

Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

HISTORIC INSTRUMENT OF THE MONTH: Thomas Rivers' Vaccinia Virus Culture Flask

JOSEPH LUNA



Flasks on view in Caspary Hall. Photo by the author.



Published schematic for "vaccine virus" culture flask¹.

In most virus movie thrillers, there's typically a scene, before the moment a cure or vaccine is discovered, where the hero-scientist is seen at a cell culture hood, in full air-locked containment gear, manipulating petri dishes with urgent abandon. With all the focus on identifying the infectious agent and finding a cure, this scene is often cast as a necessary but seemingly trivial step in the "discovery" montage, as if culturing a deadly virus in the lab was as easy as its capacity to kill.

In reality, this rarely happens. The initial process of domestication, of bringing a virus to life in tissue culture, remains a critical step in infectious disease research. But it's more often the case that our hero-scientist would've spent months, if not years—or, in some cases, decades—trying to culture a deadly pathogen in the lab before he or she could begin to study how the virus worked and test how to defend against it. To grow a virus in cell culture, the scientist must overcome at least three time-consuming and non-trivial hurdles: culturing a permissive host cell that the virus can use, isolating a virus that can actually grow in this non-organismal setting, and ensuring that this domesticated virus isn't much changed from its "wild"

counterpart. This month's historic instrument, a glass culture flask used to grow Vaccinia virus at Rockefeller in the 1930s (accession no. 68), emphasizes this herculean, if unsung, task as an early example of how such obstacles were initially overcome.

From Edward Jenner's work in the 1790s into the early twentieth century, vaccination against smallpox with the eponymous cowpox (*Vaccinia*) was done with live virus isolated from infected calves and was not without potential complications. In the 1920s and 1930s, numerous case reports of encephalitis in children caused by the vaccination process were publicized. Many reasoned that contaminated cowpox preparations were the likely culprit, or that the virus acquired new characteristics among the various cows (or people) used to propagate it. Quality control and standardization became a main concern. If there were a way to grow the virus in a controlled manner, without even the need for an animal, then perhaps a contaminant-free and safer vaccine could be developed.

With this in mind, Thomas M. Rivers at The Rockefeller Institute Hospital set out to grow *Vaccinia* in cell culture. And

in 1930 and 1931, he and coworkers published reports outlining a method to do just that.^{1,2} By serially passing the virus from rabbits to minced chick embryos in glass-collared flasks, Rivers was able to adapt the virus for *in vitro* growth. Taking it a step further, he showed that this virus caused less scarring, yet retained its ability to vaccinate both rabbits and children. Its use as a prophylaxis, however, achieved only moderate success. Despite producing favorably milder side effects, vaccination with culture-produced cowpox appeared not as long lasting as with virus grown in cattle.³ Still, it was a remarkable achievement as the first demonstration of an entirely cell culture-derived vaccine.

In an age when the very definition of a virus was up for grabs, Rivers' assumption that a virus required a cell in order to replicate was bold, for there were many claims to the contrary. Those who viewed a virus as a small bacterium asserted that it could replicate on its own. Most pointedly at the time, the laboratory of Rockefeller Institute director Simon Flexner quite famously claimed cell-free growth of poliovirus. Rivers never openly challenged the director's findings, though he did publish a series of reports outlining his failure to grow *Vaccinia* in the absence of viable cells; and in his classic text *Filterable Viruses*, he makes it clear that no filterable virus had been shown to grow without the aid of cells. This was one of his many assertions later born out to be accurate.

Rivers was appointed the second director of the RU Hospital in 1937, and continued to establish and standardize modern virology for the next quarter century. In 1948 he authored the first comprehensive virology textbook, *Viral and Rickettsial Infections of Man*, which was an instant classic. It is for this work that he is most well-known; his portrait in the hospital

lobby portrays him at his desk with the tome, no doubt made thick by the many findings made possible by growing virus in glass culture vessels in laboratories throughout the world.

