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Why Collect Fossils?

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"*Only passions, great passions, can elevate the soul to great things.*" ~ Diderot, 1746

As a person who lives an examined life, I enjoy thinking about why I choose to spend my precious and limited time on some things and not on others. I thought it might be instructive therefore to pen a brief essay about why I enjoy hunting for, finding, and studying fossils. The reasons for my intense interest in amateur paleontology are many, including the following.

Horned Lizard

Spending Time Outdoors

Fossil collecting is a hobby that gets you outdoors, often immersing you in interesting and beautiful landscapes. In previous essays in the *Rostrum*, I have described my experiences hunting for Oligocene mammal fossils in the badlands of Wyoming, Cretaceous marine fossils in Mississippi, and visiting the famous Olduvai Gorge in Tanzania where Louis and Mary Leaky made so many important discoveries of early humans, thus providing a window into our own past. While fossil hunters often have their eyes glued to the ground searching for specimens, there are many other things to be seen, including natural geological features and wild animals. In Wyoming, I frequently encounter prairie rattlesnakes, coyotes, horned lizards, pronghorn antelope and a variety of other animals that inhabit this semi-arid region. The badlands themselves, which consist of weathered rock formations, are strikingly beautiful, especially contrasted against a deep blue western sky. They are further accentuated by the billowing cloud formations so common in this part of the country. Along the James River in Virginia, I have plucked tiny turtles from the river to quickly examine and release them and observed attractive zebra swallowtails and other colorful butterflies gliding near me or sunning on the beach. In Africa, of course, there are the abundant antelope, giraffe, and a variety of large carnivores, such as lions, cheetah, and hyenas. Because hunting for fossils or visiting important paleontological sites takes me outdoors, I find that it is possible to pursue other interesting hobbies as well, including nature photography. While searching for fossils, I almost always carry a digital camera with me, not only to record the trip, but also to document any interesting animals or plants I might encounter along the way.

Zebra Swallowtail

Another benefit of a rigorous hobby like paleontology is the exercise you get hiking into and out of often rugged and varied terrain and the work it often takes to extract specimens from hard rock or other challenging substrates. This is particularly important for those of us who are getting older and work at relatively sedentary jobs. Like many of us, I spend an inordinate amount of time in meetings or sitting in front of a computer. Fossil hunting not only gets me outside, it keeps me active and in decent physical shape. Climbing around the rugged and steep rock formations that characterize the Wyoming landscape, for example, is no easy feat. In addition, there is no shade to speak of and the sun can be unforgiving, even in the early spring. One of the more challenging sites I've visited in the past few years was in Mississippi, where I had to climb down a several hundred foot elevation to access a riverside site. It was summer in Mississippi and blazing hot—over 100 degrees F. After a brief rain storm, the valley was heavy with steam and the humidity was nearly unbearable, much like tropical areas I've visited such as Indonesia, Malaysia, Papua New Guinea, Brazil, Costa Rica, and northeastern Australia. The hike out of the valley and back up to the vehicle was steep and exhausting. About half way up, I was not only drenched, but dripping with sweat, and I thought my heart was going to jump out of my chest. Nevertheless, I kept up with my colleague who was nearly 15 years younger.

Exercising the Mind

Taking a cue from MacDonald, (1983), I have always sought to be a serious amateur, assembling a library of relevant books, attending scientific meetings, and getting to know professionals who work in museums or universities. To seriously dabble in the art and science of paleontology, one must possess excellent observational skills and be reasonably good at anatomy and taxonomy. I find that paleontology helps me to develop and maintain my knowledge of both, thus exercising my intellect.

Fossils are parts of dead animals that have been preserved though mineralization. Typically, these parts are restricted to the hardest and most durable parts of organisms, such as teeth or bone, but occasionally under the right circumstances, soft parts can be preserved as well. So, in order to identify your finds, or to even recognize them in the field, it is important to know something about the anatomical structure of the preserved organisms you are collecting, whether they are invertebrates, vertebrates, or plants. For example, the teeth of various shark species, whether tiger, mako, white, cow, or the massive, extinct *Carcharodon megalodon* differ in size and shape. All of them look quite different from marine mammal teeth, which are typically more conical in shape. When a whale bone is discovered, what part of the animal does it represent: skull, flipper, rib, ear, or vertebrae? These are all questions that both the amateur and professional paleontologist must effectively answer.

Author with Cretaceous ammonite from Wyoming

Taxonomy is the science of animal classification and naming, and phylogeny refers to how various groups of animals are related to one another. What order, family, genus, species, etc. does a particular specimen belong to? There are plenty of textbooks and field guides that can help you learn the anatomy and taxonomy of various animals and plants, but the most effective form of learning is hands-on and experiential. I've found that it is much better to learn from experienced amateurs or highly trained professionals in the field where one can observe what a fossil actually looks like *in situ*. This helps one to develop a "search image" of the objects of interest, which can greatly aid your ability to detect them. Without a search image, how many times might you walk by fossils in the field, only to have someone else locate them in your footprint? That's why it's important to also know something about the geology of the site you are collecting in. What age is it? Is it terrestrial or marine? What kind of sedimentary rock is present? What types of fossils might one expect to see and collect there? All of these considerations are great ways to exercise one's intellect and stay engaged.

