

Natural Selection

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

THE PRESIDENTIAL CANDIDATES' STANDS ON SCIENCE POLICY

AILEEN MARSHALL

The presidential campaign is getting down to the wire, with only the Republican candidate all but decided, Senator John McCain of Arizona. The Democratic candidates, Senator Hillary Clinton of New York and Senator Barack Obama of Illinois, are still dueling. Whoever wins the election will have to deal with many issues, many of them science related. Science Debate 2008, a bipartisan organization comprised of scientists, congressmen, and business leaders supported by The American Association for the Advancement of Science (AAAS), proposed a debate amongst the three candidates, focusing on science-related issues including climate change, stem cell research, diseases, drugs, funding, science policy, and education. The original invitation was for April 18 in Philadelphia, but the candidates did not agree to participate. A new invitation has been issued for May 2, 9 or 16 in Portland, Oregon.

While waiting to see whether or not the science debate actually happens, we have compiled an overview of the candidates' stands on science.

Climate change and energy

Clinton and Obama propose a cap-and-trade program for carbon emissions. In a cap-and-trade program, the government would set a limit on the amount of carbon emissions companies could create. Those companies that manage to emit less than their limit could then sell their unused credits to a company that feels it will go over its limit.

According to Senator Clinton's Web site, she proposes to use this cap-and-trade system to reduce carbon emissions from 1990 levels by 80% by the year 2050. She would also try to require all federal buildings built after 2009 to have zero emissions. She proposes to increase car fuel efficiency standards to 55 mpg by 2030. Her platform

includes funding a new research agency, Advanced Research Project Agency—Energy (ARPA-E), to perform basic energy research.

In the past, Clinton has voted for amendments on clean coal technology and renewable energy. Amendment 1614 would have provided \$10 million to reduce carbon dioxide emissions from coal gasification. Amendment 1693 would have updated the

Consumer Protection and Energy Efficiency Act of 2007. This would have established a carbon capture and storage research program.

Senator McCain's Web site doesn't mention a cap-and-trade program specifically, just "harnessing market forces" to encourage alternative energies and decrease dependence on foreign oil, although he does emphasize the need for a clean environment. He did pass a bill last December on a cap-and-trade system. According to AAAS's Web site, he supports nuclear energy but opposes ethanol. McCain did not vote on any of the energy amendments that Clinton and Obama voted on. He did, however, speak against drilling in Alaska in 2006.

Medical research

Senator Clinton's Web site focuses on specific diseases and mentions how science can help. Cancer, autism, and AIDS are the

focus of her platform. She acknowledges "the National Cancer Institute has 12% less purchasing power than it did four years ago." She proposes to double the NIH and NCI budgets. She wants to provide \$700 million on autism research, including identifying the cause and providing "evidence based" treatments. She also wants to double the NIH budget on AIDS research, including finding a vaccine and providing fact-based prevention strategies. Her Web site reiterates that she helped to get the emergency contraceptive, Plan B, approved when there was political interference at the FDA.

She has released a statement vowing to overturn the ban on federal funding of stem cell research. She has also voted for an amendment that would expand the National Bone Marrow Donor Registry as well as the National Cord Blood Inventory

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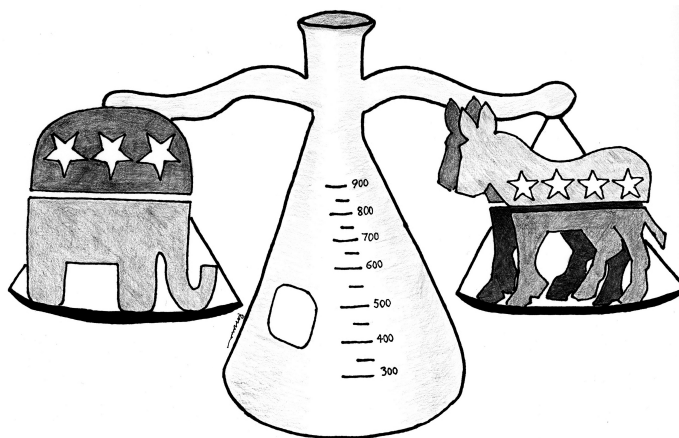


Image by Rossana Henriques

Clean Air Act to run long and short term studies on the effects of renewable fuels on the environment. Neither of these amendments passed. She also voted for Amendment 1094 to require the Army Corps of Engineers to include the effects of global climate change in all studies.

Senator Obama also proposes a cap-and-trade program, with the goal of reducing carbon emissions "by the amount scientists say is necessary," according to his Web site. The money raised would go to the development of clean energy and improving energy efficiency. Obama proposes to double research funding on clean energy such as wind and solar power. He also proposes a fund for the National Laboratories to translate this research into commercial products, and another \$150 billion to bio-fuels.

