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COOPER FAMILY ARTIFACTS COME HOME TO COOPER UNION

ANTHONY PASSALACQUA (ME ‘18)

Photo courtesy of The Cooper Union Library Archives

Within the Cooper Union library an extensive archive makes it home: a collection of letters, documents and artifacts detailing Peter Cooper’s personal and family life. On October 6th, 2015, due to the generosity of professors Peter Buckley, Robert Topper, and Sean Cusack, as well as alumni Mike Borkowsky (ME ‘96), Barry Drogin (EE ‘83), David Ellison (Arch ‘83), Sangu Iyer (CE ‘99), John Leeper (Arch ‘85), James Liubicich (ChE ‘83), and Carol & Bill Wolf (Art ‘84), the archives acquired a large amount of documents from other members of the Cooper family. This most recent purchase, sourced from a cosigner who wishes to remain anonymous, includes “340 manuscript letters and documents, 2 wallets, and miscellaneous other materials.”

Up until recently, The Cooper Archives in the library have been almost wholly related to the professional life of Peter Cooper, the Hewitts, and their business associates. Started in 1938 with the donation of 50,000 documents from Norman Greene, a great-grandson of Peter Cooper, the Cooper Archives have since expanded to include Cooper Union yearbooks, certificates, and copies of *The Pioneer*, and many other artifacts and records that follow the course of the students that have called Cooper Union their home.

The archive and its archivists receive more than 350 discrete inquiries a year, handling questions that run the gamut from “Did my aunt Tilly go here?” to “I’m looking into the economic climate of the inception of industrial capitalism.” These inquiries come from within the school about 40% of the time, and 60% of the time from people across the United States and around the world. The archivists normally work with a very small budget, of which a significant portion is spent on archival boxes to preserve existing documents and artifacts.

The new documents shed light on the day-to-day lives of the Cooper family and their associates. These are not business correspondence, but, rather, personal letters sent from brother to brother and mother to son. One that stands out particularly to Carol Salomon, Acting Director of The Cooper Union Library, is a letter announcing the death of Thomas Cooper. The letter is “very poignant, in the way that [it shows how] they described death in those days.”

The archivists, Carol Saloman and Katie Blumenkrantz, will be able to use the documents to get a better picture of the daily life of an American bourgeois in mid-1800s. Some of the documents name people whose relationship to Peter Cooper has been totally unknown up to this point, while others use nicknames that have never been seen before. After all, such things are not used in business correspondence. These documents truly “fill a hole in the archives, and give us the sense that these people had so much more to them.”

Look forward to a transcription of one of these documents in *The Pioneer* when they are available for reading. ◊

COOPER WINS GOLD AT 2015 IGEM SYMPOSIUM

ARNOLD WEY (EE ‘18)

A team of The Cooper Union students won gold at iGEM, the International Genetically Engineered Machine, competition in Boston, where 273 teams from all over the world met to present their research and get feedback from mentors and professionals in the bioengineering field. They developed a DNA synthesizing machine that uses an enzyme called Terminal Deoxyribonucleotidyl Transferase (TdT). TdT adds random letters to the DNA chain, but the Cooper team developed a winning method to ensure TdT adds only one of the specific letters desired. The winning team is Keith Joseph (ChE ‘17), Jean Lam (ChE ‘17), Chris Lastihenos (ChE ‘18), Tushar Nichakawade (ChE ‘18), John Song (EE ‘17), Lily Lin (EE ‘17), Susung Choi (EE ‘17), Ben Ma (ME ‘18), and Karlin Yeh (ME ‘18).

The machine itself works to facilitate TdT synthesis and runs the reactions. It uses custom-made peristaltic pumps to draw precise amounts of fluid from a series of reservoirs, consisting of TdT and dNTPs. The fluid is pumped into a reaction chamber, where a small segment of DNA is bonded to the reaction chamber. A thermal cycler then raises the temperature, allowing TdT to add a letter to the bonded strand. Afterwards, the fluid is removed in a wash. This cycle repeats with the next letter until a complete strand of the desired DNA sequence is built.

Photo courtesy of the iGEM Team

Last year, iGEM symposium judges encouraged Cooper’s 2014 team to develop the project further, spurring team members to continue working on the machine, working at least 6 hours a day, Monday through Friday, throughout the summer. On September 27, Jean Lam, Chris Lastihenos, Tushar Nichakawade, Ben Ma, and Keith Joseph presented their formal 20-minute presentation on stage in front of 4 judges. Afterwards, they were invited to participate in a panel discussion with the iGEM Hardware Track. Discussions at this panel included the future direction of projects as well as transitioning from a proof-of-concept to a start-up company. “The team hopes to scale down the project, making it more cost-effective through glass lithography or PDMS soft lithography. The machine could be further improved by integrating the hardware with the wetware;” says Keith Joseph, a member of the team. Other projects the team has been working on include a low-cost, introductory genetic engineering kit for pre-college students, and investigating ways to further reduce the cost of DNA synthesis using in-house methods of synthesizing dNTPs by simply shining a UV light into the reaction chamber. ◊

MAKERSPACE: BRINGING INNOVATION TO THE COOPER UNION

MONICA CHEN (CE'18)

This past summer, the Cooper Union STEM Program introduced Makerspace, a center dedicated to designing 3D-printed prototypes, to high school students. Now, students at the Cooper Union have the opportunity to utilize this space nestled on the 7th floor to bring their ideas to life.

Victoria Bill in Makerspace. Photo by Sage Gu (CE'19)

Makerspace serves to enhance the manufacturing process of rapid prototyping techniques. With the help of the facility's range of equipment, from 3D printers and computers to hand tools and solders, students can essentially go through the innovation and design process from brainstorming to designing to building the prototype in the same room. Finally, this space encourages students to integrate different disciplines into the same project, including art. "For example, an electrical engineering project can have mechanical components associated with STEAM," says Jake Potter, head Teaching Assistant for Makerspace. STEAM is a movement created by the Rhode Island School of Design to incorporate art and design into the standard STEM subjects.