But the story of figuring out how to culture deadly pathogens at Rockefeller does not end there. Rivers' work directly influenced Max Theiler, part of the Rockefeller Foundation Laboratories (in Smith Hall at the time), to culture a live yellow fever vaccine using similar passage techniques. Theiler went on to win the 1951 Nobel Prize in Physiology or Medicine for his success in doing so. In the 1970s, William Trager worked out a method to culture the malaria parasite in vitro, some 60 years after the parasite had been identified (a culture flask for malaria is also on display in the collection on view in Caspa-

ry Hall, accession no. 270). And most recently, in 2005, the Laboratory of Virology and Infectious Disease, headed by Charles Rice, published the first report of hepatitis C virus grown entirely in cell culture, some 16 years after the virus was unequivocally identified. These breakthroughs may have taken an eternity by movie standards, though in light of the actual challenges faced when growing a virus for the first time, as Rivers well knew, they rank as startling achievements. ◉

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Capitalism, Part I: Einstein on South Beach

BENJAMIN CAMPBELL

As I write this, Athens, the symbolic birthplace of democracy, is ablaze. The international financial system teeters on the brink, requiring bailouts from one client state after another just to stay afloat. Entire countries still depend upon speculative bubbles masquerading as sound economies, while bankers and bureaucrats scurry to prevent a debt crisis from bringing down the precarious Jenga tower that is the global economy. Meanwhile, the planet continues to hurtle towards climate catastrophe, with the only collective response manageable being a feeble kick of the can down the road.

This would seem to be a good time for some reflection and critical assessment of the perhaps unfounded assumptions and ideologies that have led us into these rather dire straits. However, reading *Natural Selections* columnist Jacob Oppenheim, one might be led to conclude that this state of affairs is the treacherous result of militant labor unions and naive communists preventing enlightened technocrats from guiding the free market to equilibrium. In this series, I will explore a radical alternative: that capitalism is to blame for the current crises of capitalism, and that humanity can do better than a political economy founded upon unenlightened self-interest. It is only recently that I have come to oppose capitalism, after witnessing both its spectacular failures and the impotence of

liberal reformism in the face of economic power. While this series may not lead the reader to embrace my radical position, I hope that it will foster some critical thinking about our prevailing economic order.

Leaving the laboratory

To set the stage for a serious discussion of capitalism and its alternatives, I must follow Oppenheim's lead with an article dedicated to the impoverished state of political discourse. In last month's column, sub-titled "The Failures of the Educated in Contemporary Politics," Oppenheim highlights the problem perfectly, although largely unintentionally. In Oppenheim's usage, "the educated" refers to people like him, who have attended prestigious universities and doctoral programs, and therefore evidently have a paternalistic duty to set some sort of example for the masses riding in the intellectual equivalent of steerage. Oppenheim, however, never quite explains how neuroscience or immunology might better qualify one for political judgment than, say, carpentry or geriatrics. Here I will argue precisely the opposite—that scientists are likely to be less insightful about politics than the average bricklayer, as out of their element with politics as our title protagonist engaged in a spring break wet t-shirt contest. This is because politics is nothing like science, and scientists are particularly

susceptible to the illusion that it is.

Oppenheim demonstrates this when he states confidently: "Public policy is no longer a game of ideologically based guess and check." This confidence is strangely timed, given the recent near global financial meltdown. One would think this would have demonstrated conclusively that either those in charge of public policy have little idea what they are doing, or that they are not doing it in the public interest (as we will see, it makes little difference.) More importantly, Oppenheim mistakes an embrace of ruling class ideology for some sort of post-ideological objectivity. This illusion, that there is some objective basis for political and economic orthodoxy, tends to arise from an assumption of meritocracy.

The central concept of science is that it is meritocratic. We will leave aside the question of whether this is true, and simply take it at face value that, in science, the best ideas get published in the best journals and consensus is then formed around these ideas. If, say, a microbiologist would like to learn about neuroscience, he or she is advised to peruse the top journals and consult with experts in the field, who can usually be identified by various accolades and their positions at prestigious universities. In the case where the scientist encounters multiple opinions, it would be reasonable for him or her to conclude that there is likely

some merit to each of the respective points of view.

I imagine that this is how many scientists approach politics. Since most scientists are liberals, they tend to turn to the august pages of *The New York Times* or *The Washington Post* for political analysis. The more engaged may read *The New Republic* or *The Atlantic*, or if of a reactionary bent, perhaps *The National Review* or whatever else still poses as the “intellectual right.” Certainly this is how I began with politics when I moved to the United States a few years ago. However, I was immediately struck by what I considered to be a peculiarly American political phenomenon. This is the existence of a roughly inverse relation between the size of the platform one is given from which to opine and the probability that one has anything interesting or useful to say. I have since realized that this pathology is not limited to the United States, but it seems to be in a particularly advanced stage in this country. Needless to say, it is nothing like science.

