Issue 61
July/August 2009

Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

SECOND ANNUAL WORLD SCIENCE FESTIVAL SPECIAL

New York City hosted the second annual World Science Festival from June 10-14. The festival is founded by the husband and wife team of theoretical physicist and popularizer of science Brian Greene, and documentary film-maker Tracy Day. It includes panel discussions, lectures, presentations, the mathemagician, and a street fair in the hopes of making science understandable and interesting to the public. *Natural Selections* writers attended the festival and have the following reviews.

Time, the Familiar Stranger: Oliver Sacks and Friends

Felice Kelly

Dr. Oliver Sacks is a rock star in the pop science world. When your books have enchanted the audience before you even step on the stage, it may be inevitable that your actual presence will disappoint. I have to say, I was disappointed. This panel discussion about the perception of time was moderated by author Harold Evans and featured Sacks, psychologist Dr. Daniel Gilbert (author of *Stumbling on Happiness*), and neuroscientist Dr. Warren Meck. The discussion touched on many interesting points, but it never explored any of them in enough depth to provide the audience with real insight into how our perception of time affects our lives.

Much of the evening's discussion focused on prospection, the act of looking forward in time to consider or imagine the future. We use prospection to plan our lives—we look down the road and predict the consequences of our actions now. Gilbert thinks that this process is remarkable, but flawed, and flawed in part because we shorten the time scale of the future in our minds. In other words, when we imagine the future, we leave stuff out, and sometimes that stuff can be important in determining how happy we are when we get to the future. Of course, it's necessary to leave details out, or it would take as long to imagine doing something as to actually do it. Planning is a bit of a temporal trap, and one that does seem to come up in the lab a lot: if we take the time to plan carefully enough to foresee what will actually happen, it takes as long, or longer, to plan it as to actually do it. Of course, in the lab it's often worth the extra time to plan the experiment.

Dr. Sacks was largely quiet in the discussion. He contributed a few patient anecdotes, and spoke briefly about how both Turret's and Parkinson's syndromes can be interpreted as defects in time perception, and both syndromes involve a misregulation of dopamine, which is closely tied to our perception of time. He told a story about a Turret's patient he had, who could easily catch flies in mid-air because he perceived them to be flying quite slowly. He also spoke about a patient who would get stuck in a moment of time, and when brought back to the present, she would insist that no time had passed, despite the evidence to the contrary.

One of the most interesting parts of the evening was when Meck performed an experiment on the audience to test our time perception. He first "trained" us on a given interval between the appearance of a red square and its change to a blue square. He then left the red square on the screen and asked everyone to raise their hand when they thought the square should change color. He said this was a demonstration of the sorts of experiments they do in the lab, and that the whole thing would be taped for later analysis by age, but didn't tell us anything about the results they normally obtain.

The moderator, Evans, seemed a bit over-interested in drug options for changing time perception. In fact, it seemed to be an inside joke among the panelists throughout the discussion. Perhaps they did a little extra preparation for the evening, before walking on stage. All of the panelists seemed wary of going into any detail on any of these topics, I guess because they feared loosing the audience. The end result, though, was a conversation that never really seemed to get going. The total lack of structure led to a wandering thread of ideas, and left the audience with fun tidbits, but little else. ⊙

There is Something About Mind-Reading

Leah Kelly

I'm in a hall sitting a row away from Cameron Diaz, listening to Kraftwerk, wondering if I have come to the right place. The specially commissioned introductory visuals to the World Science Festival start, and I realize that indeed I have. I'm at the "Transparent Brain" session of the Festival. We've gathered to hear four panelists talk about whether we can read people's minds, and perhaps more importantly if we can, should we?

National Public Radio's (NPR) Brooke Gladstone oversaw the evening with grace and wit, and steered the experts from veering into jargon-laden monologues. On the panel we had: Professor John Donoghue, founding chairman of the Department of Neuroscience at Brown and currently the director of the Brown Institute for Brain Science; John-Dylan Haynes, Professor for Theory and Analysis of Large Scale Brain Signals at the Bernstein Center for Computational Neuroscience in Berlin; Frank Tong, a cognitive neuroscientist and associate professor of psychology at Vanderbilt University; Paul Root Wolpe, the Director of the Center for Ethics at Emory University.

Each researcher spoke about their work, followed by a debate about the unavoidable ethical questions raised by this type of research that we will no doubt be facing in the next decade or two.

As a neuroscientist, I empathized with the researchers. They were clearly passionate about the brain and their work was aimed at figuring out more about its function. It's easy to see though how the public could interpret their research as some sinister attempt at mind reading, and no doubt extrapolations of their findings could result in some dystopian nightmare.