Already, professors are beginning to integrate rapid prototyping techniques into their engineering design curriculum in the Engineering in Design 101 classes. Additionally, this summer's STEM program has proven to be a success amongst the participants. "A lot of students enjoyed it and they built really cool things. We were working with a very limited set of tools, just 3D printers and X-acto knives, but students really pushed themselves to be creative with all the resources we could provide," commented Potter.

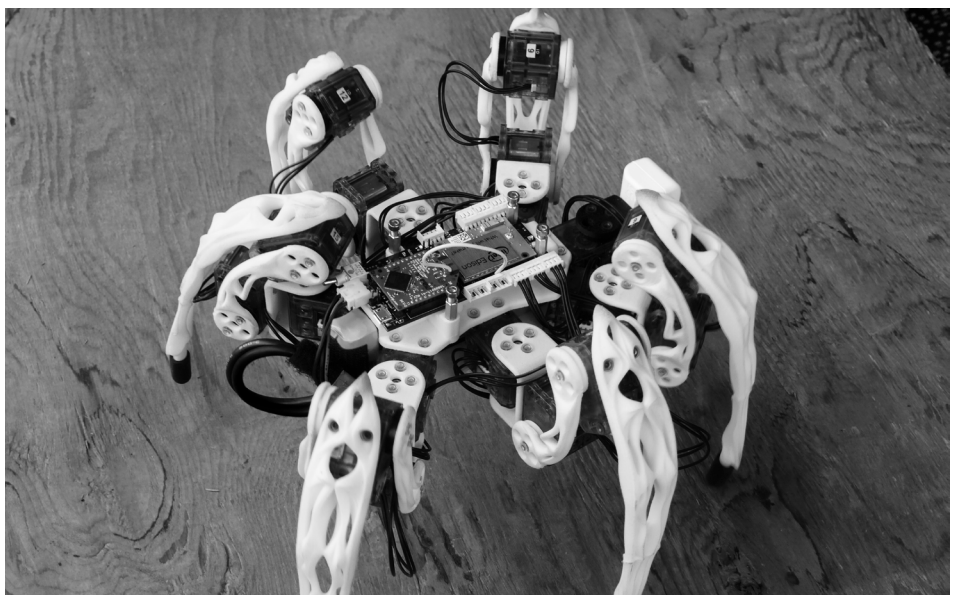
Among the many projects students worked on this summer was a wristband purposed to wake up its user when he arrives at his stop on the train. By utilizing the GPS capabilities on smartphones and data collected from the MTA website, the user could setup the wristband to wake the user right before their stop.

Another project was an atmospheric air quality sensor built into a phone. This project not only detects the air quality in the user's specific location, but also maps the pollution in different areas in the city. "3D printing was required to build a lot of the custom enclosures for the electronics. For the atmospheric sensor, the students had a bunch of different electronic components they were trying to compress into a very tight space and surround with something the user would actually want to carry around. So they 3D printed a shell for the sensor in the shape of a cute animal, which is something you couldn't do with a standard electronic enclosure, which is usually just a black cube," said Potter.

At the moment, Makerspace is still in its experimental stages and is funded by the School of Engineering. "We are trying to build up funding from the engineering department based on people's interest in interdisciplinary projects," adds Potter. To generate greater interest, Makerspace is hosting a 3D-printing contest in the month of October. For the contest, students will be asked to modify and 3D print an object posted by Makerspace on Thingiverse. At the end of the month, these students' designs will be judged and winners will be announced. Makerspace will also be hosting various workshops aimed towards prototyping, ranging from classes about soldering to basic use of AutoCAD. ◊

MAKER FAIRE 2015

BRENDA SO (EE'18)



Photos by Brenda So (EE'18)

This year's World Maker Faire was held on September 25-27 at the New York Hall of Science. It claimed to be "the Greatest Show (and Tell) on Earth – a family-friendly festival of invention, creativity and resourcefulness, and a celebration of the Maker movement". Maker Faire gathers "tech enthusiasts, crafters, educators, tinkerers, hobbyists, engineers, science clubs, authors, artists, students, and commercial exhibitors" of all ages across all walks of life to come showcase what they have made and share what they have learned. Started as a fair in California's Bay Area, Maker Faire grew in sponsorship and participation, leading to its development in other parts of the world, such as Tokyo, Rome and Shenzhen.

Originally launched as a kickstarter project, oneTesla exhibited its singing Tesla coil. Developed by two MIT students, oneTesla provides the raw materials required to build your own singing Tesla coil. The coil works by playing music from speakers, allowing electric current to fluctuate through the copper coil, thus heating up the air surrounding the tip and producing purple sparks and arcs of electricity. Tesla coil enthusiasts, sometimes called "coilers," stood in amusement and awe when the exhibitors played Beethoven's *Ode to Joy* on the singing Tesla coil, watching sparks flying from the tip of the coil and wind around the cylindrical speakers.

Mohammed Nasir, a member of the Drones for Humanity initiative, displayed a drone capable of carrying 50lbs of provisions and equipment to disaster-struck areas. After seeing so many natural disasters around the world, such as the Haiti Earthquake in 2010, he saw a need for faster deployment of aid to the victims. In an interview with the *Metro* newspaper, he said that, "The main purpose of this drone is for rapid deployment in the hour following a natural disaster, each with a setup time of about one minute. Being fully autonomous (self-piloting when given GPS coordinates), hundreds of these drones can be deployed with a crew of, say, 10 people. Most importantly, these drones are cheap: 1000+ drones for the same cost of a relief helicopter."

Apart from local inventors, there were also multinational companies that displayed their latest products and inventions in the fair. Intel displayed a series of dancing robot spiders at their booth, allowing visitors to control them with hand gestures or music from nearby speakers. Google, on the other hand, displayed multiple sewn-on circuits with conducting fibers, with functions ranging from lighting up an LED to playing a song on a piece of pink fabric.

