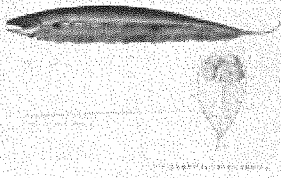


## Meeting 9 • 04 February 2014

**Week 4 (cont'd.): Plants – what they found, where they found it, why it was there, how they used it • Week 5: Week 5: Animals – Getting beyond Monsters, Jaguars, Eels, and Bambi**

Version:  
2/4/14

picture of the week



electric eel (top) and  
freshwater dolphin  
(bottom)

thought-bite of the week:

**"In this paradise of American jungles, as everywhere else, a long, sad experience has taught all living beings that gentleness is rarely linked to might."**

(Humboldt, "Personal Narrative", from *Jaguars and Electric Eels*, ed. & trans. Wilson, p. 66)

mini-text of the week (start):

**"In Calabozo, in the middle of the llanos, we found an electric machine with great discs, electrophori, batteries and electrometers..."**

Humboldt, "Personal Narrative", from *Jaguars and Electric Eels*, ed. & trans. Wilson, pp. 57-8, 62 ([read more](#))

### Topics for today (key to symbols)

(5') Thought-bite of last week (species differentiation and hypotheses) and last Sunday's folk holiday: ground hogs, marsupials, and the difference between Old World and New World creatures - including the philosophical & theological implications. This week's thought-bite: "Nature red in tooth and claw"; relation between human beings and Nature; what are the many meanings and applications (scientific or otherwise) of "change", "evolve", "evolution"?  
Leftover from last meeting: cladistic

(15') Billions of burgers, zettabytes of data, specialization of knowledge, and critical thinking/reckoning

Partner activity: How many burgers can we get from 100,000 beeves? Followed by obituary of Fred Turner and mention of an article about explosion of quantity of available data (and how to store it).

SINQing the Humboldt canoe:

1) as material for discussion of curriculum: for math: age-appropriate activities; "spiral" syllabus; calculus?! AP?! Which other subject areas did we address / could be addressed?

2) food for thought: How do you know where you learned X? How do you know that what



you learned is really true? How/When did you learn how to learn?

We never answered the question, So what could that boat hold?

importance of DATA (for Humboldt, for us; about Humboldt); example: how many position measurements did H make in a day? How many other measurements?

Sources of errors in collecting and using data. Example: detecting non-solar planets

Some data-rich docs we can't spend much time on (but could be the subject of projects): the full narrative; econ of Mexico; later views of AvH: was he too data-driven to see the Big Picture.

Review and expansion of quantification activities, with application to food. A story that includes a story problem: How do nursing mothers do it? Rough calculation vs. precise calculation. Relation to food and energy needs of explorers. What did Lewis & Clark and the "Party of Discovery" Eat? (some other time: what ate them). How does that compare to your diet? How is nutritional research conducted - how do we get, so to speak, a window into the stomach? see book review candidate *Catching Fire: How Cooking Made Us Human*

(10') How people back then became scientists (matter of class, money, educational system, sex; earlier words for "science" and "scientist", since "scientist" wasn't used in its modern sense until the mid-19th Century; example of two British geologists; caution about "presentism" (projecting our world onto the past). Check question: when did astronomy and astrology become pursuits that were distinct from each other?

(10') Review of "Standards/ My Education" writing assignment: example of preK reading assessment. Small groups discuss own experiences. So how could the standards descriptions help you get a job? What did Humboldt "major" in, how did that help him "get a job", and how (much) did he plan his career?

(20') Activation of book review assignment:

So now they're / we're / you're on board. We're just getting into the systematic discussion of sustainable environmentalism. We're finishing the basic reading (have you?), and now need to branch out for more reading.

about majors and tacit knowledge; specifications, examples of book, books you can take with you today, list of books you can choose from later; examples of high-level book reviews (here: WBF, Jaynes, *Origin of Consciousness in the Breakdown of the Bicameral Mind*); recommendations for some special topics: women in Humboldt's time; religion and science; books on the list that I don't have copies of (use library, etc.).

End of meeting: find a book, if you want one today; more chances next meeting

(05') Looking further ahead (projects, etc.): presentation (continuation) about educational standards and their parts in the course: 1) evaluating own education; 2) helping others to learn - how standards are used to develop curriculum (curricula?) and learning activities. Example of source of lesson plans; article (H0152) "School Gardens Blooming Teach Lessons On Nutrition, Environment, Science, Teamwork". This is preparation for assignments about species description and group projects.

Next meeting: triangulation, including hands-on measurements of distances, heights, etc.; activation of mid-term exam.

