

HISTORY IN JARS



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The preserved fish at the University of Wisconsin's Zoological Museum possess a certain power not ascribed to most objects. They collectively cast a spell on a visitor, holding them in a trance of mixed fascination and slight horror. It's impossible not to look despite the overwhelming desire to turn away from the slimy creatures' gazes, as though each of the specimens is staging a staring contest. Besides, there is nothing else to turn to in the crowded room. The metal shelving units reach from floor to the harsh fluorescent lights, where the fish muse silently in glass jars, occupying every inch of open surface. The countertops at the edge of the room hold boxes of fish bones, one opened to reveal a jumbled skeleton, each bone inscribed with an ID code with impossibly tiny printing. The encroaching jars stop at a sink - the preparation area - where barrels of ethanol and empty jars await the newcomers, and an empty lab coat hangs, lifeless without its owner. The only potential for relief are the ichthyology-related *Far Side* comics hung on the edges of the shelves with masking tape, but their yellowed appearance suggests age as well. In this windowless space, no matter where I turned, the dead fish prevented escape, and I had to consider their presence.

Before entering their resting places, the fish are soaked in formalin, a formaldehyde solution that arrests all decomposition (but, after extensive exposure, causes human cells to reproduce uncontrollably into cancer). The fishes' color fades almost immediately into shades of white and tan, but the tissues and body structure remain intact. After a few hours soak, the fish is placed in a jar—the kind used for canning garden produce—and filled with 70% ethanol solution, often with companions caught at the same place and time. Some jars have over a hundred finger-long fish packed together, other fish are sentenced to eternity in isolation. In all the jars, the chemical agents constantly wage war against inevitable decay, with nearly miraculous results. Fish collected in 1904 are nearly indistinguishable from those caught in 2004. Yet some material is inevitably lost: formalin denatures DNA, making it almost impossible for researchers to gather genetic information from the jars. The fish bodies almost tease the scientists with hy-

potheses that could have been tested if the formalin - what was meant to preserve - didn't destroy the genetic code.

Despite the immense numbers of fish in the collection - the museum has 150,000 individuals - only the very unluckiest of wild fish end up in formalin. They're almost all taken out of nets and traps set for research studies, where most of the fish are measured, tagged, sampled in one way or another, and re-



Seven juvenile Shovelnose Sturgeon (*Scaphirhynchus platyrhynchus*) captured in July of 1946 near Muscatine, IA.



leased. Of the hundreds of thousands of fish caught in nets and pulled onto research boats - which represent a miniscule percentage of wild living fish - perhaps 0.1% are kept for preservation. The keepers may be selected for some rare feature, like being found outside of their regular range or having a strange body trait, or they just might be unlucky, chosen to keep a record of living things at a particular time. The material they provide is irreplaceable, and if not preserved, no dollar amount could buy fifty-plus years from now.

Besides containing the fish, every jar has another crucial holding: the label, a piece of paper placed in the ethanol itself, print facing outward. Across the jars, the print styles evolve from handwritten cursive to typewriter characters to Arial font, but the information is the same: who collected it? where? when? what species? Every label has a catalog number, its distinction against the hundreds of thousands of other fish in the museum. En masse the jars take on a uniform appearance; except for size they are all the same, so that they almost appear to create one massive object—"the collection"—together. Each jar is a tile in a macabre mosaic of natural history, with its value exponentially increased by fitting into a larger depiction.

Yet a focused look at one jar reveals its contents are unreplicable, a snapshot of a particular historical moment. Take catalog number 2226, group 7 for instance. This quart size jar holds seven juvenile Shovelnose Sturgeon, *Scaphirhynchus platyrhynchus*, from a commercial fisherman in Muscatine, Iowa. They're cute (for embalmed fish), with long flattened faces and whiskers for sensing in the dark bottoms of rivers. Who would have ever known, or imagined, someone pulled these little ones out of his hoop net one day in 1946? It's hard not to ask aloud: why did you end up in those nets? were there more sturgeon then than now? did they look or behave differently? Their gazing eyes laugh but give no answer.

Catalog number 2226 caught my attention when I visited the museum as an undergrad in the Ecology of Fishes class at

the University of Wisconsin. Most of my classmates chattered away as they scooted past each other in the crowded space, their attention split between their phones and the jars. A few, like me, acted like we had entered a holy place that deserved quiet and reverence, paying our respects to the dead by staring at them intently. For me, there was *something* about seeing fish that were once animated and graceful sealed away behind glass; something bothersome but not deeply disturbing, troubling but not terribly upsetting, and it never went away.

