Eco Fact: The American tradition of sending holiday cards is estimated to use nearly 300,000 trees per year.

From Your Editors

“When you realize the value of all life, you dwell less on what is past and concentrate more on the preservation of the future” - Dian Fossey

Dear Readers,

We are once again thrilled to be able to provide another influx of environmental news for everyone. This semester has been a hectic one, and we hope that this month’s edition offers a respite, and perhaps allows for a moment of reflection on the state of the wider world around us. Within, you will find articles with topics ranging from autonomous garbage-collecting robots, to the COP21 Climate Talks in Paris, to the longevity of soft corals, and more! We hope that you enjoy!

Happy Trails!

Alex, James, Ariel and Brayden

Thank you to our staff...

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Many Call for Federal Investigation of Exxon Mobil Over Purposeful Obscuring of Climate Science
by Alex Toke

Oil and gas giant Exxon Mobil has come under fire over recently-surfaced allegations that the corporation funded research by skeptics and deniers of Climate Change science in a bid to dilute public perception of the scientific “debate” on the issue. In a move reminiscent of the tobacco industry during the 1960s, which hired advertising experts to determine the best ways to mislead the general public about the unilaterally harmful effects of smoking tobacco, Exxon Mobil is alleged to have had knowledge of the effects of continued carbon emissions as early as 1977 based on its own research, and to have hidden those conclusions from its investors and the general public, as well as hiring skeptics and deniers to publicly denounce similar scientific conclusions in the media.

In the notorious and complex arena that is American news-reporting, anthropogenic Climate Change has become another talking piece and headline-grabber for pundits and institutions attempting to secure the viewership of whichever political constituency is favored by their parent corporations. Climate Change is a divisive issue in American political discourse, despite the overwhelming scientific evidence of its existence and causes, as well as projections of its effects. In the face of the consistent expansion of information regarding Climate Change and its causes, Climate Change “deniers” or “skeptics” as they are referred to by the media remain as emboldened as ever, as evidenced by statements made by presidential candidates such as Marco Rubio and Donald Trump as recently as November.

Many American politicians and members of the general public have also called for an investigation of Exxon Mobil’s alleged actions, with some, such as Vermont Senator and presidential-hopeful Bernard Sanders, calling for a RICO investigation of the corporation. RICO, or “Racketeer-Influenced Corrupt Organization” investigations, were originally purposed for investigating and breaking up the United States’ notorious “mafia” crime families. The RICO Act, codified under Title IX of the Organized Crime Control Act, allows those who order the execution of criminal actions to be charged for the crimes their subordinates committed. RICO was also used effectively against the tobacco industry, accused of funding skeptics to spread doubt about scientific conclusions regarding the harmful effects of tobacco use.

A separate investigation is currently underway in New York, where Attorney General Eric Schneiderman is pursuing the oil giant for allegedly committing financial fraud in purposefully withholding climate science that might have influenced share prices from its investors. Exxon Mobil, meanwhile, denies any wrongdoing. Facing pressure from all sectors of global society, Exxon Mobil and other corporations like it are in for some hot water, and not just from the rising sea level temperatures their products play a part in causing.

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Atkin, Emily. “Exxon’s Climate Cover-Up Should be Investigated by DOJ, Tobacco Prosecutor Says”. Think Progress, 2015.
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China Commits Before P21
By Rachel DiSciullo

From November 30 to December 11 of this year, prominent world leaders and climate scientists will convene in Paris, France for the 21st meeting of the Conference of the Parties COP 21). Each convening of COP brings with it major changes in international climate policy--and this year, it appears that China is gearing up to be a leader.

In June of this year, China pledged to peak, or halt, its emissions by 2030, if not earlier, in a document submitted to the United Nations. This document also includes a recognition of China’s contributions to overall fossil fuel emissions, and the massive environmental and economic toll that climate change will have on the people of China. More than just cutting emissions, China committed to an overall sustainable development path, including a 20% increase in renewable energy, lowering carbon dioxide emissions per unit of GDP to 60-65% of 2005 levels, and increasing forest stock volume by 4.5 billion cubic meters of 2005 numbers, all by 2030. These important commitments are framed by a detailed description of how China will alter its policies to allow its own, and other multilateral, environmental goals to be achieved.

While this is certainly not the first of China’s climate commitments, it is indeed significant. In previous meetings of the Conference of the Parties, it was brought to the attention of the international community that highly-developed countries have emitted much more over their histories when compared with developing states. The broad use of fossil fuels by developed states allowed those states to industrialize, expand their economies, and increase national standards of living at a pace faster than the rest of the world. Developing nations never had the historical privilege of unchecked growth and unrestricted use of fossil fuels. This fact is the impetus behind the idea that developing nations have a right to an unrestricted industrial revolution. Because of this, many decisions made by the COP, including the revolutionary Kyoto Protocol, did not necessitate commitment and action from developing or developed nations, in particular India, China, and the US. While China is considered a developing nation, they are now highly-industrialized, and their overall historical consumption of fossil fuels, and emissions resulting from that consumption, has now nearly matched that of the United States.

China has also partnered with the United States to deliberate and speak on what they expect from the Paris climate talks. The states jointly expressed interest in reshaping their economies so that they are no longer reliant on traditional energy, as well as emphasizing adaptation too as an important aspect of protecting against the projected effects of Climate Change. Importantly, China and the US would like to see COP 21 produce commitments with legal force which help the world to not reach a critical 2°C change in average global temperatures.

In the past, both China and the US have been criticized for not being cooperative in international climate talks and not abiding by global standards. China’s 2015 commitment, as well as its public announcement with the United States represents an acknowledgement of its role in curbing overall global emissions and a willingness to actively participate in the 21st meeting of the Conference of the Parties.

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Geographic Information Systems let us visualize, question, analyze, and interpret data to understand the relationships, patterns, and trends of a specific area or demographic. The work that can be achieved with Geographic Information Systems, or GIS, benefits organizations of all sizes and in nearly every industry. This interdisciplinary type of work is what attracted Amanda Hannen, a Rutgers class of 2012 graduate who double majored in Environmental Policy, Institutions, and Behavior (EPIB) and Planning and Public Policy with a minor in Political Science, towards a future with GIS. That future started with work on a certificate in Environmental Geomatics from Rutgers. On the day of her graduation, Amanda was one class short of finishing that certificate. Amanda quickly made up for that empty space by deciding to earn a Masters in GIS at Arizona State University (ASU). She flew out to Arizona the same night of graduation to get started on furthering her education with GIS, which is where the story of her passion for the system starts to really get interesting.

Born and raised in the Garden State, Amanda has spent her life interested in all of the different aspects of the environment. Now, she resides in Point Pleasant Beach, New Jersey with her husband, where she was able to elaborate on her GIS path with me during a phone interview. Amanda came into her college years thinking about marine biology. With this major in mind she applied to the schools with the best programs, but only one school in her home state. That one school was Rutgers University. As time moved on she realized that marine biology was not the best path for her anymore. She searched through Rutgers’ catalog of majors and found “Environmental Policy, Institutions, and Behavior.” She believed this to be the best way to combine her love for the environment, as well as her newfound love for planning and policy. It also helped her decision that Rutgers was known for its school spirit and nationally-recognized football team.

