DR CARLO CAPONECCHIA:
Good afternoon, everyone. Welcome and thank you for joining us over lunch today. I'm Dr Carlo Caponecchia, the Co-Associate Dean Equity, Diversity and Inclusion in the Faculty of Science at UNSW. Really excited to be hosting today's event reflecting on our science history trail initiative, which was designed to increase the visibility of diverse scientists, redefine the traditional representation of a scientist by displaying these images and stories of diverse science role models throughout history. I'd like to begin by acknowledging Gadigal people, the traditional custodians of the land from which I'm joining our session today. And I'd like to pay my respects to their Elders past, present and emerging and extend that respect to other Aboriginal and Torres Strait Islanders who are here with us this afternoon. In doing that, I want to acknowledge the role that traditional owners and Indigenous people have as first knowledge creators, and their really deep understanding of the land, the sea and the sky that forms a really important source of understanding Australia, and feeds into all of our scientific understandings. Today's session will be recorded. So, if you need to leave early or miss any part, you can watch this again at your convenience as the link to the recording will be emailed out to everyone who registered. For today's event we'll be hearing from some of our really talented science students as they showcase their stories and contributions of the scientists included in our science history trail. We'll also have opportunities for questions towards the end the session. I'd like to quickly introduce and welcome the students. We have Divya Shah, Jess Chung, Juan Camilo Zapata Trujillo and Josh McCluskey. So, welcome everyone.

Where I'd like to begin is just giving a little bit of background to this project. We designed the science history trail in early 2021 as a way of partnering with current science students in an effort to re energise campus in an inclusive and equitable way following the first COVID lockdown. In early June, we started the process of recruiting current science students in so that they might research scientists through history and create a biography based on their research. To help with that recruitment, we held an information session on campus in mid-June where we discussed the project with interested students and listened to their initial feedback to kind of Co design this project as well. And we had really great feedback from a really wide range of our students. In July, we hired 14 students from across the faculty, and we hit the ground running with their research workshop co led by our outreach librarians, Kim Taylor, Monica Brian and Jennifer Whitfield. And also with our academic learning facilitators, James Bedford and Lisa Worthington. After this, students submitted a shortlist of scientists that they'd like to highlight on the science history trail. Once we finalised those scientists, students went through several writing and revision processes, guided by feedback provided by the Academic Skills team, and also through peer review. After the final draft was submitted, the EDI team, primarily myself and Mikayla Ray worked with Caroline Fox Drinkwater and Tom Bill at Ark to create a suite of digital and physical assets that created our science history trail. Of course, we originally planned on creating a physical trail on campus which members of the community could explore walking around campus and linking to the buyers with a QR code. However, this is obviously possible in the way that we imagined. Following ways to bring a physical trail to campus in 2022 with an expansion of students and an expansion of the scientists that we showcase.

But until then, we've created a virtual trail, which you can find by scanning the QR code on your screen, or clicking the link that will be placed into the chat. And I really do encourage you to explore all of the scientists that were featured and read the really very interesting bios that have been

developed by our students. And you can see all of the 14 scientists here on the screen now. Of the 14 scientists included in the trail, today we'll be hearing the stories of four of them. Dorothy Hodgkin, Julio Garavito Armero, EK Janaki Ammal and Mary Anning as told by our really talented student team. And so, let's get into hearing about these diverse scientists. But first like to introduce Divya, who will be presenting about Janaki Ammal. Divya Shah is a second year PhD student in the School of Biotechnology and Biomolecular Sciences. Welcome, Divya. Thanks so much for being here. Can you tell us a little bit about Janaki Ammal?

DIVYA SHAH:
Hi, everyone. Sure, I'd love to tell you a little bit more about Janaki Ammal. So, Janaki Ammal was born in 1897 in the Indian state of Kerala. She had quite an interesting childhood for a number of reasons. The one thing that I thought was particularly notable was that she came from a very large family. She was the 10th in a family, a blended family of 19 brothers and sisters. She was also interestingly addressed at the time mixed race, because her maternal grandfather was a British civil servant. This is interesting and unique because it meant that her childhood was quite different to that of other children who she grew up with. She had quite a hybridised childhood in the sense that she grew up with a mix of both British and Indian culture. In particular, this was important because for children at the time, especially if the cost that she was from, which was a lower cost, it was quite rare, especially for women to be granted the opportunity of having higher education. But through access to a British education, Janaki Ammal was given the opportunity to pursue this career in the sciences. So, her family was actually quite supportive of her where a number of individuals specifically from low cost and being limited women were forced into arranged marriages. Janaki's father actually very much encouraged her interest in the natural sciences. He helped in writing a book about birds in the North Malabar region from which they were from, and also maintained a pristine garden which really encouraged Janaki's interest in plants and in flowers.