Propaganda, low and high

Oppenheim, to his credit, recognizes this phenomenon at its most base—denouncing a large segment of the punditry as “bloviators.” At its lowest, this presumably includes the entire roster of Fox News, who all self-styled centrists are careful to balance with MSNBC commentators on what they imagine to be “the left.” However what Oppenheim fails to grasp is that this is only the lowest and most obvious level of the “partisan dreck” that he rightly condemns. There exist, on top of this, progressively more refined layers of propaganda marketed to the increasingly cerebral. One particularly insidious form of propaganda comes from those who are often called “wonks.” The wonk combines a superficial understanding of the issues with a geeky assurance of competence and a passing familiarity with mathematics and market economics. Oppenheim seems particularly drawn to the wonk, as he expresses admiration for “erudite, data-friendly” analysts ranging from “Matt Yglesias or Ezra Klein on the left to Reihan Salam or Josh Barro on the right.” He differentiates these wonks from the “legions of commentators repeating the same party line,” which is strange, as these wonks generally exist for no other purpose than to disseminate the policy consensus of their respective parties. Klein, Yglesias, and numerous of their hack jour-

nalist colleagues were famously exposed by the right for coordinating Democratic Party damage control in 2008. Yglesias’ last employer was the Center for American Progress, the deep-pocketed Democratic Party propaganda mill. Klein, meanwhile, often appears as more or less the voice of the donkeys on MSNBC, “the Democratic Party’s answer to Baghdad Bob,” as described by Yves Smith (one of the few insightful, and hence ignored, voices of contemporary discourse.) Thus, Oppenheim appears to conflate and confuse “middle-brow establishment partisan” with “erudite left.” To be fair, not all wonks are partisans, as there are non-partisan eggheads who exist to fill the yearning demand of centrists everywhere for a technocratic mathematically literate post-partisanship. However, these wonks almost always advance the bi-partisan agenda that the establishment agrees upon, which, incidentally, is nearly everything.

Collectively, wonks of one stripe or another are usually able to win the loyalty of most political dilettantes, who having full-time jobs of their own, are mainly looking for an individual exuding some competence to reassure them that someone out there really knows how to steer this ship (or better, that it needs no steering.) However, for some, a twenty-something blogger turned partisan mouthpiece is not all that convincing. For these political connoisseurs there exists a further level of refinement in political consumption. Perched at the pinnacle of the pyramid of pundit propagandists one finds the professors. These “experts” have extensive training in fields such as “neoclassical” and “Austrian” economics, and often have been awarded prestigious accolades in these phony disciplines, most notably the fake Nobel prize that was conjured up to disguise the ideological guesswork of the dismal science as a meritocracy. At this level one will find Paul Krugman and Joseph Stiglitz situated on what is the left-most flank of tolerated discourse, and Harvard professor and academic textbook propagandist Greg Mankiw on what was formerly the right but has since been mainstreamed as the new center, with a variety of libertarian kooks having shuttled in to occupy the new reactionary intellectual vanguard. These experts often move in and out of various administrations, such as Mankiw chairing the Council of Economic Advisers under George W. Bush, with Krugman occasionally consulted and ignored in favor of Larry

Summers by the centrist administration of Barack Obama.

Some of these experts are indeed extremely intelligent, which can lead to fascinating moments when they appear to grasp that even they have no idea what they are talking about when lifted out of the economic Flatland they pretend is reality. Krugman famously mocks most of the others as the “very serious people” of the Washington consensus, but the studious reader of Krugman can occasionally detect a vague sense of insecurity wherein he seems to realize that he is one of them. Having been tapped to join the posse after helping to lay the foundation for the looting of the last three decades, he is now tolerated to guard the rear of the bandits’ retreating caravan from the threat of pitchforks hurled by the angry townfolk. The rare moments when these experts appear to catch on to the con are, of course, glorious, such as Alan Greenspan’s admission before a Congressional committee that he was “deeply troubled” by the flaws that the recent near-Armageddon-turned bank pillaging had exposed in his ideology. No doubt it must be deeply troubling to have one’s Randian illusions of merit give way to the sober realization that one’s career was spent as little more than a lookout man in an inverted bank heist of epic proportions.