GIS has been a passion of Amanda’s because she enjoys how tangible it is: at the end of the day she can hold a printed map or data plot in her hands and show someone what she has been working on. After applying late in February (which she highly recommends that one does not do) to Arizona State University for her Master’s degree, she heard back in March, graduated in May, and started her GIS program within a week. Amanda will attest to how stressful all of that was, but also that every second was worth it. Her accelerated Master’s Program in GIS helped to show her why she became so passionate for GIS in the first place. Part of her thesis was conducted in her hometown of Colts Neck, where she taught the children at a local camp how to use introductory GPS software and programs to find geocaches she had hidden throughout the camp. The kids felt as if they were trying to find hidden treasure, and Amanda was learning how to transform the hold that electronics have on children into a positive outlet for education.

The hard work and time she put in over her years at Rutgers, ASU, numerous internships, the summer camp, and even her own GIS consulting firm for farmlands in Colts Neck, NJ, shows. These experiences helped to land her at the New York Governor’s Office of Storm Recovery as a GIS specialist and manager of GIS operations. Here, Amanda oversees the work on “really any GIS aspect you could think of.” She helps to put together research on topics such as home elevation data, population mapping, socioeconomic trends in specific areas, and flood plain maps. Considering the wide array of projects and people she works with, Amanda says that she loves her job.
To date, Amanda feels her most interesting work is that done with wetlands mapping for the Federal Emergency Management Agency (FEMA) floodplain data analysis project. Floodplain data analysis is used to describe the two primary ways that water ends up creating flood conditions. The first is through backfill flooding, which is a reaction from the body of water that results from swelling after increased rainfall or catastrophic events. The second is called spillover flooding. Spillover flooding occurs when the floodwaters make their way through a new route. The University of Kansas has a study that looks into these different types of flooding in relation to the Missouri River. Amanda herself is studying to become a certified floodplain manager, and feels that this work is so intriguing because not many have looked at the data until recently. She enjoys bringing the knowledge she has acquired into her own office and educating her coworkers about this specific field of GIS management.

All of these different maps and interesting data plots can be seen on gis-sig.org. On their site it is apparent how much of an impact putting any sort of statistics into a visual representation can be. It takes numbers and facts that the general public may not be able to understand and shows them in an appealing and concise manner.

This article gets its name from the fact that Amanda has had a long standing educational goal in her life even after all these years of schooling. Amanda is looking forward to the moment when she can be addressed as a “Doctor of Disaster” after completing a doctorate program in disaster science from the University of Delaware. She thinks the topics in that field are immensely interesting, and that is a big reason she enjoys her current job so much. The University of South Carolina published a study which revealed that at the turn of the century more than 500,000 people were killed annually by natural disasters. This death toll carried along with it a price tag in over $600 billion. After the attacks on September 11, 2001, the use of GIS helped to produce multiple maps-a-day of services available throughout the city. This helped firefighters, the police, aid workers, and the general public to understand where electricity was working, where they could use the subway, and what areas were safe to traverse.

GIS is used for many other humanitarian goals around the globe. The team at Direct Relief International’s mission is to provide essential medicines and other resources to those in need during difficult times. They proclaim that “the future of GIS…. is one of integrated, online, high-speed cartography – of map making as continuous global thought, communication, and social action.”

For these reasons, and many more, Amanda sees the world of GIS as growing every day. One of the biggest pieces of advice that shone through during our interview was when she alluded to the fact that you never know whom or where your connections are going to come from. Always keep an ear to the ground, and keep as many opportunities open as you can. Who knows, you may just be the next Rutgers graduate to fly off on the night of graduation to immediately start your next chapter of learning!

References:
Mr. Trash Wheel and Co.
By Finn Gorman

At no point in history has the human race produced as much waste as we do now. In addition to the directly-related increase in population, a ‘throwaway’ lifestyle has proliferated following the industrial revolution. Production of fossil fuels and subsequently plastics has exploded, and with the population rising, human impact on the world is exponentially increasing. We, as citizens of the developed world, have been increasingly contributing to and ignorant of the consequences of overconsumption, including human-caused Climate Change.

Blue Water Baltimore (BWB) is a not-for-profit organization that intends to “restore the quality of Baltimore’s rivers, streams and harbor to foster a healthy environment, a strong economy, and thriving communities.” BWB is a collective of five “legacy organizations” that have protected some of Baltimore’s larger watershed areas including: Jones’ Falls, Gwynn’s Falls, Herring Run, and Baltimore Harbor. BWB’s annual reports on environmental factors such as sewage, storm water, toxic pollution, and trash were instigated in 2012 to monitor and improve the quality of water. Since the creation of the report, all of the Baltimore waterways assessed have consistently failed these reports in each category.

Solving problems that humans have caused often requires human ingenuity. Innovation arrived in Baltimore as a garbage collecting device called the Inner Harbor Water Wheel, or colloquially known as “Mr. Trash Wheel”. This creation of Baltimorean John Kellett is a self-powered water wheel that collects trash on the Jones’ Falls River. The river’s current powers the two large wheels that collects and transports the trash into an onboard dumpster. Whenever the current’s power is insufficient, an array of solar panels provide supplemental energy. Mr. Trash Wheel has gone out every day since May 2014 to collect trash large and small from the river and since then 350 tons of garbage and debris has been removed from the waters. As of now about 6.5 million cigarette butts, 250,000 polystyrene containers, 200,000 plastic bottles, 150,000 chip bags, and 100,000 grocery bags are included in Mr. Trash Wheel’s work.

In addition to a societal change to reduce individual waste, innovation to remediate damage already done is a key to a sustainable and healthy future. This single case is an example of how our local, national, and global societies can effectively adapt in order to overcome the damages overconsumption has done to the world.

References:
skyTran™ for Rutgers? For the World?
by Ariel Schwalb

When I first won the Rutgers Energy Institute Contest last semester for proposing that Rutgers replace its current bus system with NASA’s zero-emission transportation system, I received mixed feedback from peers. Some thought it was “the future”, others expected it to be too good to be true. I received backlash from a few engineering and policy friends. They told me that the idea would not work, it would be too expensive, and that I was wasting my time by even talking about it. I am glad I did not listen to them, because skyTran is about to become a reality.

skyTran, a NASA Space Act Company, is building the world’s first solar-powered, elevated, rapid, personal transportation system. Their first pilot project will debut at the beginning of 2016 on an aerospace corporate campus in Tel Aviv, one of the most start-up friendly cities on Earth. CNN reported on October 23rd that “If all goes well, the company expects to expand to at least three other Israeli cities and some U.S. cities, including Baltimore, by 2018.”

skyTran was invented by Douglas Malewicki in the 1990’s. In his earlier career, he worked on the Apollo program, which landed the first humans on the moon between 1969 and 1972. The skyTran team, which today is composed of NASA engineers and scientists, including Malewicki, calls the technology “the physical internet” because “skyTran is built as an expandable grid—that is, it will never be filled to capacity. As the demand grows, more track can be installed and additional vehicles can be added to the network.

The robust state-of-the-art skyTran system grows in the same way that the Internet grows: exponentially and immediately.” Once the 12,000 person per hour capacity is reached, new skyTran lines can be built parallel to existing ones to keep up with growth. The tracks will be 20-30 feet above ground and can also be attached to the sides of buildings. It is so energy efficient that “The power used in two hair dryers can fly you at over 62 mph with skyTran.” The system can either be powered by on-site solar panels or the electric grid.