Obama also voted for amendments 1614, 1693, and 1094. He also voted for the

Booming a Biotech Cluster in New York City

JOHN WILSON

As measured by patents, publications, and NIH funding, New York's life science and biomedical research ranks among the strongest in the country. Our research institutes are located within the financial powerhouse of NYC, and yet most of our inventions are commercialized elsewhere.

NYC Bio (www.nycbio.org) is a not-for-profit organization dedicated to fostering innovation and entrepreneurship within the life science community of the NYC region. It was started by a team that believes in New York as the future biotech cluster, including members of the Rockefeller community. To aid in building a thriving NYC biotech cluster, NYC Bio needs help and involvement.

NYC Bio is now inviting entrepreneurial scientists to present their commercially promising ideas or share their experience with biotech at its first monthly NYC Bio Meet-up on Thursday, May

15 at 6:00 p.m., to be held in Proskauer Rose LLP at 1585 Broadway, between 47th and 48th Streets in the Morgan Stanley building at Times Square.

NYC Bio Meet-ups allow biotech and biomedical entrepreneurs to present technologies for commercialization, field questions and criticisms, hear and share experiences of startups and the biotech world, network, gain industry exposure, and find funding, partners, and the people needed to make biotech work. Each presenter will speak for ten minutes and answer questions for an additional five. After four presentations, there will be a break for networking.

The event is aimed for an audience of investors, fellow entrepreneurial scientists, and business leaders. If you are interested in presenting, you should contact events@nycbio.org. Consider future participation if you are unable to attend this month's meeting.

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program.

Obama's Web site vows to establish an independent institute to research effectiveness of medical treatments. He would allow Americans to buy their drugs overseas to keep prices down, and permit generic drugs under Medicare. He proposes to increase the NIH funding and improve coordination with the government and other research organizations. He wants to decrease the amount of mercury in fish and supports autism research. While a state senator, he introduced a bill in Illinois to allow stem cell research there and sponsored legislation on federal funding of more stem cell lines.

In Illinois in 2004, the state legislature developed a program to provide flu shots to lower income citizens, and Obama pushed for evidence to support this. He eventually went with the medical community's advice to provide shots for high risk groups, even though it was politically unpopular. He has supported funding for an AIDS microbicide. He also would overturn the ban on federal funding of stem cell research and expand the National Bone Marrow Donor Registry and the National Cord Blood Inventory program.

John McCain's Web site mentions setting aside federal money for disease research. He emphasizes public education to

prevent obesity, diabetes, and high blood pressure, and to reduce smoking. He supports research on autism, including improving methods of diagnosing the disease.

While he claims to support stem cell research, he has been an opponent of research on cloning. He supports only using donated embryos that would have been discarded. He did vote for the amendment for the National Bone Marrow Donor Registry and the National Cord Blood Inventory program.

Science Policy and Education

Clinton wants to ensure that science and health education is based on "accurate and complete information," according to her Web site. She has said that her science advisor would report directly to her, and not be "filtered through political advisors." She has emphasized removing political constraints on science, such as keeping the government from altering scientific reports and constraining scientists. She has supported replacing the space shuttle. She proposed to increase the number of National Science Foundation (NSF) fellowships and the amount of each fellowship by 33%.

Obama says he supports increasing the NIH and NSF budgets. He proposes immi-

Natural Selections
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gration reform, specifically of the H-1B program, to attract more scientists to America. He created programs in Illinois to help students meet math and science standards and to get jobs in high technology areas. He also created a scholarship program for minority students in the science and math fields. In the US Senate, he passed amendments to increase minority participation in the sciences. He proposes to allocate \$18 billion, once he is president, for science education at all levels, but would pay for it by delaying NASA's Mars program.

McCain is a supporter of NASA and the space program. He supports funding a program to bring men back to the moon, "accompanied by proper management and oversight to ensure taxpayers get the maximum return on their investment." He said in 2002 that science advisor John Marburger's remarks on climate change had "no credibility." He has been involved in increasing H-1B visas and NSF funding.

If you are interested in learning more about the candidates' science policies, two excellent sources are: The AAAS Web site at <http://election2008.aaas.org> and SEA's (Scientist and Engineers for America) SHARP network at <http://sharp.sefora.org>. ©

