Exhibiting Silurian Fossil Ecology in the Tradition of Natural Historians: An Interdisciplinary Study of Public Science

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SENIOR HONORS THESIS

Submitted In Partial Fulfillment of Requirements of the
College Scholars Honors Program
North Central College

5-13-2019

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Date: 05-13-19

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Date: 5/13/2019
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Introduction

Who among us has not been caught up watching an insect on the ground or a salamander in the creek, or enraptured by fizzing baking soda or a fossil on the beach? People of all walks of life know the feeling of curiosity about the world around them and the satisfaction of watching, experimenting, and learning, whether they consider themselves to be science-minded or an everyday citizen. While science as we know it is relatively recent in the grand scheme of human history, curiosity and the drive to experience things has always been around. It is this drive for experiential learning that formed the very foundation for our modern scientific fields of study, like biology, geology, and chemistry. These fields can be traced back to the natural historians of the seventeenth through nineteenth centuries who found themselves engaged with many of these fields in an experience-driven way (Ede and Cormack, 2012).

The simple curiosity cabinet was an Enlightenment-era concept in which historical artifacts, scientific specimens, and artistic and technological creations of mankind are all collected together into thought-provoking private collections (Fig. 1) (Latham and Simmons, 2014). Natural historians were the ones who were drawn to these “curiosities” of the natural world and what secrets they may reveal by engaging with them (Latham and Simmons, 2014). The methodology of a natural historian is one that is multidisciplinary and based in observational and experiential learning (Able, 2016). While the field of natural history is now considered obsolete in the face of modern scientific disciplines and the increased value placed on quantitative research, I believe that many of the concepts from that era of scientific exploration may still hold value in the realm of public engagement. Many modern scientists would agree that the public has a poor understanding
of their field and modern research. Exclusive scientific communities and jargon-filled articles make scientific curiosity inaccessible to all but those who were fortunate enough to develop an acute interest in it. It is rooted in our beings as humans to want to learn and the methods of the natural historians may be the key to making science more accessible to the public. In this paper, I will explore the historic use of experiential learning methods by natural historians, the importance of experiential learning, and how these methods can be applied to public science. Public science as a whole is woefully underrepresented in research, which is in part why I decided to undertake a basic look into the art of public science. I then use what I have learned to construct an exhibit on fossil beds local to my home in Kenosha, Wisconsin in order to further explore the application of these methods.

![Fig. 1: Engraving from Ferrante Imperato’s Dell’Historia Naturale, 1599.](image-url)
It is important to note that natural history is a broad and historic field and has taken on a number of different meanings to different people. In its modern scientific usage, as defined by Kenneth W. Able, natural history refers to observational learning answering simple questions about an organism: what it is, where it lives, how many there are, how it survives and reproduces, and how it came to be the way that it is (Able, 2016). Such questions can be used as the basis for forming hypotheses and determining research routes (Able, 2016). As is noted by Able, even natural history in this sense is often overlooked in favor of theoretical models and hypothesis testing (Able, 2016). Natural history, however, has broader implications in the historical sense. By this definition, and the one I will be using for the sake of this essay, natural history refers to a broad and multidisciplinary field of study rather than a single methodology. When natural history was itself still a field in the seventeenth through nineteenth centuries and had not yet been supplanted by more specialized data-based fields, it relied on observation, pattern-finding, and theoretical musing (Dayton and Sala, 2001). Natural historians’ appreciation and respect for nature was reflected in the often-prosaic wording of their observations (Dayton and Sala, 2001). In many ways, these two definitions hold much the same meaning: learning about the natural world by observing how it behaves. I believe it is this observational research method that ties together a field as broad and multidisciplinary as natural history and lends itself so well to the four archetypes – explorer, curator, scientist, and artist - that natural historians so often fulfill in their research.

