Produced by the RCPRS SAB

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Stephen Ritman '18

I left John F. Kennedy Airport in New York City on a hot Thursday evening in June, and descended 16 hours later on a chilly Auckland Saturday morning. My name is Stephen Ritman, and I was traveling to AgResearch for an internship during my summer vacation. Everything was different; the weather, the money, the fast food chains, and the accents; but I was confident I would find like-minded people in Hamilton and learn from them. In college I’d studied engineering, and taken a particular interest in technological advancements in food systems. I hoped this internship would shed a light on how these advancements were being implemented to impact farmers, food companies, and the consumer.

What I found on the Ruakura campus of AgResearch was much more than I could have ever expected. Not only did my coworkers have a passion for their work, they welcomed me into their family and took the time to answer my questions and share their knowledge. I was excited each morning to get advice on places to visit on the weekends, partake in breaks for tea, and of course contribute to the Primary Innovation project.

When I arrived, everybody was working hard in a comprehensive study dealing with the application of science in New Zealand. The goal was to improve New Zealand’s agricultural and food sector by considering all parties when implementing new and existing science. Oftentimes, those scientists pushing the envelope with new techniques and technologies publish a paper, and then rely on technology transfer, or a diffusion of scientific knowledge. The concept relies on individuals and companies to seek out new knowledge, and, as I learned, does not work very well. The Primary Innovation team was aiming towards an Agricultural Innovation Systems (AIS) approach. This idea involves all stakeholders being involved in the process from its inception all the way to its implementation.

To get an idea of which methods New Zealanders used in the past, my job was to look at science proposals from 2009 to the present. James Turner and I modified a list of keywords from a 2014 publication by Schut et al. to filter these proposals for the technology transfer or AIS approach. Our assumption was that if a proposal used more words such as adopt and diffuse, it was more conducive to TT. Words such as institution, networks, and interdisciplinary were more appropriate for the AIS approach. The hope was that proposals were relying less on technology transfer and more on an innovative approach. If research teams think about the implementation of their work during the beginning stages of their studies, it is more likely the end product will be useful and easily applicable to the agricultural sector right away.

To analyze the results from our analysis, we created a value called RAIS. This number is the ratio of Agricultural Innovation Systems keywords to Technology Transfer keywords. A higher value means the paper is more conducive to AIS than TT. We compared these values over the years 2009-2016 and saw that there was no clear increase in papers suited to AIS. This conclusion means that more can be done to incorporate AIS into future proposals. In addition, more papers can be analyzed using this method to present a clearer picture of AIS language use in the scientific community.

Besides the constructive and enjoyable time spent in the office, I am so grateful for the many adventures I had during my stay. I got to kayak through gorges lit up by glowworms at dusk, soak in the hot springs of Rotorua, visit Hobbiton, fly to Brisbane for a mini vacation, and even sightsee and ski on the South Island. Thank you AgResearch!
Elizabeth Weiss ’18

I had done research in the academic setting for 4 years before starting my internship at Merck, and so I was really excited to see what R&D in industry had to offer. I worked specifically in biologics discovery in the protein analytics subgroup.

On my first day, I had a basic orientation and got my employee badge. Everything seemed pretty similar at first- except for the fact that I had an office to share with another intern rather than a large room with a bunch of graduate students. The first week was spent like any other would be in a new lab: reading papers and doing safety trainings. Of course, the difference between industry and academia soon became more palpable. The first thing that struck me were the relaxed hours worked. I was used to graduate students working from 9-6 or even later and yet here everyone did their 9-5 or 10-6 and went home. It was shocking to me actually, I anticipated that a large pharma company would be stressful and hard pressed on deadlines, but that wasn’t the case. Not to say anyone slacked, but Merck allowed them to do science at a pace that was reasonable and not overwhelming.

The real difference for me though, was the difference in mindset about money. In an academic lab, funding is not easy to come by. PIs have to write grants regularly to keep the lab going and so the lab is conscious about that. In industry though, time is money so anything that saves time can and will be bought for you. It worked out excellently for me because that meant I got to use a $400,000 machine on a regular basis and do method development for it (something I would never have the chance at in academia), but it struck me at how easy going everyone was about purchasing materials.