A Portrait of a Leaf

ENGİN ÖZERTUGRUL

Everyday a constant wave of people flows back and forth through the entrance of Rockefeller Research Building (RRB), hardly noticing a drawing on the wall next to room 110. I have never seen anybody stop and look at it. I walk past it five days a week, and if it weren't for the meeting I had to attend in room 110 that Thursday, I would probably still remain oblivious to its existence. I had five minutes to kill before the meeting and I was too restless to go in. Instead, I stood in front of the door and mindlessly looked around until I noticed two gentlemen, who appeared to be in their thirties, standing fifteen feet away from the entrance. Both men were wearing a subtly patterned dark suit and dark polished shoes which made them seem obsessively neat with their fresh-cut short brown hair. They too seemed to be waiting for something, a meeting perhaps. I watched them as their gaze aimlessly wandered around the relatively empty RRB hall, eventually fastening on the largest drawing on the wall. From where I was standing, I could not see where they were looking, and out of curiosity I positioned myself behind them. There it was, a giant green leaf looking back at us. By the time I worked out the details in this beautiful display, these two gentlemen were already making dinner arrangements. Their attention span lasted ten to fifteen seconds or a little more as one of them gazed closely around four corners of the frame. He was obviously more interested in the maker than the subject of the drawing. As they were turning around in the opposite direction, I heard them joking: "These things can be worth more than you think, Dan," said one to the other while throwing his hands up and laughing.

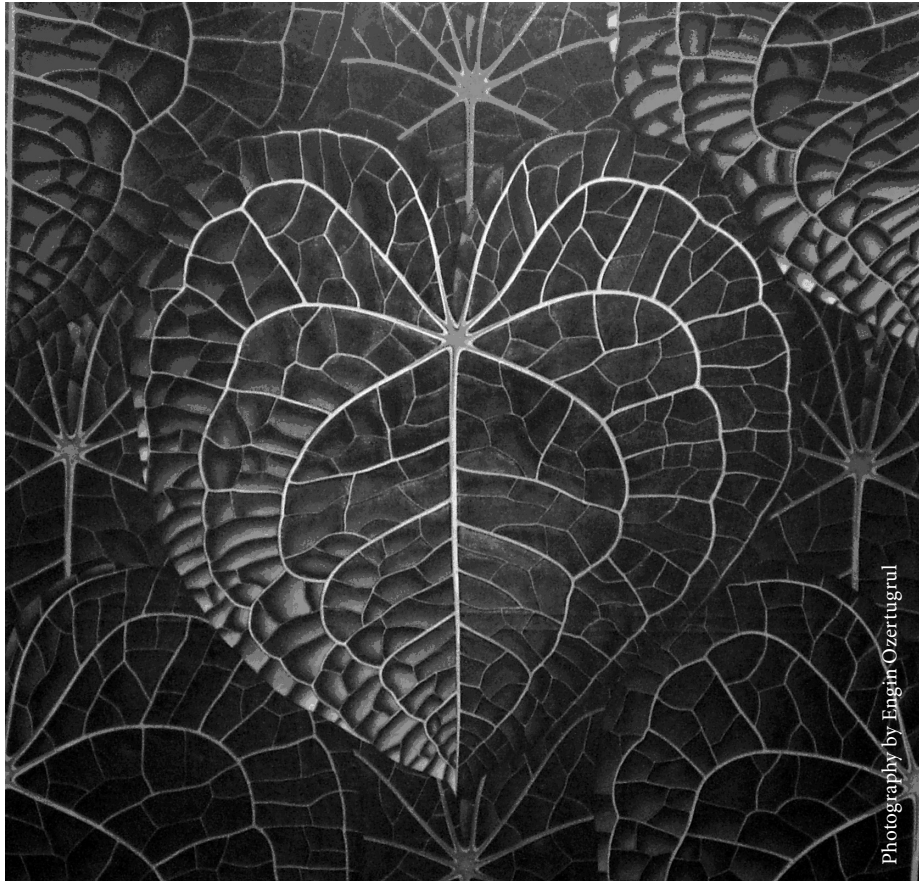
I saw a "Wall Street" face in these two gentleman while they gazed at the drawing with I-figured-it-all-out serenity. I bet they never saw the leaf because to them it wasn't there. They looked at it as they would at a "dumb blond" portrayed in the movies, beautiful, yet stripped of all other characteristics. With a last glance, I vanished behind the closed door of room 110.

What happened to us? How did something so important, so part of our lives, turn into bumper sticker on the wall or a screensaver on the computer? Is it our life of overwhelming and crashing banality that drives us insane and urges us to change things to become cooler than they were?

But then what can be possibly cool about a leaf? It just hangs there; it is boring. In fact, it's a nuisance for most. Its death is ugliness in our garden, something to be removed, burned, or kicked. And what can be important about a leaf?

Why bother? Why am I here? These are the same kind of

questions we ask at the end of a depressing day, when life pushes us this way and that. Obligations, demanding parents, failure at work, disappointments, exhaustion, all puncture our dreams and leave us stranded on nowhere shores. We come back from these nowhere shores because we remember we are not alone. We come back because we remember that nothing can erode a genuine love and kindness and an imagination strong enough to feel what another is feeling. There is no limit to this sense of unity if we can stay past the breaking up of our air conditioned chambers into the development



Photography by Engin Özertugrul

of real love and intimacy with our surroundings, nature.