**Explorer**

Considering the natural history as a field originated during the Age of Exploration, it is fitting then to touch first upon the role played by natural historians as explorers. Indeed, many
scientists could in a metaphorical sense be considered “explorers” – those who journey to unknown territories of knowledge in the hopes of making some great discovery to bring back to the collective knowledge. Many scientists, both historically and today, fulfill this role in a literal sense. Natural history emerged as a result of the new-found fascination with the natural world following the Age of Exploration (Latham and Simmons, 2014). As Renaissance-era explorers travelled the globe and brought back souvenirs of plants, animals, and manmade artifacts from exotic lands, a sense of excitement and wonder was fostered as philosophers turned their eye to the natural world (Latham and Simmons, 2014). Many of our most influential natural historians went out of their way themselves to travel to these fascinating lands. Consider Carl Akeley (1864-1926), who ventured on a number of expeditions to Africa for the Field Museum and American Museum of Natural History (Field Museum of Natural History). Akeley was not only an explorer, but also a taxidermist, and used knowledge acquired on his expeditions to construct intricate displays which are still accessible at the Field Museum. (Field Museum of Natural History). These displays were revolutionary for showing the animals contextualized in their natural habitats (Field Museum of Natural History). Akeley’s work grants the audience a sense of what it was like to travel to these places and observe these animals for themselves, just as he did (Fig. 2) (Field Museum of Natural History).
Also famous for exploration was Charles Darwin (1809-1882), whose journey on the HMS Beagle has become almost mythologized in its impact on the field of biology. Along his trip to South America, the Galapagos, Australia, and South Africa, Darwin took plentiful notes on the geography, wildlife, and people he encountered and brought back fascinating specimens that would lay critical groundwork for the conception of his revolutionary theory of evolution (Browne 1996). Darwin’s inclusion on the journey of the *Beagle* was far from unprecedented, though. Natural historians have proven to be critical components on expeditions for their acute observational skills, understanding of nature, and ability to take ample notes (Kinsey 1992). They became essential components of the U.S. Geological surveys in the nineteenth century for the collection of fossil and animal specimens and notes about the resources found (Kinsey 1992).
Conducting science on-location can be crucial to a person’s understanding of how the world works and how specimens are contextualized in their habitat, and I believe that it plays no small role in the accumulation of experiential learning. A taste for adventure can build not just knowledge, but also emotional connection with the places and subject matter that one is studying.

**Curator**

Natural history as a field is also rooted deeply in the concept of curation – that is, the collecting and display of specimens. It could well be that the kind of people who are fascinated with the workings of the natural world are also fascinated with the idea of owning and admiring artifacts of this natural world. The concept of collecting fossil, plant, and animal specimens existed long before natural history as a science did (Latham and Simmons, 2014). Even the curiosity cabinets of the Renaissance and Baroque could hardly be called the first biological collections, though certainly they were the origin story for the first natural historians (Latham and Simmons, 2014). Curiosity cabinets came about as a means of building a collection of contemplation and contained a broad array of items, including antique artifacts, technological marvels, fossils, and plant and animal specimens (Fig. 3) (Latham and Simmons, 2014). These cabinets were curated to help the collector or viewer understand the divine order behind all the objects within (Latham and Simmons, 2014).
It is little wonder, then, that some curators of curiosity cabinets began to notice other signs of order within the collections – trends across specimens, points of anatomical interest, intriguing indications of the evolution of creatures and questions about the natural world that could be answered by studying these contained objects. Ulisse Aldrovandi (1522-1605), a professor at the University of Bologna and widely considered the first natural historian, was one such science-minded curator of a curiosity cabinet (Latham and Simmons, 2014). He began using his own collection in teaching his students, as he found that having a specimen on hand provided a valuable learning experience for the students (Latham and Simmons, 2014). Even as the curiosity cabinet faded from culture, the need to collect specimens remained in those who loved the natural world. Consider Charles Willson Peale (1741-1827), an artist, taxidermist, and scientist (among other things) who curated one of the first American museums (Metzler, 2008). Peale’s collection
included a fossil mastodon, cultural artifacts, and most notably taxidermy specimens in painted natural habitats, arranged and displayed with their Linnean taxonomy, which was revolutionary for its time (Fig. 4) (Metzler, 2008). Such a collection was born not only from a love of natural history but also from a desire to share this fascination with the public in a way that only experiencing the specimens themselves can provide (Metzler, 2008).