Later: what it's like to read Darwin; Humboldt-named species; forming teams and scoping out projects (ideas for group projects); the iconic graphic of Chimborazo; 5) apps Humboldt



would have liked; what shall we do with (to??) the people who haven't revealed their interests and strengths and don't get "on board" when they're needed?

Start reading Stegner book

(05') if time: some more apps

(0') Use your computer/ smartphone map links and applications to trace AvH's route in South America, starting with his travel up the Orinoco and down the Amazon. See Helferich, p. 52 map, but be aware that some place names have been changed over time.

looking ahead: presentation of project ideas (just the ideas, not finished projects) in week \*\*

# Kindergarten test results 'sobering'

### Kitzhaber says students' scores on letter tests show 'scattershot' approach

By Betsy Hammond  
betsy.hammond@oregonian.com

The typical Oregon kindergarten arrived at school last fall knowing 19 capital and lowercase letters and seven letter sounds out of at least 100 possible correct answers, the state reported Friday. During the first days of school in September, every 5-year-old was shown a sheet with 100 capital and lowercase letters and asked to name as many as possible in one minute. The average child named 18.5. They also were shown a page with 110 letter sounds and asked to name as many as possible in one minute. The average child named 6.7.

Gov. John Kitzhaber, in prepared remarks, called the results "sobering" and said they showed that Oregon has a "scattershot" approach to early childhood education. "Things have changed in terms of what is expected" when students start kindergarten, said Jada Rupley, Oregon's early learning system director. "We would hope they would know most of their letters and many of their sounds."

State officials said they have determined, however, what scores on the kindergarten entry test are high enough to show that a student is "ready," and may never do so, Rupley said.

"This is the first year we have done this," she said. "We look at this as a way to begin a conversation, particularly between elementary schools and early childhood programs. She said Oregon needs to do a better job helping students who Please see **SCHOOL**, Page A4

### Ready for kindergarten?

The first statewide assessment of Oregon kindergartners' readiness for school included the following findings.

- On average, kindergartners could correctly name 19 from a page of 100 capital and lowercase letters in a minute
- Correctly pronounce seven from a page of 110 letter sounds in a minute
- "Sometimes to 'frequently' demonstrate interpersonal skills

**Average letter sounds identified in one-minute test**

Asian Americans	12
Whites	8
African Americans	6
Native Americans	5
Latinos	3

How ready for school are the kindergartners in your area? Our searchable database at [schools.oregonlive.com/Kindergarten](http://schools.oregonlive.com/Kindergarten) has results for every Oregon public school with a kindergarten.

# Driver sentenced, forgiven



## State sued by widow of dead prisoner



As we have also seen, British geologists were deeply involved in the race to distinguish and name geological systems with recognisable 'packages' of strata, representing discrete periods of Earth Time. The Transition strata were generally not differentiated or mapped in any detail, but thought to be comprised of an upper sequence of limestone and shale below which lay Grauwackes or Graywackes (another Wernerian term for a kind of dark-coloured sandstone typically associated with the Transition strata). Even the 1820 compilation map by Greenough showed the older Transition, Grauwacke and Primary rocks of Wales, the Lake District, southwest of England and most of Scotland as 'terra incognita'. Indeed, Smith's nephew, John Phillips, wrote:

before the Summer of 1831 the whole field of the ancient rocks and fossils ... was unexplored but then arose two men ... Adam Sedgwick and Roderick Murchison and simultaneously [they] set to work to cultivate what had been left a desert.

As usual, the truth is somewhat more complex.

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George Bellas Greenough, 1778-1855, member of parliament (1807-12), chemist and geologist, co-founder of the Geological Society of London and first President (1807-13, also 1818 and 1833). He compiled a geological map of England and Wales in 1820 that used some of Smith's work and undercut sales of Smith's own map.

The story generally told in books about the history of geological investigation in Britain is that the first systematic investigation of the strata of the Transition rocks of Wales was undertaken by Roderick Impey Murchison and Adam Sedgwick in the 1820s and 1830s. Murchison was of a Scottish family of landowners and minor aristocrats, but their land was relatively poor and provided little in the way of rents. Murchison knew from an early age that he had to make his own way in life and at the age of 15 went to the Military College at Great Marlow and joined a foot regiment in the British army as a subaltern. He

may have got more than he bargained for, as he was immediately involved in the Peninsular War, taking part in Sir John Moore's famous retreat to Corunna over the Pyrenees in winter 1808-9. Thanks to some family influence he was then able to move to a more fashionable mounted regiment of Guards, but in 1815, on making a 'good' marriage at the age of 23 to Charlotte Hugonin, the daughter of a General, was able to resign his commission and 'do' the Grand Tour of Mediterranean Europe with his new wife.