From an engineering perspective, Maker Faire showed how accessible rapid-prototyping technologies are today. The widespread popularity of microcontrollers and 3D printers has made inventing much easier than before; the idea of open sourcing inventions allowed fellow makers to refine and develop new ideas too.

"It was very encouraging for future inventors to see that creative ideas could be made into reality almost instantly."

Maker Faire is not simply a county fair or a science fair; it is a celebration of invention culture in our society. As inventors gain momentum through crowdsourcing and exhibitions like Maker Faire, those who used to be hindered by financial concerns or technological barriers to entry now see their roadblocks removed one by one. It is definitely an inspiring visit for future inventors as well — soaking up the inspiration of others' inventions and fueling your own ideas, one gets to learn more about current technologies and trends. ◊

THE NEW DORMS

THE (OLD) NEW DORMS: A PREVIEW

TANYA DRAGAN

The following article is reprinted from an issue of The Pioneer *published on April 29, 1992*

On the afternoon of Wednesday, April 15 [1992], a group of more than 50 current and prospective students as well as a handful of parents and administrators, embarked on an extensive tour of the new dorms (or "residence hall," as the administration is quick to remind us.) In small groups, the curiosity-seekers ascended to the roof in the "passenger hoist" (the construction workers' name for the outside elevator), and trickled through the floors, examining the as-yet unfinished apartments. Devoid of kitchens, bathrooms and doors, not to mention furniture, the apartments were not quite the finished product, but gave everyone a clear indication of what will be.

Most floors consist of four apartments—two 4-person apartments, with two double bedrooms; a 3-person apartment with one double and one single bedroom; and a 5-person apartment, with one single and two double bedrooms. The third floor has three "loft-style" apartments. These lofts are to house four, five and six people. These apartments are one large room, without any divisions, which will enable living there to let their imaginations run wild (to a point), and utilize the space in any way they desire. The six-person loft, which faces 9th Street, seems spacious, even around the piles of sheetrock which were stacked in the middle. The four- and five-person lofts, while interesting in that they are split level, with only a half-wall separating the two levels, are ensaddled with a "panoramic" view of the roof next door.

Each apartment has a kitchenette, consisting of a sink, gas burners (no oven), microwave oven (for the frozen food gourmet), and a half-sized refrigerator (for the new "family" of five or six, this may be a rather tight squeeze). Other tight squeezes may be the bathrooms—many of which have only stand-up shower (as opposed to a full bath), and the lack of closet— only 5-person apartments have any. All other apartments will have to do with "clothing storage units." All in all, the apartments are not overly spacious, and bring to mind a saying an Australian friend of mine had: "Not even big enough to swing a cat round by its tail."

The dorms will not be without any amenities, however. The dorm will house two common rooms: a large one, "designed for student activity," as the brochure describes it, which overlooks, and during warm weather will no doubt overflow onto, the fourth floor terrace, and a smaller television room on the fifth floor. Each apartment will also eventually be linked to a central computer.

"Each apartment will also eventually be linked to a central computer."

Another big plus (especially for nature buffs) which will be enjoyed by the whole area, and not just dorm residents, is a small "viewing park" which will occupy the area enclosed by 3rd Avenue, 9th Street, and Stuyvesant Street. The Cooper community had initially wanted to close off Stuyvesant Street in this area, extending the park to the doorstep of the dorms. This would have enabled the restaurants to extend outdoors in nice weather, and give the dorms a feeling of a "lawn." Community opposition, however, citing the threat of homeless squatters, city bureaucracy, and the expense waylaid these plans. The cost of the smaller park will be upwards of $400,000! (Anyone willing to start a fund?) This park will be important—both in improving the area aesthetically, and continuing the environmentally-conscious theme of the dorms. Many students think it's a great idea, long overdue.

Several apartments in the dorm will not be for housing students. One of these, by far the most popular with the tour, is the duplex for visiting scholar(s). Although it has a rather narrow staircase, the two floors and nice view were admired by all. Closely following the duplex in popularity is the resident manager's apartment which overlooks, and will most probably have access to, the small terrace on the west side (3rd Avenue side) of the building. The resident advisors (RA's), however, will not live in such luxury. Contrary to popular belief, they will not be living alone in an apartment: rather, they will have their own room in apartment. They will, however, be living rent-free—in exchange for the responsibilities and time they will need to put into their job.

Photo by Winter Leng (ChE '18)

The cost of the dorms, with respect to their size, was a major topic of discussion during the tour, as it has been since the cost of rent was first announced. The dorms will cost each student $480 a month, regardless of where he or she will live. Many students are of the opinion that a $2,000 a month apartment, which is essentially what a four-person dorm will cost, is rather expensive, especially as utilities are not included in this cost. (Each apartment will be billed separately for its own utility use). If the apartments were bigger, many claim the cost would be worth it, especially as it's possible to get a comparably-sized apartment in the area for less. Conversely, the cost includes the convenience of the location, the fact that the building is new, and security. The consensus most often reached was that the dorms will primarily house underclassmen coming from afar, and that once they become familiar with and assimilated to, the area and life in New York City, they will venture out on their own, in search of better bargains. Either argument is valid today: price and size vs. proximity and security; the answer will have to wait until the dorms are lived in and experienced. Perhaps even then, the answer will not be concrete. So, for now, bring on the "dorm-ites" and let's see! ◊

Laundry facilities in the new dorms. Photo by Sage Gu

THE (NEW) NEW DORMS

BRENDA SO (EE'18)

The student population at Cooper Union has grown, and it is increasingly difficult for Cooper to accommodate housing needs, particularly for first-year students. The old dorms, located at 29 3rd Avenue, only accommodate up to 180 students. Consequently, last year Cooper explored other housing alternatives, ultimately deciding to take up an offer to house students in a new dormitory development at 200 East 6th Street — now called the new dorms.

The new dorms are part of a one-year agreement with Marymount College for the current academic year. When asked how the deal came about, David Robbins, Director of Housing & Residential Education and Programs responded, "In mid-February, Marymount reached out to me directly through email. They said that their new dorms is going to fill 275 students, and they were planning to fill the building."

