Eco Fact: The flowers of Skunk Cabbage—one of New Jersey’s first plants to emerge in spring—can actually produce their own heat, allowing them to melt through snow and ice in early spring.

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From your editors...

Dear Readers,

Whether this finds you preparing for one last exam before our spring break, or already happily on a plane to warmer climes, we invite you to take a moment to look through this latest edition of The Trail. We have an exceptional spring staff with us here at the Human Ecology Department’s monthly newsletter—one whose diverse backgrounds bring you accounts of mysterious whale clans, the future of artificial intelligence here at Rutgers, and much more. Enjoy, and here’s wishing everyone a restorative time off!

Happy Trails,

James, Maia, Sarah, and Ian

A special thank you to our wonderful advisors, Dr. George F. Clark and Kristen Goodrich!
How Scientists Are Finding the Speed of Evolution
By Adriana Chumacero

It has been almost 200 years since Charles Darwin and Alfred Russel Wallace revolutionized the world of biology by introducing the theory of natural selection and other concepts such as speciation. Now, in 2017, scientists have begun to discover a global pattern of evolution by observing the shape of a bird’s bill. Studies of small island bird populations have shown a rapid burst of evolution, followed by a slowdown. This rapid diversification in the face of environmental change is called adaptive radiation; however, broader research has not confirmed this “fast-then-slow” pattern of evolution on a global scale. To uncover this seemingly paradoxical situation, a group of international researchers have begun analyzing more than 2,000 species of birds. Their research suggests that although evolution does not slow down globally, the theory of adaptive radiation still holds up.

Gavin Thomas, a professor of animal and plant science at the University of Sheffield, published a paper stating that evolution in birds does not slow down over time, but rather switches from producing major changes in beak shape to generating smaller iterations of the basic shape. By collecting 3D scans of beaks from museums representing more than 97% of extant bird species and also crowdsourcing through the website Mark My Bird (where the public is encouraged to help mark specific features on the scans), Thomas and his associates were able to trace ancestral bill shapes and rates of evolution going back more than 80 million years. The data indicate that most of the variety we see in beaks today evolved long ago, and in a relatively short amount of time. “Very early on, in the first 20 million years or so of modern bird evolutionary history, you develop a wide range of bill morphologies, with all kinds of extremes,” Thomas clarifies.

After this early propagation, scientists believe there was a shift to finer-tuned evolution, which can still be
fast-paced. For example, in Hawaii, there was a single ancestor that generated about 54 species of colorful songbirds called honeycreepers that are present today. Disasters such as volcanic explosions opened up such opportunities for local evolution to flourish. Thomas states “In these cases, we find high rates of evolution, meaning when we compare sister species, they tend to be very different from one another.” Oftentimes, the different beak shapes that emerge are similar to those that already exist elsewhere in the world. This explains why bird beak evolution, despite experiencing the greatest increase in variation in its early days, has remained relatively stable through time.

One question that remains to be answered is what actually limits the total range of beak shapes? It may be possible that genes constrain how birds can develop, or that the niches birds would be able to fill with different beak shapes are already occupied by other species. Despite not having all the answers at this time, this research has indicated that there is still much left to learn about evolution, and that it can be done by studying homologous structures.

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Retrieved: 03:57 11 Feb 2017

Ideas of what could lurk in a galaxy far, far away capture our minds on quests for discovery. Instead of hurtling through space to quench your thirst for fascinating creatures and adventure, you should opt to stay on Earth and check out our own aliens. With 95% of the planet’s oceans still unexplored, there are many strange life forms lurking below.

In 2016, one of these strange creatures was detected in the Mariana Trench, the deepest discovered section of the ocean. Researchers from Oregon State University’s Hatfield Marine Science Center conducted acoustic surveys with gliders designed for searching for baleen and toothed whales. While similar to the gliders here at Rutgers used in The Challenger Glider Mission, these gliders were equipped with custom-designed passive acoustic recording systems. The gliders were released in Guam and while traveling in the Mariana Islands Archipelago, the researchers discovered a complex, mysterious, and metallic-like sound.

Dubbed the “Western Pacific Biotwang,” the noises were observed to be composed of five parts, lasting between 2-4 seconds, and having frequencies that spanned from 38-8,000 hertz. After ruling out the source of the noise being seismic airguns, earthquakes, ice, wind, rain, or a ship, the researchers were left to hypothesize about biological sources.

Due to the low frequency and overall characteristics of the call, researchers initially believed that baleen whales were the source of the Western Pacific Biotwang. Blue whale calls are too long (10-30 seconds), fin whale calls are too short, and humpback whale calls are too complex to be the source of the calls. Researchers thought that it may be a Bryde’s whale, but the fourth and fifth parts of the mysterious call were too high.
Analysts examined the call as a whole and finally found a close match: the dwarf minke whale’s “Star Wars” call. The Star Wars call resembles the sound of a lightsaber in action and is produced by dwarf minke whales near the Great Barrier Reef. The complex structure, sweep of frequency, and the metallic ending makes them a close cousin to the mysterious deep sea dwellers.

Minke whales are the smallest of all the baleen whales and are notoriously difficult to study. Little of their biology is known other than their small stature, their tendency to minimize time spent at the surface, their inconspicuous blow, and their preference for areas with high seas; all additional areas are challenges for human study. As there are already known types of minke whales close to the study area with unknown calls, researchers feel confident naming the source of the sound as a minke whale. However, researchers do note one specific difference between this call and other known minke calls. The Western Pacific Biotwang occurred throughout the year, when most baleen calls are related to mating, which mainly occurs in the winter. The hope is to now learn more about the source by conducting more research with acoustic data, genetic and visual identification, and behavioral analysis to determine the meaning of the call.

If the source of the call is in fact a minke whale as the researchers suggest, this new information could aid in the classification of the dwarf minke whale as a named subspecies of minke whale. As of now, scientists have not sampled enough of these whales to ascertain if they are a separate subspecies or if they are more related to Northern Atlantic minke whales or Antarctic minke whales. If the Western Pacific Biotwang is in fact coming from dwarf minke whales, further genetic testing can occur on the population to determine their relationship to existing minke whale species.

Works Referenced


Rutgers University Will Not Have a 300th Anniversary
Ian Montgomery

With enormous fanfare and constant digital and physical reminders, Rutgers University celebrated their 250th anniversary. Evolving from its original name of Queen’s College and the following Rutgers College title, as well as numerous non-name related changes, Rutgers University will unlikely celebrate their 300th anniversary. If they are to survive, they will either be a shadow of their once great name or be so different that the name bears no relation to its predecessor. Advances in artificial intelligence will greatly influence how Rutgers tries to continue evolving over the coming years and Rutgers will unlikely succeed.