The pods that users will ride in, which can hold 2-4 people and a bike, are computer-driven, so there will be no need to manually drive one. The pods glide on the skyTran stream and can enter and exit without any disruption to anyone else’s ride. There are no schedules you have to follow or stops you have to make. All you have to do is order a ride on your smartphone or at the skyTran micro-station, swipe your ID in the slot when it arrives so that it can recognize you, and enjoy the trip. The micro-station can be placed anywhere-on the sidewalk, inside buildings, below ground wherever it makes the most sense for the customers. The pods were originally designed to accommodate 2 people because 75% of US commuters ride alone. If people wanted more space, they could link up skyTran pods and travel as a cohort.
If you are reading this, you probably think this system will be astronomically expensive. You will be pleased to know that skyTran’s cost is closer to the construction of a sidewalk than a freeway, and yet it has the capacity of a three-lane freeway. skyTran will cost $9-10 million per mile, while freeways cost $60 million per mile and current light-rail projects have cost $100 million per mile. This would mean that every city ride could cost about $5. NASA was able to make it so affordable by reducing the amount of infrastructure that would be needed. skyTran uses a patented technology called passive magnetic levitation system, which replaces car wheels and reduces the need for moving parts of the vehicle. The system is sleek, simple, and sexy.

I had heard about skyTran last fall and had an urge to talk to someone who works at Rutgers about this. I did not know how to navigate this, so I put it in the back of my mind until I took the Environmental Solutions course with Professor Shwom. She gave us a big assignment to create a proposal that would help Rutgers reduce its energy use and/or contribution to climate change and highly recommended that we submit our assignment to the Rutgers Energy Institute Contest. I decided to propose skyTran as a replacement to the Rutgers bus system as my project, entered the contest, and would up tying for first place.

Minutes after I had found out that I won, I approached Kevin Lyons, Associate Director of the Rutgers Energy Institute and asked him if we could talk about actually making this happen. A week later, we were at his office in the Supply Chain Management department of the Rutgers Business School, having a conference call with Richard, a NASA engineer, and Jerry Sanders, the CEO. Richard was at their Headquarters at the NASA Research Park in California and Jerry was in Tel Aviv, working on the pilot project. Over the summer, Jerry, Chancellor Edwards, and I had a phone conference. The REI is considering to do a $5-10k study this winter assessing whether skyTran will work for Rutgers traffic, as well as whether it would benefit the local community and J&J employees.

Jerry estimated it will take about three years to build a fully-functioning system, and our bus contract ends in three years, according to the Rutgers Department of Transportation... I hope not only to introduce the Rutgers community to this technology, and to see if they would want it (Jerry said he would be happy to come visit Rutgers to do a teach-in about skyTran for us at some point), but to continue getting more involved after college. I am interviewing this month to do a 10-week internship in Tel Aviv. Jerry and I have been talking about me working under him in Israel, helping him with business development this summer, post-graduation. While plans have not been finalized, I am excited about the potential opportunity to work with a company (and NASA) that wants to build a transportation system fit for the twenty-first century.

See what skyTran could look like: https://www.youtube.com/watch?v=OEMOpCRktm4
http://www.skytran.us/


Death of a Conservationist(s)

by Noha Haggag

What do drug trafficking and sea turtle conservation have in common? The answer is Jairo Mora Sandoval. As November comes to a close, so does this year’s sea turtle nesting season. Conservationists in Central and Latin America can breathe a sigh of relief after the relatively peaceful breeding season that has passed. Though looking over turtle eggs may seem like a harmless task, its unforeseen political connections led to the death of Jairo Mora Sandoval on the night of May 31st, 2013. In January 2015, the seven men accused of murdering Sandoval were acquitted. The result of the trial led to outrage in Costa Rica, and numerous environmental groups abandoning those nesting beaches in fear for their lives. Jairo’s murderers were left legally untouched and free to roam. However, due to a fortuitous turn of events and numerous mistakes during the hearing, the case has been scheduled for a retrial. These blunders in court included a misplaced recording of the defendants discussing Mora’s death, excluded telecommunications evidence, and two bottles of cologne magically disappearing from a bag originally containing three as evidence against the defendants. The retrial is not only a necessary victory for Jairo, but a victory for threatened conservationists all over the globe.

Jairo Mora Sandoval, age 26, started his life at the Costa Rica Animal Rescue in 2010. Jairo had been working with sea turtles since he was six years-old alongside his grandfather, Jeronimo Matute, who had founded Gandoca-Manzanillo Wildlife Refuge, a protected sea turtle nesting area. Jairo’s goal was to collect and harbor eggs before the hueveros, or “egg men”, could get to them.

Hueveros collect thousands of turtle eggs during nesting season and sell them as aphrodisiacs on the black market for around one US dollar each. Due to the massive amount of eggs laid during nesting season, these “egg men” can make thousands of dollars in a night. It is no surprise then that such individuals would not be fond of turtle conservation groups interfering in their illicit activities.

In May of 2013, Jairo alongside three American volunteers and the sanctuary’s veterinarian were scouting the 15 mile Moin Beach for turtle eggs. They ran into several hueveros and were taken hostage. The men drove off and left the American volunteers and veterinarian, taking Jairo with them. Soon after, he was found beaten, and dead via asphyxiation. Jairo’s death lead to international outrage amongst environmentalists. The acquittal only worsened the situation, as the United Nations condemned Costa Rica’s decision.

John Knox, a UN human rights and environmental expert, has recognized the increase in violence against environmentalists in Costa Rica. “The death of Jairo Mora is a tragic reminder that Costa Rica, like other countries, is confronting an increase in activity from drug traffickers and hunters in their protected areas and other ecologically delicate areas,” Knox adds, “These activities undermine the efforts of the government and civil society to protect the environment.”
It is important to address the growing violence against environmentalists in corrupt countries dealing with rampant corruption issues. Between 2002 and 2013, 908 environmentalist were murdered over disputes related to mining, logging, land rights, and conservation. Only six of these cases resulted in convictions.

Alvaro Sagot, a Costa Rican environmental attorney has doubts that Jairo will receive justice. “I often get asked: ‘In Costa Rica, who protects the people who protect the environment?’ The answer is: no one.”

The police and government often classify crimes against environmentalists as an act of “simple robbery”, crimes often committed in association with rural poverty, lack of police resources, and increases in development. The trend in attacks on environmentalists however, is due to lack of action and recognition by authorities and government. After all, why would the crimes decrease when those committing them realize there are no repercussions? The increase in the rate of incidence of these crimes not only affects the safety of conservationists, but the lands and animals they try to protect, the number of volunteers willing to help a cause, and the economies of countries who depend on ecotourism as its number one income, such as Costa Rica. In the year after Mora’s death, Didier Chacon, the director of Latin American Sea Turtle Conservation, saw a 90% decrease in his organization’s volunteers.

Shortly after the acquittal, conservationists formed the Environmental Truth Commission. The commission’s goals would be to try and achieve justice for those who have been victims of criminal activity over environmental disputes. It would also create a plan to keep environmentalists from further harm. The proposal is currently being considered in Costa Rica’s legislative assembly. Until the proposal is ratified, conservationists can look to Jairo Mora Sandoval’s retrial as the first step in gaining justice for environmentalists, who put themselves at risk in order to achieve their goals. The date for the retrial has not yet been determined. “The fact is that we are conservationists, not police,” said Chacon. “Someone needs to protect us so we can protect the environment.”