Cooper decided to accept the offer after talking to Chris Chamberlin, Dean of Students, Bill Mea, former Vice President of Finance and Administration and current Acting President, and Mitchell Lipton, Vice President of Enrollment Services. Robbins commented that at the time of the decision, "I realize that my application for housing were way over what I could accommodate in the old dorms, so we signed a one-year agreement with them to try it out. The alternative was to tell forty freshmen that we don't have housing for them."

Cooper occupies floors 7 to 10 in the new dorms. There are currently 69 students living in the new dorms, 34 of which are freshmen while the rest are upperclassmen. The three RAs who work in the new dorms are all seniors since half of the Cooper students residing there are upperclassmen.

In terms of space, the new dorms have a large variability between the sizes of different bedrooms. On the one hand, there are double rooms with a floor space of around 150 square feet, which are considered by many residents to be too cramped. On the other hand, there are rooms with 180 square feet of space that Marymount College assigned as triple rooms, but are considered too small by Cooper, and hence are assigned as double rooms. The costs for both types of double rooms are the same.

In comparison, in the old dorms single bedrooms have 100 square feet while double bedrooms have 150 square feet. Although the A-line bedrooms are significantly smaller than the rest, only three students reside in an A-line apartment.

While the old dorms cost $5,780 per semester, the new dorms cost $7,750 per semester. Some might wonder why the cost for the new dorms is so high, and also whether it costs Cooper anything. According to Robbins, Cooper neither profited nor lost money in the deal – all costs for renting the floors Cooper occupies are paid directly by the students residing there. It is a zero-sum deal.

In compensation with the high cost of rent, the new dorms provide a range of facilities, including a study lounge, a gym room and a bike storage space in the basement. The terrace is also open at all times for students who want to go out and enjoy the Manhattan view.

In response to questions and concerns from students about the new dorms, Robbins spoke about both the strengths and drawbacks of the new dorms. While students get to share and enjoy the facilities in the new dorms, the variability of room sizes prevents students from knowing how big their rooms would be before they arrive on move-in day. Moreover, the apartments in the new dorms are temperature controlled by thermostats, while in the old dorms the temperature adjustments are limited.

Despite the technological advancement of the new dorms, Sahil Patel (EE '18), who currently lives in the new dorms but also lived in the old dorms as a freshman, told *The Pioneer* that although the new dorms are cleaner and much closer to Cooper, "the rooms in the new dorms are significantly smaller than in the old dorms…there are no dining tables, so you cannot work with your friends. If you want to live next to Cooper and live in a clean dormitory, the new dorms are a potential option."

Amy Yen-Chia Feng (ME '18), an RA in the old dorms, expressed concerns on the division between the old dorms and the new dorms. She said, "A lot of our events take place in the Menschel and it's a bit harder to get freshman living in the new dorms to come. It's also harder to foster a sense of community in the new dorms." Despite these concerns, she is optimistic that the senior RAs who live in the new dorms "are doing their best to make up for that."

Looking to the future, Robbins said that there would be a meeting between him and the students who live in the new dorms in October as an evaluation. Chamberlin said, "David Robbins and I will evaluate student satisfaction with the new residence hall and determine if we want to pursue continuing that arrangement for another year." ◊

KNOVEL ACADEMIC CHALLENGE!

ANDY JEONG (EE ‘18)

From the week of September 28th, this semester’s Knovel Academic Challenge marks the beginning and will be held for 5 weeks, until the last week of October. Knovel Academic Challenge (KAC) is a 5-week long program in which STEM students from worldwide institutions compete with one another in solving engineering problem sets provided by Knovel’s trusted content and available interactive tools. By answering each question correctly within the given 3 trials, points are accumulated and the chance for the prizes increases, as knowledge gets accumulates as well. One can participate in the week’s challenge from every Monday of the week until Sunday midnight, and there is no time limit for submission. The prizes by KAC include Amazon gift cards, Apple iPad and SONOS speaker.

Last semester, Cooper Union ranked #8 overall worldwide, based on the total number of points scored from submitted problem sets. “It’s impressive that we ranked so highly, considering how small our Engineering student body is compared to the other schools in the contest. You can see a screenshot of the leaderboard on the Library’s website,” says Julie Castelluzzo, the librarian. Julie will be hosting a schoolwide Knovel Academic Challenge Marathon event at the Cooper Library on October 15, from 5pm to 7pm. At the event, there will be a special problem set for this event and a prize given out (separate from those offered by KAC), with food provided for the participants. She encourages all current students to attend and take a 10-minutes long problem set to help raise our ranking. For this event, please contact Julie A. Castelluzzo at juliec@cooper.edu to help out.

The Knovel Challenge Marathon at Cooper Union Library was originally planned to be held for spring, but due to the unexpected gas explosion near the school buildings it was cancelled at the last minute. Apart from submitting the answers for prizes, this will be a great opportunity to expand knowledge as an engineer by learning as you solve.

Julie is excited to hear last year that Cooper Union scored higher on the final leaderboard than Drexel University, where she learned about an event similar to KAC. She comments, “I admit to having a competitive nature, and I love to show off the talents of our engineering students, so this is a lot of fun for me, in addition to being a great way for students to learn about the tools available in Knovel to help them with their engineering assignments and projects.”

To enter the contest, go to http://knovelac.com ◊

COOPER FUND SCHOLAR RECEPTION

Acting President Bill Mea raises a glass to donors at the Cooper Fund Leadership Circle Reception on Wednesday, October 7, 2015. Photo by Yifei Simon Shao (ME ‘19)

On October 7, the Office of Development hosted a reception in recognition of donors who gave more than $10,000 last fiscal year. Donors, administrators and students attended the event, titled the Cooper Fund Leadership Circle Reception.

Students were requested to write a letter to donors expressing gratitude for their support and generosity. They were also invited to the reception to meet and mingle with donors, most of whom were alumni.