IBM Watson, an artificial intelligence, took the national stage after winning against the two best players of Jeopardy in 2011. Since then, IBM has been frantically pouring over $1 billion into Watson’s technology with over 2,000 project members to expand into the fields of accounting, law, healthcare, weather forecasting, and education. Having fallen behind in the technology race to the newer competitors of Apple, Google, Microsoft, and others, IBM wants to regain their foothold by leading the way in artificial intelligence at the business level. Whereas the aforementioned are creating artificial intelligence at a more personal level in smart phones, tablets, and desktop computers with Siri, Google Assistant, and Cortana, Watson’s teeth are being sunk into thousands of businesses to ideally generate $1 billion annually by 2018 and $10 billion annually within the next 6 years.

Education has been touted by many as the cornerstone of a civilized society because the younger generations have to eventually provide for their elders and advance the ideals and quality of life for their country. Trying to improve the quality of education, Jill Watson, powered by IBM Watson, was a programmed teaching assistant for the Georgia Institute of Technology starting in the Spring semester of 2016, and will be going onto her third semester this year. Built on the framework of Watson, Jill answered questions based on the material of previous semesters and could nearly instantaneously respond to questions and discussions. She was added as a ninth TA for the other humans to help answer roughly 10,000 messages the 300 students posted. Jill’s programmers used about 40,000 previous messages to teach her. Despite the class being related to artificial intelligence, the majority of the students never figured out Jill’s identity until it was revealed at the end of the semester.

The instructors and team behind Jill wanted to have her alone answer 40% of all questions by the end of the second semester. Now on the third semester, they are working on having the software be a tutor
instead of just a class assistant where it asks and answers more complex questions. It would be capable of “grading assignments, examinations and programming projects, cognitive tutoring on the course materials, as well as metacognitive tutoring on open-ended projects,” the class instructor said. Professors knowledgeable of the artificial intelligence fear that universities will be motivated to employ less faculty and graduate students due to lower costs, more personal lessons catered to individuals, and the potential for much higher quality in teaching. Others have argued that it could even help the human teachers have more time for lesson planning, as answering similar questions from semester to semester can often take up to 20 hours a week.

There is no doubt, however, that employment will be affected. IBM Watson, and other software like it, will only become more advanced and cheaper to run. It will hit a point where nearly no mistakes are made and it becomes cheaper than humans who make mistakes, need food, breaks, sleep, free time, and can only progress to a certain level. IBM Watson has no known ceiling for the extent to which it can advance and is even being offered for free in many places to make progress as quickly as possible. If there is any consolation for Rutgers University, they will not be alone in having to face these coming changes. Education at all levels, from preschool to beyond graduate level, will be targeted by the power that artificial intelligence brings.

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In the mid-1300’s the bubonic plague, one of the most infamous disease outbreaks in history, swept through Europe, taking with it a third of the human population. This tragic part of history is known as the Black Death, and the cause was a small bacterium called *Yersinia pestis*, which was carried through the fleas of rats. This bacterium could sweep through Europe undetected in the immune systems of its hosts, somehow managing to shut off our first line of defense before our bodies could make a full response. One type of the bacterium affects the body through the lymphatic system. Once infected, symptoms begin to show in as little as 24-48 hours through swollen lymph nodes in the groin, neck, and armpits. Fever and hematemesis followed, with death usually occurring two to seven days later. Despite the overwhelmingly high chances of contracting this disease during this time, there were some who were able to remain immune to it and, while they faced other imminent challenges, they were able to keep the bubonic plaque at bay.

This ability came with the recessive trait of hemochromatosis, which acts similarly to how sickle cell disease helps prevent its bearers from malaria. Hemochromatosis occurs when the body does not recognize it has enough iron and continues to absorb more, rather than letting it leave the body. If left untreated, this iron overload can lead to organ and joint damage and can be fatal. Why were people with hemochromatosis able to effectively fight off the bubonic plague? It all relates back to cellular biology and the way in which the bacterium infects the host through shutting down the immune system. Since iron is essential for life—especially bacterium growth—how did hemochromatosis stop the black plaque, considering that it would otherwise be a smorgasbord for bacteria?

As it turns out, the body has natural defenses that lock iron in to prevent outsiders from feeding on it. In individuals with hemochromatosis, this condition is permanent, so an abundance of iron is locked into particular cells rather than being spread throughout the body. Most cells end up with far too much, but one particularly important cell that fails to receive its fair share is the macrophage. Macrophages are the bounty hunters of the body. They find intruders, kill them, and bring them back to the lymphatic system to be disposed of. In a non-hemochromatic person, macrophages are usually loaded with iron. So, while the macrophages collect the bubonic plague bacterium, they inadvertently give the disease a buffet of nutrients that it uses to fuel itself. As *Yersinia pestis* gets within the macrophages, it can gain energy before it is delivered to the lymphatic system where it can begin attacking the body. However, in those with hemochromatosis, the macrophages lack iron, thus the bacterium starves to death on its way through the immune system.
So how was the gene for hemochromatosis selected for if it eventually led to death in those who inherited it? While the disease essentially caused those who bore it to rust from the inside out, it allowed them to live long enough to reproductive age to pass on their genes to the next generation. Through immigration, it was brought over to the Americas and is still prevalent in many people today. Further research has revealed that the gene for hemochromatosis is a common genetic variant from Western European descendants, connecting it back to the bubonic plague. While the effects are still deadly, treatment is as simple as donating blood, which has allowed people to live full and normal lives.

Disease preventing disease is an odd concept, but it is a phenomenon that has permitted certain traits and mutations to remain in our gene pool for generations. The ability of some diseases and negative traits to prolong or prevent death is what has allowed them to stick around, as they were once favored by natural selection. Everything has a purpose or a reason for its existence, whether its relevance was in the past or perhaps in the future. By looking a little deeper, connections can be found from seemingly unrelated events.

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Capstone Project: Carbon or Caffeine Fix?

Carlee Kjeldahl

In December, I went on a mini-study abroad trip with the GREEN Program to look at renewable energy and sustainability in Iceland. The main purpose of the trip was the Capstone Project, which was centered around renewable energy and sustainability. My group consisted of five women—three of which were chemical engineering majors, one a physics/economics double major, and me, an EPIB major. Our original idea was to revitalize a once coal mining-dependent town by implementing clean energy technologies and creating jobs in the community. The adviser looked at us like we were crazy, but we were determined to find a solution. As my team did our initial research, none of the ideas we found were what we had in mind. And then we figured it out...coffee grounds.