Particularly interesting is the fact that at the time in India, the literacy rate for women was actually less than 1%. And less than 1,000 women in the country were actually enrolled in higher education. But Janaki Ammal not only maintained this interest in science throughout her life, but actually was able to pursue an education that was not only at the highest standard within India, which was very rare as I mentioned, but also she managed to travel overseas. Janaki Ammal was actually the first woman of Indian origin and Indian descent to receive a prestigious scholarship from the University of Michigan in America. She studied in America to specialise in plant psychology and genetics with a focus on breeding hybrids, which is an incredibly innovative thing to do at the time. She earned her doctorate in 1931 and was the first woman of Indian descent to receive that degree in botany in the United States. One of the most notable pieces of work that Janaki Ammal had participated on was a hybridisation of a sugarcane species in India, which enabled India to maintain independence from sugar cane crops from other countries. It was very important not only to India's economy, but for showing the world that India was capable of innovative science at a time when a lot of the largest scientific institutes in the world were based in more Western countries such as the UK and the US. Another really notable piece of work that Janaki worked on was the chromosome Atlas of cultivated plants. This reference text is actually still widely used today by botanists all throughout the world. And other really important and interesting part of Janaki's story is that unlike a number of scientists of the time, she actually returned to India. A very common narrative, especially back in those days,

was for scientists from more developing countries such as India and China and South America was to get them to travel overseas and to do the bulk of their work in these foreign countries.

But Janaki Ammal thought it was incredibly important that science, especially science related to the plants of India, actually be brought back to India and into the hands of the Indian people. So, Janaki Ammal actually returned to a newly independent India in 1948 where she was appointed one of the leading positions in botany in the country. She became the head of the Central Botanical Laboratory of India, and actually led the organisation of the Botanical Survey of India, which is very important because it aimed to collect and survey native flora, and also allowed the Indigenous practices of people in India to be brought into the narrative of mainstream science. While she returned to India, a number of Patriarchs in the field, of course, some of her new methods of scientific progress, that she was very persistent and tenacious, and made sure that all the new techniques she learned while overseas came into India and were adopted heartily. Another really important thing that Janaki Ammal did towards the end of her career is that she leveraged all of this influence that she had collected overseas to help with activism and the maintenance of important national parks in India. One of her most important pieces of work and that has been incredibly important to her legacy all throughout India is that she helped stop the destruction of the Silent Valley, which is a very large national park in one of the southern states of India. As she did this, she helped again to leverage the use of Indigenous practices and also highlighted the importance of matrilineal tradition. So, the role of women in land use. That was very important in more tribe like communities within India. Janaki's work which spanned over decades, and where she continued to embark on till the very end of her life. She ensured that India's practices of science were informed by the Indigenous people. And she passed away sadly at the age of 87. But during this time, she still actively worked in her lap, because there was nothing that mattered more to her than her work. Sadly, the Silent Valley in India but she helped to preserve was not yet declared a national park when she passed away. But thankfully, at the end of the very year in which she died it was. So, Janaki Ammal's influence span, not only throughout her life, but after she passed away.

CARLO:
Thanks so much, Divya. Such a great story spanning so many achievements. I noticed in the illustration of Dr Ammal that there's a number of flowers there and plant cell structures. Can you tell us about why those were chosen?

DIVYA:
Yeah. So, the plants that you see in the background of Janaki's image here are actually roses and magnolias. These specific plants are actually hybrids that she helped to work on throughout her career. In particular, this rose is a hybrid that she worked on while she was in the UK at the John Innes Institution. So, this rose as well as the Magnolia that's depicted are both actually named after her. And importantly, the rose species and Magnolia that she worked on while in the UK. Where during the time at which she worked in the John Innes Institute. And when she actually became the first salaried female staff member of England's Royal Horticultural Society. So, these flowers not only speak to her legacy and the work that she did with hybridisation, which was really revolutionary for the time, but also to the fact that she was one of the first women, literally one of the first women of a different race in those countries to actually achieve a position of such high standing. And these

flowers actually still continued to bloom today. And if you were to visit the UK, you could actually see them still living.

CARLO:
That's fantastic, Divya. Thank so much. I guess what I would also like to ask you then is, if you could reflect on why you chose to focus on Janaki Ammal as part of the science history trail.