The story has it that, although he was inclined to the usual gentlemanly pursuits of hunting and shooting, Charlotte encouraged him to do something more useful instead. Some versions of the story relate that thanks to a chance meeting at a dinner party, the eminent chemist Sir Humphrey Davey encouraged Murchison to take up geology. Maybe his well-connected wife prevailed on Sir Humphrey to do so. Anyway, Murchison attended geology lectures in London, which sufficiently enthused him to take up the hammer instead of the gun. He soon began independent researches into the geology of parts of Sussex, the northeast of Scotland and the Isle of Arran. He also made useful contacts with the rising stars of British geology and in 1828 geologised with Lyell in France and northern Italy. As a man of independent means he could afford to spend as much time as he wanted in the field, and with his social connections was able to make use of the hospitality of local gentry and aristocracy.

By contrast, Adam Sedgwick, son of the vicar and schoolteacher of the small village of Dent in Westmorland, had done well enough scholastically to gain a sizarship to Cambridge University. This meant that he had partly to pay his way by waiting on his fellow students; it was a well-trodden route for clever but poor students to gain degrees. Sedgwick did exceptionally well, was elected a fellow of Trinity College in 1810, was ordained at Norwich in 1817, and appointed to the Woodwardian chair of mineralogy in the university and a fellowship of the Geological Society in 1818, despite only having a limited knowledge of geology. He soon made up for this deficiency and was the first Woodwardian professor in many years to take his duties seriously. From 1822-4, Sedgwick made the first systematic geological survey of the Lake District (and in 1842 was asked by Wordsworth to write a geological introduction to his *A Complete Guide to the Lakes*), made the acquaintance of Murchison, and together they geologised





in Scotland, Devonshire and Wales in the 1830s and began some detailed geological studies in the Austrian and Bavarian Alps. Sedgwick's time available for field work was constrained to the university vacations and even then he had ecclesiastical duties in Norwich to attend to.

In Wales, the two friends decided to see if they could make geological sense of the unknown terrain of the Transition strata. Sedgwick, with his mathematical skills and greater experience of unravelling structurally complex rocks with folds and faults, started his mapping from the oldest, Primary rocks of North Wales, with the intention of mapping his way south and east. Murchison was to work his way down from a known base line in younger rocks. He did his homework, assiduously picking the brains of any geological acquaintances who knew anything about the Grauwacke strata, such as Buckland and Conybeare. As a result of the advice he received, he started his investigation from the southern end of the Wye valley and worked his way northwards. He drew sketch sections down through the stratigraphic succession from the Old Red Sandstone strata into progressively older but richly fossiliferous strata, noting their characteristics and fossil content as he went. His young wife Charlotte went with him and, being a well-trained and accomplished sketcher of picturesque landscapes like so many genteel ladies of the time, she drew views of geologically interesting and significant features, which Murchison later used in his publications.

In retrospect, Murchison claimed that his mapping in Wales proceeded by 'Smithian' stratigraphic principles. Right from the start he certainly took care, whenever he could, to characterise his rock units by listing their fossil contents. But his palaeontological skills were limited and to begin with he was often basing his mapping on the physical appearance of the strata. For instance, he could differentiate between successions of shales or limestones, but since there is a considerable repetition of these strata types within the overall succession and their fossil content can to the inexperienced eye seem similar, he sometimes got confused. In 1839 Murchison recognised an Upper Silurian made up from higher Ludlow strata and lower Wenlock Limestone, below which was his Lower Silurian comprised of the Caradoc Sandstone and Llandeilo Flags, and then below this lay Sedgwick's Cambrian strata.



Roderick Murchison's wife Charlotte was, like so many of her contemporaries, accomplished at sketching landscapes and provided illustrations such as this view of the Carneddau Hills from the Wye Valley for her husband's 1839 book on *The Silurian System*.



Murchison could afford to publish the lavishly illustrated *The Silurian System* by raising private subscriptions in advance. Here, a woodcut depicts the Silurian Wenlock Limestones near Ironbridge from which the carbonate rock has been quarried for use in the local iron industry.



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 Full Text:

## THE BIRDS

Why the passenger pigeon became extinct.

