

Ebubechi Okpalugo – Rokos Report

During August, I had the most amazing opportunity of interning at the Smithsonian Institute, the largest group of museums and research centres in the world. Based in Washington DC, as you can imagine, when offered the chance to cross the Atlantic and spend a month in the capital of arguably the most powerful country in the world, I couldn't turn it down. It turns out James Smithson, the person whom provided the money for the Smithsonian to be established, went to Pembroke College, and the Smithsonian Office of Interns and Fellowships have been eager to set up a programme with Pembroke for a while. Being the first candidate, I didn't really know what to expect, but it definitely surpassed my expectations.

I was based at SciColl, an international scientific collections organisation devoted to promoting the use and impact of cross discipline object-based scientific collections, including archaeology, biology, biomedicine, earth and space sciences, technology, and others. Object-based scientific collections are samples and specimens stored mainly for research purposes. These exist over a huge range of scientific study - think the type of things you'd find in the Natural History Museum, and you're on the right track. Despite their great relevance, these collections are often neglected, and in times of financial constraint they're often the first to be cut. SciColl's aim is to ensure these collections are well-managed and accessible, coordinating between geographically distributed and independent collections so that researchers in all disciplines and countries will have the research infrastructure they need.



My first role was to assist with SciColl's public engagement, helping with the website and social media. So, I took over their twitter, tweeting about my day to day tasks and retweeting relevant material in the scientific collection world. But most importantly, I spent my days researching into the collections I had access to at the Smithsonian, and writing articles on scientific collection based areas of research that particularly interested me. My supervisor, Eileen Graham, allowed me to be independent with my exploration, and during the first week sent me off to numerous museums to start off my search.

Beginning with the Smithsonian National Museum of Natural History, Eileen particularly recommended the 'Objects of Wonder' Exhibition, introducing me to the breadth of information hidden within museum collections. But what particularly caught my eye, and a topic I went on to write an article about, lay in the Human Origins exhibit. Opened in 2010, the exhibition takes visitors through 6 million years of scientific evidence for human origins, telling stories of survival and extinction in our family tree. Brought up strictly taught creationism, human evolution is a field that I had never previously really explored. However, the variability selection hypothesis, a theory discovered by a renowned Smithsonian anthropologist Richard Potts, fascinated me. This theory introduces the idea of variability being a deciding factor for the development of human adaptability – the reason why we can survive in such a wide range of habitats today. Bi-pedal locomotion,

opposable thumbs, an increased brain size; these are all features which allow us to adapt to changing environmental factors. And so, Homo sapiens have been able to survive the dramatic climate changes that have brought about the extinction of so many others of the Homo genus. As a medical student, the part that I was drawn to was the dramatic increase in brain size seen between 800,000 and 200,000 years ago, and how this can be linked to climate variability. On the next day of my exploration, I visited the Smithsonian National Zoo, an example of a live scientific collection. Between the lions and the meerkats, I ran into an exhibition comparing the relative brain size of different animals. Coincidence? At that point I knew I had to explore further into the use of brain size as a measure of ability,

and what exactly it was about our increase in brain size that brought us out on top in nature's game of survival of the fittest. With so many ideas, the project went on quite a journey, including the opportunity to interview Richard Potts himself on his two-week break from his Southern Kenyan digging expeditions. I never reached a specific conclusion, but instead mused on the features of our interactions that make us human, and the dangers of looking for a specific measure of human intelligence. During my time there, I almost accessed the neuroanatomical collections at the National Museum of Health and Medicine, however was unable due to time constraints. The collections include samples of Einstein's brain, extensively studied to uncover the 'secret' behind his intellect (which other than an

increased number of glial cells, no reliable evidence for has been found).



Other visits included the United States Botanic garden, whom hold an extensive medicinal plants section used by the FDA and a wide range of researchers. This led me to look at the role scientific collections have to play in limiting the spread of emerging infectious diseases, such as the 2014 Ebola outbreak, almost reaching a worldwide scale. Of 1,415 pathogens known to infect humans, 61% are zoonotic, i.e. are transferred from an animal host. With globalisation and the expansion of urban settlements, humans are interacting with wild animals more, and there is an increased risk of 'spillover'. In the case of Ebola, fruit bats have evolved to carry the virus, and in the 2014 outbreak patient zero is known to be a 2-year-old boy from a rainforest village in southern Guinea, thought to have played with or eaten an infected bat. The lack of recognition of the disease and therefore slow diagnosis meant there was a delay in action, resulting in the deadliest Ebola outbreak since its first appearance in 1976, responsible for 11,000+ deaths. However,

if bat samples from the region had been collected, the virus could have been followed, monitoring mutations to create accurate diagnostic techniques and vaccinations for the deadliest strain. I was able to sit down and discuss with Diane DiEuliis, who worked with SciColl, and explores how collections can be beneficial in the aim for pandemic preparedness. She also worked for the US Department of Health and Human Services during the time Ebola made its way onto American soil, and so could give me specific insight.

Despite not being directly linked to my degree, the topics I considered touched on the social side of medicine, expanding my interest in epidemiology and public health. Being a Smithsonian intern, I had the benefits of being able to go behind the scenes, as well as exclusive access to museums which usually required long waits and pre-booking. In total I visited 13 out of 20 of the Smithsonian museums and galleries (including the Zoo), enabling me to gain the full experience of what it's like to work in such a large and collaborative institution. The chance to live with other interns of diverse backgrounds and specialities in Washington DC was a test in my own independence, and involved me cooking more in a month than I did during my whole year of university.



I am incredibly grateful for the time that I had, and urge Pembroke to continue the scheme, giving others the opportunity to expand their horizons and see where they could fit in, in such a distinguished educational institution.