At this point, the reader would be right to point out that my argument has consisted mainly of the unsubstantiated assertion that the entire commentariat are little better than paid shills for the moneyed and powered elite. I have as yet not demonstrated exactly what is wrong with the ideas of the wonks, yet alone venerated economists. However I will defer such a discussion until the third article in this series, for it turns out that it doesn’t really matter. My seemingly iconoclastic stance is in fact a truism that falls out of the internal logic of capitalism itself.

Capitalist hegemony

In a capitalist economy, the production of goods and services is dictated by human demand. Importantly, however, this is determined in a plutocratic fashion, meaning one dollar, one vote, rather than the democratic style of one person, one vote. Practically speaking, this means that Roman Abramovich can order the construction of a five hundred foot yacht with two helicopter pads while tens of millions of Russians are lucky if they can scrounge together the

rubles for a bottle of vodka with which to drown the sorrows of their impoverished existence. Incidentally, capitalists tend to consider this undemocratic nature of production not a bug, but a feature.

Now, note that in capitalism, everything possible is commodified as a good or service to be traded on the market. This includes culture, and the labor of those who produce culture, which includes political commentary and all of the aforementioned punditry, low-brow and high-brow alike. Thus, just as capitalism produces a great abundance of material goods desired by the wealthy, it stands to reason that it will produce a great abundance of political ideas desired by the wealthy. Thus, it is thoroughly unsurprising that the vast majority of political and economic discourse serves to justify the privilege of the ruling class, while there is comparatively little arguing for the extrication of the proletariat from its unfortunate position at the tail end of the human centipede. Much of the quality leftist discourse that does exist has been generated by individuals eschewing the greater rewards offered by capitalism, like the archetypical Marx in Clerkenwell. At any rate, this material must be sought out, for they don't give anti-capitalists column inches in *The Washington Post*.

One of the great ironies of politics is that capitalism's cheerleaders and apologists often deride the left for its presumably naive view of human nature. Admittedly, there is no shortage of leftists who could use a scolding on human nature from Steven Pinker's *The Blank Slate*. But it is in fact the capitalists who fail to take their own view of human nature to its logical conclusion. Economist Milton Friedman told us that "the world runs on individuals pursuing their own self-interest." It is unclear whether Friedman realized that his own prominence was nothing but the logical result of the grinding gears of this self-interest.

Politics is not science. People and ideas do not ascend in politics based on merit, but on how useful they are to those who exert power. Cynical pundits may tailor their messages to what power wants to hear, but they need not, as power will simply select what is appetizing from the ideas on offer, like choice pieces of bluefin plucked from the mass of humanity serving as its collective Nyotomori. If a second-rate pulp fiction author peddling self-interest as metaphysics is the choicest piece on offer,

well then capitalist self-interest will elevate Ayn Rand to the pantheon of great philosophers. In the end, it doesn't matter whether Ann Coulter, Ezra Klein, or Rand really believe what they are selling (my guess is no, yes, certainly), either way the dominant ideology is fashioned by the self-interest of power.

Of course, it is important to note that economic power is not the only power wielded in today's society, as we do not live in a purely capitalist economy. The plebeians still retain some semblance of a democracy, allowing them to each exert some trivial power via the ballot. This balance of power between capital and democracy, which for the last forty years has been steadily moving in the direction of capital, will be the subject of the next article of this series. For now, it suffices to say that the partisan spectrum of acceptable discourse existing between Democratic and Republican parties and their respective armies of bloviators, wonks, and economists is only a sliver of the actual political spectrum, and it is the sliver that has been deemed acceptable to the existing balance of power, which today is greatly skewed in the direction of capital.

A critical state

Most people are, of course, able to recognize the pernicious influence of economic power in its more flagrant forms, such as Rupert Murdoch's media empire and Exxon-funded climate research, but somehow stop short from realizing that "might makes right" is the basic premise upon which all political and economic discourse is judged. I speak from experience here, having had a decade of intellectual development stunted by the error of not recognizing these more advanced forms of political propaganda for what they are. I have since concluded that when a cab driver or barstool pundit opines that "they're all corrupt," there is more wisdom in this one statement than the cumulative archives of *The New Republic* and *The National Review* combined. The skepticism of the outsider turns out to be much better suited for political analysis than the illusions of meritocracy and objectiveness cultivated in "the educated."