I imagine that tomorrow morning you woke up and discovered that the familiar rock pigeon-scientifically known as *Columba livia*, popularly known as the rock pigeon-had disappeared. It was gone not simply from your window ledge but from Piazza San Marco, Trafalgar Square, the Gateway of India arch, and every park, sidewalk, telephone wire, and rooftop in between. Would you grieve for the loss of a familiar creature, or rip out the spikes on your air-conditioner and celebrate? Perhaps your reaction would depend on the cause of the extinction. If the birds had been carried off in a mass avian rapture, or a pigeon-specific flu, you might let them pass without guilt, but if they had been hunted to death by humans you might feel honor-bound to genetically engineer them back to life.

This thought experiment occurred to me while reading "A Feathered River Across the Sky: The Passenger Pigeon's Flight to Extinction" (Bloomsbury), Joel Greenberg's study of a bird that really did vanish after near-ubiquity, and that really is the subject of Frankenpigeon dreams of resurrection. Even before the age of bioengineering, *Ectopistes migratorius* could seem as much science-fiction fable as fact, which is why it is good to have Greenberg's book, the first major work in sixty years about the most famous extinct species since the dodo.

The passenger pigeon-sometimes called "the blue pigeon," for its color, though the blue was blended with gray, red, copper, and brown-should not be confused with its distant cousin, the message-bearing carrier pigeon, which is really just a domesticated rock pigeon in military dress. Unlike the rock pigeon-domesticated six thousand years ago, now feral, and brought to these shores by Europeans in the early seventeenth century-the passenger pigeon was native to North America, where it roved over a billion acres of the continent searching for bumper crops of tree nuts. It was here, like the American bison, when Europeans arrived, and it was here when the peoples we consider indigenous migrated across their land bridge thousands of years before that. It evolved on the unspoiled continent and was allied with the big trees that once covered much of the Northeast and the Midwest.

The passenger pigeon was also the most numerous bird species in North America, and possibly the world, dominating the eastern half of the continent in numbers that stagger the imagination. In 1813, John James Audubon saw a flock-if that is what you call an agglomeration of birds moving at sixty miles an hour and obliterating the noonday sun-that was merely the advance guard of a multitude that took three days to pass. Alexander Wilson, the other great bird observer of the time, reckoned that a flock he saw contained 2,230,272,000 individuals. To get your head around just how many passenger pigeons that would mean, consider that there are only about two hundred and sixty million rock pigeons in the world today. You would have to imagine more than eight times the total world population of rock pigeons, all flying at the same time in a connected mass.

No wonder witnesses frequently described the birds in quasi-Biblical, if not apocalyptic, language. A flight over Columbus, Ohio, in 1855 elicited the following eye-witness account:

As the watchers stared, the hum increased to a mighty throbbing. Now everyone was out of the houses and stores, looking apprehensively at the growing cloud, which was blotting out the rays of the sun. Children screamed and ran for home. Women gathered their long skirts and hurried for the shelter of stores. Horses bolted. A few people mumbled frightened



words about the approach of the millennium, and several dropped on their knees and prayed.

On the ground, the birds were equally prodigious. A joint at the corners of the lower bill enabled their mouths to more than double in size. Their crops could hold "up to a quarter of a pint of foodstuffs," and they could vomit at will if they saw a food that they liked better. Thoreau, a keen watcher of the birds, marvelled that they could swallow acorns whole. A Detroit newspaper in the late nineteenth century described the squabs as having "the digestive capacity of half a dozen 14-year-old boys."

In their wake, passenger pigeons left behind denuded fields and ravaged woods; descriptions conjure up those First World War photographs of amputated trees in no man's land. "They would roost in one place until they broke all the limbs off the trees," one old-timer recalled, "then they would move to Joining timber & treat it likewise, then fire would break out in the old Roost and Destroy the remainder of the timber." Their droppings, which coated branches and lay a foot thick on the ground, like snow, proved toxic to the understory and fatal to the trees.

One hunter recalled a nighttime visit to a swamp in Ohio in 1845, when he was sixteen; he mistook for haystacks what were in fact alder and willow trees, bowed to the ground under gigantic pyramids of birds many bodies deep. As late as 1871, a single nesting ground in Sparta, Wisconsin, covered eight hundred and fifty square miles, hosting more than a hundred million birds.

But the profusion was misleading. Twenty-nine years later, a boy in Ohio shot a passenger pigeon out of a tree with a twelve-gauge shotgun, killing what was quickly identified as the last wild member of the species (though Greenberg has discovered evidence of a specimen taken in 1902). A small captive population remained at the Cincinnati Zoo, including a pair patriotically named George and Martha, but there would be no new feathered nation. By 1910, Martha was the sole survivor, an extraordinary fate for a bird whose ancestors had, in Audubon's words, sounded-from a distance!-like "a hard gale at sea, passing through the rigging of a close-reefed vessel."