![Fig. 4: Titian Ramsay Peale, Long Room of the Peale Museum, 1822.](image)

Curating a collection is not only done for the sake of educating others, however; astounding connections and discoveries can be made by collecting and analyzing specimens. Charles Darwin’s most rigorous studies were conducted on his collection of barnacles – countless specimens from countless species were stashed in his drawers (Browne, 1996). These served as an ideal organism for analyzing the similarities and differences in their structures in order to flesh out Darwin’s famous theory of evolutionary progress and species radiation (Browne, 1996). Access to a physical
collection contributes to one’s learning experience. While they may never have thought about it before, many modern scientists, much like these natural historians, have likely experienced the sense of fascination that a physical specimen piques. Specimens, in a practical sense, grant the observer access to minute details they would otherwise not notice. In a more romantic sense, they seem to stir the imagination and the instinctual desire to collect, as everyone has surely felt. It is for these reasons that I believe access to physical specimens and collections can be used as a powerful tool to encourage public enthusiasm for science (and, in many ways, already is, in the form of museum collections).

**Scientist**

Perhaps the most visibly notable legacy of the natural historians is its evolution into modern science. Contemporary scientific methods no doubt have strong roots in the observant and curious minds of the natural historians, who asked questions, posed hypotheses, and conducted experiments much like scientists today. The most influential natural historians – Linnaeus, Mendel, Darwin, – serve as namesakes for many of today’s scientific institutions. For these scientists, very little prior education for the natural sciences existed and so they had to forge their own scientific questions and methodology (Ede and Cormack, 2012). All of these natural historians shared a curiosity and passion for the natural world that led to their groundbreaking contributions to science, many of which still stand true.
Charles Darwin’s intensive notes on barnacles, finches, and other specimens from his travels led to the development of his *Origin of Species* (Fig. 5) (Browne, 1996). The nineteenth-century friar Gregor Mendel (1822-1884) carried out cross-pollination experiments on the peas in his monastery garden, leading to the development of the simple Mendelian genetics model still taught in biology courses (Henig, 2001). Carl Linnaeus (1707-1778) developed the still-prevalent Linnaean taxonomic system in the eighteenth century by categorizing plants and animals based on physical similarities, which laid the groundwork for modern phylogenetic analysis (Linnaeus and Freer, 2005). The common thread between these brilliant minds is that they observed the world around them and came up with questions about why things looked or functioned the way they did.
Natural historians paid close attention and took thorough notes, and as a result patterns and questions are bound to arise that lead to groundbreaking theories and elegant experiments.

**Artist**

The mind of a natural historian is creative, observant, and passionate, and so it is little wonder that so many natural historians found themselves drawn to the arts, and so many artists to the natural world. As much as the realms of science and the arts seem to be at odds these days, they had and still have similarities in their roots and thought processes. In its earliest stages, the field of natural history was reliant on illustration in its efforts to collect and categorize specimens. Georg Hoefnagel’s *The Four Elements* (1542-1601) was among the first known natural history compendiums, a more scientifically-minded sixteenth century version of a medieval bestiary (Metzler, 2008). Maria Sibylla Merian (1647-1707) brought the periphery of the Dutch empire to citizens at home with natural history illustrations of species found in Surinam (Brafman and Schrader, 2008). Her work was revolutionary in her efforts to convey not only the animal’s appearance but also information such as its life stages, habitat, and diet (Fig. 6) (Brafman and Schrader, 2008).
In the same tradition, John James Audubon (1785-1851) set about illustrating all the known species of American birds out of a combined interest in nature, science, the arts, as well as the romantic spirit of young America (National Audubon Society). Romantic landscape painter Thomas Moran (1837-1926) also found his inspiration in the young and unexplored American wilderness (Kinsey, 1992). His talents were recruited by the American government to illustrate informative and exciting scenes of the American West as part of the nineteenth century geological surveys (Kinsey, 1992). The artistic efforts of Moran and other artists proved essential to later surveys, as the need for artists was recognized early on by the likes of Meriwether Lewis, who lamented, “I wished for the pencil of Salvator Rosa or the pen of Thompson, that I might be enabled
to give the enlightened world some just idea of this truly magnificent and sublimely grand object” (Kinsey, 1992). Having an artist on the survey team helped to capture the true beauty of the landscape, and Thomas Moran’s paintings proved so inspiring that Congress purchased his painting *The Grand Canyon of the Yellowstone* and established Yellowstone as a national park (Kinsey, 1992).