References
I have had about five cell phones, two laptops, two TVs, a kindle, and 7 gaming systems throughout the course of my life so far. Plus, I could not even begin to count how many wires I have gone through or other miscellaneous electronics I have purchased. In addition, given that I am twenty-two, I have a long time to go before my consumption of electronic goods comes to an end.

According to the Environmental Protection Agency, Americans alone throw away around 2 to 3 million tons of electronics annually. “E-Waste,” or “electronic waste” are both terms used to describe electronic devices or parts that have “seen better days”, or more specifically, have reached the end of their useful lives and are discarded, donated or given to a recycler. And while e-waste still only accounts for 10% of the solid waste stream in the United States, it is growing 2-3 times faster than any other waste stream. On the global scale, e-waste totaled around 41.8 million metric tons in 2014 and is forecasted to reach 50 million metric tons by 2018. These materials then, after use, are reused, recycled, or sent right to a landfill.

When we think about possible solutions to the accumulation of waste, what generally comes to our minds is that funky, triangular symbol that has made its way onto products, posters, advertisements, and our lives since the day we first learned what the difference between a trash can and recycling can was. “Reduce, Reuse, Recycle” – that funny little mantra that has somehow motivated our society to do increasingly-innovative things in order to protect people and our environment.

The phrase “Reduce, Reuse, Recycle” is written in a particular order, from that which is considered most important to that which is considered less (yet still very important). Yet, for a lot of people, recycling is the action we tend to perform the most frequently.

There are other ways that we can contribute to the reduction of e-waste though, one of those ways being the actual choice to reduce our consumption. Less unnecessary DVD players, iPhone cords, and other superfluous electronic devices, mean less that will one day end up in a landfill. The other way you can help contribute to the reduction of e-waste is making use of what others or you once had. This includes donating, giving away, or upcycling.
Upcycling is the action of reusing discarded objects or materials in a way to create a product of higher quality or value than originally. Yuma Fujimaki, a Japanese designer, is one example of the many who take waste electronic products and transform them into something different without the need of a recycling system. From Nintendo chiptunes to old circuit boards, Fukimaki has been able to design beautiful pendant, broaches, and much more.

If you have little experience dealing with electronics, such an activity could seem hard compared to upcycling alternatives with clothes and such. However, websites like Pinterest and other blogs have ideas and tutorials to inspire you should you wish to attempt a recycled or upcycled creation.

It is important to remember that there are also specific guidelines on the handling of various electronic wastes due to some of the hazardous materials contained within them or used in their production. Researching your local recycling regulations before attempting any project is a must.

Our Earth is not growing any larger and our consumption of electronic materials at this point is not likely to decrease. Any action you can take towards reducing your consumption, reusing goods that are still functional, or recycling/upcycling products and their components counts.

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Recently, there has been an increase in the number of vegan-friendly startups in mainstream supermarkets. One company that is climbing the ladder to success at an impressive rate is Hampton Creek. Their most prized product is known as “Just Mayo”, which is simply an egg-less mayo. The company’s tagline, “What would it look like if we started over?” is an attempt at encouraging consumers to see the bigger picture of food consumption. They further describe in their mission statement that, “(W)e started this company because we deeply believe that eating should be easy. The right thing, for our bodies and for the world, should be affordable...We’ve built a movement, and the fastest-growing food company on earth, around that philosophy.”

This four-year-old company has made incredible progress, largely due to their ingenious way of presenting their product. Hampton Creek has taken corporate social responsibility to a new level by describing their company’s mission and product as part of “building a movement”. They have used their advertising tactfully to convince potential-customers that through buying from them the consumer feels as though they are a part of something bigger, emotions not normally associated with shopping at one’s local supermarket.

In an article by Stefan Heck and Matt Rogers on what they call the “resource revolution”, Hampton Creek is cited as an example of an industry exhibiting the future of business practices through substituting current products with more sustainable ones. Production of Just Mayo is 20% less expensive than the production of normal mayonnaise by removing chicken eggs from the process, and does not rely on crops whose cultivation is particularly resource-intensive. Egg-less products remove, for some consumers, the issue of raising a whole animal just to receive a small output, which in this case are eggs. With these assets in mind, the company’s products can be found anywhere from Whole Foods to 7/11.

Because Hampton Creek has been manufacturing a whole line of food products targeted at substituting egg products, the egg industry is fearful. On August 12th 2015, the CEO of Just Mayo received a warning letter from the FDA. The letter can be summed up through this quote: “the use of the term ‘Just’ together with ‘Mayo’ reinforces the impression that the products are real mayonnaise by suggesting that they are ‘all mayonnaise’ or ‘nothing but’ mayonnaise.” This is also not including the clever double meaning of the word “just”. Furthermore, they say: “(A)ccording to the standard of identity for mayonnaise, egg is a required ingredient”.

The Egg Industry is Having a Cow

*When Animal Product Alternatives Become a Threat to Established Firms*

by Alexus Lizardi
Essentially, the FDA is arguing that Hampton Creek cannot call their product “Just Mayo” because it does not contain eggs, and thus cannot technically be considered mayonnaise.

This was not the first attack on the company. In 2014 Unilever, the company that owns Hellmann’s Mayo, filed a lawsuit on the pretense of false advertising. In addition, there were attempts by the American Egg Board to convince Whole Foods not to sell Just Mayo in 2013, because they saw them as a “major threat to the future of egg product business”. This newest attack by the FDA may not be surprising to some after examining how much of a frenzy the egg industry is in right now because of Hampton Creek’s product. The FDA issuing a warning over the semantics of the name of an alternative food product sheds light on how much of a political issue food production is, and how much influence large agriculture corporations have in court. Fortunately for Hampton Creek, the altercations with the FDA and the egg industry has done little to decrease their publicity. As of right now, Hampton Creek is not changing the name of their product and the charges made by Hellmann’s were dropped.

Hampton Creek is currently expanding their line of products to egg-less scrambled eggs, cookie dough, and cookies. The egg industry is rightly concerned for their business, but companies like Hampton Creek are already, and some would say necessary for, combatting industries that are highly protected through government subsidies.

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Cactus Mucilage to The Rescue...Maybe by Maia Scheffler

My overprotective parents always told me that if I were to ever get lost in the desert and run out of water, I could either crack open a cactus or drink my own pee. I’ve always hoped if it actually came down to it, I’d find a cactus and choose the former. Now, I don’t plan on visiting the Sahara anytime soon but, if I were to fly over to California, this tip may come in handy.

People don’t like to hear it, but we do not have an endless amount of freshwater to use at our convenience. The Earth’s fresh water is drying up and being polluted, and society needs to start working harder to figure out how to treat and purify water in the most efficient, environmentally, and economically friendly way they can, if they want to survive. Only 3% of water on Earth is freshwater, and only 1% of it is easily accessible by humans (and at the rate climate change is going, that may be susceptible to change).

At the most, we reuse treated wastewater for purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing groundwater basins. But we still need water in order to drink and bathe ourselves. And as wise as my parents are, their advice can’t be relied upon when cacti aren’t anywhere to be found and you’re too dehydrated to pee. Intriguing, but not-so-recent, studies have shown that cacti mucilage may be useful in the process of purifying water.

In 2008 a biochemical engineer, Norma Alcantar, from the University of South Florida found that the mucilage in a cactus binds to the dirt and causes the particles to coagulate, forming large enough clumps that they can settle out of the water. With these findings she turned her attention to other water contaminants such as arsenic, which usually occurs from industrial and agricultural pollution if not occurring naturally. It was discovered that the arsenic-mucilage complex is large enough that it can be removed by drawing the water through a sand filter, and that the mucilage can also kill bacteria in the water.