A leaf is the hand of nature. It is worthless, yet it is priceless. It is everywhere, in the air, on the tree, in the water, in the mud. We have been together so long. We know it so well. We can still feel it despite our keyboard dead fingers. We shall look closely. Its curves and movements are our history, its tenderness is our compassion, and its greenness is our dreams. These red lines are our highways. These yellow seas are our oceans. These dark holes, its abuses, its wounds, are our disappointments. Its coastlines are our beaches. Its veins are our waves. Its moves are our lullaby. Its death is our inspiration.

A leaf has been intimate to us. It has covered our shame. It has been our shade. It has been our crown. It has been our roof. It has been our clothes. It has been our shoes. It has been our medicine. It has been our food.

A leaf is more unifying than all the religions, philosophies, and languages combined. It carries no hatreds, prejudices, or other confusing ideas or passions. It speaks to every man's ear; it fills every man's heart.

A leaf is a mere drop in the ocean, a passing breath in the wind of time. It breathes out and enters us. It becomes our lungs, it becomes our hearts, it becomes our minds, it becomes our eyes, it becomes our hands, and it becomes us. We breathe back, we become a leaf. ☉

A Long Way Home

JIABIN CHEN

When we came to the US for further education and research training, we left home ailing parents, caring siblings, cheering friends, intoxicating food, and sometimes even loving spouses. Once in a while, we go home to see the beloved ones. However, there is always a question that makes us hesitate before the trip, sometimes even scares certain people away from making that trip home: am I able to come back to work or school in a timely fashion?

Each time you enter the US, you need a valid visa, usually issued by a US consular post in your home country. A majority of students hold an F1 visa; workers (post-docs, for example) usually an H-1B; some students as well as postdocs hold a J1 visa, which is officially categorized as the type for visiting scholars. Visas, even within the same category, are issued for different lengths of validity depending on the strategic relationship of your home country with the US. For example, the H-1B visa is issued in, perhaps, all the Western countries for three years, but only three months in China. This policy puts a Chinese scholar in an annoying position where s/he has to renew the visa each time s/he makes a trip outside of the US (given that one doesn't always make two trips in three months). On the other hand, even if you hold a visa that is good for several years, you may very likely face the same situation after the previous one expires. If a new visa is required, it sometimes casts a cloud over the entire trip because getting a visa often involves many troubles.

The application process for a visa is sometimes painful. You may have to wait for a long time before being interviewed by a consular officer. While being interviewed, many of us may be familiar with the experience

of having a different experience with every immigration officer; some give you a very pleasant time, others a much more disturbing one. Moreover, if you happen to come from a large country, getting a visa may take a significant chunk of time off your trip, which itself may be a mere couple of weeks. In India, for instance, there are only four cities, Chennai, Mumbai, Calcutta, and Delhi, which have US consular service. Many people have to travel great distances and pay for the travel charges and lodging for at least two nights, let alone the non-refundable application fee which has kept rising, and which is now at a peak of \$131, no matter where you apply. Sometimes, one may wonder, why does it have to be so frustrating when going home?

Things became exacerbated after 9/11. There used to be a courier service to get a re-entry visa so that you didn't have to go to the consulate in person. After 9/11, however, everyone must have a personal interview before a decision to issue a visa is made even if you've gone through the same procedure before. Moreover, people in certain academic backgrounds are subject to security checks, which means a long delay in their visa issuance. Unfortunately, most of us at The Rockefeller University work in the biomedical field, and are on the list. In the application form, there is now a scary question asking whether you've had "specialized skills or training, including firearms, explosives, nuclear, biological, or chemical experience." Obviously we can't lie, but, putting a yes there may detain your



Image by Doruk Golcu

case for a long time. A few years ago, many people were delayed by months to get the security check cleared. The policy aroused complaints not just from students and scholars, but also from universities, institutes, and companies for obvious reasons. It is now shortened to several weeks (three to five on average), but this is still something that many can't stand. The worst part is, you will only find out whether you are picked for security checks at the interview, and they never tell you when it's going to be complete until after it's done. You are therefore left in a stand-by position, not knowing when to change your flight ticket. Yes, staying at home is sweet, but on the other hand, you may just be having nightmares of missed classes, dying cells, or misbehaving animals.

More complications arise with the visa you hold. One might be excited to learn at first that his/her spouse can come to the US on a dependent visa. However, being a dependent usually means one has no right to work or enroll in a school in the US. The only exception is J2, the dependent of a J1 visiting-scholar. Yet, once you transfer from J1 to a different visa type, H-1B, for example, your spouse cannot work anymore.