According to The Huffington Post, Americans consume about 400 million cups of coffee per day, and that’s 146 billion cups of coffee per year! Now, that’s a lot of coffee, which equals a lot of coffee waste. But what happens if there was a way to recycle used coffee grounds and turn them into something serviceable? The company Bio-Bean has a solution.

Bio-Bean is a United Kingdom-based company that turns coffee ground waste into biofuel. Bio-Bean, which became a reality in 2014 when the company won the Postcode Lottery Green Challenge and raised millions of dollars in private investments, produces coffee ground pellets and logs to sell as fuel. The pellets can be used to warm pizza or heat entire buildings. The logs, which just became available in December, can be used to heat homes. While many people would worry about the coffee smell from burning the pellets or logs, there is in fact no coffee odor produced from any Bio-Bean products. Furthermore, all Bio-Bean products are carbon-neutral. Could something like this be implemented in the United States?

Americans are the largest group of coffee consumers worldwide, and much of the waste from this commodity heads to a landfill. My group’s plan was to implement a factory in a once coal-dependent community—which, for our purposes, was Green County, PA. Our customers would be the people of the United States and coffee companies. The project objective was to achieve clean and cheap energy production. The ecological benefits of coffee grounds biofuel include a reduction in landfill waste and the carbon neutrality of coffee grounds when used as fuel. In addition, implementation of a coffee grounds biofuel factory has the potential to boost employment opportunities in regions where fossil fuels once drove the local economy. We also wanted to encourage educational opportunities such as having factory tours for the public.
While the end goal of this project is to accept coffee grounds from households, thus promoting sustainable thought among everyday people, there are also benefits for corporate investors. Any company investing capital would promote positive public relations through a sustainable appearance, and the biofuel could be sold back to investors at a discounted rate. Waste management companies could be key partners here, as they already possess the apparatus to collect refuse from various sources.

With our capstone project, we tried to incorporate the UN Sustainability Goals. The ones that fit best were: Goal 7 (affordable clean energy), Goal 8 (decent work and economic growth), Goal 9 (industry, innovation, and infrastructure), Goal 11 (sustainable cities and communities), Goal 12 (responsible consumption and production), and Goal 13 (climate action). It was a fun and educational experience researching and working with other like-minded students. Finally, it was fascinating to see how an everyday commodity can curb a caffeine fix, while still playing a role in reducing carbon and creating fuel.

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The Privately-Funded Race to the Moon

Langley Oudemans

The race to the moon has not been on our radar for the past few decades. But that is changing. In the late fifties, the race between the United States and the Soviet Union was initiated and it wasn’t until ten years later, on July 20th, 1969, when Neil Armstrong took his giant leap onto the surface of the moon, that a winner was declared. Over half a century later, a new race to the moon has begun. However, this time, it is a private space race with a company, not a country, who will soon be declared the winner.

The Google Lunar X Prize is the catalyst of this private space race. The only spacecrafts that have landed on the surface of the moon thus far have been created by governments, so this race gives a whole new meaning to moon and space exploration. It is “a competition to challenge and inspire engineers, entrepreneurs and innovators from around the world to develop low-cost methods of robotic space exploration.” The competition involves placing a spacecraft on the moon, moving it at least 500 meters, and transmitting high-definition videos and images back to Earth. The grand prize is $20 million, second place is $5 million, and there is a bonus prize of $5 million. To take home any of the prizes, the winning teams must be able to prove that 90% of the money that funded their entry was from private sources. Similar to the timeline of the first race to the moon, this race was announced in 2007 and the deadline to launch is December, 2017.

There are currently five teams who have verified launch contracts and are vying for the prize and title. The teams are SpaceIL, Moon Express, Synergy Moon, TeamIndus, and Hakuto.

- SpaceIL is an Israeli nonprofit that was founded in 2011 by three Israeli engineers who now want more than just first prize. The team hopes that SpaceIL will inspire a new generation of interest in STEM subjects, and they have said that if they win, the prize money will go to promoting science and education in Israel.
- Moon Express is a United States-based commercial space company. They see the moon as Earth’s eighth continent. Their main goal is to open up the moon’s resources for humanity and to create an opportunity for commercial space activities.
- Synergy Moon is comprised of groups from over fifteen countries. They are working to promote international cooperation as well as collaboration between science and the humanities. They want to make many forms of space exploration available to everyone.
- TeamIndus is from India and seeks to embrace that aspect of their identity as much as possible. They are a small group of young engineers with an entrepreneurial spirit.
- Hakuto is operated by a Japanese company called iSpace, Inc, which is currently building a lunar mining business. For this project, it has an overall focus on efficiency, so they are developing the world's
There were several prizes awarded in 2014 for milestones achieved in the advancement of the project with Moon Express, TeamIndus, and Hakuto receiving awards. Moon Express won for landing and imaging, TeamIndus for landing, and Hakuto for mobility. By the end of 2017, one of these teams will likely change the way we view space exploration.

X Prize is the foundation that organized this race, but it has launched contests across many different disciplines. It calls itself an “innovation engine,” and it creates competitions that have high rewards for projects that push technological limits in ways that produce positive change. X Prize views itself as a funder of the power of private innovators. Past projects include a competition to improve crude oil cleanup from spills in the ocean and a medical sensing project with diagnoses and health monitoring. As far as the $I = PAT$ equation goes (influence = population x affluence x technology), X Prize is certainly doing its part to expand the technology variable.

The moon may seem like a space race destination of the past, but as our closest neighbor, it could be our guide to the rest of the universe. If funders and private companies are able to continue working together, the possibilities for discovery and advancement grow much faster, and the universe becomes that much smaller.

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Are You Getting Your Vitamin Sea?  
By Rupika Ketu

Sandy feet, burnt cheeks, and the sun’s heat: how is it that only the Jersey Shore can tame all these summertime cravings? For the most part, natives of New Jersey know how vital the shore is not just for our economy, but also for our enjoyment. It is the most popular place to hang around during those hot summer days and so many of us would be lost without it. Beach houses, mini-golfing, the pier, you name it! What is there not to love about it?

New Jersey residents have deep cultural ties to the shore, which makes the reality of sea level rise hard to accept. In the 20th century alone, sea levels rose 12 inches in Bayonne, Trenton, and Camden, then an additional 4 inches along the shore from Sandy Hook to Cape May. The rising of oceans is concerning since it threatens the beach communities we all love so much. With increases in sea level, the shore is susceptible to conditions like high tides, coastal storms, and amplified erosion. Can factor can combine to destroy more homes along the beach during extreme weather events.