Five years later, a plan was finally devised to use Alcantar’s research and apply it to a large scale project. The objectives of this project were to develop a water purification system based on an economically viable "green technology” and investigate its applicability to a rural community in Mexico and Haiti. The outcomes of these projects were to determine the groundwater quality after the earthquake in Haiti and evaluate the feasibility of implementing a low cost technology for disaster relief based on cactus mucilage. For Mexico, it was to show its proximity to volcanic soils where the concentration of heavy metals in local water supplies may be higher than recommended values.

These projects would have also promoted multidisciplinary participation from scientists in both America and Mexico promoting unity and shared interests in a global issue. All of this sounds rather intriguing and hopeful. However, it has been seven years since the discovery, two years since these plans were created, and neither has been put into action. The questions stand: Where did all of these plans go? And who will care enough about the Earth’s freshwater crisis to create a sustainable plan and go through with it?

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Rutgers is a diverse school where students come from all over the world to be educated in their particular fields of interests. Increasing numbers of Rutgers students come from abroad, and an already diverse community gets even more so as international students become a key part of the community. These students are actively involved in the university community, but often have little interaction with those from outside of the Rutgers. This is an important issue, as it shows that students are not interacting with members of the community they are living in. These students have skills and knowledge that can help the community in various ways, but the lack of connection between the two does not allow the community to take advantage of these Rutgers students’ abilities. To build this connection between the community of New Brunswick and Rutgers students, Dr. Mary Elizabeth Curran, who is an Associate Dean for Local-Global Partnerships at the Graduate School of Education, started a program called the Conversation Tree in the spring of 2012. Since its launch, the program has helped hundreds of community members who are not fluent in English get connected with the community of New Brunswick—including Rutgers students.

The Conversation Tree consists of three parts, which includes the Conversation Café, Professional Development and Academic courses. The bridge between Rutgers and the New Brunswick community is developed as Rutgers students take a series of Community Based Language Learning (CBEL) courses that may be registered in both spring and fall semesters. The class meets both on campus and in community settings. Also, students taking these courses can serve as Conversation Facilitators with the community-based organization, offering English as a Second Language (ESL) services in New Brunswick. Thus, these courses not only keep students connected with the community, but also help them learn and practice the skills necessary for intercultural communication and partnership.

In addition, the Conversation Café is a model that is created solely for the purpose of communication. The Conversation Café is offered in three different languages, which include English, Spanish and Mandarin. Essentially, The Conversation Café allows community members of all different cultures and ethnicities to communicate with each other in an informal setting. These culturally diverse participants engage in one-on-one or small group conversations with fluent English speakers discussing various topics. These mini-group conversations help in polishing the communication skills of the participants.

Recently, the Conversation Tree has begun to provide Professional Development for community-based organizations interested in training their own volunteers. Additionally, Professional Development is also provided to other academic and educational communities who would like to implement the Conversation Café model at their own local schools and Universities.

Thus, the Conversation Tree not only connects the New Brunswick community with Rutgers students, but also provides Conversation Café in English, Spanish and Mandarin for adult learners in New Brunswick to help them polish their language skills free of cost. This is a huge advantage for both the people of New Brunswick and the Rutgers students because it creates a mutually beneficial relationship between them. On one hand, it helps the local community members polish their language skills, while on the other it aids Rutgers students in improving their leadership and communication skills. It is also personally rewarding to Rutgers students who participate in the program, as they are able to directly aid the community. In short, for anyone who is interested in helping the community or wishes to learn and practice leadership, communication and language skills, The Conversation Tree is their best option!

Reference:
According to EcoPure, a firm that produces portable and cheap home water filtering systems, 2.5 million plastic bottles are used every year, and over 75% of that plastic ends up in landfills. Of the 7 billion pounds of Polyvinyl Chloride (PVC), the type of plastic used to make bottles, thrown away each year, only about 1%, or 18 million pounds, is recycled. Americans also use 103.1 billion plastic bags each year, of which less than 1% again is recycled. The main problem with plastic is that it cannot be easily broken down; it has an incredibly long life span in landfills, and many types merely break into micro particles in the ocean. Plastic tends to linger in an ecosystem that it is introduced into, and has detrimental effects on both human health and the environment. The problem would not be so severe if plastic were not such a prevalent material in human society due to its cheap production cost and multitude of uses. Plastic has become a double edged sword: while it is an extremely useful material, it has nightmarish effects on the global environment. But could the solution be hiding under a log in the Amazon?

A type of fungus recently discovered in the Amazon, *Pestalotiopsis microspore*, has been shown to ingest plastic, and this could have serious implications for bioremediation programs in the future. Little yet is known about the volume or speed that this elusive mushroom can consume but if these rates prove to be significant, it could be the only known way of converting polyethylene-based products into environmentally-friendly hyphae-based organisms. If this newly-generated organic matter from the fungus is determined safe for the environment, it could change overnight the processes of how we dispose of our plastic materials. Since our current bioremediation efforts when it comes to plastic consist of “putting it somewhere else”, this could be a real way of disposing of plastics safely and cheaply. Of course, it could simply cause more problems later—what one does with five metric tons of anaerobic mushroom spores that are left over from a cleanup operation remains to be seen—but it could potentially create a new chapter in sustainability efforts.

In addition to causing consternation in the scientific community, a discovery like this, if properly researched and controlled, could also be a significant public-relations boon. Taking a tour of a mushroom plant that eats plastic could be really fun for children and adults who want to learn about trash disposal techniques and the importance of recycling. Perhaps, 15 years from now, people will look at this article and laugh about how common the fungus is in disposal techniques. Maybe the use of *P. microspore* will become so widespread, humanity will enter a renaissance of more sustainable plastic usage, or maybe this mushroom will just remain an interesting scientific discovery—either way, the possibilities, like the amount of waste plastic, are seemingly endless!

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Be careful, meat-lovers: the World Health Organization recently published a finding that processed meats can be a main cause of colorectal cancer. Scientists believe that something chemically changes in the meat during the treatment process that causes a collection of carcinogenic chemicals. WHO defines processed meats as “meat that has been transformed through salting, curing, fermentation, smoking, or other processes to enhance flavor or improve preservation.” These carcinogenic meats include bacon, sausage, hotdogs, and some deli meats.

Twenty-two experts followed more than 800 epidemiological studies to reach this conclusion. These experts found that eating about 50 grams of processed meat every day could increase the risk of colorectal cancer by 18%, which is equal to 4 strips of bacon and 1 hotdog per day. In addition to this finding, WHO classified processed meats as “Group 1 Carcinogens.” This group consists of substances that have, throughout time, provided sufficient evidence to conclude that they can cause cancer in humans. Among this list of carcinogens were tobacco and asbestos. However, this does not mean that processed meats are as dangerous as smoking cigarettes. WHO clarifies that the “classifications describe the strength of scientific evidence about an agent being a cause of cancer, rather than assessing the level of risk.”