John-Dylan Hayes first spoke about his research. Experiments involve presenting people with images of simple objects, then using fMRI to build individual image databases of brain scans in response to these different visual stimuli. From the personal image library, a specially designed computer program can then predict from a person's brain image which object the individual is looking at. A form of mind reading you might think, but John is quick to point out that the more complicated the images become, the more subtle the differences are in the brain images. Also, these will be different across individuals as well, so we are far from being able to read another person's mind. At the moment we can tell that a person is looking at the same picture of an orange that has previously been presented to them.

More interestingly, when the database is built from brain images made during a decision-making task, the program can predict which decision a person will make based on brain activity, before the individual is actually conscious of making the decision—our pattern of brain activity gives away the decision, before we know it ourselves!

Frank Tong is asking similar questions with his research. He wants to know when people are looking at something, what part of the image they are really focusing on? By recording images from human brains when their attention is focused on different orientations (for example: lines), he can use brain scans in the individual's library to predict the part of the image that person is focusing on in a complex scene. Also what is striking is that, from these brain scans, he can tell about an object that the person is imagining, completely independently of any actual visual stimulus. This is one step closer to reading people's thoughts rather than just reading out a response to the presentation of an image.

These findings are still mainly confined to laboratory research, shedding light on the way the brain responds to stimuli and processes information. However, Gladstone was keen to highlight how these tools could, and probably will be applied in the everyday world, from job recruitment to courts of law.

Some of the research presented is already dramatically affecting peoples' lives, providing the basis for some undeniably useful applications. Donaghue and colleagues have developed technology that enables people who are paralyzed through stoke or spinal cord injuries to move prosthetic limbs, or even a wheelchair, via an electrode that reads out the spiking of neurons and translates this information into movement. These studies are in early stages: although only four people were analysed, he seems confident that this will develop into movement of real limbs via implantation of tiny electrodes and wires. The age of the bionic man is upon us. Are we ready for it?

Paul Root Wolpe doesn't think we are. He says we need to be thinking about how we want this technology to be used in society and how the law should be changed accordingly. Do we own our own thoughts? Will the police have thought warrants? How much can we rely on these mind reading machines? Will people have to testify though a computer? Will underlying bigotry be exposed, maybe bigotry that we ourselves are not even aware of?

It's hard not to default to Orwellian clichés at this point. Wolpe's take-home message is clear: although we're not there yet, technology is progressing fast and we need to be vigilant as a society about where we want to set the boundaries and who gets to set them. ⊙

Be Kind, Read This Article

Anna Magracheva

Humans aren't the only animals to exhibit cooperation, so how are we different from other animals? On June 12, as part of the second World Science Festival, Alan Alda moderated a discussion called "What it Means to be Human: The Enigma of Altruism" at the Skirball Center for the Performing Arts at New York university. The panelists included Rob Boyd, Professor of Anthropology at the University of California at Los Angeles; Sarah Hardy, anthropologist and Professor Emerita at the University of California, Davis; Dominic Johnson, who combines degrees in evolutionary biology and political science to study the role evolution plays in human behavior; Xavier Le Pichon, Professor and Chair of the Department of Geophysics at the College de France in Aix en Provence; and Edward O. Wilson, noted sociobiologist and Pulitzer Prize winner. The panel opened by defining altruism.

To define what makes us human and determine what made us that way, we have to start by finding a working definition of altruism. The panel agreed that altruism is not exactly the same as cooperation, since with cooperation both parties benefit. E.O. Wilson pointed out that the question of altruism in humans is more complicated than in animals because of the role genetics plays. There must be a point where altruism evolved.

The first social insects appeared during the Jurassic Period, and once creatures with a forebrain appeared, evolution of social creatures really took off. The research of our own Rockefeller University (RU) professor Donald Pfaff is an example. Also, it seems that some degree of altruism is innate, as Alda illustrated with a video where kids watched adults struggle to pick up something out of reach. The kids, not yet able to talk, would spontaneously walk over and pick the item up for the adult. Monkeys exhibited the same behavior, as well as cooperation when it was necessary for both monkeys in a cage to pull together on a rope to get a treat. Evidence of human altruism reaches back as far as 40,000-70,000 years. A skeleton of a blind, crippled man was found buried in Iraq dating back to that period. Because the man was in his 40s it meant that the society took care of him when he was alive, as well as giving him a proper burial.

The panel still wanted a "boom" moment, a point in time to which you could pinpoint the beginning of altruism. The "boom" moment that was introduced was in insect evolution. Out of many radiating lines of evolution one had a mutation that led to a nest that was better, and as a result the young did not leave the nest, meaning the mother didn't have to rebuild the nest later. The insects pool resources and remain in one area. Now they are collaterally related, and exist as a group. The selective pressure of the group overcomes selfish

tendencies. But leave it to E.O. Wilson to come up with an example from the insect world.