DIVYA:
So, Janaki Ammal actually made significant contributions to such a number of fields. So, she worked in psychology, genetics, phytogeography, ethnobotany, and also pioneered the use of Indigenous and gendered approaches to land use. And for those reasons, as well as a number of personal reasons, which I'll go on to mention, I heard that it was incredibly important that a scientist like her who although somewhat well known in India is very largely unknown in most other countries. So, I think it was important that she was included in the science history trail because she challenged racial and gender boundaries to occupy spaces that were never before available to women, let alone a woman from a country like India and those of mixed race. She demonstrated through her life and all of her work assistance and tenacity as well as a devotion to science, and showed that these things were not incompatible with a woman's gender or with any particular race. Furthermore, I felt the historic resonated with me on a personal level. As an Australian born Indian woman, I've often kind of felt torn between two worlds. I never really felt as though I fully belonged, or was enough to be embraced by other culture. But in researching Janaki Ammal, who so vehemently embraced different parts of her culture, and also forged her own identity and refused to be defined by one label. I felt that I had the example of a role model who, despite so many odds, was able to embrace her heritage and also thrive in other countries and bring the learnings of her people to others and also the learnings of other countries back to her own nation. I think Ammal's defiance and her undying scientific curiosity enabled her to transcend borders and to (UNKNOWN) the globe at a time when most women, especially from India, were not able even unnecessarily travel to other cities and other states. In particular, there was one story I read while I was researching her that really stood out to me, that I think really spoke to her free spiritedness and her ability to kind of thrive under different circumstances.

So, as I mentioned earlier, Janaki actually travelled to the United States to finish her education and received her doctorate. On the way to the United States, she had to have to stay in the Ellis Island detention centre, as was common practice of the time for all incoming arrivals into the country. It was actually quite a tough process being that people often have to stay days, if not weeks, and be vetted really thoroughly through a number of often very invasive questions. But when Janaki Ammal did that, despite kind of the advice of a number of other people who told her that she should dress in western clothes, try to assimilate, only speak in English and things like that. She instead thought that it was really important that she highlight what her culture is. And she didn't want to have to feel like she was hiding or becoming someone else to get into this country, but she wanted to actually embrace her. So, she showed up in her traditional clothes, which is the saris that you can actually see depicted in the portrait of her head. And she still spoke in her native language as well as in English. And while she was there, there was one particular guard who took a liking to her. He actually thought that she looked like an Indian princess. And when he asked her whether or not she was, she very spirited didn't deny it. And I thought that was quite an entertaining choice. I think

many of us in a situation like that would be taken aback. You know often it seems kind of ignorant for someone to make an assumption like that. She realised that, at the time, it was an easy way for her to maybe get through this process that would otherwise be quite tough. So, she was just like, "Yes, of course, I'm a princess." And as a result of that, she was kind of enabled to get into the country even faster. And I thought, yeah, the story really highlights that under certain circumstances it's important to remember who you are and maintain your connection with your heritage, but also to kind of just like go with the flow and embrace the circumstances that are presented to you. And to do so with like good spirits. Yeah, so it was a story like that. And I hope that was particularly interesting and a fun thing to do that, especially when often the narratives that's presented, especially about scientists, is one that's quite serious. I felt that this kind of brought the humanistic element back to Janaki's story. And, yeah, I think that was really important to ensure that she's well understood. And one final thing that I thought was really important and speaks of her work is the fact that she is quoted often saying that her work is what will survive. And I think it is important because it does. It's to the prosperity of India through the sugarcane and the preservation of the Silent Valley and the blooming of those roses and Magnolia species were named in her honour that we can see that Janaki's work has transcended the legacy of maybe even just her name. Because her work is what really has survived.

CARLO:
Thanks so much, Divya. I agree that's such a great story about remembering the importance of heritage and culture. And thank you for doing such a great job of researching Dr Ammal's biography and sharing that with us. We're going to move on now to talk about our second featured scientist. And I'd like to introduce Jess Chung. Jess is a second year student in the School of Biotechnology and Biomedical Sciences. And Jess chose to research Dorothy Hodgkin. Welcome, Jess.

IT'S GREAT TO HAVE YOU WITH US. JESS CHUNG:
Pleasure to be here.

CARLO:
Can you tell a little bit about Dorothy Hodgkin, please?

JESS:
Yeah. Yeah, sure. OK. So, Dorothy Hodgkin was a Nobel Prize winning chemist who specialised in X ray crystallography. Her achievements included the discovery of 3D biomolecular structures like penicillin, vitamin B 12, insulin and a steroid called cholesterol iodide. That's, well, first because it was the first storage structure to ever be solved. Her insights into penicillin structure were crucial to refining antibiotic production, especially during a time like World War II. And her discovery of vitamin B 12 structure in 1955, which took seven years won her a Nobel Prize in Chemistry, being only the third woman to win a Nobel Prize in Chemistry and the 13th woman overall to win a Nobel Prize in general. But our most impressive thing was probably solving the structure of insulin, a project that began in 1935 after she was given a crystalline sample of insulin in 1934, and spent 34 years. She spent much of those years... Oops, sorry. I think, there we go. She spent much of those years refining x ray crystallography techniques for usage on complex molecules like insulin because the technology hadn't caught up back then, until she finally solved the structure of insulin with her team in 1969. Her work paved the way for mass production of and eventually widespread usage of insulin as a treatment for diabetes, saving millions of lives.