For some, this idea of processed meats causing cancer can seem outlandish, but the risk is very much real according to WHO. However, these opinions are not uncommon, as cancerous risk perceptions take time to change. Opinions on smoking cigarettes changed slowly throughout the 1950’s to the 1970’s. Smoking was a practice most individuals assumed to be harmless throughout the 50’s and when asked about cancer-causing behaviors, only 2 percent of a sample of adults in Manchester answered smoking. By 1972, roughly 70 percent of American associated smoking with cancer, and by 1999, 92 percent of Americans believed cigarettes caused cancer. Similarly, since 1980, scientists have been suggesting that colon cancer was possibly linked to the consumption of processed meats. In a 2002 survey, only 1 percent of meat-eating Americans believed eating too much meat caused cancer, as opposed to 42 percent of vegetarians. Possibly in concordance with the recent health craze, this awareness has risen tremendously. When asked by the American Institution for Cancer Research, 38 percent of Americans correctly associated cured meats as a cancer risk in 2015.

On a more precautionary note, Susan Gapsur of the American Cancer Society suggests that meat-eaters should...
consider limiting their consumption of processed meats and believes that people should incorporate more plants into their diets and find alternatives to meat, such as beans. After all, scientists have yet to determine a “safe” amount of processed meat consumption. Amplifying the risk of eating processed meats is important to avoid, since the issue has received much backlash and skepticism. However, it is crucial for individuals to know these risks so they can maintain their health.

Regardless, WHO’s decision is not saying that people need to stop eating meat or drastically alter their diets. Rather, it is implying that individuals who consume high levels of processed meats are at a greater risk of developing cancer. So the next time you attend a holiday dinner, maybe try skipping the cured meat and adding some more green beans to your plate.

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The world’s hottest places may be uninhabitable by the end of the century.

Global warming in the eyes of the deniers is an image of the world becoming so unbearably hot that it is comparable to Hell on earth. Scientists and many other environmentally-conscious people often assure them that this is wrong. Climate change is not just warming, but rather an array of changing climates, hot and cold, wet and dry, all over the world. However, in certain parts of the world, the first image could become a reality by the end of the century.

According to a new study, the Persian Gulf could experience deadly heat waves by the end of this century. Though this is not groundbreaking news, previous studies have not predicted this possibility occurring for at least 200 years. The researchers Jeremy S. Pal and Elfatih A. B. Eltahir used a method that incorporates not just temperature but also humidity. Instead of just using temperature as a measurement, they used a method known as “wet-bulb” temperature. This is the temperature of an object (in this case, a human) as a result of evaporative cooling (also known as sweating), assuming there is good airflow and constant ambient air temperature during the reading. While sweating is the first step in cooling down the body, the actual cooling process takes place when sweat evaporates off the body. In very humid conditions, sweat cannot evaporate off of the body and the body cannot cool, causing potentially deadly situations when such conditions last for prolonged periods. The wet-bulb temperature is not the same as the heat index, which combines relative humidity to air temperature to offer the apparent temperature (“what it feels like”). For example, a wet-bulb reading of 95 degrees Fahrenheit would be a heat index reading of about 165 degrees Fahrenheit. This is the wet-bulb temperature that Eltahir and Pal say would be the point at which a person drenched in sweat would not be able to cool off.

The areas around the Persian Gulf are the ones expected to be affected first, due to the warm currents of the Gulf. This includes Qatar, the United Arab Emirates, Kuwait, Bahrain, and Saudi Arabia. Coincidentally, Qatar, the United Arab Emirates, and Kuwait are among the richest countries in the world, ranking number one, number eight and number 19, respectively according to a 2015 study from Global Finance Magazine. Other estimates rank Bahrain and Saudi Arabia among the top 20 as well. This area also has a very high population growth rate, with Kuwait at number two and Qatar at number five in the world according to estimates from the World Bank. The wealth shows that the possibilities of survival for those who can afford air conditioning is strong. However, with the spikes in heat waves, the poor of the area will not be able to survive, even if they are in good physical condition.

This overall implies an increase in resource consumption. The increase in air conditioner use alone will contribute to the problem of increased energy use and increased burning of fossil fuels, essentially intensifying the problem.

This will not just be a domestic issue, as about two million Muslims make their pilgrimage to Mecca every year in Saudi Arabia. The pilgrimage is a very important part of the Muslim religion and is one of the five pillars of Islam. Every Muslim is expected, if physically and financially able, to make the pilgrimage at
least once in his or her life. The pilgrimage must also take place during the last month of the Islamic year, which is based on a lunar calendar, so the timing of the pilgrimage is always changing and could occur during the hottest times of the year. The rituals of hajj (the pilgrimage) require outdoor rituals for extended periods of time, and the predicted heat wave could threaten this sacred experience and negatively impact the lives of Muslims all over the world.

This prediction illustrates how climate change is not only an environmental problem, but also a problem that will negatively affect people economically, socially and culturally. Furthermore, it does not stop in the Persian Gulf. The threats of climate change will continue to spread around the world and many areas that are of extreme importance to us now will become uninhabitable. Every researcher who has worked on some aspect of this study agrees that the only way we can prevent this (and we do still have time to prevent it) is to reduce our greenhouse gas emissions, thought this must happen at the global level.

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China’s Foggy Intentions

by Mackenzie Pitt

As a developing country, growing your economy is crucial in order to provide for your people. The more people you have, the more wealth, resources, and energy needed to support their lifestyles. Having the largest population of any country, China has experienced exponential economic growth within the last two decades, and as a result, its landscape has changed dramatically. With a steep increase in industrialization, thousands of power plants and factories now exist throughout the country, many of which process raw materials.

Perhaps the biggest cause of landscape alterations is coal. Coal production has become China’s lifeline throughout its growth. Today China is both the largest producer and consumer of coal in the world. The increasing need for coal in China has created millions of new jobs and improved the standards of living for its citizens. Large mining sites have displaced many families, but all are relocated to new and improved housing as well as compensated for all costs by the coal companies. However, the beneficiaries are also the victims. Coal, although playing a large role in energy supply, releases massive amounts of smoke full of toxic compounds. As the largest consumer of coal, many of China’s regions have become engulfed in clouds of chronic smog. While it is true that the average income amongst the Chinese working class has increased by hundreds and many families are now able to afford higher-quality housing, an estimated 1.6 million deaths in China per year are linked to air pollution. “If you checked the villagers’ health, most would have black lung disease,” said one Chinese farmer who has experienced the effects of coal first-hand.

The three most prominent pathogens found in coal smoke are selenium, arsenic, and mercury. These toxins can insidiously accumulate in the body even when only exposed to small amounts. Dental and skeletal fluorosis, arsenic poisoning, and loss of hearing in children are just some of the health threats that have become frequent in China and are associated with coal burning. Toxins from coal can enter the body in a number of ways. Coal production waste also poses a threat to water quality, which can sometimes enter water systems undetected. The pollution has even reached as far as the islands of Japan, causing bouts of acid rain. But waste alone is not the only danger. The lives of those working in coal mines are constantly in danger. Not only is the risk of mining accidents high, but the workers are in direct contact with the black substance, absorbing particles through their lungs and skin.

China has been believed to account for one fifth of the world’s carbon dioxide emissions, solely from coal burning. Recent findings have shown that the nation has been burning up 17 percent more coal annually
than what has been reported by the Chinese government. That amount alone is more than the total annual gas emissions released by Germany’s private sector. This discovery has caused a big upset internationally since China claimed that it would halt carbon dioxide emissions by 2030.