An explanation of the development of altruism has to reconcile individual benefits versus benefits to the group. It takes the development of empathy, cooperation, and self-monitoring. There's no doubt that altruism is a complex trait, which is why it is so rare, even among those that have already developed it. ⊙

Science, Faith, and Religion

Leah Kelly

"We don't think enough about God to talk about him" spouted Lawrence Krauss. A slightly more diplomatic take perhaps than the ever-controversial Jim Watson proclaimed at the opening gala for the World Science Festival: "There is no reason to believe in God."

So why have this panel? Why have a discussion about God at a science festival? A cynical view might be that this is America and certain sponsors needed to be pleased. "We may as well have a panel on science and pornography," Krauss continued. This joke and metaphor was revisited throughout the discussion by all panel members. The fact is, it is a common and perpetuated view that science and religion need to be pitted against each other. By bringing a scientific believer, a Jesuit Ph.D., an atheist philosopher, and an agnostic scientist together, the goal for this panel discussion was to demonstrate that science and religion can exist in harmony side by side. Even if this was not the original intention of the debate, or even if the debate had an intention, it's the conclusion that emerged. Believer or non-believer, we are all just looking for answers and I think the debate was successful in highlighting that.

The panel consisted of the Catholic cell biologist: Kenneth R. Miller, Professor of Biology, Royce Family Professor for Teaching Excellence at Brown University; the Jesuit cosmologist Brother Guy Consolmagno earned undergraduate and masters degrees from MIT, and a Ph.D. in Planetary Science from the University of Arizona, he was a researcher at Harvard and MIT, served in the US Peace Corps (Kenya), and taught physics at Lafayette College, Pennsylvania, before entering the Jesuits in 1989; the atheist philosopher Colin McGinn, Professor of Philosophy at the University of Miami, his research interests include the philosophy of the mind (particularly consciousness, intentionality, and imagination), as well as ethics, and philosophical logic; the non-believing scientist Lawrence Krauss, Foundation Professor in the School of Earth and Space Exploration and Director of the Origins Initiative at Arizona State University.

The debate was hosted by journalist Bill Blakemore who has been with ABC News since 1970, and has been ABC's Vatican correspondent throughout the papacy of Pope John Paul II, and was ABC's Rome Bureau Chief for six years.

The panelists were very self aware that they were very white, and very male, engaged in clever banter with an openness and a begrudging acceptance of each other's views. It was a rhetoric of language and metaphor, with talk of Popper, irrationality, evolution, and Santa Claus, but they also knew it was probably futile to expect to change anyone's opinion on personal faith or lack of it dramatically.

I think it was apparent to the audience that if everyone of faith were as intelligent and well-educated as the panelists, then none of the negative extreme behavior associated with religion would exist. The point everyone agreed on was that education was key. Miller said "I believe in God because evolution is right." I left with a positive feeling that people could believe what they wanted without imposing on the progression of science and vice versa.

Miller summed it up: "Science is understanding seeking truth, and Faith is truth seeking understanding." Both science and faith are about asking questions. But the real question was—where was Richard Dawkins? Maybe he will be on the 2010 panel on science and pornography. ⊙

Free Willing Along

Anna Magracheva

Moderator Sir Paul Nurse, who needs no introduction, started off questioning if his presence as the moderator was an exercise of free will. "Yours to Decide, Fate, Free Will, Neither or Both?" was held June 13, at the 92nd Street Y. The panel began by defining free will. Patrick Haggard, a researcher at the Institute of Cognitive Neuroscience, University College London defined it as the ability to respond when it is not obvious what the response is, something entirely different from reflexes. Alfred Mele, Professor of Philosophy at Florida State University describes it as being a rational decision, made without coercion, and executed without pressure while it is possible that another decision could have been made. The third panelist, Daniel M. Wegner, Professor of Psychology at Harvard University, jokingly pointed out that the panelists had all sat down and crossed their legs in the same fashion, therefore defining free will as that which seems to be lacking on stage.

If the world is deterministic and you can use information you have to accurately predict what will happen next, then free will can't exist. If we look at the world through quantum mechanics, which says that the world is probabilistic, we can have free will. However, does randomness lead to free will? If you think of quantum mechanics as a roulette wheel in the brain, then making a decision by spinning the roulette wheel would be random, but would not equal free will. The panelists' definition of free will really equated more to complexity of a decision than to what many people define as free will, a completely independent decision.

When it comes to moral responsibility and free will there is a lot to explore, and the panel was only able to skim the surface. We worry that morality will go away if we define brain workings like those of a machine, since philosophers say free will is required for moral responsibility. Will we have to adjust the law to accommodate genetic and biochemical explanations of the mind? Roman law required mens rea, or a "guilty mind." But does it exist in an individual like Phineas Gage, whose personality changed completely after a metal rod destroyed his frontal lobe, or in someone who claims that they aren't responsible for the crime they committed because they were born homozygous for the U allele of the tryptophan hydroxylase gene? There is a need for neuroethics to be developed to deal with these issues.