*Fig. 7:* Thomas Moran, *The Grand Canyon of the Yellowstone*, 1872.

Art was and is indispensable to the field of natural history not only for its ability to capture clearly illustrated and accurate detail, but also for its ability to convey the romantic and emotional aspects of nature in a way that text or even photography cannot typically do. Such qualities are often overlooked in science due to their subjective nature, but imagery is a powerful tool. Art can be used both to promote emotional engagement with subject matter and convey factual information. This marriage of ideas is an important one, especially in regards to sharing science with the general public, as many of these natural history artists wished to do. People do not wish to engage with science unless they are emotionally invested, and they tend not to become
emotionally invested on the basis of data alone. Consider the issues regarding vaccines and climate change today, in which the general public “feels” that science is wrong on these fronts and chooses to ignore hard data in favor of their own beliefs. I believe that illustration serves as a way to capture attention and communicate to the viewer important aspects of its subject matter in a way that frames this information as worthy of one’s attention. Natural historians had a talent for observing and appreciating the beauty in nature and used art as a means of studying and communicating aspects of the natural world.

**Learning through Experience**

This essay began by defining natural history as a field marked by observational research. All natural historians exercise their practice through observation of the world around them – going places, collecting things, watching, learning, asking questions, and sharing their thoughts with the world. As explorers, curators, scientists, and artists, natural historians shared a commonality in that they sought to learn about the world through experiences and to share these experiences with others. Any scientist today will say that they found their passion for science by mucking around in a backyard stream or mixing up concoctions of kitchen chemicals – experiences that many children have as they begin to collect experiences with the world around them, but few foster into a lifelong interest. Educational thinkers have come to recognize the importance of experiential learning for its ability to solidify information in one’s memory and foster a passion for the subject matter. David A. Kolb, whose work is anchored in part to the Lewinian experiential learning model, proposes experiential learning not as a replacement for more traditionally academic and abstract methods, but rather as a complement to further solidify ideas and formulate new applications (Fig. 8) (Kolb 1984).
Norman Evans, another researcher of experiential learning, proposes that not only does de-emphasizing experiential learning discourage passionate emotional engagement with the subject matter, but that it is also reflected in the lack of interest in higher education (Evans 1992). Evans claims that 60% of adults feel that they are “hopeless as learners” simply because they did not connect with the one method of engaging with subject matter in academic circles (Evans 1992). While experiential engagement with the world is recognized for its value in educating children, it remains an important part of forming ideas in adulthood despite the shift in emphasis towards academic learning as we grow older. Fortunately, some scientists are beginning to recognize the importance of experiential outreach with their audience as certain issues like climate change become more pressing. In an effort to both repackaging data in a digestible way and to connect emotionally with the audience, students and researchers at the University of Minnesota have converted data on climate change into a musical piece (Hansman, 2015). In a similar fashion, efforts and organizations have sprung up globally that are meant to bridge science and the arts in an effort to combat climate change (Artists & Climate Change). Experiential approaches to public education are not new, however – as previously explored, museums have existed since the emergence of the curiosity cabinet as a means of interacting with education (Latham and Simmons, 2014). All of us as humans have a curiosity at our core driven by the desire to seek new experiences
and learn new things firsthand – this is why we seek to travel, collect, ask questions, and create, experiences that are not exclusive to natural historians but rather universal among all people. By playing to these desires, we foster a passion for the world around us, both in ourselves as scientists and in others as we share what we’ve learned.