Many say Hurricane Sandy was just the beginning, and as New York governor Andrew Cuomo said, it is indeed “a wake-up call” with a lesson to be learned. Future predictions from New Jersey flood maps imply sea levels will continue to rise “between 1.7 and 3.1 feet under minimal warming scenarios, as much as 4.5 feet if high levels of carbon emissions continue.” Let’s take a step back and look at the issue on a larger scale. As more scientists are linking greenhouse gas emissions and climate change, essentially the main contributor to sea level rise, humans have to start considering their negative impacts on the planet.

From a political perspective, a group of Republicans is looking to propose a $40.00 per ton tax on carbon emissions. Though President Trump “vowed during his campaign for the presidency to pull the United States out of a global pact to fight it,” a light of hope is being cast with this group of Republicans. The group explained to the New York Times that the evidence behind climate change is too extensive to be ignored. This carbon tax proposal is being co-authored by James Baker, former Secretary of State during the George H. W. Bush administration, Henry Paulson, former Treasury Secretary under George W. Bush, and George Shultz, former Secretary of State under Ronald Reagan.

On the other hand, there is still conflict at the federal level about controlling emissions as another group of politicians is looking to repeal former President Barack Obama’s Clean Power Plan. Policy drafting is a lengthy process, so as residents and inhabitants of New Jersey, we must take action to help protect our adored beaches.
There are numerous ways in which one can reduce their carbon footprint, which will in turn help prevent sea level rise from getting any worse. Eliminating or simply reducing your meat consumption and turning off excessive lights in your home are just a few examples. Is driving to your destination the only option? Try carpooling! Reusable water bottles can keep you from becoming one of the Americans that consume over 8.6 billion gallons of bottled water per year. Furthermore, the 17 million barrels of oil that go towards producing plastic water bottles every year could be fueling more eco-friendly public transportation instead.

Not only is reducing carbon emissions an option, but so is raising awareness about sustainable development in the shore area. New Jersey resident David Kutner began a non-profit called New Jersey Future through which he advocates for sustainable land use and growth policies. Kutner is not just promoting redevelopment along the shore that suffered the consequences of Hurricane Sandy, but rather ways in which residents can be proactive in developing their homes and businesses to adapt to sea level rise. Just like Kutner, we can either start a movement or become a part of one.

Let’s put our passion for the beaches to use. As Dr. Seuss wisely put it, “Unless someone like you cares a whole awful lot. Nothing is going to get better. It's not.”

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The movement of intentional living, otherwise known as off-the-grid communities, is gaining serious momentum in the United States. An off-the-grid lifestyle is generally defined as living without dependence on public utilities, which can include electricity and conventional food networks such as grocery stores. For those wanting to opt out of conventional materialism and compromise conveniences of everyday American life, many have chosen to move themselves to communities based on independence, self-governance, and local food systems. Mark Sundeen is the author of The Unsettlers: In Search of the Good Life in Today's America, where he hopes to learn for himself how to lead a good and satisfying life through the stories of modern day hippies. These communities are spread out across the country, changing the lives of their residents and visitors looking for a new inspirational perspective on the meaning of life, as we know it.

One of the communities that Sundeen discusses in his book is the Possibility Alliance, located in rural northeast Missouri. The community is entirely free from the use of fossil fuels with no electricity, and residents do not use cars or other fuel-powered vehicles. They also use outhouses instead of regular bathrooms and plumbing systems. Members of the community use bikes and horse drawn buggies to travel to town and to the local train station to pick up visitors. There are large organic vegetable gardens that provide food for the community for the entire year, and residents raise chickens, horses, and goats as well. The Possibility Alliance is based on an Amish homestead consisting of about 80 acres. A number of visitors come every year to witness the practice of simplicity and self-reliance in this intentional community.

Ethan Hughes, the founder of the Possibility Alliance, personally expressed that the community lives like kings and queens, despite existing well under the poverty line at less than $3,000 per year. Hughes said the first moral principle that guides the community is radical simplicity. The Possibility Alliance teaches some 1,200 people who come every year to learn about permaculture, organic gardening, animal care and other technologies at absolutely no cost, essentially giving them valuable life skills for free. These skills are ones that free the community's reliance on outside services and guide the path towards independence in every logistical aspect of daily life. The Possibility Alliance also values gratitude and a commitment to developing greater kindness and appreciation of life. Hughes practices this through stewardship of the environment, as well as through inclusive activities and meditation programs.

When discussing the logistics of energy and consumption, Hughes stated, “The amazing link is that when we are more alive, we need less stuff. People who come here are really connected and alive with their friends, relationships and connections to the Earth, and they don’t need a lot of stuff to be content. I would guess that their ecological footprint, whether they’re trying or not, starts to drop.” With community members homesteading, eating fruit right off the trees, and reading by candle at night, they seem fulfilled and...
satisfied with the simple joy that comes from this lifestyle. Sundeen’s book discusses the ways in which these people take pride in constructive, hands-on work, while reaping intrinsic rewards of happiness through living in voluntary poverty.

When Ethan Hughes was asked what he would change about modern society, he answered with a change in the kindergarten through twelfth grade education system. He spoke about an educational system that would encourage the highest realm of human potential in the heart, one that would give kids an education that was not about monetary success, but rather emotional and heart success. In his belief, the world would transform after these changes to the educational institutions in the United States were made. Hughes argues that instilling different values in children, whose minds are the most creative and receptive, can overturn our consumption-based culture and the typical viewpoints of success in the American Dream.

The thought of these lifestyle changes to most people can seem too extreme, difficult to fathom, or turn into a reality. One can just brush it off and go back to checking work emails, Facebook, Instagram, and so on. However, it is possible to take some of these principles and apply them to conventional, daily life. Radical simplicity followed by the Possibility Alliance can be taken away as more everyday simplicity, and a goal to enjoy the conversations and relationships we have rather than the stuff we want to buy or the virtual lives we tend online. These intentional communities are heartening in that they lend a new perspective on living life in the present, and a possibility that we too can follow in their footsteps without leaving our lives behind.

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What Should You Know About LED Lights?

By Humna Wajid

The light-emitting diode lightbulb, commonly known as LED, was first invented in 1962. Ever since, there has often been environmental hype around getting people to use LED technology and the products containing it. This immense popularity of LED lights is not without reason.

A few of the most important reasons for the popularity of these lights include their energy efficiency, the fact that they last longer than the usual incandescent bulbs, emit negligible amounts of UV radiation, and have fewer potentially toxic elements in them than their popular alternative, CFL bulbs. All these advantages make LED lights ecologically friendly products.

In 2010, USAtoday.com reported that “more than 425 million 60-watt incandescents are sold each year in the United States, representing half the domestic incandescent market.” Industry estimates also include claims that new LED lightbulbs have the potential to save 32.6 terawatt-hours of electricity each year. This is enough to power the lights of 14% of U.S. households.