CARLO:
Thanks.

Thanks, Jess. That's a really good summary and really interesting material. I noticed in the portrait of Dorothy that her hands are quite permanent. Was there a reason for that in the illustration?

JESS:
There was indeed a reason. Dorothy was also disabled. She began experiencing pain on her hand at 24 and was diagnosed with rheumatoid arthritis, an autoimmune condition that affects the joints. Basically, the immune system thinks that the joints are invaders, and they start attacking the joints. An infection for years after her initial diagnosis triggered her first flare up and her condition gradually worsened over time causing crippling deformities in both her hands and her feet. Her has deteriorated to the point where she can no longer use the main switch of the X ray equipment required for her experiments, which is not ideal. So, in response, she had a longer lever for the main switch on the X ray made for the switch. She also combated arthritis flares with aspirin and heat treatment. And during the three day marathon that culminated in her solving insulin structured, Dorothy wore slippers while she worked due to severe swelling in her ankles. Like another more well-known therapy. She also spent a great deal of time using a wheelchair in her final years. And despite her failing health, she remained scientifically active travelling to Beijing in 1993, a year before her death. That's pretty impressive considering she's based in Britain and air travel back though wasn't exactly comfortable.

CARLO:
Thanks, Jess.

I think it's great that we know a little bit about some of the accommodations that she was able to make. I wondered if you could reflect a little on why you chose to focus on Dorothy.

JESS:
Sure thing. I first targeted her for multiple reasons. Her fascinating story, her success as a woman in a traditionally male dominated field and how she dealt with being disabled. One thing we both have in common is neither of us overcame our disabilities because it's not something to overcome. Accommodate, absolutely. Work around or with, yes, but overcome, no. Dorothy winning a Nobel Prize didn't magically cure her rheumatoid arthritis, nor did a word of the health problems that have caused her in her old age. The overused trope of disabled people supposedly overcoming our disability, whether through our achievements or just by living our lives is ridiculous. To overcome implies that we've defeated something. Except also often it's not our disabilities we've defeated, it's the inaccessible world that we find ourselves in. All the hoops we have to jump through to get the support we need, societal expectations where we are expected to be practically superhuman, or were painted as lazy. We're not trying hard enough, don't have the right mindset or faking it when most people can get away with mediocrity, with being grumpy, sad, negative, angry with being human. Disability and achievement are not mutually exclusive concepts. Disabilities don't prevent achievements and achievements don't negate disabilities. Dorothy's achievements did nothing for her health issues. And the same thing, me doing all my courses doesn't change the fact that my brain

is wired differently to most. It doesn't magically rewire my brain to be more in line with that of the majority, it doesn't get rid of my executive dysfunction, or my chronic shortage of neurotransmitters or my time blindness, or the fact that I live in a society not set up to accommodate people like me. So, yeah.

CARLO:
Thank you so much, Jess. Thank you for the research that you did on Dorothy and for sharing information about her with us at your honour. Well, thank you. So, let's move on to meet our third scientist, Julio Garavito Armero. And I'd like to introduce Juan Camilo Zapata Trujillo. Juan is a PhD student in the School of Chemistry, and is focused on Julio Garavito Armero for the science history trail. Welcome, Juan. Thank you for being here. I hope that you can tell us a little bit about Garavito. Introduce us to him.

JUAN CAMILO ZAPATA TRUJILLO:
Oh, yeah. Hi, everyone. Yeah, of course. So, Julio Garavito Armero was a Colombian astronomer who lived between the end of the 19th Century and the beginning of the 20th Century. From a very young age he stood out as a child prodigy in both science and mathematics, and exceptional academic performance throughout his Bachelor studies. He was appointed head of the National Astronomical Observatory, which was the most prestigious scientific position in Columbia at the time. And he took advantage of this opportunity to make great contributions, being stewards into astronomy, especially in the field of celestial mechanics where he spent most of his time studying the trajectory of different astronomical bodies that passed by earth in the early 1900s. He also studied the trajectory of the moon, providing key insights into how the moon's orbit can influence metrological phenomena on earth. All these contributions were led and recognised by the International Astronomical Union, who decided to name one of the moon's far-side craters a 'Garavito'. That's why we all have in our backgrounds these little moon here just to acknowledge and recognise that one of the crater is named after him. This one is an 81 kilometres wide crater, so like pretty big crater. And it has another five smaller craters that surrounded that are also named after him, but with different letters. So, like Garavito A, B, C, D, and E. Alongside his passion for astronomy, Julio Garavito Armero also made several contributions into other fields. He travelled Columbia mapping their position of the stars in the night sky to provide some of the first detailed maps of the country. But he was also interested in economics, literature and pedagogic. Some historians even classify Julio Garavito as what we would call today an early science communicator, as he was commonly asked to provide accessible explanations to the public regarding natural occurring phenomenon such as eclipses, or earth quakes. There's even a rumour that if someone saw Julio Garavito leaving the National Economic Observatory in like late hours in the night, it was either because something bad has happened or something bad is about to happen. For 20 years up until his death, Julio Garavito Armero served as head of the National Astronomical Observatory, performing an outstanding job characterised by his commitment and dedication. So, yeah.