The last, and maybe most important difference, is the way that the research is done. In academia, you follow a project from start to end and do all of the parts in between. In industry, projects are pipelined. This means you do the same type of work for several projects. This allows you to get very good at what you do, but it offered less variety than I was used to. It was certainly a trade-off and one that’s important to consider when choosing a career in research.
As a high school student, being accepted to Cornell was an awesome feeling, but being accepted into the Rawlings Presidential Research Scholars (RCPRS) program was the icing on the cake! I had participated in science research throughout high school, and I was very excited to be able to continue to pursue my research at Cornell. As soon as I arrived, Kristin and the other members of the RCPRS community made me feel very welcome and at home. The freshman colloquium series did a great job of getting me oriented to conducting research at Cornell and provided a lot of great guidance on things like picking an area of interest and finding and connecting with a faculty research mentor. In high school, I conducted research involving citizen science, however, after taking a class with Professor Jeffrey Hancock my freshman year I became intrigued with one of the topics that was covered in class - online deception. With the help of the RCPRS program, I was able to connect with professor Hancock and begin working with him to explore the field of online deception in greater depth. Through my varied experiences during my 4 years, I learned a great deal about myself, including what I was interested in, and more importantly, what I had no interest in pursuing.

Although many students in RCPRS end up going into academia or other research related positions, many do not. During my time conducting research at Cornell, I have learned that my interests and goals lie elsewhere, and as a result I will likely not pursue a career in academia or research. However, being able to conduct research during my time at Cornell has been an immensely valuable way to improve my critical thinking and research skills outside of regular class work. I will take these valuable skills gained through research with me as I enter the workforce. Thinking holistically, I think that most valuable benefit I have derived from being a part of RCPRS are my close relationships with the faculty members that I collaborated with during my time at Cornell. I hope to continue to maintain a relationship with the program upon graduation, and look forward learning about the research that future members of the program conduct!
David Rosenwasser '18

Halfway through Freshman year and 5 minutes after a rough final architecture review, I nervously walked up to Professor Sabin and proposed the idea of working in her lab. Offering (in my mind) almost nothing in terms of computational design experience…or 3D printing…etc, my expectations were not exactly high. To my surprise, however, Jenny didn’t chuckle at this idea and in fact allowed for a journey of learning and mentorship to begin that has lasted nearly three and a half years and will perhaps even last a lifetime.

This learning experience and relationship that RCPRS spurred led to a rollercoaster of learning curves and discoveries that has been arguably more impactful than any other part of my education here at Cornell. Thanks to the generosity of both RCPRS and the Sabin Design Lab, I’ve had extraordinary opportunities to pursue personal and lab related research trajectories across the globe. A month in India and Thailand allowed for engagement with textile design and production of traditional crafts. Trips to Israel and Japan addressed questions of 3D printing and large-scale manufacturing. In the coming weeks, I’ll have the privilege of attending Fabricate, a conference in Stuttgart, Germany focused on digital fabrication within the context of architectural research. This even still neglects to mention the various conferences and symposia, unimaginable without introductions and pathways drawn by RCPRS and the Sabin Design Lab.

Alongside these trips, numerous skill sets and technologies have been learned within lab research, helping to further my interests and become more capable as both a researcher and designer. From 3D printing in a range of printers and scales to CNC machining and robotic fabrication with a 6 axis robot arm, the lab introduces equipment and crash courses to this technology that is essentially unheard of for undergraduates within a school of architecture. Building cutting-edge prototypes and partaking in the construction of internationally-recognized museum installations become part of normal activity within the lab. Not forgetting the importance of collaboration within the Sabin Design Lab, its critical to note that the lab’s pursuits depend upon strong relationships with other disciplines. Weekly meetings often bring together undergraduates to post-docs in numerous fields outside of AAP such as fiber science, physics, computer science, mechanical engineering, biology, and material science.

It seems fair to say that RCPRS acts as the impetus and support structure for what can become some of the most valuable mentorships on Campus. On the other hand, it is the responsibility of students in our program to believe in themselves and drive their research pursuits, hopefully encountering an invaluable mentor along the way. Speaking to Professor Sabin in particular, I could not ask for a more inspiring educator and mentor. Her leadership within the lab brings clarity and her familiarity with scientific research allows for architecture students such as myself to begin learning about scientific conventions and generally how research can even exist within a design school. In short, it is clear that Professor Sabin is conscious of a need to introduce these learning experiences to her students, so long as we as young researchers do our best to listen and respond with productive failures and successes.