Last year, Chinese Premier, Li Keqiang vowed to start the war on pollution, even though China has avoided doing so in the past. In a recent meeting of the National People’s Congress, Li Keqiang was asked about rising concerns about pollution amongst Chinese citizens, a topic which was brought to light by the powerful documentary, Under the Dome. He went on to say how reducing emissions and improving air quality continues to be a priority for the Chinese government, even though Under the Dome was legally banned throughout China shortly after its release. For now China’s true intentions on coal remain foggy, but actions always speak louder than words.

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“Come one, come all! The global search for tiny scientists with cave diving experience has begun. Facebook message me, future underground astronauts, for the experience of a lifetime.” With a little less medieval flare, Lee Berger, a paleoanthropologist and professor at the University of the Witwatersrand, posted on Facebook about the experience of a lifetime, looking for slender scientists that could fit into a narrow 30 meter drop chute in the Rising Star Cave of South Africa.

After first reviewing photos of the scattered bones taken by two of his explorers, Berger knew he was looking at what could be the most important discovery of Hominids since Lucy back in 1974. Having to take a look firsthand, but not being small enough to fit into the 7-inch wide crevice, Berger did what all sane scientists would do and sent his 15-year old son down into the cave instead. Matt Berger emerged from the cave with tears in his eyes, stating that the bones he saw “were wonderful. His hands were shaking for three minutes before he could even take a picture.” Right then, Lee Berger called up National Geographic for funding and knew he needed special people with special skills. He then did what anyone would do: put an ad on Facebook. Within the next couple of months, six young women recovered more than 1,500 elements of dozens of hominid individuals--more early hominids than Lee Berger had ever seen in his entire life. The now dubbed Rising Star Exhibition had not only discovered the richest early hominid site in the history of the search for human origins on the continent of Africa, but also a new species of human ancestor, Homo naledi.

The human-like skull, versatile hands, long legs and humanlike feet were all features of *H. naledi*. The species’ skulls are most similar to other early members of our genus, though they differ significantly in many respects. As a tiny-brained hominid, *H. naledi* is a creature that would not normally be expected to possess complex behaviors. Despite this, the questions remains of how these bones got into such an absurdly remote
chamber. They hadn’t been living there, as indicated by an absence of tools or food remains, and the bodies had clearly been distributed over a long period of time. No bite marks were found on the bones to discern if they were left there by predators, and no rubble or stone had been found on the cave floor, eliminating the possibility that they had been carried there by water.

“When you have eliminated the impossible,” Sherlock Holmes once reminded his friend Watson, “whatever remains, however improbable, must be the truth.”

Berger and his team came to the rare conclusion that *H. naledi* was deliberately disposing of its dead in the chamber. The impact of this is significant. Until this moment, it was thought that the idea of ritualized behavior directed towards the dead was unique to *Homo sapiens*. It in fact may have been our singularly unique attribute that separated us. Now comes the possibility that these ancestors of ours had the complex thought process needed in order to perform these burial actions.

The Berger team is now working on dating the fossils and discovering their real worth. “No matter what the age, it will have tremendous impact,” Berger claims. The lack of sediments and other animal fossils in the cave has also put a stopper in the time table information we are all begging these anthropologists to figure out. These scientists and their discoveries discern humanity in the wreck of a ruined body, and give these species back their faces and identities. They remind all ecologists why we are here in the first place: because we treasure human life.

**Resources:**

New Species of Human Relative Discovered in South African Cave (National Geographic Society Press Room)  
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This Face Changes the Human Story. But How? (National Geographic) By: By Jamie Shreeve, National Geographic Photographs by Robert Clark PUBLISHED September 10, 2015.  

New human species discovered (New human species discovered)  
The 2016 Presidential Debate: How America Discusses Climate Change
by Rachel Rodriguez

Every four years, American voters get to make the biggest decision for the country: who will be the next to lead us? Until the voting polls close, candidates fight tooth and nail to gain not only the trust of their fellow Americans, but their votes. This year’s news was swamped with a myriad of captivating (for better or worse) stories about the candidates’ opinions on important topics, such as the future of Planned Parenthood, abortion policies, immigration, minimum wage increases, and climate change. As a whole, Americans tend to see politics in a lens of pure dualism; it is black and white (or perhaps more fittingly, red and blue). How this translates in the overall discussion of global warming will undoubtedly be of increasing importance.

In the case of the Democratic presidential debate, which was held October 13 of this year, climate change was mentioned as an opening statement for four out of the five presidential candidates, the only candidate without this opening statement former Virginia Senator Jim Webb. It then continued to spark an insightful game one might call, “Which Democrat is the Most Progressive?” Bernie Sanders, the independent Vermont Senator, called for the immediate attention of Americans’ towards solving the global warming crisis. He spoke of the event as a moral issue as well as an environmental one, stating in his debate that “Today, the scientific community is virtually unanimous: climate change is real, it is caused by human activity, and we have a moral responsibility… to leave this planet a habitable planet for our children and grandchildren.” He continued his argument by stating that climate change is, in fact, the number one national security threat facing the United States. Maryland Governor Martin O’Malley expressed the same sense of distress towards America’s stance on global warming. However, his approach was slightly different from that of Bernie Sanders.

"We did not land a man on the moon with an all-of-the-above strategy," stated O’Malley. This is believed to be in retort to the Obama administration, which has used this term to describe its plan for energy in statements such as "We can get there as a nation, but it's going to require presidential leadership." O’Malley also went on to explain that he was the only candidate to have the initiative to tackle the climate change crisis. He directly targeted presidential candidate Hillary Clinton, stating that she took far too long to come out against the Keystone XL pipeline. In response to this allegation, Hillary Clinton defended her months of silence by mentioning her partnership with President Barack Obama during the 2009 United Nations negotiations to get the Chinese government to come to a political agreement addressing climate change. She also defended herself from O’Malley’s accusation by saying that she would be on the “forefront of dealing with climate change” if elected.
Approximately two weeks later, on October 28, 2015, the Republican candidates took to the stage to discuss their plans for making America a better nation. Just as in the Democratic presidential debate, each candidate had their own interpretation on climate change, and addressed the issue with responses as eclectic as the candidates themselves. Three of the Republicans seemed to have come to a unanimous decision before the debate even began. Florida Governor Jeb Bush declared himself a global warming “skeptic”, and while he admitted that he is not a scientist, he stated that the earth “may not be warming.” His other right-winged opponent, Ted Cruz, has a strong stance on the idea of climate change. The Texas Senator, in a late night show appearance before the presidential debate said, “My view actually is simple. Debates on this should follow science and should follow data. And many of the alarmists on global warming, they've got a problem because the science doesn't back them up,” a statement which several scientists have debunked and protested. Of course, Donald Trump also made sure to get his two cents in about climate change. Long before the presidential debate, just like Bush and Cruz, Trump seemed to be doubtful of the idea of global warming as an issue. In fact, he publically decreed that global warming is nothing more than a hoax, citing cold winters as evidence that scientists are completely wrong about the idea of climate change.