CARLO:
Thanks, Juan. They're really great insights into his life. I like that element of someone's late in the laboratory, something bad has happened or is about to happen. I hope that doesn't translate to us too. Well, I understand that Garavito is really well known in Colombia, but probably not so much in

Australia. And that's a great reason for showcasing him here. In fact, he's still on the Colombian currency. Is that right?

JUAN:
Yes, yes, that's correct. He was in one of the Colombian banknotes during that time. Unfortunately, not anymore because, like, I don't know, five, four years ago they changed all the Colombian notes like for different persons, but he was there for a really long time. Yeah. So, yeah.

CARLO:
Thanks also for pointing out, Juan, that our backgrounds here have elements of the backgrounds of all of our featured scientists in our showcase. So, if you're wondering what's in our backgrounds, it's all from the backgrounds of the scientists in the history trail. So, Juan, maybe you can tell us about what led you to choosing the focus on Garavito.

JUAN:
Yeah, absolutely. So, I chose Julio Garavito Armero to be included in the UNSW science history trail to showcase the role that Colombian scientists have played throughout the history of science. Unfortunately, today, Colombians are widely stigmatised for unfortunate reasons. So, for example, illegal drugs trade, political corruption, or unsafeness. And these can sometimes overshadow the achievements and contributions made by Colombian people. As a Colombian scientist myself, I think showcasing and acknowledging the contributions of Julio Garavito and those from many other Colombian scientists can help in changing that narrative and the stigma around Colombian people. Julio Garavito Armero sets an example of scientific determination and passion, and I think his legacy is worth remembering and celebrating.

CARLO:
Thanks, Juan. It's a really great story and great imagery. And thank you for sharing. Some of you are going to be a matter of story with us. So, we're going to move to our final scientists in our showcase today. And that's Mary Anning. And first I'd like to introduce Josh McCluskey. Josh is a third year PhD student in the School of Biotechnology and Biomolecular sciences. So, welcome Josh. Can you tell us a little bit about Mary Anning?

JOSH MCCLUSKEY:
Hi, thank you Carlo, I'd be happy to. Mary Anning grew up in England in the early 19th Century. So, her scientific career is fascinating to me in that it was never officially a scientific career. She started out as essentially a hobby collector. She grew up in a fossil rich coastline and uncovered fossils with her father and brother. They would walk the beaches and dig up fossils, and they would take them back to a fossil shop they run out of their house, and they would sell fossils to supplement the family income. When Mary was 14, her father died leaving her family in quite desperate poverty. And so the hobby shop turned into the family's main source of income.

Now, while Mary was finding these fossils, she took meticulous notes on each of the fossils she found. And she taught herself quite a comprehensive knowledge of geology and comparative anatomy. And the fossils that she found would later be identified as novel dinosaur species. So, she was key in discovering the ichthyosaur, the plesiosaur and the pterosaurs, which may be among the

most identifiable dinosaurs today. Her work that she found were key to the acceptance of George Cuvier's theory of extinction, which claims that species could go extinct. And that work in turn paved the way for the acceptance of Darwinian evolution by natural selection, which I think was a key pivotable moment in human history was accepting evolution.

Mary really stands out to me. She overcame... Well, she didn't really overcome it, she was excluded from it. She faced barriers that were put in place to keep her out of the professional scientific world. But she did make a profound scientific contribution to them.

CARLO:
Thanks, Josh. Those really are really important contributions. I recall from our discussions through the project that we talked about how Mary didn't have access to textbooks. Can you tell us about what happened there?

JOSH:
Yeah, for sure. So, Mary Anning was educated in a class based system, which excluded all forms of science from lower education. And as a woman in the early 19th Century, she was prohibited from attending university. So, she didn't have access to university materials. So, she made friends with the librarian at the local university, and would go into the library, borrow books, or textbooks, bring them home, and she'd hand copy out the textbooks and use that information that she'd collected that way to compare them with her fossils. And that was the basis of a lot of her discoveries and a lot of her identifying new species.

CARLO:
Wow. That's fascinating. Things are a lot easier for students today, certainly don't have to hand copy textbooks. But I think it's still remains the case that you should be friends with the librarians. as I think we've found in this project. So, Josh, I wonder if I can ask you to just reflect on why you chose to focus on Mary Anning.