Below are two Photos of Polybrick (1 and 2, as 3 hasn’t yet been published officially). The photo was for an article that Wired Magazine did, and at this point Polybrick has been featured at the Cooper Hewitt Smithsonian Design Museum in New York, San Jose Museum Of Art, and now the Centre Pompidou in Paris.
Ariadna Lubinus ‘20 - Environmental Engineering, CALS

_Hometown:_ Frisco, TX

_Research:_ I work with the Department of Earth and Atmospheric Sciences in the field of remote sensing, specifically interferometric synthetic aperture radar (InSAR). InSAR is a tool that can measure ground uplift and sinking due to all sorts of causes. My current project involves developing maps, called interferograms, of California’s surface deformation patterns by combining SAR images. These interferograms help us to understand how Earth's surface deforms in response to earthquakes and human manipulation of subsurface fluids. I utilize Linux, a computer operating system, to interact with the computer command line and organize my images faster. Hopefully my research will give us insight into predicting natural hazards and comprehending how human activity can alter the ground's movements.

_Other Interests:_ Cornell Film Club, Long distance running

_Summer Plans:_ I may take on an internship with the Kohala Watershed Partnership in Hawai'i and/or take summer classes at Cornell.

_Post-Graduation Plans:_ I hope to be an environmental engineer, engineering consultant, or conservationist.

_Fun Fact:_ I speak (almost) fluent German. Tschüss!

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Neethu Pottackal ‘20 - Chemical Engineering, Engineering

_Hometown:_ Edison, NJ

_Research:_ We are developing and testing water sensors (tensiometers) that measure the amount of water a plant needs in the moment for optimal growth and maintenance. Unlike the current tedious water measurement system of soil sensors, these water sensors are compact, feasible to use and allows for direct and instantaneous communication with the plant: the sensors are “plugged” into the plant stem and/or tree trunk. And, the water content is determined from water chemical potential caused by tension/pressure buildup in the sensor. This innovation is expected to not only tremendously benefit the agricultural sector, but also ameliorate one of our biggest global challenges to conserve water and make vital advances both in the medical and geology field. Currently, we are developing and investing ways to improve the sensor, such as increasing its measurement range, to bring it to the market in the near future. These unique, novel waters sensors will ultimately change the way we communicate plants and the natural world.

_Other Interests:_ Co-Events Chair for the women in STEM club called Scientista: we organize networking and outreach events for college and school students. Member of the Cornell's Student Assembly's Restructuring Committee: we discuss and propose ideas for better student representation and improvement of the assembly structure.

_Summer Plans:_ I plan to continue my research here at Cornell while taking a summer class.

_Post-Graduation Plans:_ I look forward to attending graduate school for chemical engineering and business and hopefully have or initiate a start-up of my own.

_Fun Fact:_ I was born in Japan
Garrett Hastings ‘19 - Archaeology, CAS

Hometown: Chittenden, VT

Research: I have been analyzing bird videos and comments of Red Backed Fairy Wrens to record their behaviors to see relationships between dull birds (male and female) and bright males. The data comes from the field location in Australia. I am currently moving to a more archaeology focus with Dr. Seeley on Appledore Island on Shoals and will write a paper to conclude my bird research. My archaeological research involves using maps, GPS, and GIS to locate archaeological significant structures on Appledore, including ones that have previously had faulty data. From the 1800s to the early 1900s, a hotel was situated on Appledore, and a bunch of the focus of the project will involve locating structures from that time. I will be going to the island this summer to collect the data so it can be entered into the ArcGIS system to be used for future purposes.

Other Interests: I have worked backstage on a few productions, write reviews for the Cornell Sun, write stories, volunteer back home (particularly with Vermont Adaptive Ski and Sports), and am the leader of a forming club on campus called Scare Me.

Summer Plans: I plan to use GIS, maps, and GPS to locate archaeologically significant sites on Appledore Island.

Post-Graduation Plans: I plan to move onto grad school afterwards.

Fun Fact: I'm a Native American Jew, and I've traveled across the country three times by car with family.

Kanaai Shah ‘19 - Hotel Administration

Hometown: Saratoga, CA

Research: I am conducting research with Dr. Peng Liu, an associate professor of real estate and finance at the Hotel School, on understanding tenants in regional malls around the US. This research focuses on explaining how demographics influence the size of shopping malls and the optimal allocation of tenants of various competing and complementary stores. Tenancing plays a huge role in the success of commercial real estate properties because renting space is the primary source of income for owners. In addition, I am conducting research on improving the validity of hotel guest satisfaction surveys. The research project is focusing on recalculating published guest satisfaction scores to more accurately reflect the performance of hotel properties around the world.