Is there a way to solve all the hassles associated with the visa? If not, there is always a long way home for many. ☹

Rockefeller Film Series: Spring with the Sloan Foundation

ALEXIS GAMBIS

While most disease-themed melodramas give in to the far too easy route of eliciting sympathy for the ailment-afflicted protagonist by enshrouding the unfortunate human being in stereotypical, saintly victimhood, *The Diving Bell and the Butterfly* (*Le Scaphandre Et Le Papillon*), like its mysterious, symbolically laden title, has something far more meaningful and complex in mind. Though directed by US artist and occasional filmmaker Julian Schnabel, who also helmed *Basquiat*, touching on the tragic life of the

Haitian-American artist, and adapted for the screen by South African-born screenwriter Ron Harwood (*The Pianist*), the film has a distinctly flavored authentic aura as a French language production. *The Diving Bell and the Butterfly* won the Alfred P. Sloan Foundation Feature Film Prize for its depiction of scientists and engineers in a realistic and compelling fashion.

At the end of May, we present a collection of short student films which won the Sloan Award at various film schools around the US.

The films have been displayed on the online Sloan exhibit of the Museum of the Moving Image. It would be a real treat with stories about *First Vampires*, an animation about the first isolation of vitamin C, and an unusual science-driven love story. ☺

Screenings in the Caspary Auditorium (Mondays at 8 p.m.)

May 12, *The Diving Bell and the Butterfly*

May 26, Short Science: A collection of short student films



*This month, Natural Selections features Sharisse Brown, Assistant Director of Tenant Services in the Housing Office
Country of Origin: USA*

New York State of Mind

1. How long have you been living in New York? All my life—38 years.

2. Where do you live? Queens, NY, but was born in the heart of Harlem.

3. Which is your favorite neighborhood? Harlem. When I was growing up, everyone and everything in Harlem was real. Money and status never played a part in how you were viewed as a person. Everyone looked out for each other and made sure you lived life as your parents taught you.

4. What do you think is the most overrated thing in the city? A New Yorker's attitude. Most people who come to New York feel they need to have a hard exterior in order to make it while in fact, we are some of the friendliest people you would come across.

5. What do you miss most when you are out of town? Definitely the food, convenience, and night life. I love being able to jump in my car at midnight and do my grocery shopping or get a double dipped waffle cone at 1 a.m.

6. If you could change one thing about NYC, what would that be? Crowds in the residential areas. I don't mind walking around the city and rubbing shoulders with my fellow New Yorkers, but when I go home I would rather not live in an area where four to five two-family houses were built on a one-family lot.

7. Describe a perfect weekend in NYC. The perfect weekend in NYC would involve brunch at the Shark bar, followed by an afternoon of shopping in the city, lunch at Jackson Hole or BBQ's, a show on or off Broadway, dinner at Penang, and a follow-up at a lounge with friends. [On Sunday,] after a morning of Church service, I would opt to just relax and gear up for another filled week in the big city.

8. What is the most memorable experience you have had in NYC?

When my dance company, the JASPER Ensemble, won a place in Apollo history. We celebrated in the theatre and the theatrics just spilled out into the streets. All the passersby that weren't sure what just happened congratulated the dancers, smiled, and celebrated along with us.

9. If you could live anywhere else, where would that be? Anywhere in the Caribbean or Hawaii. It's such a great place to get away from for a period of time, but no matter how many times I visit these places, Dorothy from Oz said it best: "There's no place like home."

10. Do you think of yourself as a New Yorker? Why? Of course. Like most New Yorkers, I have an abundance of confidence, have made the decision to live life and not be in fear of what could be, and love to be in the thick of it all. Only in New York could you enjoy an international day of shopping in SoHo, eating in Little Italy, browsing in Chinatown, partying in Harlem, and entertaining on Broadway. ☺



Life on a Roll

Looking Forward



Images by Adria Le Boeuf

John Milton: Poetry, Prose, and Science

ZEENA NACKERDIEN

To many novices, the blending of science and art, highlighted in the RU *Science in the Media* series, seems to be a recent event. It comes as a surprise that cross-fertilization of the disciplines reaches back as far as the seventeenth century. John Milton, the English poet whose works are celebrated in an ongoing exhibit, *John Milton at 400—A Life Beyond Life*, at the New York Public Library, represented the embodiment of a writer who integrated activism, scientific knowledge, and poetry. Although the exhibit focuses exclusively on his life, prose, and impact on contemporary as well as modern artists, we can discover much about his scientific and political thinking by studying the poet's own words.

Milton is shown at the exhibit as a ten-year-old boy depicted in a stipple engraving. Who knew he would blossom into the writer of *Areopagitica*, an impassioned defense of freedom of speech and a foundational essay for the First Amendment to the US Constitution? Milton's other writings may have been more provocative, notably a tract justifying regicide which earned him a stint in prison.