Acting President Bill Mea kicked off the event by unveiling the new donor wall, hanging in the lobby of the Foundation Building. The attendees were then directed to the Cooper Suite on the 8th floor to enjoy the snacks and open bar together on the rooftop, under a clear Manhattan night sky.

Richard Lincer, Chairman of the Board of Trustees, also gave a speech. He highlighted that several trustees were in attendance and engaging with the community, including Eric Hirschhorn (ME ‘89) and alumni trustees Robert Tan (Arch ‘81) and Edgar Mokuvos (EE ‘78), which he said was something “that’s a positive thing that we haven’t had in about a year or so.”

“As we said, we’re not going to restore the trust instantaneously, but the key is that people are now willing to talk to each other and maybe even smile at each other. There may be a divergence of viewpoints, but we can have a civilized dialogue and try and figure out a path forward. In that regard, your [all attendees] support is critical,” said Lincer, before handing over the podium to Student Trustee Jessica Marshall (EE ‘17). Marshall was joined by incoming Student Trustee, Monica Abdallah (ChE ‘17), and outgoing Student Representative to the Board, Devora Najjar (ChE ‘16). In her speech, Marshall thanked donors and all attendees. ◊

AFTER FARM-TO-TABLE ADVENTURE, COOPER ARTISTS RETURN TO NYC

MATTHEW GRATTAN (ChE ‘19)

DeVonn Francis (A ‘15) and Angus Buchanan Smith (A ‘15). Photos by Enroot Collective

This past summer two Cooper art students—one former and one current—put a spin on locally sourced food. DeVonn Francis (Art ‘15) and Angus Buchanan-Smith (Art ‘15) went on a culinary adventure to different farms in the UK, hosting farm-to-table dinners at each stop.

Their project, entitled Enroot, aims to “bridge the gaps” between producers and consumers of food. The two founders are now back in town to show their thanks to their supporters.

Originally from Virginia, DeVonn has a rich background in cooking and working in restaurants. He ultimately chose Cooper because he has family in the New York area.

Angus hails from Edinburgh, Scotland and decided to take a gap year working for his cousin in New York City. Angus’ cousin later introduced him to Cooper.

“I was kind of in awe of the whole situation and Cooper,” said Angus, “applying was one of the best things I’ve ever done.”

Angus grew up on a dairy farm in Scotland, where the dairy industry has changed considerably over the past decade as well as in the rest of the UK. Due to global economic pressures on the industry, smaller dairies, including Angus’ family farm, were forced to shut down.

While back at home one Christmas, Angus brainstormed with his brother about traveling and connecting with farmers. Angus proposed the idea to DeVonn and that plan eventually evolved into Enroot.

Before leaving the US, DeVonn and Angus contacted the farms to see if the farmers were willing to host Enroot and to determine what sort of ingredients were available.

Then, Enroot traveled to different farms between Scotland, England, and Wales. The Enroot team consisted of about 6 people per event but included 42 people over the course of the three-month venture.

During each 10-14 day visit, Enroot would first interview the farmers about their farming situation. At the end of each stay, Enroot would host a dinner for the immediate community. The farmers, who produced the food were also present at the dinner to encourage dialogue.

In some respects, Enroot echoed the historical relationship between food production and consumption. DeVonn and Angus had to work within the seasonal constraints to create their menu for each location.

“We’re very lucky to be able to have our bananas imported and eat strawberries year-round,” Angus explained, “but being able to support the infrastructure right around you at that time of year is important. It’s about knowledge.” “And by knowledge, we mean the ability and the right for people to know what options they have outside supermarkets,” DeVonn added.

Angus Buchanan Smith (A ‘15)

Enroot also strove to return to traditional cooking methods, like roasting half of a lamb over an open fire. “It’s a very simple way of cooking, but it goes back to traditions of what it meant to use everything,” according to DeVonn.

Through Kickstarter, DeVonn and Angus raised $20,000 in twenty days for Enroot. “Kickstarter was a fantastic platform, and a lot of it was down to the Cooper Union community,” said Angus.

Having completed the farm-to-table tour of the UK, Enroot has been hosting events in New York City for the Kickstarter backers. Angus and DeVonn even have an event planned on Oct. 16 specifically for Cooper students. A portion of the proceeds from this event will go to help Harvest Roots Farm and Ferment, an Alabama farm run by friends of DeVonn and Angus.

DeVonn and Angus are currently working on a book and, in time, would like to reconnect with the farmers they visited. For the future, the two want to expand the ways in which they bring consumers together with food producers.

“We want to give power back to people to make decisions about food for themselves and to know that there’s more out there than Two Bros.” DeVonn mused. “In its simplest from, [Enroot] is like one large research project,” Angus said, “these dinners give us access to local agricultural advisors and local farms and farmers.”

Enroot has proven to be quite the learning experience as well as an artistic one.“We both consider [Enroot] an extension of our artistic practice,” Angus commented.Angus and DeVonn are also looking forward to working more closely with the Cooper community.

A few words of advice from DeVonn and Angus: find people to work with.“To get a second opinion on something is always better than to do it on your own devices,” DeVonn said. “There’s no way we could have done this project without the amazing support we had from so many different people,” Angus said.

And about that party on Oct. 16—homemade hotdogs might be on the menu. Stay posted for the location. For more info, visit: www.enrootcollective.com/reservations ◊

FACES OF COOPER: KEVIN TIEN (EE '12)

KRISHNA THIYAGARAJAN (EE '18)

The Cooper Pioneer: Where are you from?

Kevin Tien: I am originally from Central Jersey. Monmouth County to be a bit more specific.

Can you tell me about your educational and professional background?

Well, I applied to many schools and got into them. I got my undergraduate degree in Electrical Engineering from Cooper Union, masters at Columbia University and I am currently doing my PhD in Circuit Design in Electrical Engineering at Columbia University. I have also worked at IBM Research and Ferric Inc., a hardware startup in NYC.

When did you learn about Cooper Union as a student and what brought you here?

