be seen. “Snapshot Serengeti” asks users to tell scientists what animals are represented in this massive dataset, including filters and reference images to help users feel confident in their conclusions. Publicized as a way to access the “secret lives of Africa’s most elusive animals,” “Snapshot Serengeti” has been wildly successful. Swanson suggests there is something compelling in this call to explore the perceived wild parts of the world that goes beyond the Internet’s obsession with cute animals. But is this more than outreach? Can scientists get good data? Yes. The project sends every image to multiple users and it does not allow users to answer “I don’t know,” ultimately aggregating these responses into a consensus dataset that scientists are confident using. In addition to producing data, technology allows the public access to wild places in safer and less destructive ways.

Humans encounter sharks in a variety of ways. Cage diving encounters, which Michaela Thompson dramatically narrates, are created through a carefully orchestrated suite of practices that bring humans and sharks together. The ocean location is chosen for shark proximity, while chumming and bait attract the carnivores. Cage diving is big business, especially in Thompson’s field site of South Africa. But these desired encounters have led to censure about the potential for undesired encounters, the disruption of ecosystems, and concerns about the caloric expenditures required of these enticed sharks. Some of the harshest critics allege that chumming changes sharks’ behaviors in relation to human and puts other water-users in danger. True or not, fear of the bait-and-trained shark has sparked vigorous public debate and influenced water protection measures. Thus, while ecotourism has been presented as a panacea for conservation, we must consider its consequences for the humans, animals, and environments.

Discussion Highlights:

- Do we need a category between wild and domesticated? Thompson proposes bait-and-trained sharks, which act violently and unpredictably but probably not naturally, as boundary animals.
- Geoff Belknap noticed that these papers all used cameras as interlocutors. Is the image enough or is a more visceral or intimate engagement with nature something that humans need? The panelists agree that images tend to be either a starting point that sparks a desire for a physical encounter or a souvenir of that encounter.
- Berris Charnley remarks that (perceived) authenticity united these papers. Thompson notes that tourists don’t see the artificiality.

- Panel 2 highlighted the funding hurdles of scientific research. Conversely, do these lucrative ventures need science? Because of fierce competition among tour operators, Thompson explains that some companies try to attract customers by claiming they are doing real science and have PhDs on staff. But in some regions, like Swanson's Tanzanian site, there is real tension between the tourist economy and the research community. There are concerns that tagging and other research interventions might disrupt tourists' imagined wild, though some seem to enjoy encounters with researchers in the park.
- Are these wild animals commodities? Do conservation projects and tourist economies, which favor charismatic species, do damage by valuing some animals over others? In Rubenstein's experience, the charismatic species become poster-creatures for the entire environment. They earn the protection of their habitat and so other animals benefit too. Sharks are certainly commodified, but this has not ensured that their environment is protected. The waters around South Africa are being exhausted by Chinese fishing operations. The ownership of a landscape (or seascape) and the nature of the economy matters.

PANEL 6: WILDNESS AND DOMESTICATION

The Impact of Pets on Encounters with Wildness

Janet Browne, Aramont Professor of the History of Science and Chair of the Department of the History of Science, Harvard University

The Domestic Cat: Family Pet or Wild, Solitary Predator?

Lauren Finka, Research Fellow in the College of Science, University of Lincoln

Nostalgia for the Wild: The Industrialization of Truffle Tree Orchards in France

Peter Oviatt, Ph.D. Candidate, History, Anthropology, and STS, MIT

Janet Browne explores how petkeeping practices and the portrayal of wildlife by mass media together blur the boundary between wild and domestic—and how this blurring can lead to misconceptions and occasionally dangerous encounters between humans and other animals. In the past five years in North America, 17 humans have been killed by wild bears, 6 by sharks, and 4 by mountain lions. But these numbers seem modest when compared to the 37 humans killed by domestic dogs in 2010 alone. Still, the attacks by “wild” animals are avoidable and often occur because the humans are intruding on an animal's territory or otherwise acting foolishly. Why? People's relationships to their pets may provide an answer. Browne refers us to *The Expression of Emotions in Man and Animals* (1872), in which Charles Darwin used anecdotes about pet dogs to argue that animals' emotional and intellectual abilities are related to humans'. Darwin used the familiar and domestic to transform the natural world into something less threatening and to assuage anxiety about humans' animal ancestry. Browne also points to Dmitry Belyaev's fox domestication project, begun in Siberia in the 1950s, which produced behaviorally and morphologically tamed foxes within two decades of selective breeding. One implication of these instances is that the wild might always be seen as potentially tame. And a consequence of mass media depictions of wild animals more broadly is that the wild might seem always to be a representation, even when encountering it in the flesh—or as flesh. The history of

domestic pets has played a part in creating this misconception.