The first half of the exhibit focuses on Milton's childhood, early career as a prose pamphleteer and member of Oliver Cromwell's government, marriages, progressive deterioration of his vision (possibly due to glaucoma), and some of his works. His epic poem, *Paradise Lost*, brings one closer to

appreciating the influence of science on his writing. Lines in the poem that speak of "a Tuscan artist viewing the moon through an optic glass" refer to the astronomer, Galileo Galilei, whom Milton met on a trip to Italy. In re-imagining the story of Adam and Eve, Milton drew heavily upon scientific lore of Medieval-Renaissance times to compare the universe in terms of Heaven, Hell, Earth, and Chaos. The other scientific allusions found by scholars in the poem may stymie the average reader, but we can all appreciate the creativity of a mind that incorporated "the paradoxical invention of gunpowder from materials in the soil of Heaven" into his poetry.¹ Add to these lines his nuanced interpretation of the good-versus-evil conflict and one begins to see why diverse figures such as Charles Darwin, Norman Mailer, Helen Keller, and Malcolm X found inspiration in his words.

Milton's appreciation of the sciences stretched beyond the imagery, as evidenced by his exhortations to others to advance their scientific studies to the "most exact structure and surgery of the human body," and by his understanding of the "godlike power and force of mind."¹ However, he had several critics, including Sir Walter Raleigh, who denounced his work as "a monument to dead ideas," and T.S. Eliot, who felt that his poems played a role in the "dissociation of sensibility" that occurred in English poetry after



Image courtesy of Wikipedia

Portrait of John Milton

Shakespeare and Donne.

The exhibit also reflects on music influenced by Milton's words. Joseph Haydn's 1798 oratorio, *The Creation*, is a brilliant adaptation of *Paradise Lost*, while the heavy metal band, *Cradle of Filth*, echoes Milton's sympathetic portrayal of Satan in their song *Better to Reign in Hell*.

The exhibit, which marks the quadricentennial anniversary of his birth, runs until June 14, 2008 in the New York Public Library. ☺

Reference:

1. K. Svendsen, *Milton and Science*. (Harvard University Press, Cambridge, 1956).

Je m'Excuse

Today with great sadness I am announcing that I'm officially hanging up my lab coat to prepare for a possible court appearance. I wish to set the record straight for all those under the delusion that I have disappointed them. A bitter and menacing e-mail has been circulated campuswide detailing new procedures to "prevent egregious embezzlement of research funds." Although I'm constrained by my attorney from speaking about this matter in great detail, I wish to point out that I am highly troubled by the skepticism expressed by the university's financial auditors just because I happened to have spent the majority of the last four months at conferences in tropical islands. Why not blame the conference organizers instead of venting an irrational jealousy of my tan in a completely inappropriate manner? If I had really wanted to abuse the system, why would I have refrained from using the hotel minibar? Some questions have

also been raised about my frequent dining at Masa billed to a lab expense account. I can only pity the sort of shortsighted penny pincher who would begrudge a couple of colleagues and me the basic \$800 sushi essential to facilitate a convivial atmosphere of scientific exchange. The lab funding that was accidentally transferred to my private bank account was the result of a simple clerical error on the part of a high school student who was very enthusiastic about gaining hands-on experience in the financial aspects of lab management.

Despite all my perfectly reasonable explanations, for those who might still question my integrity, to convince you of my unbounded ethical zeal I need only remind you of my efforts to secure the dismissal of a technician who had accidentally taken home a packet of lab Post-It notes.

You may have heard some nasty rumors about use of inappropriate Web sites.

I would like to point out that the many hours spent surfing *Scientific American* were not entirely wasted, as I did find some information about beetle foraging habits that will always be with me. I have now been identified as responsible for the controversial anonymous online science blog: *FoxScience*. Any comments posted there concerning university members that might be misconstrued as deeply vitriolic should actually be taken in the manner of friendly constructive criticism in which they were written.

Science is bigger than one individual. Doug, please take care of my constructs for me. I can't believe that I won't be around to see them grow up to full insert size. (Pause for tears.) I might have fallen victim to a horrendous injustice, but I take comfort that my cause is just, my citation record unparalleled, and my scientific immortality assured. ☺

Logical Fallacies of the Incredibly Credulous

MATT SEKEDAT

Last month I rambled on about the technique of skepticism and the utility of logic in our everyday lives. It's one thing for me to wax philosophic about it, and another to put it into practice. We have the difficult task of determining when to be skeptical and when to concede to a well-supported argument. There are no rules for this, but there is a list of logical fallacies that can be useful as a guideline. It is, of course, impossible to circumvent all of them all of the time. The more one avoids them, however, the more logical one's arguments become, and the less susceptible we are to being duped by pseudoscientific claims. Here I will discuss two logical fallacies, and apply them to a recent, newsworthy example.