I did not know about Cooper Union before I started applying to schools. It was really the scholarship money that brought me here. Compared to other schools, I thought that it was worth it to go to Cooper Union since it was free back then. I did get into another school which was completely free, but since it came down to be about the same cost, I decided to come here because I felt that Cooper was more prestigious.

Why did you choose Electrical Engineering?

I was good enough at it and that's it. I didn't really have any particular passion for what I did and I never felt that it was my calling. It was just the path that I chose to walk in life. I don't exactly love engineering. I was introduced to it when I went to a public high school where there was a program that allowed me to see more of science and engineering during my time there I thought being an engineer pays off.

How do you think you have changed since you arrived here as a student?

I mellowed out a lot at Cooper. I used to be more hotheaded and more arrogant. Some people who know me might say that I was worse before coming to Cooper. In a way, my time as a student at Cooper tempered me and it gave me humility. It made me realize that it doesn't matter if we're good engineers at the end of the day. I realized that there is so much more to life than being good at a certain job. Being a good parent, for example, is so difficult. No one really teaches that.

Photo by Yifei Simon Shao (ME '19)

Cooper also made me realize that we over emphasize competence and we are arrogant about ourselves as STEM majors. That arrogance makes it very easy for us to bash on the humanities and the other majors and, in the beginning, I think a lot of my peers slipped into that. Everyone has their own road that they walk and just because you're taking the STEM path doesn't make you better than the other disciplines. By the end of my senior year, I stopped thinking of myself as particularly important in comparison to the rest of the world. But, man, there were a lot of stereotypical aspects of engineers that I grew to dislike while I was here. Cooper played a really big role in making me that cooled down man.

What advice would you give to the students?

You need a thirst for learning and understanding anything and everything that you do. There is always something to learn. You should look at something and ask yourself "why is this true?" and convince yourself that what you learned is true, or in some instances, not true. If a computer program shows you a solution to a problem, you need to know the underlying reason why it showed you that solution. The program might not be telling you the truth. It's the same thing with people, politics and larger groups. Students need to realize that you all are young. Go home and have fun. We're in New York City. You guys are in a great position in life. Experience is a continuum and we're all but voyagers on a great ocean of pleasure. You need to get the most out of it as you can. You also need to realize that hope is the first step to disappointment. Don't hope that something will happen, make it happen! We're all going to die one day, so question everything and enjoy life as much as possible.

What are some of your favorite hobbies/pastime activities?

I am a musician and am active in NYC's Chinese traditional music scene. I play a traditional Chinese string instrument on stage. I also play video games occasionally and I'm interested in board games such as Diplomacy.

You joke a lot during class. Tell us a joke.

My dog has doesn't have a nose. Well, how does it smell? Horrible! ◊

FACES OF COOPER: PROFESSOR DIRK LUCHTENBURG

KAVYA UDUPA (BSE '19)

The Cooper Pioneer: Where are you from?

Dirk Luchtenburg: I'm from the Netherlands.

Can you tell me a little bit about your academic background, both educational and professional?

I did my Bachelor's and Master's in Aerospace Engineering at the Delft University of Technology in Netherlands. Afterwards, I went to Berlin, Germany and did my PhD work in flow control there. I did my post-doc and taught a bit at Princeton before coming to Cooper.

How did you hear about Cooper?

It was actually sort of random. My roommate at Princeton went to Cooper and came to Princeton for his PhD. He told me about Cooper - it was sort of interesting, he said it was a "good school in New York" except I've never heard of it. So, I did a little research and went to Academic Keys, a site for jobs in academia, and applied for a few professorial jobs. I got an interview here and didn't get that specific job at the time, but Professor Wootton offered me a job to work for him in the Mechanical Engineering department. I did that for a while and then the new position of Assistant Professor in the department opened up – I applied and I got it.

How long have you been teaching at Cooper?

I started teaching here last year. I did research with Professor Wootton my first semester. My second semester here, they asked me if I would like to teach so I was an adjunct for a while. In January 2015, I became a visiting professor as I was teaching two courses and starting this semester, I became an assistant professor.

What is your role in the Mechanical Engineering department and as an assistant professor?

My role? Teaching, I guess. Basically, they were looking for somebody with a different background than the professors here. I'm interested in fluid dynamics especially in how it relates to feedback control and this combination of ideas is sort of what I bring to the department. Another component of my work was to simplify complex computer models into a form that you can actually work with in real time.

Is this your first year doing the EID101 project?

To be honest, this project is a little out of my comfort zone. I'm more of a computational or simulations oriented guy so I'm venturing a little with this whole applied and hands-on approach. As of right now, we're doing a little bit of theory like why do airplanes fly or why can they fly or how do they create lift? And then, I let them work on designs and present them to the class. Basically, I am trying to give them a little of my knowledge of airplanes but at the same time give them enough freedom to develop stuff on their own.

Photo by Yifei Simon Shao (ME '19)

In terms of guidelines for the project, as of now I've just told them these are your choices, you need to bring this package from A to B. One of the groups talked of using a grasp mechanism to pick up the object and to move it from A to B.

What other courses do you teach here?

I have taught Feedback Controls and Engineering Mechanics - I am actually teaching that right now. This course basically discusses statics and dynamics. I have also been teaching Vibrations. As of now, I am teaching two courses per semester as that is typical for a first year professor. Afterwards the course load gets ramped up.

How do you like your job and experience here at Cooper?

I think it's been amazing. At first, I was a little surprised – I think the students here can be really shy. But, this is a great atmosphere; the students work really hard. I remember my first class, I had assigned a homework assignment and at the time, I did not really know how long it would take a student to complete the assignment as I, myself, was new to the class as well. I told the students to complete the homework and include just how much time it took each of them to do the assignment. Some people worked on it for eight or ten hours and they didn't complain at all. They just took it and did it. I was really surprised that the students worked so hard - it actually made me feel a little bad. So, I think most students here have a really good mindset but they seem a little shy. Apparently it's a Cooper thing.

Who's your favorite professor to work with?