Now, one might believe that the Republican end of the political spectrum may entirely slander the work of several scientists, and may lead this country two steps back in our attempt to be more environmentally aware. But to this I say, there is still hope. On October 28, during the Republican Presidential debate, two Republicans actually criticized their opponents’ lack of scientific evidence, let alone scientific understanding, while discussing climate change. South Carolina Senator Lindsey Graham replied to his opponents’ denial of climate change by stating “I have been to the Antarctic. I have been to Alaska. I am not a scientist, and I've got the grades to prove it. But I've talked to the climatologists of the world, and 90 percent of them are telling me the greenhouse gas effect is real, that we're heating up the planet.” He went on to discuss his plan for addressing climate change, saying “I just want a solution that would be good for the economy, that doesn't destroy it.” New York Governor George Pataki backed Graham’s statement on global warming by stating, “It's also not appropriate to think that human activity, putting CO2 into the atmosphere, doesn't make the Earth warmer—all things being equal. It does. It's uncontroverted.” His plans for addressing climate change involve implementing tax credits to encourage the private sector to produce clean energy.

As for America’s stance on the environment, as more articles and scientific reports are released about our effect on climate change, it seems as though we, too, are beginning to form a general consensus. A recent poll taken in September shows evidence that self-described conservative Republicans—usually known for either denying or being cynical of scientific findings—are beginning to worry about global warming. As of September of 2015, 54% of self-described Republicans believe climate change is a real threat. This begs the question of whether politics will remain purely black and white (or red and blue) for much longer.

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Future Implications of Ocean Acidification on Soft Coral

By Taylor Dodge

Since the start of the industrial revolution, anthropogenic CO2 has been released into the atmosphere at unprecedented rates, increasing over 16 times since the early 1900’s. Based on this trend, the pH of the ocean is expected to drop in the oceans’ surface waters by .25 by the year 2100. The ocean is the largest sink for atmospheric CO2—that is, when more CO2 is released into the atmosphere, more is taken up by the ocean. As carbon dioxide increases in the ocean, the amount of hydrogen ions increases as well, causing ocean acidification. These additional hydrogen ions bind to carbonate ions, meaning that there are less carbonate ions to bind to calcium to form calcium carbonate. This is a problem for many organisms, especially corals, who use calcium carbonate to form either an internal calcite skeleton (soft corals), or an external aragonite skeleton (stony corals).

Significant interest has been shown concerning the effects that ocean acidification may have on calcification processes in coral. While there has been a great deal of research in respect to stony corals, information is scarce for soft corals. A lack of information and poor understanding of calcifying mechanisms makes it difficult to predict the response of soft corals to increased ocean acidification. In order to advance our understanding of the possible outcome of increased atmospheric CO2, my coauthor, Jeana Drake, and I used molecular biology techniques to better understand to processes of soft coral calcification biomolecules.

Coral Acid Rich Protein (CARP) 4 is a coral specific protein that displays a high percentage of the acidic amino acids. CARP 4 is one of four proteins that can bind calcium stoichiometrically as well as precipitate aragonite, which is the main component of its skeleton. Originally believed to be specific to stony corals, a partial sequence alignment comparing the CARP 4 of four stony corals to an unknown protein of a soft coral suggests that soft corals could possibly possess this CARP 4 gene.
The molecular biology techniques used in this experiment were successful in gathering sufficient data to come to a credible conclusion. Although a whole gene sequence was not retrieved, enough data was collected to support the hypothesis that CARP 4 is likely present in soft corals. This information is crucial in understanding the evolutionary history of biomineralization proteins in Cnidaria. Having a good foundation and understanding of its evolutionary history can help scientists predict whether stony corals and soft corals have the capacity to adapt to rapid climate change and ocean acidification.

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The practice of harvesting wild creatures for scientific description is certainly not a new one. In creating his seminal *The Birds of America*, John James Audubon shot hundreds of birds in pursuit of specimens for sketching. Today, museum basements are often rich in biological specimens collected by past naturalists.

However, a sense of tradition did not stop a firestorm of online outrage from forming in reaction to an article published by the National Audubon Society in late September. In an online post, the organization detailed an ornithological expedition’s discovery of a seldom-seen tropical bird, the Moustached Kingfisher. The bird resides on only one island in the Southwest Pacific, and has only been formally described by scientists on two prior occasions. In total, the scientific community’s knowledge of the bird was limited to just three specimens, all of which were female. The male plumage remained entirely unknown to all but the island’s indigenous residents. It was for this reason that the expedition, upon capturing and photographing an adult male Moustached Kingfisher, chose to “collect” the specimen—that is, to euthanize and preserve the male for further genetic and morphological study.

Many Audubon readers expressed outrage, arguing that the act of collecting an animal so rare represented scientific hubris, lack of respect, and a threat to the persistence of a rare species. In online threads, many questioned why adequate information on the bird could not have been obtained through photographs, blood samples, and body measurements.

This perhaps unexpected reaction from the Audubon readership prompted the organization to issue an opinion piece one week later, authored by the same biologist who collected the Moustached Kingfisher specimen. In that piece, the biologist described the methods used to estimate the species’ population size, and assured readers that, given his population estimates, the collection of one male would not adversely impact the species’ viability. The biologist also cited the value of collection in determining evolutionary history and advancing arguments for conservation. Such information can only be made, he wrote, through detailed morphological and molecular study, which is often not possible through mere photography or field samples.
Though the ire over this particular incident seems to have been defused, it hints at two much larger phenomena: the divide on the place of specimen collection in modern science, and the gap between scientific communication and public perception.

To be sure, the practice of specimen collection has been used frivolously in the past. 17th and 18th century naturalist collections often focused only on the most novel and fantastical species in an effort to cater to the tastes of the elite. And while aesthetic collections may be a thing of the past, many scientists today argue that lethal methods of collection are unethical and unnecessary at a procedural level. High-definition photography and tissue samples, they argue, can yield the same information as a euthanized individual. Others believe that lethal collection may be appropriate, but never before a population’s size can be reliably estimated.

Besides internal divides in the scientific community, the controversy over the Moustached Kingfisher highlights the need for effective scientific communication with the public. To the non-scientific community, the euthanasia of a rare and charismatic animal will inevitably be difficult to accept. Creators of scientific content for non-scientific audiences would do well to explain the methods and needs behind scientific collection of an animal for further study.

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The Trail Mix

Dr. Clark’s News of the Weird

The Continuing Crisis
-- In October, the student newspaper of Toronto’s Ryerson University reported a mighty scandal that upset the student body: The school’s executive offices' restrooms routinely supply two-ply toilet paper while most other campus buildings offer only one-ply. Following up on the hard-hitting Ryerson Eyeopener’s expose, The Canadian Press noted that the universities of Guelph, Ottawa and Toronto comfort all toilet-users' bottoms the same. Ryerson officials defensively noted that older plumbing in many of their buildings cannot handle two-ply paper. [Inside Higher Education, 11-2-2015]

2015 COP 21 in Paris
As the 2015 Climate Change talks, or “COP21” begin in Paris this week, there has been a great deal of preparation “done by presidents and climate ministers, severely affected nations and some of our biggest polluters. They have been here before, so any newcomers will have to do their homework, and not just on Kyoto's failure. The low carbon economy can already be seen in our electric cars, pipelines carrying power from Iceland or wind-up radios in less developed regions. Stringent targets are all very well, but the transfer of finance from the rich to the less-developed world has always created selfish misappropriation and the unwillingness to cooperate associated with mistrust. Green energies now seem to have the edge over much maligned fossil fuels but the lack of watertight agreement will mean recent shifts towards maintaining the country’s energy supply or adopting a pragmatic approach to the extraction of (slightly) greener energy sources could become avalanches of fracking, gas extraction or even coal exporting!"

Read more at: http://www.earthtimes.org/politics/world-waits-wonders-warms/2884/#sthash.JPOBch7m.dpuf