Other Interests: Outside of research, I am a member of Cornell Bhangra, a nationally acclaimed, Punjabi folk-dance team that competes around the nation. I also am a member of Cornell Real Estate Club; a Guest Experience Manager for Hotel Ezra Cornell, a four day hospitality industry conference run entirely by students at The Statler Hotel; and a Teaching Assistant for HADM 2230: Financial Accounting.

Summer Plans: I am looking for an internship in commercial real estate to complement the research conduct through the RCPRS program.

Post-Graduation Plans: After graduating, I would ideally like to work for a real estate investment trust, focus on understanding a broad range of real estate investments ranging from industrial to residential real estate, and attain my Master of Business Administration.

Fun Fact: One fun fact about me is that my birthday is three years and one day after my brother's birthday.
Kevin Su ‘19 - Computer Science, Engineering

Hometown: Cupertino, CA

Research: I am working with the Shen Group, where we are designing an interlock system using a programmable logic controller to protect sensitive lab equipment in the event of a power failure. The interlock monitors the status of the lab equipment by reading in analog voltages, relay states, and TTL levels. Should one of these drop below or above a certain threshold, the interlock takes the appropriate measures to act as a failsafe, such as sealing certain vacuum chambers, then sends out a text and email notifying us that it has been triggered. Ultimately, we plan to expand the number of lab equipment that is protected.

Other Interests: I am the Technology Team Lead for Life Changing Labs, a Full-Stack Developer for the software startup Vispio, and a Commodities Analyst at the Cornell Hedge Fund.

Summer Plans: Software Engineering Internship at Google

Post-Graduation Plans: No solid post-graduation plans yet, but I do want to work in industry for a few years first.

Fun Fact: I have helped perform 20+ full autopsies.

Liz Abeles ‘18 - College Scholar, Arts & Sciences

Hometown: Washington, DC

Research: My College Scholar research centers on understanding how Chinese medical practitioners draw on both western biomedicine and traditional Chinese medicine to create individualized care for cancer patients. I have been studying Mandarin for nine years, and plan to conduct interviews with Chinese practitioners to understand how they define their practices and the extent to which they draw on western versus Chinese medicine. I am also interested in the ways in which local culture and global politics affect their individual choices and communication of disease and healing to patients. Some of my central questions include: how does culture produce certain perceptions of cancer? How do western and eastern healing modalities approach the treatment of cancer? How is practitioner self-identity constructed through individuality in medical practice?

Other Interests: Outside of my College Scholar research, I study lymphoma in the Singh Immunotherapy and Cell Engineering Lab (ICEL) in the Sibley School of Mechanical and Aerospace Engineering. I am a Recruitment Chair for the Running Club, an E-Board member of Arts & Sciences Peer Advisors, a BEARS mentor, a member of Alpha Epsilon Delta Pre-Health National Honors Society, and a Student Assistant in Flora Rose House on West Campus. In my spare time, I also love volunteering at the Ithaca Free Clinic downtown.

Summer Plans: RCPRS has given me the opportunity to travel to Beijing, China, where I will visit hospitals and conduct interviews in Mandarin to understand cancer perceptions and healing methods. I will also spend part of the summer here in Ithaca to continue lymphoma research with the Singh Lab.

Post-Graduation Plans: I plan to pursue an MD/Ph.D.

Fun Fact: I recently ran my first marathon-- and qualified for the Boston Marathon!
Meet our Rawlings Scholars!

Richard Chen ‘18 - Human Development, College of Human Ecology

Hometown: Calgary, Canada

Research: Memory models can use neuropsychological data to predict cognitive impairment and Alzheimer's. However, these models make an assumption that responses to test batteries perfectly matches mental representations. My research seeks to improve memory models by using quantum probability to account for counter-intuitive phenomena like false and superposed memories, and entanglement.

Other Interests: I am involved with service organizations that volunteer with older adults, as well as martial arts.

Summer Plans: Hopefully staying in Ithaca to do research!

Post-Graduation Plans: Medical school

Fun Fact: I'm from Canada!

Dennis Delasi Nyanyo ‘18 - Biology, Arts and Sciences

Hometown: Accra, Ghana

Research: My research is focused on developing new tools for studying the stem cell niche in the small intestine in mice. Specifically, I'm exploring ways of staining whole blocks of tissue using a technique called CLARITY. This allows for probing proteins and various molecular markers after the stem cell niche is disrupted using femtosecond laser ablation. These techniques will be useful for a wide range of studies because it adds the identification of specific proteins to in vivo studies. Although in vivo imaging can reveal interesting dynamics, it is limited in the molecular specificity of labeling. I am also studying the onset of colorectal cancer and trying to understand features that permit some cells to develop into cancers while others do not.