Martha spent four years as a melancholy zoo attraction. Visitors tossed sand to get her to move. Officials offered a thousand-dollar reward for a mate, but on September 1, 1914, the last passenger pigeon in the world died.

That we know the date is part of the jarring incongruity of the story. Imagine knowing that the last Tyrannosaurus rex keeled over on a Tuesday in June. Newspapers described how Martha was frozen in a three-hundred-pound block of ice and sent by train from Cincinnati to Washington, D.C. There she was skinned, stuffed, and put on display at the Smithsonian for a nation guiltily waking up to its role in the destruction of the bird and its habitat.

Equal parts natural history, elegy, and environmental outcry, "A Feathered River Across the Sky" has been published to coincide with the hundredth anniversary of Martha's death. Greenberg, a bird blogger and the author of "A Natural History of the Chicago Region," among other books, has also helped create Project Passenger Pigeon, a loose affiliation of educational institutions, museums, and nature societies hoping to use Martha's anniversary as a "teaching moment" about the tangled relationship between people and the natural world.

A painstaking researcher, Greenberg writes with a naturalist's curiosity about the birds, the more than forty-two genera of plants they ate, the crops they favored, and their love of "mast"-the collective name for beechnuts, acorns, and other hard forest fruits that fall in staggered cycles of reproductive boom and bust. Passenger pigeons had an uncanny knack for discovering mast, possibly because they dispatched scouts, though it is hard to know for sure, since the bird was little studied while it lived, beyond how to catch, kill, and cook it. Answering even basic questions about the passenger pigeon requires a sort of forensic ornithology, which gives "Feathered River Across the Sky" an unexpected poignancy at the very points where it is most nature-nerdy. A characteristic sentence begins, "Yet another of the great questions that can never be answered regarding the life history of this species is how many times a year they bred." But the central question that Greenberg sets out to answer is how a bird could go from a population of billions to zero in less than fifty years.

The short answer is that it tasted good. Also, it was easy to kill and so abundant that it often seemed, in the days before refrigeration, like the quail that fell on the Israelites in Exodus. In 1781, after a crop failure, a flock of pigeons saved a large



swath of New Hampshire from starvation. Despite the occasional apocalyptic shiver, most Americans looked up and decided that it was cloudy with a chance of meatballs.

The birds were such tempting targets that, in the early eighteenth century, cities had to ban hunting in town, because, in the words of one ordinance, from 1727, "everyone takes the liberty of shooting thoughtlessly from his windows, the threshold of his door, the middle of the streets." You did not even need a gun: you could poke them from their nests with poles or beat them out of the air with clubs-the weapon of choice Mark Twain recalled from his boyhood, in Hannibal, Missouri. Squabs were fattened on "pigeon milk"-the sloughed-off lining of the birds' crop that parents regurgitated for their young-and got so plump, Greenberg reports, that they would fall to earth with a "splat."

The birds even killed themselves. Greenberg conjures a vision of pigeons crammed into their huge roosts, and then asks the reader to "imagine the destruction that would ensue when tree limbs, or at times entire trees, snapped and plummeted to the ground, crushing hundreds if not thousands of birds. When flocks descended to drink, at times the birds that landed first would drown under the weight of newcomers." No wonder Martha lived so long in her lonely cage.

Seneca Indians called the bird simply Big Bread, and told a story about an ancient white pigeon visiting a warrior with the news that passenger pigeons had been selected as a tribute to mankind. Greenberg gestures toward the notion that Native Americans harbored a proto-conservation ethic toward the birds, but that distinction breaks down as his narrative of destruction progresses, which is perhaps just as well, because our propensity for using things up is certainly species-wide. It was paleo-Indians who helped hunt megafauna like the mammoth to extinction, the Maori in New Zealand who ate the flightless moa to death, and prehistoric Pacific Islanders who extirpated more than a thousand species of birds.

For both Native Americans and European settlers, the appearance of passenger pigeons or the discovery of one of their giant roosting grounds became a festive occasion where every member of the family had a role: shooting the birds, knocking squabs out of nests, chasing the unfledged runaways, and collecting the dead for pickling, salting, baking, or boiling.

Many of the hunting stories have a tall-tale aspect perfectly in tune with the fantastic aura that surrounds the birds. Boys stuck long hickory poles into the ground, pulled on ropes tied to the tips of the poles, and knocked birds down simply by making the poles quiver. Nets were stretched between trees. A roosting ground in Tennessee was set on fire and "scorched corpses were then collected the next day for personal use or sale" from two-foot-high piles of the dead.