Gosh I don't know. I haven't met all the people yet. Right now, I can only say my favorites in terms of interest. I think Professors Wootton, Delagrammatikas and Mintchev are doing cool stuff because I have talked to them a lot. But, I have got to say Professor Rinaldi is doing something amazing – that's actually why I applied for the job. All of their work helped convince me to stay.

What advice would you give to Cooper students?

Be less shy, for sure. I have been seeing a lot of students taking charge in independent studies and senior projects and I really like that – continue to take initiative. As a student, find something you really like and a professor you really click with and do interesting work with, you have to exploit the fact that Cooper is a small school. It's a really small setting and students should take advantage of the resources. The whole working together thing makes it so much friendlier as well – I don't feel the stiff competition amongst students that is evident in other schools. Also, talk to your professors. I have some students who I taught in previous semesters stop by at my office asking for advice or letters of recommendation.

What are some of your hobbies? What do you do in your free time?

I've been really busy lately. But, if I am not busy, I like to travel a lot. I've been to Costa Rica, New Zealand, Israel, and pretty much every country in Europe since that's where I am from. I want to go to South America next since I've never been. When I was a bit younger, my buddies and I would work for a month to get money to do what we wanted and then go somewhere, rent a Jeep and go from town to town. That's actually how I explored Costa Rica and New Zealand.

Actually, when I was in the US I was doing an internship with the Air Force Academy and I got into gliding. I guess that's the disadvantage of New York City – not being able to do daring activities on a whim.

I used to play pretty much any sport – I used to play soccer and in college, I played volleyball and was into martial arts. I also enjoy reading – especially autobiographies and popular science magazines. ◊

NEW GENDER-NEUTRAL FACILITIES ANNOUNCED

PRANAV JONEJA (ME ‘18)

“In an effort to create a more welcoming and safe campus environment for all members of the Cooper Union community, we are pleased to announce the designation of additional campus restroom facilities as ‘Gender-Neutral,’” writes Chris Chamberlin, Dean of Students, in a campus notice email.

The email announces the addition of new gender-neutral bathrooms on the 3rd floor of the Foundation Building and on the 3rd and 5th floors of the New Academic Building (NAB). These changes took effect on October 12, 2015. Prior to the announcement, the existing gender-neutral facilities were located on the 6th floor of the Foundation Building, LL2 of the NAB and in the residence hall at 29 3rd Avenue. All of these facilities will continue to be designated gender-neutral.

The announcement comes on the heels of a number of emails sent and statements made by students expressing support for an immediate change in the gender-neutral facilities on campus.

Among those who sent emails to administrators and has been vocally and visibly advocating for the creation of such facilities is L Curran (EE ‘18). In emails to Chamberlin and Acting President Bill Mea, Curran wrote, “The current situation for bathrooms, especially in the NAB, is very stressful. I should be spending time in sixth floor labs doing work, but I get anxious about going to the bathroom.”

Xe (She) further explains, “Many trans students, especially in the engineering school, do not feel comfortable being out or presenting as they want to, and labeling all bathrooms as gender neutral will make trans students much more comfortable.”

The argument in support of gender-neutral bathrooms extends further than just comfort though. There is a need for facilities that are safely accessible to everyone.

When bathrooms are not made adequately accessible to everyone, it is the gender nonconforming group in particular that is marginalized. In these situations, they are faced with two options:

The first is to “hold it,” by which it is meant they must suppress the need to pee for the entire time they are on campus. At best, this is a matter of extreme discomfort, and at worst, this can directly cause kidney problems and other long-term health issues.

The second option is to use one of the existing single gender bathrooms. This exposes people to ridicule, harassment and even assault — an unacceptable risk for someone who is really just trying to use the toilet.

Indeed, the entire matter is too complicated for something as simple as going to the restroom. “I just want to pee,” L writes at the end of xer (her) email.

Chamberlin took immediate action in response to the emails, writing that, “no one should have to leave a building to find a place where they feel safe to use a restroom.”

First, Chamberlin met with students on several occasions to understand the situation as it existed and get a better picture of how to meet the needs of transgender people.

Andy Overton (Art ‘16), Joint Student Council (JSC) member, confirmed that Chamberlin brought the topic to a JSC meeting and sought to discuss solutions that will actually work. Andy highlighted that solutions had to be considered based on a balance between how easily they could be enacted and how effective they would actually be in providing relief to the problem. For example, it was initially suggested that students who request access could be given keys to the faculty bathrooms on every floor of the NAB. However, the problem in this scenario is one must ‘out’ themselves every time they want to go to the toilet. Moreover, this solution essentially creates a third category of bathrooms, which further ostracizes and marginalizes the gender nonconforming group.

Andy also provided an account of how long the issue of gender-neutral bathrooms has been brewing at The Cooper Union. Starting in late 2013, a group of students came together and began to express support for the creation of gender-neutral facilities. According to Andy, the responses from the administration back then ranged from, “do we really need it?” to refusal citing budgetary constraints.

In a refreshing change of pace, Chamberlin swiftly followed through with action after meetings with students. He made assessments and proposals for specific changes to campus facilities in meetings with Bill Mea and Carmelo Pizzuto, Acting Director of Facilities Management. Ultimately, the solution they reached is the one announced and being enacted now.

“It’s amazing the way that Chris [Chamberlin] identified the problem, worked with Buildings and Grounds, got approval from the President, and followed through to make the changes,” Andy said.

Andy also pointed out, “Broadly speaking, the discourse around gender identity has only now been taking place here [at The Cooper Union].” In reference to the more inclusive communities at other college campuses, he said, “Cooper is maybe finally catching up with the discussion.”

Of particular note is the fact that an exhibition in LL1 this month entitled, “Bring Your Own Body: Transgender Between Archives and Aesthetics,” will be flanked by two gender-neutral bathrooms on the same floor. Even though it is a simple change of signage, it will be highly effective in solving the problem for the duration of the exhibition. Both L and Andy welcome the efforts, but separately voiced dismay that this never happened in the past, during the Dark Matter poetry show last year for example.