Despite their vast potential as substitutes for the incandescent light bulb, LED lights have not yet gained the same popularity enjoyed by their incandescent counterparts. This could be due to the cost associated with LED lights, as they are a little more expensive than the usual incandescents. But, many people do not realize that while LED bulbs are more expensive to buy at first, they can save tons of money in the future by cutting the cost of monthly electricity bills, as they are energy efficient and long-lasting.

All in all, I strongly recommend using these eco-friendly LED lights. Not many people are aware of the enormous advantages of LED lights and therefore overlook them as an option. These great substitutes for our everyday incandescents can not only save our future financially, but also ecologically.

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On January 30th, 2017, Representative Paul A. Gosar (R-Ariz.) introduced the House Joint Resolution 46, which would repeal recent regulations that updated the National Park System’s (NPS) ability to oversee private oil and gas companies that want to operate in national parks. Under what are known as the 9B rules, the Park Service, which controls the surface of natural parks, can decline drilling rights to parties that own resources beneath the surface if it determines that the operation would be an environmental threat.

Gosar says he is not trying to target the 9B rules drafted in 1970, but rather the modernized 9B laws enacted in December 2016, that were put into place as an environmental safeguard. The modernized 9B regulation states the allowance of stronger enforcement for safety standards and uncapped reclamation bonds, which the National Park System could require and force on companies’ extraction operations that impact national parklands. Instead of only 40 percent of national park wells being protected, now all 534 wells can be declined for use by the Park System. If House Joint Resolution 46 becomes law, the NPS will lose authority over their new safeguards and will not be authorized to enforce repairs by oil or gas companies, who can severely damage the park’s wells without any repercussions. Unless a new law by Congress is specifically put into place allowing these regulations, Resolution 46 would create a dangerous, candy-land-like, free-for-all for large corporations on public land.

“These challenges are direct attacks on America’s national parks. Each of these rules provides the commonsense protections for national parks that millions of Americans demand. If the Park Service’s drilling rules are repealed, national parks across the country would be subjected to poorly regulated oil and gas drilling, threatening parks’ air, water and wildlife,” says Nicholas Lund, senior manager of the National Parks Conservation Association’s Conservation Programs. He continues, “These attempts to weaken protections put our parks at risk. And by using the Congressional Review Act process, Congress is forever tying the hands of the agencies charged with protecting America’s favorite places. If Congress wants to protect national parks for future generations, it must reject these challenges.”
If this regulation is nullified under the Congressional Review Act, it will prohibit agencies from releasing any similar rules, regulations, or safeguards similar to the repealed law, unless specifically mandated by Congress.

As many times as Representative Gosner justifies this proposal with the claim that he “simply seeks to block a midnight Obama administration regulation implemented in November,” that he says “targets the livelihoods of existing drilling operations in national parks,” it is just not the truth. In actuality, the new 9B regulations have been under review and in development since November 2009. Although this new proposed law would allow operators to drill for valuable resources and create potential economic development, a line must be drawn somewhere. Companies should not be able to destroy the NPS in the pursuit of more limited and nonrenewable resources, while at the same time operating free from liability for environmental damage.

Gosner’s sudden rise to the congressional spotlight came as a shock to many, since he was once considered quite the outsider. After his proposal of the House Joint Resolution 46, he was suddenly appointed as the Subcommittee Chairman of Energy and Minerals under the Energy and Natural Resources Committee. This, added to President Trump’s vow to push for more energy development on federally controlled lands, has many environmentalists feeling suspicious and uneasy. I know I am.

Works Referenced


As an environmental student, I strive to make decisions that will lower my carbon footprint. For many people who want to be more conscious of their environmental impact, an easy step is cutting out dairy and meat, as livestock are significant contributors of greenhouse gases. The burps and farts of cows release about 200 to 500 liters of methane per day, representing a huge environmental concern, as methane is a greenhouse gas with greater negative impacts than carbon dioxide.

The decision to not eat dairy and meat may be simple for some, but for others who find their diets supported by these common foods, removal is not an easy decision to make. Fortunately, a new solution to this problem has been found in an unlikely place. Joe Dorgan, a dairy farmer from Prince Edward Island in Canada, was attempting to save money on feed for his cattle when he decided to give them a feed mixture with a local ingredient: seaweed from the nearby beach. What began as a monetary decision turned into a small business where Dorgan sold cattle feed mixed with the harvested seaweed.

The process of actually selling the feed required approval from the Canadian Food Inspection Agency, which sought input from Rob Kinley, a researcher with the Australian government who has done significant research on the effects of seaweed on ruminant flatulence. Through Kinley’s research, it was discovered that adding a sprinkle of seaweed into a cow’s daily feed could reduce fermentation of methane in a cow’s stomach. While any seaweed was found to be effective, Kinley’s team sought the species of seaweed with the largest methane reductions.

They found that a type of red algae commonly found off the coast of Queensland, Australia, known as *Asparagopsis taxiformis*, was the key to this project.

With this new seaweed, while the cows were still burping and farting as normal, methane production was cut by 99%. As 65% of greenhouse gas emissions from livestock come from cows, this is a big improvement. However, while this solution is promising, it is not yet ready for large-scale operations, as this species of seaweed is not produced in large enough quantities. But Kinley is optimistic that farmers will begin to push for increased production, and he believes that “The social license to operate for all industries is getting more and more difficult. It’s becoming increasingly important to be aware of global climate change and what’s contributing to that. Ultimately, it is much more consumer friendly to be environmentally friendly.”

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**ALGAE: A FIX TO THE COW-METHANE PROBLEM?**

**AMANDA ZIZACK**

As an environmental student, I strive to make decisions that will lower my carbon footprint. For many people who want to be more conscious of their environmental impact, an easy step is cutting out dairy and meat, as livestock are significant contributors of greenhouse gases. The burps and farts of cows release about 200 to 500 liters of methane per day, representing a huge environmental concern, as methane is a greenhouse gas with greater negative impacts than carbon dioxide.

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**Works Referenced**


Mercury Levels Dropping in Tuna

Dana Walter

Tuna remains the largest source of mercury consumption by Americans, despite warnings from scientists and public health officials regarding physical effects of eating too much of the fish. But there is good news for fish lovers. As industrial sources cut down on their mercury emissions due to U.S. federal regulations, recent research has found mercury concentrations in some fish are dropping. A study published in *Environmental Science & Technology* reports that this is the case for many larger fish species at the top of the marine food chain, including the popular Atlantic Bluefin tuna.