It is important to differentiate between free will in thoughts versus actions. While chaos and random events lead to actions, free will can't be simply about acting randomly. It has to be a self controlled action. In closing out the discussion, Paul Nurse asked the three panelists point blank if there is free will or not. Alfred Mele related the question of free will to the question of what level of control is needed to be held accountable for an action. Patrick Haggard said that the interesting topic of research is into how the brain handles situations where there is not an obvious answer. Daniel Wegner pointed out that the real question when it comes to free will isn't whether we have it or not, but what gives rise to the feeling of free will? ⊙

Rated XX: Being an expectant postdoc

Jeanne Garbarino

I am about to reveal the profoundness of my inner nerd by admitting that Tuesday is my favorite day of the week simply due to the presence of the science section in the *New York Times* (no, I don't get out much in case you were wondering). So, as I perused through these much anticipated articles on a recent June Tuesday, I came across a report entitled "Women Bridging Gap in Science Opportunities" that caught my eye. Essentially, the point was that women working in science, mathematics, and engineering are being offered similar opportunities to their male counterparts. However, the article also mentioned that despite the growing number of women holding Ph.Ds in the sciences, the female applicant pool was still relatively small. Has the glass ceiling transformed itself into a retractable dome? Perhaps. Regardless of the many issues involving male-female inequities, this article got me to think about how things have changed over the years, in particular on the subject of having a baby while working in the lab. This is a very pertinent topic since I, myself, am extremely pregnant while writing this (and by extremely pregnant I mean that the onset of labor can occur at any moment).

Cartoon by Adria Le Boeuf

In order to respect my need for keeping things organized in a chronological order, I will start by describing what it was like for expectant postdocs in the late 1970s at Rockefeller University (RU). Luckily, I was able to contact two very successful women for their input on this matter: Dr. Debra Wolgemuth, Professor of Genetics and Development and head of the Ph.D. program at the Institute of Human Nutrition at Columbia University; and Dr. Selina Chen-Kiang, Professor of Microbiology and Immunology as well as Pathology and Laboratory Medicine at Weill Cornell Medical College. Both of these extraordinary women trained as postdocs in the laboratory of Dr. James Darnell and both of these women had children while doing so. Although it is impossible to fully capture one's experiences with such a brief description, I will try to describe the general atmosphere for which these women worked as accurately as possible.

During their tenure in the Darnell laboratory, both women studied RNA metabolism at a time when the concept of splicing was just emerging. Needless to say, this was an exciting era for geneticists and developmental biologists. However, this excitement also brought with it an intense pressure to publish, maybe even more so for the women in this field. It was generally the case that women in these positions felt the need to out-perform their male peers just to be respected at a similar level. In my discussion with Dr. Wolgemuth, she described the general environment at RU as very hierarchical, with very few women role models (who might have held assistant professorships at best). She hypothesizes that the aggressive environment, "life in the fast lane", just didn't attract women in large, or even modest, numbers. In the Darnell lab, she recalls there being about five female scientists, including Dr. Chen-Kiang. Furthermore, Dr. Wolemuth did not fail to emphasize that these women were all highly motivated individuals–a necessary trait required for survival. Although these women were dedicated to their scientific careers, a higher power infiltrated several of their own biological mechanisms: the desire to have children.

Dr. Wolgemuth and Dr. Chen-Kiang both became pregnant around the same time while working in the Darnell Laboratory. Although Dr. Chen-Kiang fondly recalls the supportive and thoughtful nature of her mentor, both women have described encountering unfavorable situations with their male peers, namely several of the male postdocs within importance to these women thereby restricting their abilities to work with certain reagents. Perhaps their male counterparts found this to be unfair as they did not necessarily have a valid reason why they could just stop working with something. Also, having women in the lab, especially women who were expecting, was not a common occurrence and it is very likely that there was no real established protocol leaving the men in very unfamiliar territory. Unfortunately, unfamiliarity can often lead to rejection and aggressive behavior. In fact, Dr. Chen-Kiang remembers a sentiment from one of her male colleagues that it would be better to be pregnant with twins–this way your time away from lab work would actually be worth it. And Dr. Wolgemuth recalls trying to exit the floor coldroom on a Sunday afternoon only to encounter a male colleague observing from the corridor as to how "superwoman was going to get it together" (getting the coldroom door open when your baby in vivo was as big as the HeLa cell culture bottles—actually not easy to negotiate)—well she got out of the coldroom, no thanks to the colleague.