Application

Experiential learning has been a driving force throughout my life – both in the formation and pursuit of interests. It is for this reason that I was so drawn to the ideology behind natural historians – not only were their endeavors and accomplishments fascinating to me, but I also felt a sort of kinship with them, their interests, and their philosophies. Experience drives curiosity, which leads to seeking further experience; and so, when I discovered a small grey rock on the Kenosha shores of Lake Michigan, with fossils of striking white rings and black latticework, I was intrigued. More of these stones popped up, mostly the signature white crinoid rings and black bryozoan fans, but some featured the distinct scaffolding of coral or gracefully isolated brachiopod shells and the image of this ancient ecosystem began to form in my mind. I needed to know more about these fossils – where were they coming from? How old were they? What did they look like before being encased in the eternal records of dolomite?
My curiosity about this fossil formation and my desire to share this excitement with others would lead me on a multifaceted exploration of their history and ecology that echoed the endeavors of the natural historians of the Age of Exploration. My curiosity itself was rooted in the experience of walking along the chilly lakeshore and finding the fossils myself; small and easy to miss, but powerful in the spark of discovery I experienced that set off the snowball effect of curiosity. These fossils lent themselves to hours of contemplation – sitting with the rock, admiring it wet and dry, and turning it over in my hands. I looked closely at every little structure present in every animal and tried to imagine what they looked like, and then compared them to fossil guides to confirm the species I had found. I collected as many of these fossils as I could, categorizing them based on which species could be found in them, keeping the most interesting specimens on the top of my
shelf and compiling the rest in small tubs. Seeing them all together began to give me a sense of the ecosystem that these creatures once existed in together. Today they are simply organic shapes encased in rock, but they were put there by real animals that grew, lived, and died just like animals today. The aspects of exploration and collection in my exploration of these fossils formulated a sense of location and reality that made them seem all the more impactful. My fossils were not remarkable specimens by any means – they were common and waterworn - but the fact that I had found them myself on the shores of my very own Kenosha was what made them fascinating to me. They represented a physical memory of a Kenosha that existed long before Kenosha did, when our continent did not yet exist and in the place of Lake Michigan sat a prehistoric sea. The desire to learn about these fossils and my local history drove me to become the explorer, curator, scientist, and artist in my own learning experience to analyze a fossil bed with very little previous information available to the public.

Contemplation and observation can accomplish a lot when it comes to fossils, but they have no weight without the efforts and knowledge of countless researchers before me. With fossils on my desk and the indispensable wealth of knowledge afforded by the internet, I began to seek the answers to the questions I had about my fossils, starting with how old they were. Typically something like this would be done by analyzing geological strata, but because my specimens were washing up on the shore of Lake Michigan from some underwater fossil bed, I could not know exactly what strata they were situated between. I could, however, postulate that if they were breaking off the fossil bed and washing up on shore, they were likely coming from a surface stratum – and this information could be found in geological maps. I looked at maps provided by the Wisconsin Geological & Natural History Survey and found that the exposed layer of rock closest to where I was collecting was Silurian in age, deposited about 443-416 million years ago.
Furthermore, the quantity of fossils found from this particular fossil bed (indicated by the grey matrix and white crinoid rings) far outnumbered fossils found from other beds at the same site (typically featuring different species in a different colored matrix). My fossil hunting expeditions at other sites around Lake Michigan yielded no fossils of the type I was collecting at the Kenosha shoreline, indicating that this particular fossil bed was likely located offshore near my collection site. When looking at fossil inventories of Silurian era beds in other regions, the types of species found matches closely with the fossils that I had been collecting (Watkins 1977, 1991, and 1993, Johnson 1999). From this information it was fairly safe to claim that my Kenosha fossils were Silurian in age.
What species, then, was I finding? I had a casual knowledge of local fossils as a result of the fossil collection hobby, but would need to rely on the expertise of previous researchers for a confident identification. With the help of a number of illustrated fossil guides (specifically from the Wisconsin Geological & Natural History Survey, as well as the Illinois State Geological Survey, whose diagrams I found to be more clear and helpful) I was able to identify the fossils I was finding by applying visual comparison of my findings to those in the diagrams (Wisconsin Geological & Natural History Survey, Illinois State Geological Survey). Identifications were easy to make because most of the fossils I had been finding were relatively common (Fig. 11). Through
comparisons to illustrated diagrams as well as to photographs of other identified fossils, I was able to identify 5 organisms in my collected fossils: spiriferid brachiopods, crinoids, bryozoans, and tabulate and rugose corals. Because of the water-worn nature of my fossils and the close similarities that many species within these groups have to each other, identification on a more specific level than this was not possible, an issue that plagues even seasoned researchers for Silurian fossil beds (Watkins 1993).
Fig. 11: Diagrams used in fossil identification. a. Brachiopod diagrams provided by the Illinois State Geological Survey. b. Bryozoan diagrams provided by Illinois State Geological Survey. c. Crinoid diagram provided by the Illinois State Geological Survey. d. Tabulate and rugose coral diagrams provided by the Wisconsin Geological & Natural History Survey. e. Rugose coral structure diagram provided by State University of New York Cortland.