JOSH:
Of course. Mary Anning's struggle stood out to me very significantly. So, I personally wasn't able to finish secondary education and wasn't able to attend university until my mid-20s. And so reading about Mary Anning and learning that she faced similar barriers, it was fascinating to me. And I really connected with that. I also think it's really important to identify scientists to face these barriers early on, and imagine them in today's world. And imagine, would they face those same barriers? And then I think that's a really good way of gauging societal progress. So, Mary Anning, if she was born today, she'd be attending normal school, she'd be allowed to attend university. But due to her socioeconomic class, the quality of her education would be less. And I think that's important to keep in mind with the increasing privatisation of school.

CARLO:
Thanks so much, Josh. And thank you to all of our students who've presented on the scientists that they've researched. We're going to move now to a Q&A with our panellists. And I want to remind our audience members that we'll then move to live questions from the audience. So, if you do have

some questions for our panellists, I encourage you to add those into the chat. And we'll come to those very soon.

But I guess I wanted to ask our students about why they wanted to join the science history trail and why they feel that it's important to have inclusive representation in science. I thought we might come first to you, Juan.

JUAN:
Yeah, sure. So, that's a good question. I think I wanted to join the science history trail project because I saw it as an opportunity to make my contribution into the model. So, I think sometimes it is common to feel concerned or upset about how biased the standard image of a scientist can be. But most of the time I just stopped there. You know, like there's being concerned or upset or complain about it. So, being part of the project actually allow me to do something about it and sort of like get my voice heard.

SO, YEAH. CARLO:
Great. How about you, Jess?
(BACKGROUND NOISE)

JESS:
(INAUDIBLE)
Apologies, I think, I was muted there. I joined this project because representation seeing stories were told from different perspectives, especially ones that have been historically ignored. Well, it matters a lot to me. Portrayals of scientific communities or the scientist often focus on members of traditionally privileged groups. And representation of diverse individuals is often relegated to an afterthought reusing the same few groups or people, or is based off and reinforces stereotypes. When you think disabled scientists, people usually think Stephen Hawking and not Dorothy Hodgkin. It doesn't accurately reflect the actual diversity within the scientific community and creates a falsely homogenous impression of scientists that is detrimental in the long run.

CARLO:
Thanks, Jess.

I also wanted to ask about how you all found the learning resources. So, it was quite a process to complete this project. And we had a number of resources through the library and assistance with academic skills writing. And that, I think, had a really important impact on the project. So, I wonder, perhaps, Divya, you could reflect on how you found those resources.

DIVYA:
Yep, I feel it was actually really, really useful to have access to the librarians and also to have the process that we had in place of sending multiple graphs back and forth to kind of fine tune the work that we were producing. I think, as a student, a lot of the work we do is very independent. Like, yes, we have good luck on occasion. But most of our writing is rarely ever seen by anyone besides ourselves and those who are marking it. So, I think this project provided a really unique opportunity

for our writing to kind of be seen by numerous people and for us to have the opportunity to do it in a way that would ensure that like the public and that people who weren't necessarily familiar with the work we had been working on would be able to understand and to best communicate these ideas. I think this is particularly important because part of the reason I thought it was very important to do this project was to improve my science communication skills. I think, especially at a time like this, like what we saw with COVID, misinformation spreads like wildfire. It's really important that scientific information be conveyed to the public in like a way that is concise, without sacrificing the integrity of the work and what's actually being said. So, I feel like the access to resources to improve our writing was incredibly important in ensuring that we were maintaining the integrity of the work we were doing while still making it understandable and fun and easy to read. So, I definitely found this process of outreach and going back and forth incredibly useful.

CARLO:
Thanks, Divya. What about you, Josh?

JOSH:
Yeah. Much of what you said, the academic skills writing thing was fantastic. I think it was a really beneficial exercise to have works that were edited by someone who's not in my field. As you know, many researchers are pigeon holed quite severely, we tend to edit each other's work. And it's good to be able to write something and have that writing looked at by an external source. It was a really, really good learning experience.

CARLO:
That's great. Thanks, Josh. And it's really great to hear that in addition to being able to showcase to the scientists, there were additional skills that you were all able to either develop or refine through this project. So, that's really great. I also wanted to just ask, reflecting on this project myself and working with you through the period that we worked on it, I found it to be really fun. And I wanted to ask you, what was your favourite part of working on the science history trail project? So, maybe, first back to you, Josh.

JOSH:
Thanks, Carlo. I think my favourite part of it was working with a group that wasn't in the same pigeonhole as I am. So, that was really nice as well to hear, meet new people and, you know, from different fields. And also the being able to read all of the other bios as well and really gain a better appreciation for the rich diversity that's historically been in front.

CARLO:
Jess, what was your favourite part?