The feeling was not new, but it had been barred from my memory for over 15 years. As we inched along the shelves, memories of a childhood visit to the Field Museum of Natural History in Chicago resurfaced into my consciousness. My mom and I wandered through an endless maze of specimens posed in diorama scenes, complete with painted backgrounds and fake vegetation. It looked like seven square feet of the Amazon, African savannah, or Arctic had been picked up and placed indoors.

"This is like the zoo! But everything is dead," I burst out as I bounced between the displays, excited about all the animals but trying to make sense of it all. I wasn't upset or disgusted by all the dead things, but I didn't get why there were halls filled with stuffed animals. "Why don't they just keep them alive? Why do people want to come see them dead?"

"That's how people used to be able to see things before there were zoos," Mom explained, "How could they keep all this alive in the middle of the city?"

"But they kill them just to put them in here?" I was feeling guilty and somewhat responsible for supporting such an enterprise.

"Oh no, they all die naturally, and someone decides to keep them," she reassured me, and I wouldn't realize this wasn't true until my junior year of college.

Though my mom's answers were satisfactory for my six-year-old mind, she was just scraping at the surface of the rich

past of natural history collections. The practice of collecting dead things began in the late 1700s. Back then, our fishy friends were preserved in rum before the invention of formaldehyde. Carl Linnaeus had just invented his hierarchical system for naming species, which placed them into neat nesting categories and gave them each two Latin names - one for genus and one for species, a system we still use today. Naturalists, as they were called, could now not only collect organisms but actually make sense of what they found, and, most of all, gain the honor of naming them. European society was also wealthy enough to pay for budding naturalists to accompany voyages around the world and fill ships with once-living things. In an age before *Nature* documentaries on PBS, their more bizarre findings were put on display where visitors could marvel at exotic nature. It was such a prevailing trend that at the first Board of Regents meeting for the University of Wisconsin (UW), a plan for a natural history collection was already in the works, to establish a reputation as a legitimate institution.

The Field Museum is one of the oldest and best-established natural history collections in the United States, the kind of place UW was trying to imitate. Despite my uncertainties about the place as a six-year-old, the Field was the perfect place to fall in love with biology, and fanned the little flame of nature study rather than putting it out. After another visit in middle school, I became slightly obsessed with life science, taking notes on high school level biology textbooks and meticulously copying anatomy diagrams. The Field Museum was where I first heard the story of evolution—they had a walk-through “timeline,” complete with fossils and drawings—and it spurred me to diagram all the phyla and families of living things (never completed). Nearly 15 years and 60 biology credits later, I thought I’d look at the collection of fishes at UW a little more scientifically. Yet rather than thinking of hypotheses and observing patterns in the specimens, I’m still stuck in that six-year-old mindset, unable to answer the pervading question: “Is it really okay to put living things in jars?”

Every rational argument I work through says yes. The possibilities for study are endless: scales and bones reveal growth rates, body composition and size hint at the health of a population, and toxins and disease persist in the tissue. Trends in body shape can be traced across regions and time. Scientists can check out the specimens used in the studies they read to verify the results. Outside of research, specimens are essential for students—like me—to learn how to identify species, providing a far more tangible learning experience than looking at pictures. The death is justified, done cleanly, and for a clear purpose, with plenty of individuals left for the population to persist.

But there is something profound missing in this view of nature, organized by numbers and nested in categories. Natural history collections give the impression that all there is to



Laura Halverson Monahan, Curator of Collections, University of Wisconsin Zoological Museum. (Photo by David Tenenbaum)

know about nature is facts, but the fish are not merely a thousand tidbits of information packaged into an object. Each fish grew from a single cell into a complex being with scales of an intricate shade and pattern, fins for a particular kind of motion, eyes to perceive its surroundings... all coming to be by a process of its own, beyond the full comprehension of humans. I can hardly stop looking at the jars because their contents, by some miracle, existed once as a swimming creature, and every second I’m there I am flooded by a greater realization of how marvelously complex and unfathomable life is. The labels might inform, but they can’t inspire the viewer to see the fish as any more than objects, and so my awe is mixed with uneasiness. I’m not suggesting we start giving the fish names like “George” or “Victoria,” or hold memorial services that recount their unique features, but I yearn to know that the whole scientific exercise doesn’t inherently wipe out all the beauty and wonder. In viewing the world through the lens of Latin names and categories, is it possible to still be struck with awe?