Mercury (specifically, methylmercury) is a neurotoxin—the same one that wreaked havoc on Japan decades ago in an outbreak now known as Minamata Disease. Irreversible side effects of severe mercury poisoning can include muscle weakness, loss of peripheral vision, lack of coordination, impairment of hearing and speaking, and a “pins and needles” feeling in the appendages and face. Infants in the womb may be exposed when their mothers eat toxin-rich fish; due to their vulnerable brains and nervous systems, this population is far more likely to exhibit damage to their cognitive thinking and fine motor skills. While the way someone's health may be affected by mercury exposure depends on numerous factors, seafood ingestion remains the most common exposure pathway. At this point, almost all people have at least small amounts of methylmercury in their bodies, reflecting the widespread presence of this chemical in the environment.

It is no surprise that the drop in mercury concentrations measured in marine predators such as the tuna seems to follow the United States’ efforts to reduce mercury levels in factory smokestacks, the Atlantic Ocean, and the general atmosphere. Though Asian coal burning is still the primary culprit behind global mercury emissions, between 1990 and 2007, North American emissions went down 2.8 percent annually, while mercury in north Atlantic waters dropped 4.3 percent annually. More recent studies also show that, between 2001 and 2009, mercury in the air surrounding the Atlantic Ocean declined by 20 percent.

Similar numbers and patterns were apparent in another recent study concerning fish meat itself. Researchers from Harvard University, Stony Brook University, and the University of Massachusetts analyzed tissue samples from over one thousand tuna captured and tagged between 2004 and 2012. Over this eight-year duration, the mercury content in the fish flesh dropped drastically—an average of 19 percent. The researchers say this means that federal reductions in mercury emissions have swiftly lead to reduced mercury concentrations in numerous fish species, with the Atlantic Bluefin tuna hosting less and less mercury every year.

Despite these findings, dietary recommendations from health officials remain the same: the average adult should eat no more than six ounces of tuna per week, and vulnerable populations such as pregnant women should eat even less. Mercury emissions worldwide are still rising from coal burning in Asian countries, but progress is being made. The decline in tuna mercury concentrations simply goes to show what good national policy and monitoring can accomplish.
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Whether you live on campus, off campus, or commute, you will end up drinking the water at Rutgers from time to time. However, most students are not aware of where their water comes from, and often write it off as gross tap water without a second thought. Despite Rutgers’ extreme size—after all, our campus is large enough to stretch across both New Brunswick and Piscataway—its water is still provided by the same sources as the municipalities it calls home. What exactly does that mean?

If you live on the College Avenue, Cook, or Douglass Campus, you are in New Brunswick. The water that comes through the tap in residence halls, campus buildings, and off-campus houses are all from the New Brunswick Water Utility. If you live on Cook Campus, you may have noticed the large fenced off area on the corner of Dudley Road and Nichol Avenue. That fenced off area is exactly where New Brunswick manages its water. Local!

On the other hand, if you reside on the Livingston or Busch Campus, you are in Piscataway. Piscataway water is from a completely different water utility, called New Jersey American. New Jersey American has a few sources that their water comes from before it is treated and makes its way to the tap. If you ever notice a taste difference in the water between the campuses, that could be the explanation.

Here’s the thing about tap water: it’s regulated. The water coming through your tap is tested multiple times a day, and monitored closely for any possible changes in water chemistry. Additionally, according to New Jersey American, “…every water provider in the country is required to provide consumers with detailed water quality reports to assure its compliance with EPA standards.” Which means that as a member of the public, you have access to the water quality reports. Both the New Brunswick Water Utility and New Jersey American are on top of their water standards to ensure that it is safe for human consumption.

What’s stopping you from trying the tap more often? If you are an avid water bottle drinker, you probably enjoy bottled water for the convenience and the taste. The problem with bottled water is that it is not regulated like your tap water is. As previously stated, tap water is tested multiple times per day. However, bottled water is regulated by the FDA rather the EPA, and their standards are different. The FDA only requires weekly testing and does not share its findings with the EPA or the public. Additionally, some water bottling companies simply bottle other municipalities’ tap water, which just makes it expensive tap water.

But perhaps the biggest impact of bottled water lies in the bottles themselves. Plastic water bottles are not only wasteful, but according to the Container Recycling Institute, “85% of plastic water bottles end up in the trash even though they are made of recyclable materials. Americans throw away an average of 38 billion water bottles a year, which won't biodegrade for 1,000 years.”
Is there a middle ground? Can you enjoy crisp, clean, tasting water without buying plastic bottled water? The answer is yes! Across the four campuses in academic buildings, there are water bottle fill stations. These fill stations are equipped with a filter that is certified to further reduce lead, particulate matter, chlorine, odor, and taste. All you need is a reusable bottle to fill! Next time you use the water from your kitchen sink, or at a fill station, you will now know exactly what you’re getting yourself into.

Works Referenced


On December 7th, then-President-elect Donald Trump nominated Oklahoma Attorney General Scott Pruitt as administrator for the Environmental Protection Agency. With a Juris Doctorate from the University of Tulsa, eight years as an Oklahoma senator, and seven years as the Attorney General of Oklahoma, Dr. Pruitt has a distinguished record as a public official. However, he does not have a notable environmental background, and his previous decisions and statements given during his confirmation hearing indicate that he intends for the EPA to act much differently under the new administration.

As the Attorney General of Oklahoma, one of Mr. Pruitt’s first actions was to create a “Federalism Unit” within his office to oppose federal regulation under the Obama administration, including a number from the EPA. This unit has sued the EPA over twenty times, all unsuccessfully, since its formation in defense of state utilities and businesses unwilling to comply with federal regulations. Critics claim that Mr. Pruitt’s actions demonstrate a disrespect for the EPA’s mission and a willingness to overlook environmental damage, while supporters instead claim that he was simply defending states’ rights against federal infringement.

Regardless of whether environmental protection depends on federal regulation, it is clear that Mr. Pruitt does not approve of how the EPA operated under Obama, and will likely work to grant states more autonomy in their environmental decisions. In practical terms, this means that states that have incentives to oppose environmental regulations, like West Virginia, Louisiana, and North Dakota, would allow industries such as oil drilling and fracking to operate with more freedom. Meanwhile, states like California and New Jersey with strong traditions of environmental protection will maintain their existing standards and regulations.