Lauren Finka focuses on the ethology of cats, particularly in relationship to humans. Cat domestication likely originated in the Middle East around 8,000 years ago in agricultural areas where localized grain stores attracted vermin on which bold wild cats preyed. The humans would have tolerated the bold cats that hunted well, though they continued to roam free and interbreed with cats that never approached humans. As an animal ethologist, Finka asks if modern domestic cats are truly domesticated. Genetically and morphologically, domesticated cats remain similar to their wildcat ancestors. What about behaviorally? Wild types live as solitary hunters, though they are prey for other predators, and they spend much of their time foraging and exploring. Domestic cats are confined to smaller territories, are less stimulated, and often share space with unrelated animals. Some cats adjust better than others, as they have evolved to be more socially malleable than their ancestors, but it remains difficult to communicate with these ancestrally asocial animals. In the meantime, humans can appreciate the potential pressures of life as a family pet and work to mitigate those pressures.

A Frenchman named Dominique, whose family had achieved success in the wine industry, has recently acquired a truffle tree nursery. Anthropologist Peter Oviatt wants to understand why Dominique would leave behind a reliable industry for this risky venture. The truffle, it turns out, is the new frontier. Dominique's family had learned how to tame grapevines and he wanted a challenge. Oviatt describes Dominique's impulse as a "wild nostalgia," playing on Renato Rosaldo's "imperialist nostalgia," defined as a lamentation for the destruction of nature in which the lamenter has a hand. Oviatt explains that when yoked to nostalgia, wildness indicates a personal adventure that is embedded in familial, regional, and national histories and values. Truffles in their wildness are doubly valuable to the hopeful cultivator. Their cultivation promises financial gain along with domination of nature. But wildness is fleeting; once truffles are turned into a standardized crop, their wildness vanishes and their value along with it.

Discussion Highlights:

- What are the stakes or implications of anthropomorphizing? Browne explains that Darwin used it as a methodological device. The qualities Darwin attributed to zoo animals and his pets were qualities of respectable, middle-class Londoners. This was a strategy, playing on his readers' presumed position as pet-owners, to demonstrate humans' position within rather than apart from the natural world.
- Anthropomorphizing or projecting human experiences upon animals is hardly an accurate way of gauging animal experience. Finka has been developing techniques to detect pain in the facial expressions of felines. An informal survey of the participants (images were shown and hands were raised) yielded no consensus as to which cat was in pain and which was pain-free because the physical cues are so subtle.
- What does "wild type" really mean? Finka notes that "wild" can refer to an animal's phenotype or genotype. But the history of hybridization is so long and muddled, it isn't always clear what wildness looks like at the genetic level. Perhaps wild phenotypes (or rather, the right kind of phenotypes) are more important to a wild life.
- Truffle cultivation is a multispecies endeavor. Farmers plant entire orchards and cannot predict where the truffles will grow, so they rely on animals to locate them at their peak.

Some traditional truffle hunters employ pigs, but they like to eat the truffles. So dogs are usually the animals of choice. There have been attempts to create a truffle-finding machine, but thus far the dog is that machine.

CLOSING REMARKS

Sally Shuttleworth, Professor of English Literature, St. Anne's College, University of Oxford and Gowan Dawson, Professor of Victorian Literature, University of Leicester

In her closing remarks, Sally Shuttleworth comments on themes that emerged across the panels, including: new frontiers, the wild within, nostalgia, and anxiety coupled with attraction to the natural world. She also points to the romanticism and anthropomorphic nature of Jack London's 1903 adventure novel from which we have borrowed our workshop's title.

Gowan Dawson revisits the spatial and temporal aspects of wildness. Alfred Russel Wallace's "primeval forest," is an example of both. The naturalist is working in a distant and arguably wild place, which he conceives of as set in a distant time as well. Compelled to return to language, Dawson reminds us that "wild" is an overdetermined and multivalent term. He also stresses that wildness and language are antithetical. In speaking about the wild, we populate it with human presence, despite the fact that a primary definition of the word suggests human absence.

