



Career Interview with Entrepreneurial Scientist, Dr. Toby Parkes (PhD)

Habiba Abbasi

Climate change is a growing global crisis that requires input from interdisciplinary experts to adapt to the consequences of such changes in our physical environment. In conjunction with this, the human population is exceeding in exponentially increasing the anthropogenic footprint. We at JYI had the privilege to chat with a scientist who is at the forefront of such issues and is progressively making a difference in the climate change arena.

Dr. Toby Parkes is currently a biologist contracted as a Founder at [Deep Science Ventures](#), a venture studio that funds science company development, particularly in sectors which tend to see fewer start-ups created. Given his work in using novel technologies to reduce the impacts of humans on the climate crisis, Parkes has created a startup to further his research interests; Rhizocore focuses on soil technologies that can boost the carbon capture potential of ecosystem regeneration projects, as well as commercial forestry. “We have some of the worlds biggest ever problems in terms of population growth and climate change and I want to work towards solving global problems that we have right here and now,” Parkes expresses. By analyzing plant microbiology, Parkes can use agriculture and natural systems to enhance carbon capture, ultimately working towards society’s goal of balancing the production and removal of carbon emissions from the atmosphere.

Prior to this enterprise, Parkes pursued an undergraduate degree in Biology at the University of Bath. “I chose a Biology degree because I’m broadly interested in the natural world. I grew up in an agricultural rural village in Shropshire, England, and worked on farms when I was younger,” explains Parkes. Additionally, “I spend lots of time in the mountains. One of my hobbies is as a mountaineer, so I have been to some spectacular places and the natural world inspires me, hence, I chose to study Biology”.

During the first and second years of his studies, Parkes was given the opportunity to explore the fungal diversity on campus and the surrounding woodlands. He also conducted practical laboratory sessions in which he investigated the multiplicity and uses of plants in terms of energy and food production, enabling him to appreciate the dependency of humans on plants. Parkes furthered his interest in plant biology through an industrial placement year at the Royal Botanical Gardens, Kew in Sussex, England where he worked on innovations in seed storage. Here, he worked with a team of plant scientists (botanists) who explored new methods of



seed storage to accommodate unique plant species that require conditions for survival. “It was a fantastic year which cemented my desire to work with plants,” describes Parkes.

Parkes then embarked on a PhD in Molecular Plant Biology at the University of Bath, looking at the plant immune system and plant infections. Parkes notes that “as much as I loved the research I was doing, it was not directed towards an application,” which transitioned him out of the academic world and into the start-up world. A fundamental resource that helped Parkes during this transition (and that he highly recommends) is [Spin Up Science](#), which supports entrepreneurial scientists to become leaders in driving global change by founding companies.

This brings us to the present day. Rhizocore is grounded in the scientific research of plant biology and soil technology. Parkes explains, “the production of such soil technology is based on a group of soil-borne organisms called mycorrhizal fungi which are symbiotic (mutually beneficial relationship) with plants. These fungi scavenge nutrients such as nitrogen and phosphorus from the soil and transfer them to the



plant, which in turn increases the production of oxygen by the plant. The carbon that the plant takes in enters the plant root networks or gets transferred into these fungal networks where it is stored long term. Therefore, the more fungi present in the soil, the more carbon is stored in their systems.” Interestingly, depending on several different factors, “the soils carbon store can be increased by around 20 to 50 percent when using these fungi!” Parkes affirms. The use of this technology will be upscaled by production of a biofertilizer which is added as a supplement to the soil, either as a pellet or as a spray.

Following the launch of Rhizocore, Parkes wishes to devote his efforts to reducing the world’s agricultural land use. He is dedicated to going wherever he thinks it is most likely that he will make an impact, and currently, “I think that is through the start up route because this is where I feel I am needed,” Parkes describes.

Upon reflecting on his educational journey, Parkes states, “I wish I had been given a more balanced picture about what academia and research is.” Accordingly, here are Parkes’ three top tips for science undergraduates:

1. Forget About Grades – “All you will be doing is tailoring your work and what you do at university, so it scores mark. This fundamentally takes the learning process away from you. It is really important that through your university career you study what you enjoy learning about”.
2. Learn How to Split Your Work Life Balance – “Treat your student life as if it is the start of your work life and fit that into your schedule. Get your evenings and weekends back”.
3. Start Conversations – “Do not be scared to start talking to people: your peers, mentors, PhD student, professor and CEOs that you come across. Everyone at a fundamental level is a human being. They want to share what they are doing, and you can learn from that”.

Ultimately, the field of restorative agricultural techniques could solve some impending global issues such as food security and sustainability by increasing the productivity of agricultural systems as Parkes is currently achieving. With increasing recognition of venture studios, such as [Deep Science Ventures](#), scientists like Dr. Parkes can use their expertise to create novel technologies to help solve such issues.