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I wanted to interview D'arcy Thompson in person, but unfortunately he is extremely dead, so I couldn't. Instead, I did the next best thing: Late one night in the deep depths of Shriram, I pulled out an Ouija board and summoned his ghost. Suddenly D'arcy Thompson's ghost was standing in front of me. He looked at me and stroked his beard, which was neat because I didn't know that ghosts could do that. I immediately began to ask him questions before he could he retreat back to the spirit world. What follows is the 100% true transcript of my interview with D'arcy Thompson's ghost.

Me: Mr. Thompson, it's very good to meet you. I wanted to know, how did you first become interested in science?

D'arcy: Ah, well, that is a story of both tragedy and fortune. As you may know, my mother passed away when I was an infant, and so I was jointly raised by my father, aunt, uncles, and grandfather. My grandfather was a veterinary surgeon. My uncle John was also a veterinarian, while my uncle Arthur was a physiological chemist. Their work gave me a curiosity for the inner workings of animals. My father studied the classics, and through him I learned of the mathematical concepts of the Greeks. But, of course, I am no great mathematician.[4,5,6]

Me: That's cool. So what was your major in undergrad?

D'arcy: What?

Me: Oop, sorry. What topics did you study in university?

D'arcy: I was first attracted to medicine, as you can surmise from my upbringing. I intended to study medicine at Edinburgh University, but while there I became acquainted with the great marine biologist Sir Wyville Thompson. His elaborate accounts of marine life intrigued me, and I found myself drawn to the natural sciences.[6] So I transferred to Trinity College at Cambridge, where, fortunately for me, the natural sciences were flourishing. Michael Foster was establishing the school of physiology. F. M. Balfour and Adam Sedgwick had taken leadership of the school of zoology, and they were building the Zoological Laboratory. Thus, I found myself immersed in the study of animal forms, and I was guided by some of the best men in the biological sciences.[3]

Me: Wow, that's pretty lucky. So I know that you became a professor after that, but you also did quite a bit of fieldwork studying fish and the oceans for the government, both in Alaska and in Europe. Which did you prefer, your work as a professor, or your work as an ocean explorer?

D'arcy: Well, you see, my boy, when they first sent me on those expeditions, I thought I had found the job of my dreams. I loved the sea, and I loved to explore the world beyond Britain. But I soon found that the job did not involve exploring the unknown- rather, it involved tedious measurements and meaningless calculations and dull reports, over and over again.[3]

Me: Sounds about right. I mean, this was a government job.

D'arcy: Yes, my boy. As I measured the length of this fish or the salinity of that water sample, I found myself constantly distracted by my musings about mathematics or physiology. And so I knew that I must put my focus in my academic studies back at home. Yet, my experiences on the ocean were not all useless- I managed to collect many samples from the Arctic waters, and I made vital observations that contributed to my future works.[3]

Me: Did you ever consider going into industry?

D'arcy: What?

Me: Nevermind. Now, finally, I have to ask you about *On Growth and Form.* Everyone says that it's your greatest work, and it's still pretty popular 70 years after your death. How did you come up with your ideas in this book?

D'arcy: I'm delighted to hear that my work has not faded with time. Let's see…I performed many studies of animal forms at university and early in my professorship. I wrote about new Hydroids from Australasia, the nerves and the blood of jawless fish, the inner ear of the sunfish, a tapeworm isolated from the bizarre Australian echidna, the rare *Ancistroteuthis* cuttlefish, and the feathers of a hummingbird, to name a few. In short, I studied a diverse array of creatures from all regions of the Earth.

Many of these creatures were fairly obscure or ignored by other naturalists, but I believed that they could teach me some previously unknown secrets about the natural world.[3]

At the same time, I continued my studies of the classics. I took inspiration from the Greeks- a bit from Aristotle, but primarily from Pythagoras and Plato. From Aristotle, I took a keen eye for observation and a desire to accumulate facts. From Pythagoras and Plato, I took the idea that the solutions to all of the world's mysteries relied upon "Number," and this included the mysteries of the natural world. Of course, I did not subscribe to number worship. Rather, I interpreted this as the idea that the world's mysteries (including the mysteries of the natural world) could be solved via a mathematical approach. I studied physics, engineering, and mathematics from both ancient and modern texts. I took the time to converse with physicists and mathematicians.[3]

I saw that copious amounts of information about the natural world had already been accumulated by other men, so I did not seek to accumulate more. Rather, I set about analyzing some of this information from the point of view of a physicist, a mathematician, or an engineer.[3] Thus, I began to reveal the connections between "Number" and animal form.

Me: That's cool. I also don't collect much of my own data, although that's mostly just because all of my experiments fail. Anyway, could you summarize some of your most noteworthy findings from *On Growth and Form*? Or maybe some of your favorite ideas?

D'arcy: Certainly, my boy! As you may know, my overarching hypothesis was that physical forces put constraints upon organisms, which gives rise to the forms that we observe. My views were in conflict with those of the Darwinists of my time. The Darwinists clung to their doctrine of fitness; they believed that each of an organism's traits must contribute some fitness benefit to the organism. I, on the other hand, proposed how certain traits can be more simply explained by physical forces acting on matter with particular properties. As I said in my book, "cell and tissue, shell and bone, leaf and flower, are so many portions of matter, and it is in obedience to the laws of physics that their particles have been moved, moulded and conformed" (pg. 10). Furthermore, we can describe these physical forces mathematically, and so it seems that indeed Number underlies form.[2]

I believe my most noteworthy finding to be my theory of transformations. As we have discussed, I studied many fish specimens of various shapes and sizes. I noticed that, remarkably, if one were to draw a coordinate system upon each of these fish, one could convert between several related species of fish via a series of coordinate transformations. We may view the fish as a "function," and the variations between species occur via deformations of the coordinate system on which the "function" lies. And we may alternatively view these coordinate systems as force diagrams; in that case, we can see how physical forces may act upon a body plan during development to produce the variations in form that we observe among similar species.[2]

Me: Awesome! I love your mathematical description of seashell form as well- that partially inspired some of my grad school essays, so you kind of helped me get in here! On that note, one more question: What advice would you have for a budding young scientist now, in your distant future?

D'arcy: My advice to you, my boy, is something that I have said many times before: Science should walk hand-in-hand with Art. I myself had no artistic talent, but yet I saw the beauty in the natural forms that occupy every niche of our world, and I saw beauty in how Form can be so simply explained by Number. Think like an artist and appreciate the beauty of the natural world. My concern is that scientists in your time will lose their artistry as science becomes intertwined in commercial ventures.[3]

Me: Yep, that's definitely a valid concern.

(It was at this point that I noticed that some dark spirits had gathered. I was a little concerned because they were beginning to cackle ominously in my ear and they were writing warnings in blood on the whiteboard, so I decided that it was time to wrap things up.)

Me: Thanks so much for talking with me, Mr. Thompson! Unfortunately I have to go burn my Ouija board. Goodbye!

D'arcy: So long, my boy! Good luck in your scientific endeavors!

He faded away, and I was left to wonder about science and art and such. I also wondered if ghost D'arcy Thompson actually thought that I was a boy, or if he just said that to everyone.

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