JESS:
For me, it would probably be learning about the existence of many scientists that I probably would have never heard of otherwise. Out of the 14 scientists featured on the history trail, I'd only heard of one breath-taking quote, Lise Meitner, and only in association with the atomic bomb. I feel like if I hadn't been involved, I'd probably never have learned about many of these brilliant scientists, including Dorothy Hodgkin.

CARLO:
And, Juan, what was your favourite part?

JUAN:
Right, yeah. I think I will second what everyone just said. I think seeing the project finalised, what's definitely one of my favourite parts of it, being able to look at all these different biographies and learn new stuff. But I think on top of that, having the illustrations with every biography, so being able to actually do the face to the science and the contributions made by every scientist, I think it was very important. Because sometimes we might forget that scientists are also people, you know, and I don't know having that experience and being able to see this person and like with the different objects that can relate to their contributions. I think it was pretty amazing. Yeah.

CARLO:
And how about you, Divya? What was your favourite?

DIVYA:
Yeah, I completely agree with everything everyone said so far. It was a really good opportunity to meet likeminded people who also saw the importance of actually doing work to increase awareness and representation of more inclusive scientists. But I think for me, another element which I found really enjoyable was working on the portraits as well like getting to go back and forth into the feedback. And like Juan kind of mentioned, the opportunity to use like a single image to represent that the multifaceted human was interesting. So, as you can see, or would have seen in a number of these portraits, not only do we have elements of the time they worked on, but things that presented their personality or their heritage. And as I was saying, science communication I think is incredibly important, especially in times like today where there's so much misinformation spreading. So, being able to use a single image to convey so much information and to be able to work with the arc team to work on that I think was actually really fun and interesting.

CARLO:
Great, thanks to you. We are now gonna move to our live Q&A session. So, questions from the audience. So, I'd encourage our audience members to raise some more questions for us to discuss in the rest of our session. So, we do have a couple. And so one of the first questions we have is about the academic skills. And the question is, do some of the academic skills resources translate to other contexts? And if so, are they readily available eg to use in different teaching contexts? Just wonder, Josh, if he might be able to have some thoughts on this one for us.

JOSH:
Yeah, for sure. I think they're an incredible resource that could be used for any general audience work. One thing that I find with academic pigeonholing is that we have information that we want to share. And we want to share that to people who don't have that information. So, the best people to edit your work and gauge its accessibility is people who don't have that information. So, in that context, the Academic Skills writing team would be ideally suited for any works going to a general audience.

CARLO:
Do you think that it's something that you'll be able to use in other, either other courses. Or, I mean, you're a PhD student, Josh, but you may be able to use some of those skills elsewhere?

JOSH:
For sure, yeah. I will be using them in the future. I think there's many situations where you would benefit from having more concise writing. Whether you'd be using, you know, published works, or professional blogging, or I think that there'd be a lot that the team would help.

CARLO:
OK, great. So, another question that we have is asking what the most challenging part of the project was. So, where was it? Difficult? What were some of the things that you found to be a challenge? So, maybe, Jess, you could have a think about this one for us.

JESS:
Challenges. OK, challenges. I guess the biggest challenge would mainly be making sure to keep on top of my coursework in addition to like meeting like the deadlines and stuff. I mean, they were incredibly supportive. The staff were incredibly supportive during the entire process. But I still did struggle quite a bit. Because, well, coursework doesn't stop for the history science history trail, so.

CARLO:
So, it's about managing time.

JESS:
Yeah, time management. Considering I am very much time behind, that was easier said than done.

CARLO:
Does anyone else have a quick response to that one about the challenges? Divya.

DIVYA:
I think I also just struggled to like fit into the lead count. I think, especially something like this where you get really excited about the scientist that you're researching, it's really hard to manage things like a webcam, or a cash account. I noticed the first draft of my biography, I think it was like 2,000 words or something, and the final was meant to be down 500. I think that again really reiterates the importance of having access to those academic skills workshops and access to the librarians and people to read our draft, because it helps you to learn how to cut your work without feeling like you're cutting off your own arm. I think I'm someone who really struggles with separating my work from myself. And I think having other people read it and give that perspective helps you also to prioritise, which I think is really important for science communication. But often you want to get across a very important message and don't have much time or space to do so. So, I think, yeah, one of the major challenges was learning just how to write for an audience in like a condensed and concise way.

CARLO:
As I recall, I was pretty strict with that word count as well. Juan, it looks like you wanted to say something there as well, challenges.

You're still on mute, Juan.

JUAN:
Yes. Sorry, I had a problem with the internet. Yeah. So, I think one of the most challenging parts of the project, in my case, was actually finding sources to read. So, like to provide the information when drafting the biography. Because, yeah, as most of these scientists are underrepresented scientists, there is not a lot of information about them. Like, freely available. So, that was definitely a challenge. And also, in my case, Julio Garavito being a Colombian scientist, he was even harder to find sources that were written in English. So, most of them were written in Spanish. But, yeah, I think, yeah, maybe finding some resources was one of the most challenging parts of the project.