I wondered how those who contribute to and maintain the fish wrestled with these ideas. So I turned to Laura Halverson Monahan, the curator of collections at the UW Zoological Museum. She allowed me to stay in her office and ask anything (and everything) I wanted to know about the collections. While the stories about rare finds and history of the collection were interesting, I most wanted to know what it was like for a person to come into a work place with cabinets of skulls, furs, and jars of formalin every day. Immediately, she said, “You get used to it. Living and dead animals are kind of two separate things—when I see a squirrel on the street, I don’t think of the squirrel skeletons at the museum.” She added, “It’s sort of weird—it definitely is. I don’t like for things to die, but sometimes I get excited for a new species I haven’t worked on to come in. Like when Puddles the hippo died at the zoo, I couldn’t wait to work on it—but it had to die first.”



I was somewhat disappointed by this dichotomy of thinking, the disembodiment of life from the material, but I lost no respect for her. Her passion for the specimens shone through our whole discussion, and unlike most people, she spends her whole day seeing all the parts of nature. I can hardly blame her for handling the question of her subjects' deaths in this way.

But it wasn't as clear-cut as I'd thought. Later, she made an offhand comment about the importance of the label information, which I had seen as objectifying the collection: "Without that knowledge it's just an object that's abstract to me, with no story behind it." She meant to emphasize the importance of proper protocols, but I saw a philosophical statement: the fish tell a story all their own—perhaps not a complete saga, but a winding tale that has ended and yet is never ending, because no observer can take in all the detail.

It would be impossible to write about the fish collection at UW without consulting John Lyons, the adjunct curator of fishes. He's been the most prolific contributor to the UW fishes collection, dunked his hands in formalin countless times, and has stared at the jars longer than anyone else. From the

guest lecture he gave our fishes class, I knew he was a field-tested scientist, highly proficient at recognizing minute traits and analytical in his view of the natural world. He created a whole online identification key for the general public to learn how to identify fish, filled with hundreds of his own photos to illustrate the nuanced differences. Clearly there's something about the fish that drives him to observe and document them so closely, but I wondered how he considered his own connection to the fish.

If Lyons thought it was strange for an undergrad to call and inquire about his fish specimens, he never showed it. We spent nearly an hour talking about the preservation process before I finally asked why the preserved fish are important. Lyons didn't appear sentimental, but his tone shifted, with a clear zeal and certainty arising in his speech like a pastor before his congregation.

"This is our natural heritage," he paused, choosing words: "I don't know if it's okay to make this comparison, but we take care of churches, artifacts, and historical sites to show future generations where we've been. If we don't preserve it, years from now people will ask 'Why didn't we keep this?'"

The pride in his voice was clear, and his respect for the fish reverberated. A church, something sacred... Lyons saw the jars as precious objects, but still objects nonetheless.

Or so I briefly thought. I figured his response to my question, "So are you pretty much used to killing fish then?" was predictable—how could you put around 50,000 fish in jars and not get desensitized?

"Does it bother me to kill things?" He repeated. "Sometimes. They're fascinating creatures and I don't want to take their lives. There have been times when I should have taken something but let it go instead. Then I'll look back and think, 'yeah, we really should have kept that one for collection,' but I don't usually regret letting them go."

A prominent biologist, E.O. Wilson, wrote, "In our hearts we hope we never discover everything." For me, admiring the mysteries held in the jars and contemplating the questions they pose is not a quest for an answer that will put my musings to rest. The joy of the collection is that it stirs up these thoughts of death and life, rekindling the childlike wonder that fuels my daily studying in college. It reminds me that I cannot take the jars for granted, or the lives of the fish that they hold.

Sources

Lyons, John. Interview with the author. 7 Mar 2014.

Monahan, Laura Halverson. Interview with the author. 6 Mar 2014.

"What's available at the zoology museum?" *University of Wisconsin Zoological Museum*. University of Wisconsin, Madison, n.d. Web. 10 Mar 2014. <http://www.zoology.wisc.edu/uwzm/collections.html>



John Lyons with a tuberculate River Redhorse captured (and released) while electrofishing the Wisconsin River, May, 2013. See <http://tinyurl.com/electrofishing>. (Photo by Olaf Nelson)