“We will continue to evaluate our campus facilities and seek to continue to make modifications to ensure a safe, welcoming and comfortable environment for every member of the Cooper Union community,” wrote Chamberlin in the campus-wide email. ◊

COGENERATION: A NEW APPROACH TO COST REDUCTION

DANIEL GALPERIN (ChE ‘18)

Disclaimer: The opinions in this article are those of the author alone. The numbers, however, are factual.

With so many things happening at The Cooper Union ranging from administrative to operational changes, there is quite a bit of talk about the need to spend less. Acting Dean Stock spoke about “living within our means” when interviewed by *The Pioneer* previously this semester, and Acting President Mea said “the goal is to become operationally adequate so we can at least break even and spend no more than we earn.”

Previously, discussion of reducing Cooper’s expenses orbited around the earnings of certain administrators. Of course I agree that the numbers seem excessive, and I remember how bewildered I was the first time I heard them, but maybe it’s time for a new approach. Why keep beating the dead horse, when there are other ways for the school to save money. I think our operational adequacy can come from resources that are already in place and perhaps could be optimized.

In a building full of complex chemical instruments, machining equipment and a flux of 1,000 people in and out, extremely large amounts of energy are consumed daily. The New Academic Building consumes an average of 600 kilowatts (the equivalent of about 200 households).

I spoke to Professor Melody Baglione, who incorporates many of the sustainable systems in our building into projects for mechanical engineering students. Prof Baglione was kind enough to explain the complicated process of how the cogenerator produces electricity and heat, but more importantly she explained the cost saving aspects of the cogenerator.

The building has two utility service lines for metering electricity purchased from the Con Edison utility grid. Each meter would read roughly the same electricity consumption, but with cogeneration, the amount of electricity Cooper Union needs to purchase for the second service line is reduced by as much as 250 kW. The cogenerator uses natural gas purchased from the grid to produce electricity and heat for the building and is located on the roof of the NAB. Onsite cogeneration is more efficient than purchasing electricity from the grid since otherwise wasted heat is captured for use. It was installed in the NAB at the cost of $1.2 million dollars, but with a grant of $400,000 from New York State Energy Research and Development Authority as a combined heat and power (CHP) incentive.

Cogenerator on the roof of the NAB. Photo from Prof Baglione’s faculty page.

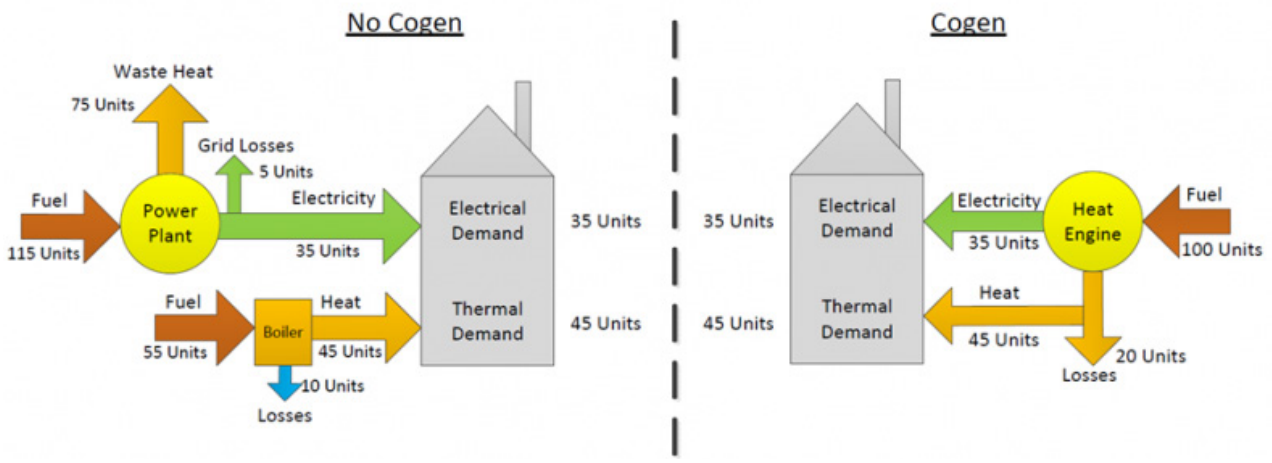
Despite the high cost of installation of the cogenerator, it is estimated to save the Cooper Union $200,000 annually. The actual savings depend on the actual run hours and fluctuating natural gas and electricity rates. It is important to note that as the cost of natural gas goes down and the cost of electricity goes up, cogeneration saves the school even more money.

The cogenerator isn’t some superhero though; it’s not flawless. Prof Baglione mentions that an element called the absorption chiller is not working at the moment. I was assured that it isn’t an integral part of the cogenerator, as it is only used in the summer to help cool the building by using the excess heat it generates through some nifty refrigeration process or other. However the discussion of repairing the absorption chiller hinges on whether or not it is a good enough investment. This is to say, “will repairing this item cost more money than the item will save us?”

It also came up in discussion that there happens to be another cogenerator on the roof of the Foundation Building. Although the NAB consumes around two-thirds of the energy of the campus (where “campus” is defined as the NAB, Foundation Building and dorms), the Foundation Building constitutes a significant amount of energy cost for the Cooper Union as well.

As of now, the Foundation Building cogenerator is not working at all, which may be due to the way the cogeneration plant was initially tied into the building’s existing systems. Professor Baglione, along with Joe Viola (ME ‘16), are working with the Facilities staff to understand the best options for getting the cogenerator at the Foundation Building up and running again. She drew a parallel between the “investment” arguments made previously. More research and analysis needs to be done before any real claims are made, but according to Prof Baglione the savings that the Foundation Building cogenerator could produce would probably outweigh the cost of repair.

Perhaps the cogenerators are helpful but not helpful enough for the investment involved in repairing them. On the other hand, perhaps the cogenerators can be repaired or optimized and save our school a lot of money. Either way, we need to look into other methods of balancing the operational budget instead of banging the “fire everyone” drum. I think this might be a good place to start. ◊



An energy diagram showing how cogeneration uses less energy.