Perhaps more worryingly, Mr. Pruitt has consistently expressed skepticism towards the preponderance of scientific evidence supporting anthropogenic climate change. While never explicitly claiming that the average global temperature is not increasing or that human activity has no role in the increase, he has shied away from the scientific consensus. What his supporters call sensible caution is condemned by both the scientific community and his political opponents as mere denial. From the transcript of his senate confirmation hearing:

**Pruitt:** Senator, I’ve acknowledged to you that human activity impacts...

**Sanders:** …The scientific community doesn’t tell us it impacts, they say it is the cause of climate change.

While skepticism seems like a healthy perspective at first, it does not stand up to the vast body of evidence pointing in favor of anthropogenic climate change. Having a potential EPA administrator so out of step with the scientific majority indicates that something is wrong with one of them, and in this case, Mr. Pruitt does appear to have sympathies with parties that have an interest in weaker federal environmental regulation. If climate change evidence and the EPA must be muzzled to do so, Mr. Pruitt will certainly be willing to make it happen.

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- United States Senate. “HEARING ON NOMINATION OF ATTORNEY GENERAL SCOTT PRUITT TO BE ADMINISTRATOR OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY,” January 18, 2017
- United States Senate Committee on Environment & Public Works. “Scott Pruitt’s Alternative Facts on His Environmental Record,” January 30, 2017
Up to the middle of the 20th century, the US-Mexico border was viewed as a gradual area of demarcation. By the end of the century, enforcement authorities understood the border as a sharp physical division between nations. The Southwest Border Enforcement Strategy, starting in 1994, was predicated on making it difficult, if not impossible, for drug smugglers and undocumented immigrants to enter the United States. The “Southwest Strategy” regarded geographic entities such as deserts, rivers, and mountains, as natural barriers that served to enhance border control.

To further protect the border, President George W. Bush signed the Secure Fence Act into law in 2006, officially fragmenting transnational habitats on the southern border. To add insult to injury, the Secretary of Homeland Security Michael Chertoff waived all environmental laws for the border fence’s construction. These policies have threatened the flora and fauna of the area, which is considered to be one of the most biodiverse on the continent. According to the research of Juanita Sundberg, a professor at the University of British Columbia, “nonhuman actors” like ocelots and arroyo toads are being devastated by physical barriers between the United States and Mexico.

Whether it is a fence or an 18-foot wall, any physical structure along the United States’ southern border will fragment 2,000 miles of one of the most biologically diverse regions in the nation. Wildlife watchers spend an estimated $463 million each year in the Rio Grande Valley, which contains more than 700 species of vertebrates alone. It sits at the convergence of two major flyways for migratory birds, and people come from all over the world for a chance to see some 500 different bird species.

This fragmentation is exacerbated by the fact that most proposed border enforcement sites run through wildlife refuges, like the Buenos Aires Refuge, Cabeza Prieta National Wildlife Refuge, and the Coronado National Forest. Fragmentation has already resulted in the destruction of some specialized habitats, loss of endangered species, and inhibited animal migration. For many large mammals like bison, a physical border has impeded their ability to migrate in response to climate and resource availability. Species with small populations and specialized habitats have arguably suffered the most from disruptions along the border, according to Jesse Lasky, an assistant professor of biology at Pennsylvania State University. Lasky’s work indicates that a border wall would put additional stress on arroyo toads, California red-legged frogs, black-spotted newts and Pacific pond turtles.
Five of North America's six wildcat species live in the borderlands, three of which do not live anywhere else in the U.S. The jaguar, ocelot and jaguarundi are all critically endangered in the U.S. due to habitat loss and historical hunting, and populations continue to dwindle because of border policies like the 2004 Arizona Border Control Initiative. Despite environmental restrictions regarding wildlife in federal refuges, border patrols, camps for law enforcement, and road construction for patrol vehicles were permitted in these areas. Artificial lighting illuminated brush, which served to hide migrants, but also provided essential sanctuary for felines. Federal environmental officials were concerned that harsh lighting was detrimental to the wellbeing of these endangered feline species.

Consequently, environmental advocates including the No Border Wall collectives have strongly opposed law enforcement measures in environmentally sensitive border areas. The Department of the Interior responded to such criticisms by committing $50 million to fund mitigation of “unavoidable impacts to natural and cultural resources.” Ecosystem damage can be avoided through general land-use planning, in which the government can promote border security and conservation simultaneously. The federal government should reprioritize, focusing on a comprehensive and inclusive border policy that does not sacrifice crucial ecosystems for the sake of border control.

Works Referenced


The Trump Administration’s Temporary Freeze on EPA Grants and Contracts Prompts Concern in the American Public

by Nicole Benalcazar

On January 23rd of this year, the incoming Trump administration instituted a freeze on all of the United States Environmental Protection Agency (EPA) grants and contracts, totaling billions of dollars. In an internal email sent to all EPA employees, the Trump Administration informed them that “Until [the Trump administration] receive further clarification, this includes task orders and work assignments.” An EPA staffer came forward to The Huffington Post to disclose that the new Administration also mandated a gag order forbidding the EPA staff from releasing information or talking to the press without the permission of the White House. The unprecedented freeze of grants and contracts was implemented by President Donald Trump’s pick for the EPA transition leader, Myron Ebell, the director of the Center for Energy and Environment at the libertarian think tank Competitive Enterprise Institute. Ebell claims that the freeze was meant to “make sure nothing happens they don’t want to have happen” and that the action was not dissimilar to those taken by past administrations. However, a former Obama administration EPA staffer has revealed that in past transitions it was normal for the incoming administration to review and inspect the work done by the EPA but that the freeze was unusual and highly disconcerting. Other staffers in federal agencies such as the Department of Agriculture and Health and Human Services were also asked to refrain from communicating with the media.

More than a week later, the Trump Administration lifted the grants and contracts freeze after a full review of the agency’s grants was completed. According to the EPA’s acting administrator Catherine McCabe, the grants and contracts reviewed by the transition committee are available to be rewarded and that no delays are to be expected. McCabe endeavored to diminish the fear and anxiety of EPA employees and concerned citizens by stating that, “…educating the President’s new transition team about many aspects of the Agency’s programs and operations. This is standard practice for a transition, as are many of the government-wide and agency-level actions the new Administration has taken this week.” She defended the transition team’s orders as routine practice for most incoming administrations. Her attempts to justify the actions of the Trump administration and boost the morale of the American public were enfeebled by the senior White House advisor on the EPA transition Don Benton. Benton asserted that political appointees would have increasing input regarding the EPA’s scientific research.
Benton’s comments have caused mass concern within the scientific community because they violate an EPA policy prohibiting EPA officials from intervening or manipulating the scientific research being conducted by the agency’s experts. Scientists both in and outside the agency are concerned that the new administration may severely interfere with scientific data through manipulation, cuts in funding, etc. Environmental organizations and scientists alike particularly fear that the EPA under Scott Pruitt may target climate change research. The looming uncertainty about the future of the EPA grows as rumors of President Donald Trump preparing an executive order regarding the agency come to light. The EPA is an incredibly vulnerable agency because of the ambiguity involving its work and its benefits. Despite this, it has survived and thrived in various transitions in the past. It will only grow more resilient as the American public becomes more aware of its importance and purpose.