And so politics is dangerous terrain for the scientist, who has wandered so far out of the laboratory that if he is not careful he

can end up following these illusions into an uncritical assumption that intellectual merit is what gets one past the velvet ropes of SoBe. As for Einstein himself, he would have known better than to enter upon the crass landscape of mainstream politics. Einstein rebuts Oppenheim's technocratic conceit more succinctly than I in an article entitled "Why Socialism?": "We should be on our guard not to overestimate science and scientific methods when it is a question of human problems; and we should not assume that experts are the only ones who have a right to express themselves on questions affecting the organization of society."

Here I have suggested that the vast majority of economic and political commentary serves to support existing power. It must therefore be set aside if we are to embark on a serious discussion of capitalism and its alternatives. If, for a moment, we entertain the paternalistic view that we as "the educated" have a special role in political discourse, then I would suggest that it is to think deeply, critically, and independently about political ideas, and not simply accept the frameworks and ideologies that have been selected and amplified by the scions of power. Further, where possible it is our natural role to encourage the development of actual science, such as experimental economics, to replace the simplistic mathematical models that have been used to give an objective veneer to the self-interest of the relative few. This faulty economic foundation, upon which capitalist hegemony rests, will be the subject of the third article in this series. But first, we will more fully explore the internal tension between democracy and capitalism that has given rise to "an oligarchy of private capital the enormous power of which cannot be effectively checked even by a democratically organized political society." Things have only gotten worse since Einstein wrote this, in 1949.◊

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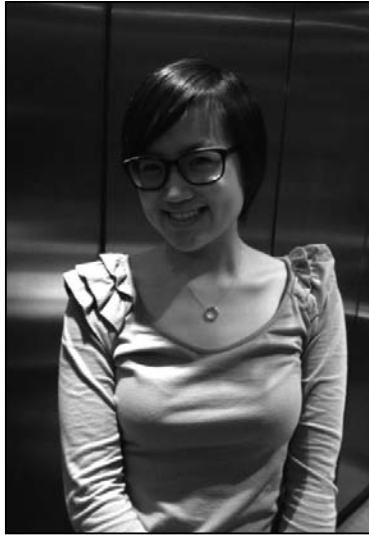
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This Month Natural Selections interviews Kelly Poon-Lin, Research Assistant in the laboratory of Neurobiology and Genetics.
Country of origin: Hong Kong

New York State of Mind

- 1. How long have you been living in the New York area?** 11 years.
- 2. Where do you live?** Manhattan, Hell's Kitchen.
- 3. Which is your favorite neighborhood?** Midtown West/Columbus Circle. The west side of Central Park area.
- 4. What do you think is the most overrated thing in the city? And underrated?** I think Times Square is overrated and that the Upper West Side (UWS) is underrated. I love the UWS. The restaurants and bars around there are great.
- 5. What do you miss most when you are out of town?** I miss my mom's cooking!
- 6. If you could change one thing about NYC, what would that be?** I would fix up the subway system. I would make the subways cleaner, cheaper, more efficient, and make sure they run on time.
- 7. Describe a perfect weekend in NYC.** A perfect weekend would be having brunch and doing lots of shopping. I would also go biking with friends along the path by the West Side Highway. After biking we would go for Jamba Juice.
- 8. What is the most memorable experience you have had in NYC?** My most memorable experience is kind of scary. When I was still in high school I was on the subway with my parents one night and



this man with a bloody face walked onto the train. The train was pretty empty and at one end of the train there was also a deliveryman sitting by himself not bothering anyone. The man with the bloody face started yelling and screaming at the deliveryman in the corner. The train then stopped while we were between stations and the man with the bloody face started punching and hitting the man in the corner. It felt like forever until the train started to move again and there was nothing anyone else could do to stop the man with the bloody face. Finally, when we got to the next station the beaten-up deliveryman got off the train and tried to look for the police or someone to report the incident to but there was no one around. I still have somewhat of a subway phobia and get scared when the trains stop underground between stations.

- 9. If you could live anywhere else, where would that be?** If I had to stay in the US, I would want to live in Boston because it's another big city. Otherwise I would want to move to Kenya and live with the Maasai people.
- 10. Do you think of yourself as a New Yorker?** No, not really. I'm pretty relaxed and I'm not impatient enough to be a New Yorker. I don't get upset about every little thing. ◉

Why is the Hoboken's Saint Patrick's Day Parade cancelled this year?