Knowing how these animals behaved and interacted was the next step. Any community of animals consists of a number of different survival approaches and interactions between species. All species found boast modern counterparts in one way or another – Crinoids, Bryozoans, and Brachiopods all have extant representatives of their groups, though today they are not nearly as numerous or diverse as they would have been in the Silurian era. While both tabulate and rugose
corals are extinct, corals as a whole still populate modern seas. From these modern counterparts, the function of a living Silurian seafloor community can be extrapolated. Much like modern corals, tabulate and rugose corals formed calcium carbonate skeletons that protected their soft bodies in life and remained behind as fossils following death. However, while many contemporary coral communities formed around the physical structures of the corals, in this community, the environmental substrate seems to be the clustered debris of dead animals, especially crinoids, whose scattered rings occupy by far the most matrix space in these fossil beds (Watkins 1993). These crinoids, known casually as “sea lilies” or “feather stars”, are thought to be essential shapers of the Silurian seafloor ecosystem for their high rates of substrate deposit (a crinoid’s skeletal rings scatter when it dies) and high-level filter feeding (Watkins 1977). Other groups with contemporary, yet often unheard-of, counterparts are the brachiopods and bryozoans. Brachiopods, though they resemble bivalve molluscs, are actually a phylum of their own marked by their particular symmetrical growth (which differs from that of bivalves) and the presence of a stalked pedicle which anchors them to a surface (Illinois State Geological Survey). Bryozoans, also referred to as ectoprocta, are small coral-like creatures that form colonial skeletal nets (Illinois State Geological Survey). All creatures listed are filter feeding invertebrates, who would have taken advantage of the algae and cyanobacteria growing in the warm shallow Silurian seas, but other fossil beds from this period have been found to include annelid worms, cephalopods, trilobites, and snails, introducing more complex interactions to this community, including predation, scavenging, and decomposition (Fig. 12) (Watkins 1991).
Fig. 12: Silurian communities including crinoids, brachiopods, tabulate and rugose corals, and bryozoans (Winston 1982).