While on the topic of having no established protocol, I questioned both women on the terms of maternity leave. To my surprise, there was no such thing as maternity leave at that time. Having had a child two years ago and knowing how much time it takes to get used to the physical changes (including a severe lack of sleep), I could never imagine being able to get back to work in such a short time frame. I suppose this is a testament to how devoted and driven these women, and women just like them, were. Both women worked straight up to their due date, something that is very commonly done now. However, their time away from the laboratory was significantly short. Dr. Wolgemuth stayed home for approximately two weeks (normally allotted for vacation purposes) before returning to work. Luckily, she was able to arrange for her first few weeks back in the lab doing mostly data analysis. Dr. Chen-Kiang was in a very fortunate situation where she was able to time the birth of her child with the writing of a review article–a process that could be done from home (except for when she had to go into lab to get her papers since the Internet and PubMed was not an option back then!). Of course, these arrangements would not have been a possibility if childcare was not attainable. Because her husband was a lawyer and had a paycheck significantly higher than that of a postdoc, Dr. Wolgemuth was able to hire a nanny. Dr. Chen-Kiang was also in a favorable financial situation and could afford a nanny to help take care of her newborn. Both women state

New York State of Mind

This month* Natural Selections *interviews Elizabeth Glater, Laboratory of Neural Circuits and Behavior (Bargmann Lab).
Country of Origin: USA

How long have you been living in New York? I have lived in New York for about two and a half years.

Where do you live? I live close to Rockefeller on the Upper East Side.

Which is your favorite neighborhood? I am still exploring the city and deciding on my favorite neighborhood. I like neighborhoods where you can sample food and hear languages from different parts of the world like Chinatown and Jackson Heights.

What do you think is the most overrated thing in the city? And underrated? This is a hard one. New York lives up to its reputation in almost everything I can think of. So as a native Bostonian, I'll have to say the Yankees are overrated, and hope I don't get into too much trouble for saying that! As for what is underrated, I think that New Yorkers are actually very kind and helpful to one another and this is often underrated. Strangers are almost always willing to give you advice (sometimes even before you ask!) about the best subway and bus routes, ways to hail a taxi, and restaurants to try or avoid.

What do you miss most when you are out of town? I miss people-watching. In New York, there is always something a little out of the ordinary going on whether it is a dog wearing sunglasses, a layperson jumping into the street to direct traffic for no apparent reason, or Ben Affleck arguing with the Paparazzi. The best part is that while some people will stop and stare, others will just walk right by.

If you could change one thing about NYC, what would that be? I would appreciate it if drivers were less aggressive taking turns when there is a walk light.

Describe a perfect weekend in NYC. A perfect weekend in NYC would include great weather, meeting friends for a great dinner, preferably at a restaurant with outdoor seating, and attending a play. Sunday would start with a delicious brunch at home followed by an afternoon in Central Park where I would read a novel under the shade of a big tree.

What is the most memorable experience you have had in NYC? My favorite experience so far has been seeing the Broadway show "In the Heights"—it is an amazing show and cast.

If you could live anywhere else, where would that be? I think London would be fun because it has great theater and you don't need a car.

Do you think of yourself as a New Yorker? Why? I don't think of myself as a New Yorker yet. I don't wear that much black and have more patience than many New Yorkers. However, strangers have started asking me for directions, and so maybe I am starting to appear more local. ⊙

that continuing with their career would not have been a possibility if it were not for their childcare situations. Knowing firsthand how difficult it is to find affordable daycare, I can certainly say that fate was on their side!

Fast forward to present day. Luckily, women like Dr. Wolgemuth and Dr. Chen-Kiang have paved the way for someone like me who desires the best of both worlds—a successful scientific career and a happy family life. I would like to add that this is entirely possible because not only have these two women maintained stable families, their children have gone on to do great things. Selinas daughter is currently an MD/PhD student at RU, and Debra's daughter is a graduate student at the School of Social Work at Columbia University and her son is a financial analyst at US Airways. I became pregnant with my first child during the second to last year of my graduate studies and received nothing but support and praise from almost everyone. Surprisingly, the only negative feedback I received was from a fellow female graduate student. She was under the impression that the timing of this child would significantly impact my ability to graduate in a reasonable fashion. (FYI, I was the first person in my class year to graduate). Although I received an incredible amount of support, the pressure to graduate was very intense and I was only able to stay home for six weeks; certainly a lifetime in comparison to the experiences held by women of previous generations. Maternity leave policies are a little different for a postdoc at RU now. After becoming pregnant with my second child as a postdoc here, I found myself doing some required research on this topic. I learned that postdoctoral associates are given six to eight weeks paid maternity leave, depending on mode of delivery (vaginal versus cesarean birth), and that this can be further supplemented by vacation time (not inclusive of winter holidays). Leave time for postdoctoral fellows is subject to the stipulations set forth by their grant, but similar to postdoctoral associates, vacation days (sans winter break) can also be tacked on to this time giving an average of nine to twelve weeks total paid leave. I will say that we are lucky in comparison to many women who are in similar positions. However, I strongly feel that although much progress has been made, maternity leave (and paternity leave) as a whole is still a concept that is under construction. I hope that one day it would automatically be assumed that a mother takes six months paid leave to be with her child without it being considered an atrocity towards laboratory progress. For now, we should be thankful that there is legislation on our side and know that it is obviously getting better with time. At least for postdocs at RU. ⊙