AILEEN MARSHALL

There has been a Saint Patrick's Day parade in Hoboken, New Jersey, along Washington Street, on the first Saturday of March for twenty-five years. The parade is organized by a private Hoboken Saint Patrick's Day Parade Committee, much the same way the Ancient Order of Hibernians runs the Saint Patrick's Day parade in New York City. However there is also a history of trouble surrounding this parade, just like there used to be with New York City's parade. Besides the usual public drunkenness, fighting, and public urination, there have been reports of sexual assaults and vandalism. Last year there were 34 arrests made, including two sexual assaults, and 296 citations. One woman stated that revelers trying to get into a party broke her antique door. The town of Hoboken reports a cost of \$150,000 in extra police officers and sanitation from the 2011 parade. The town has required extra help from the Port Authority, NJ Transit, other towns, and the sheriff's office to patrol this parade.

This year, the mayor of Hoboken, Dawn Zimmer, decided to move the parade to a Wednesday in order to cut down on the criminal activity. The Parade Committee met to discuss the option, but found it lacking and subsequently made the decision to cancel the parade for this year. Appearing to blame the mayor for this decision, they published a letter on their Web site stating: "The idea of

marching in a parade in the dark on a weeknight is as insulting as it is unreasonable... Moving forward, we will proudly consider the gracious invitations we have received from other communities throughout the State of New Jersey to march in their celebrations of Irish heritage. Evidently, there are some elected officials elsewhere in the state who have figured out how to protect their residents during ethnic, religious, and other community celebrations." A spokesman for the committee, Bill Coughlin, was quoted by *Business Week* as saying that "our take has always been we are not responsible for what goes on before or after the parade."

There is evidence on social media that some people plan on showing up along the route the day the parade was supposed to be anyway. There are pub-crawls planned and a "Lepre-Con" event modeled after the Santa Con event here in NYC. The Lepre-Con Web site states, "Dress up in full Leprechaun garb or other Irish festive gear and head over to Hoboken, NJ from 9 a.m. onward on Saturday March 3, 2012." Their Web site shows that over 3,000 people plan to show up. The mayor said there will be law enforcement present on the day of the regularly scheduled parade in case there are still public disturbances.

It is not known whether there will be a Saint Patrick's Day parade in Hoboken next year. ◉



Credit: RU

In Memoriam Dr. Norton Zinder (1928 – 2012)

Norton Zinder, a molecular biology pioneer and Rockefeller University professor since 1964, passed away in February. Norton is best remembered for his discovery of genetic transduction in the laboratory of the late eminent RU professor Dr. Joshua Lederberg and identification of the first bacteriophage containing RNA. Norton is survived by two sons, Stephen and Michael, and five grandsons. ◉

PDA Corner—Postdoc Salaries, Tri-Institutional Initiatives, and the Superbowl!

ASMA HATOUM

When hard work pays off, everyone wins. Thanks to the hard work of our president, Dr. Marc Tessier-Lavigne, and the Academic Council, new postdoctoral compensation guidelines for Fiscal Year 2013 were hammered out this past fall. In a November meeting, the PDA discussed these new guidelines with Dr. Tessier-Lavigne, along with Dean Dr. Sid Strickland, Associate Dean Emily Harms, and Vice President of Human Resources Virginia Huffman. Dr. Tessier-Lavigne and the Academic Council were very receptive to the needs of the postdoctoral community, and instituted an increase in salary brackets by \$3000. Regardless of employment start date, this salary adjustment will become mandatory on July 1, 2012. Regarding additional benefits, long-term disability (LTD) and life insurance, these will be added to the postdoc benefits package in July 2012. During the meeting, Dr. Tessier-Lavigne made it clear that he views the Rockefeller University (RU) postdoctoral community as the “heart and soul” of this institution, and he is committed to meeting postdocs’ needs as we navigate the current economic situation together. In alignment with this assertion, Dr. Tessier-Lavigne and the Academic Council plan to revisit these issues at least once every two years. A detailed description of the new postdoctoral compensation guidelines can be accessed online: http://inside.rockefeller.edu/hr/FY2013_Postdoctoral_Compensation_Guidelines

Toward creating professional development opportunities, the PDA launched its postdoc seminar and lunch series in January. This series is intended to provide a platform for postdocs to present their work in a relaxed,

informal setting. This year, the floor was open to Rockefeller postdocs, as well as to our colleagues in the Tri-Institutional (Tri-I) community. The call for speakers was met with great enthusiasm, and most available slots were filled within a few days following the announcement. The seminar series is truly a Tri-I event, with nearly equal representation across all three institutions. Seminars are scheduled for one Thursday each month from January to June, starting at 12:30 p.m. in Weiss room 301. Two 20-minute talks will be given for most sessions, and a pizza lunch is provided. On January 26, Ana Domingos, a postdoc in Jeffrey Friedman’s lab, presented her practice job talk to a packed audience, and received much appreciated constructive feedback afterward. Based on the success of this first session, the series promises to benefit equally the speaker and the audience. Future seminars are scheduled for February 16, March 22, April 12, May 10, and June 21. As each date approaches, e-mail announcements that detail the speakers and talk titles will be sent out.