Other Interests: Co-Founder, Hewale: Startup that helps Ghanaian hospitals digitize patient records, Funding Board-International Student Union, Cru, International Student Admissions Ambassador

Summer Plans: Research in the Schaffer-Nishimura Lab in Ithaca

Post-Graduation Plans: I will take a gap year to do research before going to medical school

Fun Fact: I love to cook.

Chris Traver ‘17 - Information Science, CALS

Hometown: Croton on Hudson, NY

Research: My research involves looking at how people are deceptive and lie online. In my experiment, I asked participants to report the result of rolling a die 3 times, and incentivized them to lie by offering more money for reporting higher rolls. Some participants were presented with a picture of eyes. We found that the picture of eyes was better at reducing lying among participants. We also found that those who had higher risk aversion were less likely to lie.

Other Interests: Cayuga's Watchers, Guiding Eyes for the Blind

Summer Plans: Traveling to Australia

Post-Graduation Plans: Working at General Electric

Fun Fact: I own my own digital media business
Meet our Rawlings Scholars!

Aditya Agashe ‘17 - Computer Science, Engineering

*Hometown:* Albany, NY

*Research:* I am involved in 2 research projects. The first project is under Dr. Deborah Streeter to write a book called Swipe to Unlock: The Secrets Behind Everyday Technology that explains the core concepts behind everyday technology and their social implications. Our research focuses on compiling all of the knowledge needed to succeed in obtaining a (non-developer) role at a technology company or in thriving at an existing role that involves lots of communicating with engineers or intensive use of software products. The second project is under Dr. Nancy Chau to see What Affects Consumers’ Likelihood to Shop Online: A Conjoint Study on Millennial vs Non-Millennial Online Grocery Shopping Behaviors. This research focuses on determining what factors affect online grocery shopping behaviors between millenial and non-millenial shoppers.

*Other Interests:* Outside of research, I run a company called Belle Apps (www.belleapps.me) that builds and optimizes software for clients. I enjoy envisioning, designing, and developing products and so far we have helped six clients build their websites and mobile apps to launch their businesses. Apart from the company, I enjoy cooking, hiking, ping pong, and board games.

*Summer Plans:* Over the summer I plan to visit family and also travel for a few months. I plan to travel to Germany and Italy for 3 weeks and then go to South Korea for another 3 weeks.

*Post-Graduation Plans:* After graduating I will be working as a Program Manager at Microsoft in Seattle.

*Fun Fact:* I enjoy singing in the shower.

Morgan Shelton ‘17 - Animal Science (minor in Biomedical Sciences), CALS

*Hometown:* Houston, TX

*Research:* For the past 3 1/2 years, I've been in a pathology lab in the vet school under Dr. Andrew Miller. We look into the pathogenesis of diseases in dogs, mainly focusing in neuropathology. In particular, I have been looking into the effects of naturally acquired canine herpesvirus (CHV) associated meningoencephalitis in puppy brains. The virus causes significant morbidity and mortality and puppies, and most often, the puppies die before neurological symptoms occur. While CHV's effects on the brain have been described experimentally, the neuropathology of naturally acquired cases is poorly characterized. Therefore, my lab has been trying to change that.

*Other Interests:* Cornell Herpetological Society, Cornell Swing Dance Club, Christian Union, BOSS, MASS, CU IMAGE, Let's Get Coffee

*Summer Plans:* Honestly, I'm just going to relax back at home and get ready for what I'll be doing this upcoming fall.

*Post-Graduation Plans:* I'll be going to The Ohio State University College of Veterinary Medicine! I'm interested in exotics/wildlife medicine, international veterinary medicine, and pathology research.

*Fun Fact:* When I was younger, my mom wouldn't let me get a snake, so instead she let me get a Giant African Millipede for a pet. His name was Millimeter and he was awesome.
Our Featured Peer Advisor!

Amiri Banks

Major: Interdisciplinary Studies
College: CALS
Post-Graduation: UPenn Masters of Higher Education
Fun Fact: I speak German and Japanese

“He's very kind and patient, just overall and outstanding person.”

“He was not only an advisor, but a friend and confidant :)”