More elaborate methods were used, of course-like luring the birds into nets with a live pigeon, which is the origin of the term "stool pigeon." A demand for stool pigeons opened up a trade in live birds, and so did the later development of "trap shooting," in which live birds were mechanically launched into the air for sportsmen. So many birds died in transport to the shoots that huge numbers were needed. (The "clay pigeon" was devised by passenger-pigeon hunters to replicate the experience after the actual birds grew scarce.)

As long as America was rural and untraversed by railroads, the killing did not seem to do much more than dent the vast pigeon population. After the Civil War, however, things began to change rapidly. You could find out by telegraph where pigeons were nesting, get there quickly by train, and sell what you killed to a city hundreds of miles away. Soon market hunters began operating on an enormous scale, cramming tens of thousands of birds into boxcars-especially after Gustavus Swift introduced the refrigerator car, in 1878. This meant that rural migrants to growing cities could still get wild game, and the well-heeled could eat Ballotine of Squab e la Madison, served by a new class of restaurant, like Delmonico's, in New York, where fine dining was becoming a feature of urban life. All this coincided with an explosion in logging, which began destroying the habitat of pigeons just as hunters were destroying the pigeons themselves.

Greenberg hauntingly documents the way people kept "seeing" the birds after the great flocks vanished, or devising outlandish theories to explain where they might have gone. The journal *Science* speculated that they were in the desert of Arizona; another journal, the *Auk*, suggested that they were east of Puget Sound, and a lumberman claimed to have seen millions in Chile. Henry Ford was convinced that they had all drowned in the Pacific en route to Asia. The flocks were like phantom limbs that the country kept on feeling. Or perhaps the birds' disappearance, and the human role in it, was simply too





much to bear.

In keeping with these fantasies, it isn't at all surprising that there is a plan afoot to resurrect the bird, or at least to bring back a genetically approximate simulacrum. To this end, Revive & Restore, an offshoot of Stewart Brand's Long Now Foundation, has enlisted the assistance of the Harvard geneticist George Church, who helped initiate the Human Genome Project, to work on what is frequently referred to as "de-extinction."

De-extinction became big news after a conference last March-sponsored by Revive & Restore, TED, and National Geographic -broadcast plans to take passenger-pigeon genes recovered from the toe pads of museum specimens, combine them with genes from the band-tailed pigeon (the genetic next of kin), and use them to modify another bird, possibly a chicken, so that it would lay a passenger-pigeon egg that could be raised by a band-tailed pigeon but taught to flock by a homing pigeon. If all this sounds like pure fantasy, bear in mind that in Dubai, in 2011, a "chimeric duck" was successfully engineered: it walked like a duck and quacked like a duck but was in fact a chicken, at least reproductively.

"Feathered River" touches on de-extinction in a few neutral paragraphs in the appendix, without getting into the question of why anyone would want to bring back a bird whose habitat was destroyed, and that descended on buckwheat fields like a plague of locusts even when it was there. But the destructiveness of the bird hardly disqualifies it from serving as an environmental teaching tool. If anything, the passenger pigeon is a bracing corrective to notions of a natural world detached from its fecund terrors. The bird's propensity for eating everything and taking over earth and sky makes it seem, frankly, a little like us. As Greenberg notes, "a widely held view is that this species could not sustain itself without a giant population," so that decline itself became a cause of further decline. In other words, passenger pigeons lived by collaboration on a giant scale, and may have died by it. Yet what Greenberg sees is not the clash of two irreconcilable species with gargantuan needs but a story of victimizers and victims.

We did hunt the passenger pigeon to death, even if we didn't quite understand at the time what we were doing. We also might have saved it, at least in token form, if only our technological genius and our conservation consciousness-two things that set us apart from other animals-had come together sooner. But Greenberg's emphasis on bloodguilt can give his book a religious impatience, however secularized. He has a habit of blurring time and place so that the whole country seems hell-bent on blasting, stomping, and literally biting the pigeons to death, as if it were this zeal, and not a complex web of industrial and environmental factors, that led to their extinction. "What a shame that passenger pigeons became extinct," he writes, mocking a woman whose 1808 memoir recalls the "gayety" of a pigeon hunt-at a time when there were perhaps five billion of the birds in the world. "Future generations would be denied the near euphoria that apparently accompanied raising a gun toward a flock of pigeons and firing."

Human beings live in their historical and cultural contexts as much as passenger pigeons lived in fields, trees, and sky; it is important to remember, for example, that rural people hunted for food in the days before factory farming and supermarkets. The chicken industry in this country alone kills more than seven billion birds a year-far more than the total number of passenger pigeons at their peak. Nobody in the nineteenth century had figured out how to make the slaughter of the birds sustainable, but it is worth wondering what we would think of the passenger pigeon, and ourselves, if they had.