1) Post Hoc Ergo Propter Hoc: This is an extremely common lapse in deductive reasoning. It translates from Latin to "after this, therefore because of this," but clearly a temporal correlation does not equal causation.

2) Observation Bias: Particularly relevant to research studies, this arises when people arbitrarily remember certain results. Also referred to as selection bias, an example some may relate to is when couples argue over whether the toilet seat is being put down regularly after use. Wives generally remember only the times that they find it up and argue that their husbands never put it down. Husbands, of course, only remember if they put it down and argue they never leave it up.

There are roughly 40 common fallacies in all,¹ but they demand more space in order to examine them adequately. I'll come back to them another time, but for now we can agree that arguments employing one of the above tactics should be identified as dubious at best. Use of one does not negate an otherwise strong argument, but can be a sign that your evidence is weak. Much of the full list is common sense, yet making a fallacy-free argument can be difficult. No matter how much restraint we have, it's easy to fall back on a logical fallacy or two. On the other hand, we can watch for them in order to guard ourselves against pseudoscientific claims simply by asking if the claimant is using fallacies.

All of this brings me back to the issue

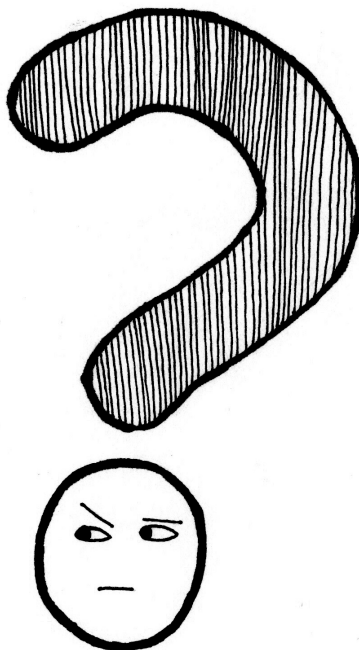


Image by Rossana Henriques

at hand; being skeptical is an offshoot of being scientific, but that does not mean that we should check our skepticism when we exit the front gates onto York Avenue. I have always been astounded by the popularity of "natural" remedies. They have the potential for benefit, but more often than not they tend to be overpriced vitamins and herbs marketed as cures. A recent class action suit against Airborne Health, Inc., the manufacturer of Airborne cold remedy, resulted in a settlement of \$23.3 million to be distributed among those who purchased their product.² The company was embarrassed when it was revealed that they had misled the public by advertising a clinical study that was suspiciously carried out in the basement of a house in Florida.³

Many people are still enamoured by the product despite zero evidence for a positive effect and several egregious examples of misrepresentation by the company. A 2004 review of their claims found "there is no conclusive evidence that this product or any of its ingredients prevents colds or shortens their duration," and the levels of vitamin C recommended (1000 mg per dose, 3 times

per day) may cause kidney stones.⁴ Likewise, each dose contains 5,000 IUs of vitamin A, which is one and a half of the safe upper limit⁵ (hypervitaminosis A can lead to birth defects and other serious problems).⁶ Still, advocates for the product will tell you that it drastically shortens, or even completely cures their colds. Why the discrepancy between science and the observations of millions of Americans? Once the logical fallacies are considered, it's easy to see where consumers have strayed. Proponents will tell you they took Airborne, and their cold went away; case closed. Post hoc ergo propter hoc—if you take a pill and your cold goes away, it does not mean that the pill led to this end. Many people claim that they used to get terrible colds all the time until they began using Airborne. This is a classical example of observation bias—they are preferentially remembering the times that it worked. There is a saying: "If left untreated, a cold will last seven days. If you take something for it, it will last a week." No one remembers a cold that goes away on its own, but you will always remember the times they are "cured."

We take these arguments for granted when we scrutinize a scientific study. Scientists would never take anecdotal or cherry-picked evidence as proof, nor would they assume causation without proper supporting evidence. This is especially true in cases like this one, having no prior plausibility for the product to actually work. We should apply this same skepticism when we are confronted with a bit of pseudoscience outside of our lab. It saves us from the trouble of mailing in receipts to get a refund for a product that does not work and that may in fact cause us harm. ☺

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1. <http://www.nizkor.org/features/fallacies/>
2. <http://airbornehealthsettlement.com/index.htm>
3. <http://abcnews.go.com/GMA/OnCall/story?id=1664514&page=1>
4. The Medical Letter on Drugs and Therapeutics, 1199, 2005
5. As defined by the Codex Alimentarius department of the USDA
6. <http://www.nlm.nih.gov/medlineplus/ency/article/000350.htm>

A Lab Quiz

ADRIA LE BOEUF

Are you receiving the training you deserve? How does your lab/professor match up to others? Try the professor/lab quality quiz!

The game works for both students and postdocs; for the postdoc version, change every instance of the word "student" to "postdoc," and let T_{PhD} equal the number of years of the average length-of-postdoc minus the number 4.