Results

This project consists of a museum-style exhibit constructed with Natural Historian philosophies and methods according to the four roles I identified. My objective was to create an engaging and educational experience. By applying elements of exploration, curation, science, and art I intend to convey to the viewer, who may know very little about local Silurian ecology, both factual information about the fossil organisms on display as well as a sense of intrigue and emotional connection with the subject matter. To accomplish this, I decided to present actual fossil specimens from the collection site (intended to convey a sense of real presence accomplished by actual specimens rather than words and pictures) alongside full-color detailed illustrations depicting a reconstruction of the animals during their lifetimes (Fig. 12). Because these illustrations were meant themselves to convey information, it was important to consider what information I wished to convey about the animals. I wanted my viewers to make the connection between the fossil specimen and the living animal depicted, and so I included both live and dead animals in my scenes. I also wished to communicate the fact that this was a living ecosystem and not isolated incidences of animal life, and so I chose to include a number of
different organisms in each scene. Present in every composition are crinoid columnals scattered across the sea floor, as I found this aspect of their sediment building to be important. Tall, graceful crinoids are silhouetted against the water’s glowing surface above, and are intended to communicate to the viewer how vital crinoids were to Silurian-era Wisconsin reefs, as emphasized by Racine formation researcher Rodney Watkins (Watkins 1991). I chose to work in markers for these pieces because, in my experience, my marker work is the most attractive and engaging part of my portfolio and consistently catches viewers’ attention. Vibrant colors and intricate details, which are key qualities of my marker illustration due to the nature of the medium, were used for their ability to capture the attention of casual onlookers and stir the imagination. I also wished to convey the idea of warmth and liveliness, which were important because I wanted my audience to imagine the warm, shallow seas and tangible lives of these animals, despite having lived in a drastically different time. Careful attention was paid to rendering the sunlight on the surface of the water and the atmosphere of the sea as the scene moves back in space, creating the illusion of being physically in the sea with the fossil life and to make my audience feel immersed in the archaic ecosystem. Such romantic ideas may seem inconsequential to someone of a practical scientific mind, but I wished to try for this emotional appeal to the imaginations of the audience in order to capture their sense of adventure and intrigue, which were feelings that played an important role in garnering my own interest in this fossil bed.
Fig. 13: Final illustrations of reconstructed Silurian fossil life from the Kenosha coast of Lake Michigan.
Alongside the fossil specimens and illustrated reconstructions, a small blurb of information accompanies each animal (Fig. 14). This will give the viewer ideas to consider while contemplating the fossil and reconstruction in front of them – what was this animal like? What role did it play? How does it compare to animals that I know? The goal is not to make the audience feel obligated to learn, but rather to make them want to know more about this obscure yet local fossil bed.

![Fig. 14: Framed fossil display mockup, including reconstruction artwork, fossil specimens in shadow box, and information tag about the animal.](image)

Additionally, I wish to convey to the audience both the excitement of discovery that I felt while collecting these fossils, and the ability to begin recognizing fossil forms *in situ*. An interactive display will accompany this gallery exhibit consisting of stones from Lake Michigan, including a number of typical fossil conglomerate stones I have collected, in a low bin of flowing
water. Audience members will be encouraged to sift through the stones and see what fossil stones from this site look like on the shores where they were found. This display is intended to further convey a sense of the reality of these fossils and the fact that anyone can find prehistoric history out in the world if they know where and how to look.

Who, then, is the audience? For the time being, these fossil displays will be presented to students, faculty, and family at North Central College, which is proximal (about 75 miles) to the Kenosha fossil beds and locally boasts similar fossils from the same era. Potential futures for this project include donation or loan to the Kenosha Public Museum, a small free-to-access museum which has local fossils and other geological specimens on display as well as anthropological artifacts. Viewers to this locale will have the added emotional connection of very likely encountering these same fossils for themselves while walking the Kenosha coastline, as well as the impact of physical location while contemplating the town’s history 415 million years prior.

Ultimately, my goal with this project was both to explore these fossil beds in a way that was comfortable and engaging for me and then to convey these feelings of excitement and intrigue about these fossils to a non-science-specific audience. My hope is that by packaging the authentic fossils that I found with attention-grabbing and engaging artwork as well as information about the animals and an interactive display, a passion for the local fossil bed will be cultivated in viewers. This passion may extend beyond my project into their own interests, be they fossils or ecology or local history, or even just the satisfaction of knowing a little more than they did the day before and sharing this information with others as I was driven to do for them.
Sources Cited:

Able, Kenneth W. 2016. “Natural history: an approach whose time has come, passed, and needs to be resurrected”. ICES Journal of Marine Science. 73(9):2150–2155.


Hansman, Heather. 2015. This Song Is Composed From 133 Years of Climate Change Data. Smithsonian.com.


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