Connection to Nature: Past and Present

As a trained ecologist, I am fascinated with biological diversity and how it evolved, and intensely interested in the phylogenic relationships between extant living organisms and the ecological pressures that led species to develop various adaptations, whether physiological, anatomical, or behavioral. Hunting for and studying the evidence for ancient life therefore comes naturally to me. In particular, I am fascinated by extinct species and the various processes that led them to the end of their lines, whether it was competition from other species or natural disasters such as asteroid impacts or climate change. I love looking at my extensive collection of ammonites with the realization that this was one of the most abundant of all marine creatures so many hundreds of millions of years before the present. Thinking about these creatures and their potential connection to extant nautoloids, such as the chambered nautilus, gives me a sense of the "immortal" nature of DNA – the building blocks of all life – and the continuous lineage of living things passing through the long, seemingly endless procession of geological time. It reinforces my perception that there is beauty in nature and evolution and reminds me of Charles Darwin's famous quote from *The Origin of Species*: "There is grandeur in this view of life, with its several powers having been originally breathed into a few forms or into one; and that whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved."

Learning about life, whether ancient or modern, reaffirms my own deep connection to nature and prevents me from becoming victim to the shallow attractions of modern consumerism. Noted conservationist

E.O. Wilson (1984) has argued that humans are born with an instinctual love of nature or "biophilia", and hunting for the evidence of ancient life forms (i.e., fossils) is just one more expression of this deep-seeded phenomenon.

Excitement of Discovery

Several books exist on the psychology of collecting. As in big game hunting or angling, the hunt for objects of interest is in itself a thrilling aspect of the collecting experience. Indeed, fossil collectors are also trophy hunters in the sense that they enjoy bringing their "quarry" home and proudly displaying it to others. While there is a certain narcissistic quality to this practice, Muensterberger (1994) suggests that – more often than not – the roots of this passion can be traced back to one's formative years. That was certainly true in my case. I greatly enjoyed collecting rocks and fossils with my father when I was a child and the times I spent with him in gravel pits and rock shops and beachcombing certainly set the stage for my later interest. This intense passion for collecting is not necessarily a bad thing unless the collector becomes an insufferable braggart rather than a student or a teacher or if his or her collecting becomes so obsessive that a single-minded focus causes them to neglect other important aspects of life, such as family or work. In fact, this passion for collecting can have many important benefits. Amateur paleontologists have made many finds of great importance to science (Macdonald, 1983). That being said, it is important to pass such finds along to museums where they can be properly studied and documented in the peer-reviewed scientific literature. When I hunt in Mississippi with my friend and colleague George Phillips from the state's Museum of Natural History, he retains the scientifically significant specimens I find for the Museum's study collection, but places my name on the label as its collector.

The commercialization of the fossil trade with the excessive prices being charged for fossils is highly problematic in that it can attract people to the hobby for all the wrong reasons. I find it objectionable that any fascinating, attractive, or scientifically significant fossil would be viewed simply as a source of hard currency rather than a rare natural object deserving of our awe and respect. That is certainly not the reason I collect fossils and I suspect that it is not the core motivation of most serious amateur collectors. I hope that geological societies continue to stress the ethics of collecting to make sure that people are drawn to our hobby for all the right reasons.

Social Interaction

We humans are social beings and one of the great joys of amateur paleontology is spending time with others who share our passion. Not only do I enjoy going into the field with friends, I also relish the time spent at geological society meetings, conferences, and other related events. The vast majority of the people I meet through our hobby are a pleasure to be around and have an intense curiosity about nature and life. While amateur paleontologists may differ greatly in their age, work, backgrounds, religious beliefs, levels of education, financial status or ethnic origin, they are all brought together by a shared interest, and that can be a powerful attraction.

Author with friends in the Wyoming badlands

Conclusions

In conclusion, the reasons that I enjoy collecting fossils are many, including the chance to spend time outdoors, to exercise and stay in shape both physically and mentally, to learn more about wildlife and nature, both ancient and contemporary, to experience the thrill of the hunt and discovery, and to share knowledge with and to learn from others. Paleontology is a form of citizen science and makes a wonderful hobby for both young and old. In its practice, it is possible to better understand and appreciate deep time and the evolution of all life on earth, including ourselves.

(All photographs provided by the author.)

Acknowledgement

I dedicate this article to my friend and fellow MGS member John Wolf, who recently passed away unexpectedly. John was the embodiment of the "teacher-student" amateur paleontologist who was always ready to share his knowledge with or to learn from others. When I first met him, he presented me with a small

collection of representative specimens from the Chesapeake and Delaware Canal site he was so fond of. I will never forget his kindness and generosity.

References

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