My first real coming of age foray into the world of science began with religion.

As many children do, I grew up fascinated with lost worlds. Books littered my shelf detailing plants and animals that had left only their scattered remnants as a legacy for us to discover and provide with unpronouncably cool names: Pachycephalosaurus, Carcharodontosaurus, Maiosaurus. But for a kid, 150 million years is enough to place something in another dimension, so there was little to make me think that the timeline presented in these books conflicted with the one taught in Sunday School. In my mind, they were completely separate and equally true. Soon enough, however, my church made it clear that this historical conception was unequivocally wrong. Before I had even learned the meaning of natural selection, I was shown the battle lines between creationism and evolution. By age fourteen, I had become a local standard-bearer for intelligent design giving speeches and engaging in heated debates with science teachers.

However, it seems I have always been guided by an innate affection for empiricism. Unsatisfied with a purely Biblical argument and encouraged by my teachers, I dug deep into the scientific evidence presented by both sides. Despite internal protest, I was awed by my transformation in thought. I could not deny that I had been misled in my opinions but rather than coming out frustrated, I was fascinated by the change in viewpoint and the excitement that comes with a better understanding of the world.

A transformation of this sort, however, was not enough to compel me to seek a career in science. As in most introductory science classes, my high school labs consisted of following protocols and recreating experiments, the results of which were already well understood. Additionally, no mention was ever made of the possibility of a career in research. This all suggested to me that further research in science could be done only by the most brilliant minds. The only biology-related career options seemed to be in medicine, a field in which I was decidedly uninterested. Without any paths of interest in the field, I decided to abandon biology and seek a degree in international relations

Fortunately my liberal arts education at Earlham College precluded the possibility of forgetting about biology altogether. Two years in, I took a survey course in biodiversity. Although I found the topic intriguing, it was largely the presentation by the course instructor, Leslie Bishop, that pulled me in. Her knowledge and enthusiasm for the material and for her research rekindled my interest in biology and got me thinking about pursuing a career in science. I soon made my official entry into biology with many questions in mind. In particular, I was fascinated by the possibility of exploring empirically and in scientific terms many of the theories that arise in the social sciences. It didn't take long before I became acquainted with E.O. Wilson, sociobiology, and the fantastic world of social insects.

In line with these initial interests, I participated in my first research experience under the direction of Chris R. Smith investigating the genetic basis for caste determination using the red harvester ant, *Pogonomyrmex barbatus*, as our study system. As part of the study, I became familiar with a number of basic genetics research techniques including DNA/RNA extraction, primer design, and SDS-PAGE. More significantly, though, in working with a group of three other fellow undergraduates on the project I learned the power of collaboration in developing techniques, analyzing data, and troubleshooting protocols. We presented our findings at Earlham's Annual Poster Conference. Although the results were preliminary, they highlighted some key ideas in our developing understanding of evolution. One such finding was that a particular protein kinase, target of rapamycin (TOR), a key factor in the evolution of caste differentiation in honeybees may have played an opposite role in ants. This raises questions about the ways in which preexisting genetic composition can constrain or facilitate the evolution of novel adaptations.

As I developed this scientific mindset, I also started contemplating other questions unrelated to this research. While tromping around Earlham's back-campus forests, three other undergraduate students and I noticed beaver stumps at significant distances from nearby open water. With a growing interest in the foraging behaviors of North American beavers (*Castor canadensis*) and how they fit into a broader optimal foraging theory, we began developing a project to examine this. Hypothesizing that foraging at greater distances over land requires greater energy use and puts an individual at higher risk of predation, we wanted to see how and if beavers' tree preferences changed with distance from water. As we pursued this question, maneuvered through the challenges of experimental design, and finally presented the results, I grew excited by process of seeing a research project through from start to finish. Moreover, by collaborating with a group of individuals with diverse skills, I learned a great deal about doing field research, tree identification, GIS, and statistical analyses. In the end, our data provided us with interesting results. Contrary to our expectations we found that our beaver's tree species preferences did not appear to vary significantly spatially and that the species-specific preferences they did show were different from those in other parts of the US. We were invited to present these results for the broader public as part of Earlham's Biology Department Colloquium Series, a wonderful experience that gave me one of my first opportunities to think deeply about how one translates research for a broader audience in ways that are simultaneously comprehensible and captivating.