CARLO:
Yeah, and I guess, because looking for biographical information is not what we normally go and look for when we look for scientific research. So, it was a bit of a shift in what we normally look for. Thanks for that. We have another question here about the illustrations. And so the questioner has said, the illustrations are stunning, which I agree with. I think that the illustrations that have been done by the team and arc, they've done such a great job. The question is, were they produced by UNSW students? No, they were produced by the design team at Arc. While the author's just touched on having input into the design, can you explain more about the process? I certainly can. But I know that Divya, you mentioned the design process. So, maybe you have some thoughts on this one.

DIVYA:
Yeah. So, it actually really, as I was saying, is a fun process. Especially I think in science, it's not like we often necessarily get the opportunity to kind of work on things like this where you have design involved in it. So, at least on our end of things, what would happen is that Mikayla and Carlo would send us over drafts of the illustrations in the state that they were like in the process of them being made. And then we would make comments, for example, in regards to the style of the illustration, the colour schemes that we used, and also what elements of our scientists story or their work we wanted to incorporated into the artwork. So, in terms of the background, and things like that. So, the process, I think, was fun because we had the option of kind of going back and forth in the different iterations of the design. And I think it was also interesting because we got to see how the designs progressed from the first to the final product. And I think it also encouraged a lot of really good discussion within the team. Like, for example, in the first round of illustrations that we saw when we had to pick the style of illustration, some, for example, with a bit more cartoonish, whereas others were closer to the versions that you see today, which are more close to ideal lifestyle of illustration. And this provoked really good discussions in terms of the importance of when doing a series on inclusion, of including the actual features of individuals are not necessarily cartoon eyes forms of them, which could become trivialised into the nature of their work or highlight certain tropes of a certain race or a certain group of people. So, I think, although on the surface of things and illustration doesn't seem like something that's going to spare a lot of discussion, it actually can. Because an illustration in the whole picture can speak a thousand words kind of thing. Even just going through the process of looking at the illustrations, we actually, I think, really discussed some important things and built upon the work that we were doing.

CARLO:
Thanks, Divya. Yeah, I think we've got time just for one more question before we wrap up. So, maybe some brief responses to this one. And that is, how would you like to see the project evolve or expand in future years? Do any of you have some thoughts about where we could go to next with this? Acknowledging, of course, we didn't quite get to do it in the way we wanted this year because of COVID. Does anyone have some thoughts on that? Juan.

JUAN:
Yeah, no. Well, of course, absolutely being able to see this in person, I think is the most obvious one. I think the original idea of having the different illustrations around campus, and like people being able to scan the QR codes and go through their biography, I think is definitely something good. I think expanding on that, I don't know how likely would it be, but it would be really cool to not only focus on like a university thing, but maybe like go beyond that. So, I don't know whether that's something possible. But going to different places in like in the city or maybe museums, or things like that, I think it would be something really amazing for the project. And I think it will maximise the impact and like the amount of people that can actually get to see this.

CARLO:
Great. Thanks, Juan. I think those were really great ideas, and certainly things that we'll be exploring and coming to you all to have some input in as we expand into the future. So, unfortunately, we've reached the end of our time today. I'd like to thank everyone for joining us here on the panel and our audience members as well. I want to really thank our panellists for sharing their experiences with us today, and for sharing the research that they did. And for, you know, to also congratulate you for standing up and being leaders in diversity and inclusion at UNSW and UNSW Science. Our session today is being recorded. And it'll be made public and shared with everyone who registered for the event. If you do have a spare a few minutes, there's a link to a feedback survey that will be made available for you as well. And we'd appreciate any feedback that you have on today's virtual event, and indeed on the science history trail. And we hope that you can go and take a look at all of the bios and illustrations that are in the trail. I note also that there were some questions that we didn't get to, and the EDI team will endeavour to answer those questions and can make those responses available. Because I know some people are wanting to know about sharing of resources from academic skills, for example. So, we'll make sure that we come back on those issues. And so today we shared the stories of for scientists that are included in the science history trail. And as we've mentioned, you can learn about the remaining 10 scientists and download the full set of our science history trail posters, which will soon be available. Posters that can be printed and displayed by following the link in the chat. And, of course, I'd also like to acknowledge, as displayed on the screen now, all the other students who weren't part of our showcase today, but all of the other 10 students who also did a great job similar to Josh, Juan, Jess and Divya in researching the scientists that are featured in our history trail. So, congratulations and thank you to all of them. If you'd like to watch any of our previous inclusive science series, you can do so on our science EDI website, which is also linked in the chat. Thank you for being with us for your questions and for your interest in this really exciting, important and fun project. And I hope you have a great afternoon.