It would also have been useful if Greenberg had explored the fact that when the last of the great flocks were being killed off, in the eighteen-seventies, America was suffering from the aftershocks of the Panic of 1873 and the economic depression that followed. (In her book "Flight Maps," the historian Jennifer Price does this well.) Financial hardship doesn't have to justify the elimination of a species to help explain why poor country people saw a flock of birds not as a conservation opportunity but as an economic one. This is especially important in light of Greenberg's environmental purposes, since today, too, regions of economic hardship often overlap with areas where many species are at risk of extinction, surely an argument for making economic development a cornerstone of environmental activism. There is only so much fair-trade chocolate one developing country can produce.

Greenberg's book is rich in natural history, but when it comes to human history he is more of an environmentalist looking back in anger. He introduces trap shooting by writing, "The great fun that naturally flowed from killing passenger pigeons



was evidently not enough for some. They wanted competition and ways to turn the slaughter into a game." The scattershot sarcasm manages to dismiss hunters, financial necessity, and human nature along with Greenberg's immediate target.

Understanding the relationship between guns and conservation is as important as understanding the relationship between passenger pigeons and beech-nuts. The environmental movement that emerged as the passenger pigeon was disappearing-and that was inspired by the bird's plight to save the bison-was largely a movement of hunters. The Boone and Crockett Club, founded for rich sportsmen in 1887, by Theodore Roosevelt and George Bird Grinnell, morphed into a powerful lobbying group that boasted among its members John F. Lacey, the Republican congressman from Iowa, who spoke movingly about the passenger pigeon on the floor of the House of Representatives as he argued for what became the first federal bird-protection law, the Lacey Act, of 1900. These men were conservationists not in spite of their trophy hunting but because of it-they wanted vast protected forests because they wanted a vast supply of creatures to kill. The "near euphoria" of shooting things, in their case, was a key to saving them. But the patricians of the Boone and Crockett Club shared Greenberg's contempt for market hunters, men who made a living from the things they killed.

One of the club's members, Madison Grant, went further, moving the club toward a more strictly preservationist attitude, and the radical idea that unspoiled nature itself is the trophy. Arguably the most important environmentalist of his age, Grant created vital hunting laws, built the New York Zoological Society, and helped save the bison. That he was also a biological racist of such extreme convictions that Hitler sent him a fan letter is, however, also part of the story. So is the fact that William Hornaday, who helped Grant reintroduce bison into Oklahoma, displayed a Congolese Pygmy in the monkey house of the Bronx Zoo in 1906.

The environmental movement has more skeletons than *Ectopistes migratorius* in its closet, and why shouldn't it? We are only human, and as complex as the creatures we mourn. Now, however, would be a good time to lay out all the bones and see them as part of the teaching moment that Martha's anniversary provides.

In his appendix, Greenberg includes a lone paragraph called, simply, "Eugenics," in which he expresses bafflement that among the papers of his hero, A. W. Schorger-whose 1955 book on the passenger pigeon became the source for all later studies-he found a pamphlet warning that "talented humans" were going the way of "yesteryear's passenger pigeon."

"It takes a far more imaginative mind than mine," Greenberg observes, "to connect the extinction of the passenger pigeon with eugenics." But in fact he makes the connection himself when he writes about R. W. Shufeldt, the scientist who dissected Martha for the Smithsonian. Greenberg notes that he was "disappointed to learn" that Shufeldt, along with important scientific work on birds, "authored a vile screed on domestic race relations. So while he had no regard for many of his fellow citizens, he was moved by the object on his dissecting table." Such was the passion men like Shufeldt displayed for nature that Greenberg, despite his disgust, can't resist closing his account of Martha with the scientist's sentimental decision not to dissect the bird's heart, and with his salute to "the last 'Blue Pigeon' that the world will ever see alive."

Two years after Martha's death, Madison Grant published "The Passing of the Great Race," a warning about the threat to pure "Nordic" peoples from immigrants he viewed as invasive species. White men, Grant believed, needed protection as much as the bison and the passenger pigeon. To that end, he helped persuade Congress to keep Jews, Asians, and Eastern Europeans-the rock pigeons of the world-out of the country.

Is it possible to love the bird on the table more than your fellow-citizens? Of course-especially if you gerrymander humanity into discrete populations and value some groups more than others. For Grant, this was a racial matter, but there are lots of ways to divide a population. We no longer live in an age when a powerful President and his hunting buddies can snatch up millions of acres of wilderness and set them aside for the public good; without a broad consensus, there is not much hope of saving anything.