Discussion Highlights:

- What does the wild look like? Berris Charnley refers us to an essay in *Uncommon Ground* (Anne Whiston Spirn's "Constructing Nature: The Legacy of Frederick Law Olmsted") that contrasts the artificiality of Central Park with the fact that most visitors consume it as a natural occurrence. Harriet Ritvo mentions that in her undergraduate environmental history course she shows students an image of Central Park. When asked if it is natural, most students answer affirmatively. But when Ritvo shows them an aerial image of the park, revealing its geometric design, the students question their initial response.
- Is wildness somehow an American quality? Sally Shuttleworth pointed to Jack London's nostalgic and masculine version of the wild, a historically-situated form of the American wild. Peter Oviatt's truffle farmer, Dominique, certainly believed wildness to be particularly American. He told Oviatt that he admired him and other Americans because they preserved an adventurous nature best of anyone.
- Certainly the wild can be linked to nationalism. Speaking as a Canadian, Geoff Belknap notes that his homeland's wildness is a cold wild. But it is also idiosyncratic. Ellie Bors reminds us that there are many personal baselines for that dictate one's conservation ideals and opinions about the natural world. Emily Zakem points to the class differences that influence encounters with wildness. Some people vacation in national parks, some visit cabins in the woods, others only have access to public parks.
- What would it mean to an animal for something to be wild? How would you transpose that category? The participants struggled for an answer, as we have already agreed that the wild is an anthropocentric category. Michaela Thompson jokingly suggests that family pets have reason to be wary of toddlers, which are a wild (i.e. unpredictable) type

of human. Lauren Finka proposes that wild humans are the ones whom roaming or feral cats fail to enroll into the community that habitually feeds them.

- Naturally, the beaver (MIT's mascot) made its way into our closing remarks. Sally Shuttleworth explains that beavers are being re-introduced in some parts of England in order to manage the landscape. But since these animals change landscapes, often drastically, Shuttleworth predicts a beaver problem in the near future. Michaela Thompson notes that there have been similar problems in the United States. In Maine, custodians of a managed wetland are using "beaver deceivers" to distract the animals from creating dams in areas that are intended to be flow freely. Lauded as the engineers of nature, the beaver is an appropriate totem animal for this workshop.

WRAP-UP AT WOODS HOLE

After two days of talking about the wild in a comfortable classroom, participants ventured into the field to reflect on the workshop themes. Our chosen field site was Woods Hole, a community located in Falmouth, Massachusetts at the base of Cape Cod. Once a bustling port town, Woods Hole now is known as a hub of environmental research. The Marine Biological Laboratory (MBL) and the Bureau of Fisheries claim Rachel Carson as their most prominent researcher and the Woods Hole Oceanographic Institution (WHOI), which awards doctorates in concert with MIT, boasts itself as the foremost non-profit organization for ocean research and exploration.

We traveled the 80 miles to Woods Hole on chartered bus along an interstate system that some might perceive as devoid of nature. But along the way there were uncomfortably frequent reminders—roadkill dotted the highway—that encounters between humans and the rest of the world are messy.

Ellie Bors and Noelle Held took the group to the Woods Hole Ocean Science Exhibit Center, where participants could see models of ships, like the submersible human-occupied vessel (HOV) *Alvin* that explored wreckage of the *Titanic*, and retired research vehicles, such as the autonomous underwater vehicle (AUV) *Remus*, which survived multiple shark attacks and captured footage of this particularly modern type of shark-scientist encounter. Encounters with the wild are necessarily mediated.

WHOI graduate student Casey Zakroff took participants on a tour of the Environmental Systems Laboratory, where he researches how ocean acidification impacts the hatching time and size of squid. We filed through the lab, perpetually damp because of the seawater that is pumped for experiments, and peered into long plastic tanks that held a handful of sea creatures. Zakroff's acidification experiment was not running during our visit because its infrastructures (consisting of PVC piping and plastic trash bins) needed fine-tuning.

Ultimately, the Woods Hole visit had little to do with the wild. The taco shack in which we ate lunch was touristy. The rocky beach on which we watched the waves had a lifeguard tower. The roads on which we walked were paved. The dock on which we sunned ourselves and sipped beer was moored securely to shore. The wild was nowhere to be seen. But that's the thing about the wild—we only seem to know it when we see it.