It was during this time that I also stumbled across a number of papers describing the 'intelligent' behavior of the plasmodial slime mold, *Physarum polycephalum*. My mind already on questions of foraging behavior, I was curious to see if much 'simpler' organisms, ones without any neuronal network, could also make complex changes in behavior based on the spatial distribution of resources. Working independently, I developed a project during my final undergraduate semester that used time-lapse photography to document post-resource discovery behavior in these molds as a function of pre-resource-discovery foraging time. Although a simple study in theory, it did not take long in doing this project to realize the subtle difficulties in working with a new system. As there were no faculty members at my school with experience working with *Physarum*, much of my time was spent doing preliminary work figuring out the best way to cultivate the molds and to develop an effective experimental design. In the end, I found that these multi-nucleated single-celled organisms do alter future behavior in light of past experiences with their environments suggesting that they have basic memory functions that play a role in relatively complex decision-making. I presented these results at undergraduate research conferences at Earlham and Butler University. Though often frustrating, I absolutely loved the challenge of designing, developing, and carrying out a research project on my own then sharing the results with the public. In fact, this was the final push I needed to be convinced that I should pursue a graduate degree in evolutionary biology. There was, however, another field I wished to look into first.

Ever since taking the biodiversity class that had brought me into the scientific fold, I had had a nagging interest in education, specifically wondering why, despite strong interests in biology, I had wandered so far from it. This got me thinking about how introductory science and math courses could be taught in more engaging ways. So in wanting to learn more about this and get involved in service, I took a volunteer AmeriCorps position following graduation as a tutor and mentor in a public high school in Seattle. Focusing primarily on increasing mathematical and scientific literacy among academically struggling 9th graders from economically impoverished backgrounds, I came to realize the challenges of teaching and exciting youth in these areas. This experience highlighted the importance of not only of developing new and creative ways of engaging students in these fields, but connecting students with knowledgeable adults beyond their teachers.

After completing my AmeriCorps year, I was hired by the school to assist in developing and managing a program that connected graduate students from a nearby university with 9th graders through regular tutoring and classroom support. This experience also enabled me to teach my own remedial math and algebra class this past summer for a high school readiness program through the YMCA. Additionally, through involvement with the Seattle Aquarium I had the opportunity to share my love of biology with a broader audience through volunteer work as a Marine Science Interpreter and by working a camp counselor for their marine summer programs. These programs had me doing super fun things with kids and adults alike, dissecting squid, combing beaches for cool animals, and watching live-action urchin mating among other things while sharing my knowledge about marine organisms, ecosystems and environmental issues.

Through these experiences three lessons stick out in my mind, namely that 1) science and math become more interesting for everyone when they are connected with the real people who work in these areas, particularly if they show their passion and are able to communicate their ideas in non-technical language, 2) lasting learning comes more easily through hands on experiences that allow students to develop and pursue their own questions and ideas, and 3) one of the most powerful ways to teach is by making strong personal connections with your students.

Despite spending two years out of academia, I could no longer suppress a desire to expand my own understanding of the world and to begin pursuing answers to fresh questions. In an attempt to find a specific field that had questions I wanted to pursue, I browsed literature across the spectrum of biology - but my interests remained broad and I had difficulty pinning myself down to a particular system. In large part, this is why I was so drawn to Mike Travisano's fantastic work doing experimental evolution with microbes. Here was a system where I could ask significant broad-scale questions about the ways in organisms evolve and be able to test these questions experimentally. Joining this lab has opened up avenues for me to examine ways in which genetic and ecological factors interact to constrain or facilitate evolution.

As I enter my first year of graduate study, my aim is to continue developing my own scientific interests and pursuing answers to outstanding questions in evolutionary biology, while continuing to share my passion and knowledge with the broader public. In particular, I'm interested in engaging youth through question-based science in a way that demystifies the process but also pushes them to think critically about how one finds answers to those questions. In this vein, I have begun working with Teaching SMART, a program that brings undergraduate and graduate students to neighborhood schools to lead hands-on lessons in math and science. Additionally, I am currently acting as a teaching assistant leading labs for one of the University's non-major biology courses, an experience that is challenging me to seek innovative ways to pique interest among students who are not initially excited by science and to help them grow as scientifically-literate non-scientists.

It is odd to consider the circuitous path I took from a creationist to a career evolutionary biologist, but it seems I have always been guided by two things: a desire to fully understand and discover for myself the way the world works and a passion for instilling this zeal in others. So it is with these things in mind that I begin the next stage of my life with a dedication to contribute meaningfully to a field I once fought avidly against.