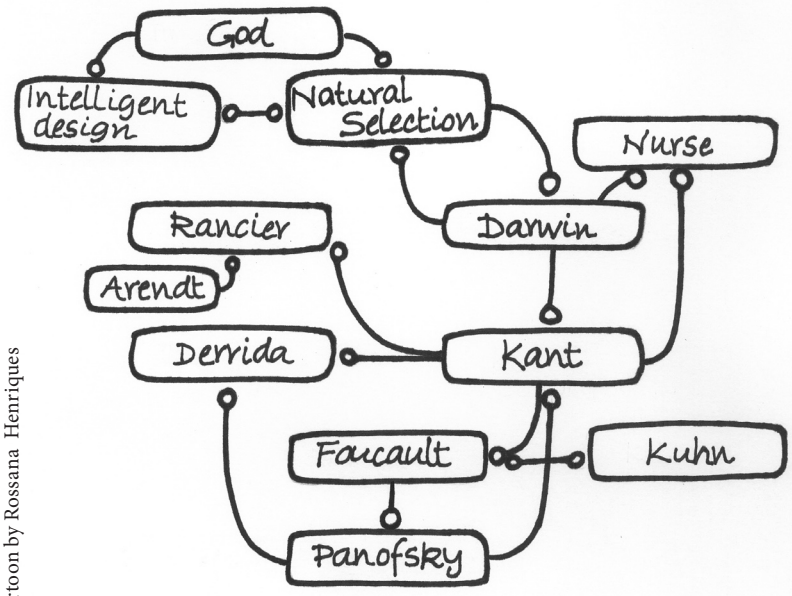
The Order of Things

Bernard Langs

I recently read an interview with Sir Paul Nurse, President of The Rockefeller University (RU), in which he is challenged to defend Charles Darwin and the process of natural selection. As I took in the text of the discussion, I was intrigued and quite pleased that Sir Paul stated in the conversation that "Kant was the first person I came across talking about systems, etc. over 200 years ago." It just so happens that I am currently reading Immanuel Kant's, *Critique of Judgment* and was happy to hear that Dr. Nurse had at one time experienced the pleasure, or in my case, the struggle, of diving into the pool (or abyss) of that philosopher's oeuvre.

A few weeks after coming across the Darwinian debate with Dr. Nurse, I read a passage in the "Judgment", where Kant appears to be, from what I can decipher, making a rather modern argument against the theory of Intelligent Design and Creationism. For example, he writes, that "…we do not convert nature into an intelligent being, for that would be absurd; but neither do we dare to think of placing another being, one that is intelligent, above nature as its architect, for that would be presumptuous." Of course I am taking the passage out of context, and perhaps twisting it to suit my purpose, much like statisticians who manipulate data. I was led to Kant through reading French philosophers such as Derrida and Foucault and especially Jacques Rancier (Hannah Arendt, a German philosopher, was much indebted to him as well). I have read some modern French philosophy on and off over the years, and returned to it after joining an architecture Web group that posts chapters from philosophical writings that view architecture as a possible source of helping mankind get out of its modern treacherous condition. This concept, the discussants almost take as a given, is not utopian rhetoric, but a concrete plan towards learning how mankind got into this global mess and then taking that knowledge to make an ordered blue print on how to alleviate suffering.

One of the books I decided to read as a consequence of the selections posted by this group was Michel Foucault's *The Order of Things: An Archeology of the Human Sciences*. This book by Foucault was of interest to me since I am an employee at RU, where I am not a scientist, but work as support staff. I do have a degree in biology however, and am able to catch the drift of a technical treatise or journal article. I have read a lot of Dr. Nurse's secular writings as well as his fascinating Nobel lecture. As I read Foucault, I wondered if Dr. Nurse or any other RU scientists had dabbled in the area of French philosophy and if this area of study was of any consequence to the field of medical research. For if architecture, which exhibits this symbiosis with philosophy, offers a step towards corrective planetary measures, surely so does science, and perhaps all of these disciplines might find common ground and a certain kind of kinship.



Cartoon by Rossana Henriques

Foucault's point in *The Order of Things* is that there is no flat, one-dimensional time line in scientific discovery. Over thirty years ago, I read Thomas Kuhn's The Structure of Scientific Revolutions and I seem to recall that his theory took a more linear approach. As a counterpoint, Foucault writes in the Forward to the English Edition of *The Order of Things:* "For, on the one hand, the history of science traces the progress of discovery, the formulation of problems, and the clash of controversy; it also analyzes theories in their internal economy; in short, it describes the processes and products of scientific consciousness. But on the other hand, it tries to restore what eluded that consciousness: the influences that affected it, the implicit philosophies that were subjacent to it, the unformulated thematics, the unseen obstacles; it describes the unconscious nature of science."