To assess the quality score of a professor's lab, simply gather the "Lab Statistics" values, and then gather the "Individual Experience Values" for as many fellow students or postdocs as possible. Average the I_i values, and plug everything in to receive the professor's Q_{prof} score.

A good score will be positive, and will vary in magnitude (about 5-20) between realistic students and postdocs (student

scores will likely be greater in magnitude); a bad score will be negative and will also vary between students and postdocs.

If you like the quiz and would like to know how your fellow colleagues calculated their Q_{prof} score, send in your results either to me at aleboeuf at rockefeller.edu or to *Natural Selections* at naturalselections at rockefeller.edu. If we get enough responses, we will publish the results based on your input. Please make sure to indicate who your boss is and whether you are a student or a postdoc. You can also calculate and send in your total Q_{prof} score using only your own I_i and V_{lab} values, if you prefer. If you go this route, please include the I_i and V_{lab} values in addition to the Q_{prof} score and we can average things here. ☺

Lab Statistics

S_{happy} = # of current content students

S_{deprs} = # of current depressed students

t_{prof} = time as professor (years)

$f_{\text{pub}} = \frac{(\# \text{ of papers/year}) * 10}{\# \text{ people in lab}}$

$X_{\text{prof}} = \frac{(\# \text{ of lab - alums who are now professors}) * 10}{t_{\text{prof}}}$

T_{PhD} = (average time to PhD) - 5

$f_{\text{fight}} = \frac{(\# \text{ of lab fights in the past year}) * 5}{\# \text{ people in lab}}$

$f_{\text{Sprob}} = \# \text{ of years in the past 5 with funding problems}$

Individual Experience Statistics

f_{talk} = hours spent talking with professor/week

q = quality of conversations ($0 < q < 3$)

t_{stud} = time in lab (years)

$f_{\text{wise}} = \frac{\# \text{ of times given very wise advice by prof}}{t_{\text{stud}}}$

$f_{\text{bad}} = \frac{\# \text{ of times given very bad advice by prof}}{t_{\text{stud}}}$

f_{pester} = # of times pestered for results/week

$f_{\text{coll}} = \text{days per month expected to work on something for which you will receive no credit}$

I_i = individual experience of individual i

Gather I_i for each student, i , in lab.

$$(1) \quad I_i = (f_{\text{talk}} * q + f_{\text{wise}}) - (f_{\text{bad}} + f_{\text{pester}} + f_{\text{coll}})$$

Average all I_i for values.

V_{lab} = lab vibes

$$(2) \quad V_{\text{lab}} = S_{\text{happy}} - (f_{\text{fight}} + f_{\text{Sprob}} + S_{\text{deprs}})$$

Q_{prof} = professor quality score

$$(3) \quad Q_{\text{prof}} = I_{\text{average}} + V_{\text{lab}} + f_{\text{pub}} + X_{\text{prof}} - T_{\text{PhD}}$$

In Our Good Books

The reading suggestions have been kindly provided by staff members of the downtown bookstore McNally Robinson.

The Frankfurt School Revisited and Other Essays on Politics and Society, by Richard Wolin

While useful as an introduction to and critique of the work of the Frankfurt school of thinkers, Wolin's true project over the course of these essays is an examination of the continuing validity of the social-democratic project, post-Enlightenment thought and, by extension, an indictment of many un-reflexively radicalized trends in current philosophy. A deft and engaging treatment of difficult and divisive topics.

Fragments of an Anarchist Anthropology, by David Graeber

This is one of the greatest pieces of radical thought that I have ever come across. I can't get over how much amazing stuff is in this little read. If anarchy, anthropology, egalitarianism, or direct democracy have any interest to you, then you'll love this.

Birding Babylon: A Soldier's Journal From Iraq, by Jonathan Trouern-Trend

Trouern-Trend, an avid birdwatcher, went to Iraq as part of the US invasion and took his binoculars with him. This fascinating little book blends birding, war, and sociological observations with sharp little illustrations. Birds and war. A bee-eater on barbed wire. It's both unsettling and hopeful.

I Am a Bunny, by Richard Scarry

With a raised fist, Nicholas makes an ontological claim that sets him apart from other species. Like Nietzsche's *Zarathustra*, the protagonist of this tale takes on the roughest conditions Mother Nature has to offer and keeps his inner strength and sanctity throughout. Apparently orphaned, Nicholas blasts through this setback while making the best of out anything. All other bunny tales pale in comparison (all apologies to Pat).

McNally Robinson independent bookstore is well worth a visit. They have a fantastic selection of books on their shelves. The store is located in NoLiTa at 52 Prince Street between Lafayette and Mulberry. Visit them on the Web at <http://www.mcnallyrobinsonnyc.com>. ☺



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