Also in January, the RU PDA met with our PDA colleagues at Weill Cornell Medical College (WCMC) and Memorial Sloan Kettering Cancer Center (MSKCC). The main purpose of the meeting was to touch base and to discuss the possibility of coordinating other Tri-I initiatives. In addition to RU PDA members, attendees included Francesca Avoga-



Watching a close game, as the Giants overtake the Patriots on Superbowl Sunday.

Credit: Alok Shah

dro, the MSKCC PDA president, Ronald Perez, the WCMC PDA president, and eleven other MSKCC and WCMC PDA representatives. Several social and professional development joint activities were proposed and discussed, including a family day/picnic in the summer, a soccer tournament in the fall, a Tri-I postdoc seminar series in the fall, and a career fair. The launch of a Tri-I newsletter was also proposed. To follow up on these possible initiatives, a Tri-I committee was formed. Paul D’Agostino volunteered to serve on this committee as the RU representative, and Frances Gratacos from WCMC will serve as the secretary. The committee members plan to meet once a month, and updates on joint Tri-I events will be forthcoming.

On the social front, the PDA hosted its annual Superbowl party in February. Over 100 postdocs and students gathered at the Faculty club to watch the New York Giants overtake the New England Patriots in a very close (and exciting) game. Traditionally, the PDA hosts one other social event in the spring or summer; suggestions (and volunteers) are always welcome. Stay tuned for the announcement! ◉

Vox Clamantis In Urbe The Emperor Has No Clothes or An Investigation into Environmentalism

JACOB OPPENHEIM

Back in middle school, I recall a class discussion on the destruction of the rainforest. We followed the path of logical reasoning from loss of habitat to loss of species and overall biological diversity. I was unsatisfied, however—how did this impact human life? As the teacher made clear, loss of biological diversity was *prima facie* a loss for humanity. To this day I remain unconvinced, yet I still greatly appreciate the diversity of life that remains. On what grounds do environmental arguments rest?

The central idea of environmentalism is that humanity should keep earth in a “natural state.” This entails: preserving all remaining natural habitats, preventing species loss, anti-nuclear activism, the spectrum of moralizing anti-pollution arguments, and the neo-Luddism and anti-humanism of Paul Ehrlich. These are based not upon cost-benefit analysis, but are rooted in a desire to preserve the Earth as it once was in a pre-technological age. To be clear, I do not consider pragmatic arguments based on universal considerations of human utility in the above, a subject that I shall return to later. To an environmentalist, preservation of the “natural state” of the world is an obvious, natural truth. But nothing is less natural than preservation of the world in one specific state. As scientists, we should know better.

The vast majority of lineages¹ that ever lived are now extinct. While the record of mass extinctions seems to indicate occasional catastrophic losses of biodiversity due to climatic forcings, volcanism, and/or asteroid impact, setting such events aside still leads to the inexorable conclusion that “nature,” and its manifestation in evolution by natural selection, does not care about the sum total or diversity of lineages. We can observe these events only at the small end of the taxonomic spectrum due to the brevity of human life (and the relatively short time that observational science has been conducted). However, a few examples can be readily seen. Professors Rosemary and Peter Grant at Princeton University undertook a long-term study of the population of Darwin’s finches on one of the islands in the Galapagos. Rather than finding constancy in the natural environment, they observed perpetual flux. A drought one year and a large storm another both led to a massive cull of birds: one killing off lineages with extreme beak sizes, and the other leading to the deaths of all birds with medial beak sizes.