While I was reading Foucault, I pondered sending Dr. Nurse a copy, as I had once thought of sending him, upon his accession to the Rockefeller throne, an imitation ivory panel of a small Medieval carving of God's act of the creation of the animals, Genesis. This, in my imagination, would have adorned his new office. I decided against the gift, and was amused when a couple of months ago I stumbled upon a speech he gave at Christ's College comparing Milton's vision of "the" creation to Darwin's. Truth be told, I am very fond of Renaissance and Medieval art and have read a tremendous amount on the subject. In fact, Foucault's approach to the history of science to mirror Professor Erwin Panofsky's system of deciphering the meaning in the visual arts by intensive study of all areas—social, political, and religious—of the era from which a work is produced. French philosopher Jacques Derrida, in his book, Truth in Painting takes a nearly Panofskian look at this medium through deconstructionism. It was this book that made me decide to read Kant's Judgment rather than the more famous *Critique of Pure Reason* since the Judgment delves into art as well as the systems referred to by Dr. Nurse in the interview on Darwin. Perhaps we have come full circle.

I was recently walking on our campus with a colleague (who is not a scientist) and we were taking in the beauty of the surroundings. I told him that I am not a traditionally religious person, but that I believed that on some level, "God" had given us this beautiful world with trees and clouds eons ago, and then, like Elvis, had "left the building," that is, departed for good to leave us to our own devices to enjoy it. I hope that science, art, and architecture will help us return to peace, so that we may enjoy our stay here in this world again. Somehow, it's not Intelligent Design, and not purely Darwinism one ponders, but in the words of the film character Forrest Gump when discussing whether or not there is an ordained fate, maybe it's both. But it is only science that can give a rational account of the structure of everyday biology and matter through systems, physics, mathematics, etc., while thoughts on how and why it all began (Creation) are left to the poet. ⊙

Summer in the City

Aileen Marshall

New York City has been called the Capital of the World. There are so many exciting things to see and do in the city. Unfortunately, it can also be one of the most expensive cities to live in or visit. That makes it tough for those of us in the academic sector who don't make Wall Street salaries. However, come the hot summer days, there is a wide range of outdoor activities that are either free or inexpensive.

Probably the most well known are the free concerts at the Great Lawn in Central Park. The New York Philharmonic will present its usual two concerts this year: on July 14 and July 17, 2009. Concerts start at 8:00pm and there are fireworks afterwards. These concerts are famous for people picnicking on the Great Lawn, usually with wine and cheese. Enter the park at 79th or 85th Streets and Fifth Ave. If you are more interested in hearing the concert, arrive early to get a place up front. The more serious picnickers are toward the south end. More information about these concerts can be found at www.lincolncenter.org.

Another great Central Park event series is SummerStage. At Rumsey Playfield, this is a series of a wide range of music, dance, and spoken work productions. Most events are free, but there are a few benefit concerts put on throughout the summer. This year the Metropolitan Opera gives free presentations in Central Park's Summer Stage on Monday, July 13, and at East River Park on Friday July 31. The headliners this year include Ziggy Marley, the New York Pops and Comedy Central. Enter the park at 69th Street and Fifth Avenue and follow the path to Rumsey Playfield. For some of the more popular artists, a line forms in front of the gate well beforehand. There are bleacher seats in back, with Astroturf up front, sometimes setup with folding chairs. You can bring in food, but no glass bottles. There are food vendors inside. For a complete schedule, go to www.summerstage.org.

One of the best Central Park activities is Shakespeare in the Park. Produced by the Public Theater and presented at the Delacorte Theater, this year's play will be Twelfth Night from June 10 through July 12. Tickets, although free, can be obtained by standing in line in front of the Public Theater the morning of the play, or in front of the Delacorte Theater from 1:00pm. These are very good productions which usually draw a crowd. The complete schedule can be found at www.publictheater.org.

Lincoln Center hosts some very fun and inexpensive events in the summer. Lincoln Center Out of Doors presents a range of international music and dance events, with some special events for children. This series is free and runs from August 5 through 23 this year. Midsummer Night Swing is a run of dance events with everything from salsa to disco from July 7 through July 25. There are group dance lessons at 6:30 p.m. and live music at 7:30 p.m. Tickets are $15 and can be purchased on the day of the event or online. Both series are on the Josie Robertson Plaza at Lincoln Center and more information can be found at www.lincolncenter.org.