Works Referenced:


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What’s The Dam Problem?

By James Duffy

“When you build a dam, you are playing God.
And it’s tough to be God.”

Few statements better summarize mankind’s current relationship with dams than this, spoken by an Army Corps of Engineers specialist on the subject. Access to river water retained by dams has nurtured modern agriculture, industrialization, and urbanization. But the extent to which dams pay off their economic and ecological costs has come under increased scrutiny. Resource managers, especially in the eastern United States, where dams rarely provide hydropower or service water-scarce communities, now face the decision of updating these aging structures, or removing them in favor of more natural river management regimes.

Rivers are in many ways the Earth’s beasts of burden, transporting sediments, nutrients, and even living things across the land’s surface. The interference of dams in these services has been well-studied.

For example, the decline of the once commercially vital American shad is partly attributable to dam construction on Atlantic Coast rivers in the 19th century, which were largely used to divert water for agriculture and other human uses. Acting as barriers to shad migration, these dams denied many American shad populations access to their upstream spawning grounds. The resulting crash in reproductive rates, exacerbated by overfishing, led to the collapse of American shad as an important regional food source—a role it had played since pre-colonial times. This scenario has played out several times over in various species of migratory fish.
And while ecological concerns often take precedence in discussion of dam removals, the topic is one of those joyous few where private property enthusiasts and mainstream environmentalists can find common ground. Since many aging dams in the eastern U.S. now lie on private land, the cost of maintaining them—and the liability for any damage incurred by dam collapse—often falls on private landowners.

These factors have caused many resource managers to push for removal of dams when possible. Since 1980 alone, over 500 dams have been removed from rivers in the eastern United States, and the tally is growing. This region is particularly ripe for dam removals, as many of its dams from the mid-twentieth century (a time when an estimated $2 trillion was spent on new dams in the U.S.) have begun to lose structural integrity.

There is often a degree of community pushback against dam removal. For instance, dams are frequently popular sites for human recreation; the deep reservoirs they create are often used as swimming holes, the fish that gather below them make for easy angling, and passersby often admire them as a falling water feature. Dams are sometimes also seen as a symbol of cultural heritage, valued for the role they once played in local economies. For this reason, the prospect of removal often angers longtime residents, to whom the dam is a community fixture. And while the long-term ecological benefits of dam removal are manifold, the average layperson might be forgiven for finding that argument less than salient.

This topic is, admittedly, a bit wonky. After all, why care about the future of one rather obscure type of infrastructure? Debates around dam removal bring community stakeholders together to discuss management of a shared resource—a collective activity which should be treasured. Few topics can bring farmers, regulators, swimmers, anglers, environmentalists, historic preservationists, and regular citizens alike, to the same table. But discussion of anything pertaining to our shared water resources does just that. For this reason, the debate surrounding dam removals is a valuable tool for engaging communities with their local environment.

Works Referenced


Standing Rock Has Not Given Up and Neither Have We
By Alexus Lizardi

After months of civil protests at Standing Rock by the Sioux and their supporters over the construction of the Dakota Access Pipeline, President Trump signed a memorandum influencing the Army Corps of Engineers to grant easement for the pipeline.

The Dakota Access Pipeline is a pipeline being built to transfer crude oil through North Dakota, South Dakota, Iowa, and Illinois. Proponents of the pipeline explain that the project will create jobs as well as bring the United States closer to energy independence.

The pipeline crosses through the Missouri River next to the Cannon Ball River, which is an integral part of the survival and religion of the Native American tribes of the area due to it being both a source of water as well as a sacred burial ground. The indigenous people explain that any breakage or mishap with the pipeline will lead to the contamination of the waterway and all connecting waterways.

While the news of the pipeline being given the ‘okay’ to be finished is disheartening to its opponents, that has not slowed down the numerous political actions being taken against it. The Sioux are in the process of suing on the grounds that the pipeline would interfere with their First Amendment Rights. The Sioux will be utilizing the Religious Freedom Restoration Act which “Prohibits any agency, department, or official of the United States or any State (the government) from substantially burdening a person’s exercise of religion even if the burden results from a rule of general applicability.” The tribe hopes that they can prove the construction of the pipeline violates their freedom to exercise their religion, which relies heavily on the sacred burial lands and body of water neighboring the pipeline.

The legal battle may have little chance of succeeding. While the land that the pipeline is running through is historically native land, in modern day, that area is not recognized as private tribal land; rather, it is under the ownership of the government. Therefore, it will be difficult for the tribe to make the claim that land which is not legally recognized as their own is endangering their religious expression.

While the tribes have continued to do everything in their power to protect their land, their message has spread across the country. Two cities, Seattle and Davis, have divested from Wells Fargo in part due to its funding of the Dakota Access Pipeline. Seattle’s message was particularly salient, as the decision to divest from the bank came a few days after Wells Fargo announced they would donate $500,000 to help nonprofits improve infrastructure and health resources in Seattle neighborhoods.
Financial divestment as a means of expressing political disapproval has its own history here at Rutgers. The Rutgers Fossil Fuel Divestment Campaign was started in 2013, with its main mission being to convince the Board of Trustees and Board of Governors at Rutgers to cut their ties with fossil fuels. Rutgers Fossil Fuel Divestment called for that money to be spent in forward thinking ways, such as investing in renewable energy.

Whether it is the water protectors at Standing Rock, the citizens of Seattle, or right here at Rutgers, it is clear that the pushback against fossil fuel is becoming stronger. While the fate of the Sioux against the Dakota Access Pipeline is now uncertain, it is evident that many across the nation are listening and educating themselves about the dangers that lie in the confines of this black snake of a pipeline.

Works Referenced


Dr. Clark’s Strange Tales

- Glenn Schloeffel, vice president of the Central Bucks school board in a Philadelphia suburb, recommended that science books be viewed skeptically on "climate change" because teenage "depression" rates have been increasing. Surely, he said, one factor depressing students is reading all that alarming climate-change data. [Rice University via New York Post, 2-16-2017]

- In Portland, Oregon, in January, Ashley Glawe, 17, a committed "goth" character with tattoos, piercings and ear-lobe holes ("gauges") was, she said, "hanging out" with Bart, her pet python, when he climbed into one of the lobes. She couldn't get him out, nor could firefighters, but with lubrication, hospital emergency workers did (thus avoiding an inevitable split lobe if Bart had kept squeezing his way through). [The Oregonian, 2-1-2017]

Questions, comments, or want to join The Trail staff? Email us at epibtrail@gmail.com.

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