In a similar vein, the construction of dams by beavers frequently leads to a massive change in local biodiversity, as a formerly moving stream becomes a lake. When lineages expand into new territory, they frequently drive many native species to extinction². Such events are disruptive but inherently natural. All lineages are driven to reproduce and maximize fitness. Where a lack of competition does occur in the natural world, it is because it has been selected due to its provision of a benefit to at least one species. In fact, lineages frequently act in ways counter to diversity, even if it is in their pragmatic interest not to do so. A classic example is the boom-bust behavior of predator-prey cycles in the wild. It would perhaps behoove wolves in fat years to eat fewer sheep and reproduce less so as not to cause a population crash. Yet such behavior is neither observed nor likely possible. Human alteration and exploitation of resources is natural and prone to the same “lack of

foresight” we observe in animals³. Thus we return to the pragmatic argument for environmentalism. As we have seen, however, the moral argument is not rooted in any scientific conception of what is “natural.” Nature and evolution are blind to the preservation of diversity; they simply do not care.

Moralist environmentalism is a religion. It is based on principles that cannot be proven by logical reasoning. It must be taken on faith. These principles seem to spring from a Judeo-Christian conception of man’s duty. In Judaism, there is the concept of *Tikkun Olam*, repairing a broken world. This has been taken to mean not just duties to one’s fellow man but towards the natural world⁴. Adam is given dominion “over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.” Thinkers both Jewish and Christian have stressed the preservationist aspect of such dominion. Early environmental movements similarly sprang out of Christian theology. Here a fundamental irony exists: the green movement, which is generally filled with atheists and is no friend of organized religion, is itself religious in nature and derives its fundamental principles from a bastardization of the very religions its followers have abrogated.

Whatever its roots, these religious principles in and of themselves are a second irony. In creating a duty for humans that exists for no other species, they implicitly accept the fundamental principle of all religions: that humans are not natural. They are different and above the beasts of the earth. Given the privileged position of humanity, in its consciousness and duties, the anti-humanism espoused by thinkers of the Paul Ehrlich “Population Bomb” school is somewhat strange. Since humans are different from and greater than the rest of life, it seems nearly impossible to argue that the human population is bad for the earth and should be reduced. This belief springs from the assumption that current human behavior is unnatural—a self-contradictory argument as it is premised upon the notion that humans are different from the natural world. And human behavior isn’t particularly unnatural. Maximizing fitness by altering our environment just makes mankind a more successful beaver. The moral form of sustainability arguments, too, falls to such reasoning. Once the core principles have been logically ferreted out, we see that the emperor has no clothes.

The explanatory power of this view is quite strong. Moral environmentalists continually advocate solutions based not on an understanding of economics or science, but on positive beliefs. Classic examples include the local and organic food craze (actually bad for the environment), anti-nuclear activism (despite nuclear power being the best current bet for carbon replacement), and the opposition to Keystone XL (won’t reduce oil dependence, but will ensure that oil continues to be shipped in more dangerous methods, while funneling more money to Middle Eastern dictatorships).

I do not mean to imply by all the above that I am opposed to action on climate change, pollution of all kinds, and saving endangered species, but rather that these arguments can only be logically grounded in pragmatic concerns of human utility. Pollution is bad because it shortens lives and destroys the beauty of the world we inhabit. Overfishing reduces the number and diversity of fish we can

eat. Climate change threatens to kill us all. And endangered species, at the very least, charismatic megafauna, are worth preserving, because we value observing them and knowing that they exist. These are all benefits that must be balanced against costs in dollars and in human lives. We all value things differently, be they the relative worth of money, a good job, national prosperity, homogeneity in our communities, and the natural environment. We elect representatives to advocate for our beliefs and trust them to weigh associated costs and benefits. This system is imperfect at best, but at its heart, it springs from logical principles elucidated during the Enlightenment. To all of us who love the natural environment, is this not a firmer foundation for our beliefs? And for those who believe in a moral case, founded upon human responsibility, should it not be that we use that most uniquely human of our features, the power of logic and reason, to direct our action? ◉

References:

1. As molecular genetics has convincingly shown, there is no scientific basis for the term “species” or any other taxonomic unit. Rather, there is only a phylogeny of lineages that have been forced into a Linnaean schema.

2. While the frequency of such events has been accelerated by migrating human populations, they are entirely natural and have been observed in the geological record. See, for instance the adaptive radiation of mammals.

3. Jared Diamond’s *Collapse* is about this very phenomenon. Classic instances include Easter Island and the Mangareva-Henderson-Pitcairn ecosystem.

4. The requirements for Kosher slaughter in Leviticus and Deuteronomy are likely the oldest form of animal rights in the human history.

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Life on a Roll



Winter in the Park by Elodie Pauwels