And without a capacity for complexity there is not much hope of knowing even what needs saving. The great biologist E. O. Wilson speaks about a coming wave of extinctions whose scope eludes us, because though there may be anywhere from ten million to a hundred million species in the world, we have identified far fewer than two million. Unlike the passenger pigeon,



these creatures may be hidden in oceans, forest canopies, handfults of earth. It takes effort and imagination to sift through this information, just as it requires an educated humanism to figure out whether a de-extinction project holds real environmental promise or is only an ancient longing for resurrection disguised as bioengineering.

Thoreau, in a mysteriously beautiful passage in his 1862 essay "Walking," likens the diminishing numbers of passenger pigeons in New England to the dwindling number of thoughts in a man's head, "for the grove in our minds is laid waste." Thinking of the birds as missing thoughts is a good way to honor them. Martha and her billions were undone by the complicated, pitiless tangle of our modern industrialized world, but Thoreau's nineteenth-century protest-"Simplify, simplify"-will not help us in the twenty-first. Indeed, when it comes to our relationship to nature, the wish for simplicity may be the most destructive thing in the world.

**BLOCK THAT METAPHOR!**

From the Allentown (Penn.) Morning Call.

The longest game in Penn State history ended with members of the alumni band washing onto the field after Belton's touchdown capped a messy masterpiece that took the wind even from the Lions' head coach.

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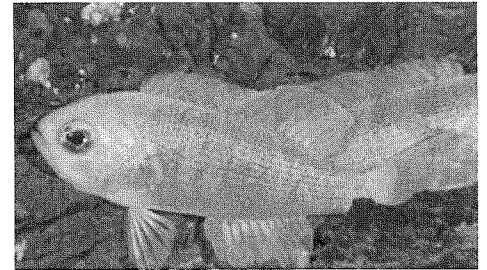
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## A fish story: PSU student names new species, wins National Geographic contest, expands ministry

A new species of fish was discovered off the coast of Chile last February, and Tania Curiel, an 18-year-old international studies major at Portland State University, won a National Geographic contest to name it. The prize is a 10-day trip for two to the Galapagos Islands over spring break in March.



She's going to do more than just enjoy a vacation, however. Curiel and her traveling companion - her father Hector, the pastor of Peniel Ministries in Gresham - will take an extra six days to visit FEDICE, a Christian service organization in Ecuador that helps poor rural communities. They're hoping to learn some things that they can apply to their own missions in Sonora, Mexico, where they travel every December.

"One thing that's really important to me is to support things that are already working. FEDICE builds chicken coops and teaches classes in agriculture. I think we could do the same kind of thing in Sonora," she said.

The trip plans all started with a fish.

National Geographic Explorer-in-Residence Enric Sala discovered the bright green, orange and yellow fish in the waters surrounding the Desventuradas Islands near the Tropic of Capricorn. He consulted with experts who believed the fish was a new species.

Since new species need names, Sala launched a "name this fish" contest on Facebook. Curiel clicked on it, and within 20 minutes came up with the name that was chosen above more than 9,500 contestants: "El Chilito."

In an article (<http://news.nationalgeographic.com/news/2013/10/131010-name-this-fish-contest-winner-pristine-seas-exploration-science/>) in National Geographic she explained that the name combined Chile, where it was discovered, and "ito," meaning small or cute. Sala said in the article that the name made him think of the color of the fish, which reminds him of a hot chili pepper.

Curiel got an email notification of her win in October "while I was typing in my cubicle, sipping a cup of cold coffee and listening to an overplayed Taylor Swift song," she said.

The side trip she and her father take to visit FEDICE in Quito, Ecuador, will build on the missionary expertise they've gained on their annual trip to Sonora, on the border with Arizona. They've been going there every December for the last six years to bring gifts and distribute food to some of its poorest citizens. Last year members of the congregation built wood stoves

([http://www.oregonlive.com/portland/index.ssf/2012/12/southeast\\_portland\\_church\\_take.html](http://www.oregonlive.com/portland/index.ssf/2012/12/southeast_portland_church_take.html)) out of propane tanks, and had them shipped and installed in ramshackle homes in

Sonora where the high-desert nights often dip below freezing.

Curiel has started a blog (<http://elchilito.wordpress.com/>) about the fish, the contest, and her upcoming trip. Read it at [elchilito.wordpress.com](http://elchilito.wordpress.com)

*(Above left) Tania Curiel and her father, Hector, will travel to Ecuador in March.*

*(Above right) El Chilito, photographed last winter. Photo by Avi Klapfer/DeepSee.*