SummerStage at Central Park

HBO sponsors a summer film series at Bryant Park. On Monday nights, the movies this year range from Hitchcock's The Birds, to Rocky. Blankets and food are allowed. The lawn opens at 5:00 p.m., but there is usually a crowd gathered well in advance to get a spot. The movies begin at sunset, and they show an old Warner Brothers cartoon beforehand. People will cheer for Porky Pig's famous sign off. (…That's all folks!). The complete schedule is at www.bryantpark.org. At both, the Central Park Great Lawn concerts and Bryant Park, it is traditional to have some members of your group arrive early to secure a spot, and have some predetermined arrangement of balloons or a flag for the rest of the group to find.

Another great venue is Hudson River Park. It runs for five miles and hosts a plethora of summer events, all of which are free. The Moon Dance series features a live band on Friday nights, ranging in style from swing to tango. On Pier 54, on West 14th Street, dance lessons are given at 6:30 p.m. and the bands start at 7:00 p.m. The RiverRocks series, also on Pier 54, focuses on up-and-coming musicians. The River Flicks events feature two series of outdoors mov-

Bryant Park

1996.

ies. The Wednesday night movies are held on Pier 54 from July 8 through August 19. The theme this year is *I Know What You Saw Last Summer* including such great movies as *The Dark Knight* and Vicky Cristina Barcelona. The Friday night movies are more family oriented, including such fare as *The Wizard of Oz* and *Star Wars: The Clone Wars*. These are shown on Pier 46, at Charles and West Streets. Both movies series start at sunset. Free popcorn is available if you get there early. Some seating is provided, or you can bring a blanket to sit on. The RiverFlicks events are usually not as crowded as the Bryant Park movies. The Hudson River Park Trust also hosts several other series of free summer events, more information can be found at www.hudsonriverpark.org.

The River-to-River Festival, meant to boost the downtown economy, hosts almost 500 different free cultural events June through September. They host a variety of artists; from Arlo Guthrie to a showing of the movie *West Side Story*. Information about these many events can be found at www.rivertorivernyc.org.

There is a series of free concerts on Roosevelt Island, http://www.rooseveltlive.com/.

Two good Web sites to find information about these and other events in the city are: www.newyorkled.com and http://newyork.citysearch.com. The NewYork led site also includes a complete calendar of the city's many street fairs. With all of these options available, one can have a great summer in the city without going broke.

(*Please note: this is an update of an article that originally appeared in* Natural Selections *in June 2006*) ⊙

Cool Places to Drink when the Weather is Hot

Shauna O'Garro

Bohemian Hall is considered the granddaddy of all beer gardens in the city. For a long period of time, it was the last remaining beer garden in New York City—there used to be hundreds. Although there has been a recent resurgence in the beer garden style bar, this place is an old favorite for New Yorkers. The Hall, also known as the Czech Beer Garden, attracts so many people because of its large outdoor seating area, its selection of Eastern European beers, and its delicious kielbasa and wurst from the grill. They also have a table service menu offering hearty Czech fare. The crowds drawn to the beer garden are representative of every type of New Yorker, and the bar is family-friendly so children are an integral aspect of the bar's atmosphere. You will often find them playing on the stage in the center of the garden (if there isn't a band or televised sporting event being shown). Before they renovated, dedicated beer drinkers would brave bathroom lines that could make a grown man cry, but they've added an extension that is exclusively bathrooms, which all patrons of the beer garden appreciate. Bohemian Beer Hall is a must for anyone looking for a great outdoor bar experience.

Bohemian Hall and Beer Garden
29-19, 24th Ave., Queens, NY
http://www.bohemianhall.com

Although it's the newest beer garden in the game, Studio Square is well on its way to becoming New York City's favorite outdoor drinking spot. While Bohemian Hall has a rustic, old-world appeal, Studio City is modern and industrial. It is the largest beer garden in the city by far, measuring 18,000 square feet, and it has a large indoor seating space as well. Their beer selection isn't as appealing to the beer aficionado as it could be, but they do have a large selection of beers. Sangria is also on tap, for those who want alcoholic refreshment on a hot summer day but aren't in the mood for beer. They also have a grill serving up sausages, wurst, and burgers, which are all delicious. When the line for the grill gets too long, or if you don't eat meat, sushi is also available. There's a fire pit for when the nights start to get chilly, too. Despite it being the new kid on the block, Studio Square has the kind of inviting atmosphere that will draw you back more than once over the summer.

Studio Square Beer Garden
35-33, 36th St., Queens, NY
http://www.studiosquarenyc.com

While the Boat Basin Cafe isn't technically a beer garden, there's no way it should be left off of this list. Right along the Hudson River (you can dock your boat there and then have a bite to eat at the restaurant), the cafe offers beautiful views of the river and of the Palisades over in New Jersey. The beer is relatively cheap, as is the basic grill grub. There are more upscale offerings on the menu for those who are sick of burgers and brats. The place can get really crowded—who can resist a view of the river, the limestone arches of the rotunda, and the open-air patio? Even when it's

crowded it's a great place to relax and have a drink while checking out a summer sunset.

Boat Basin Cafe
West 79th Street & the Hudson
River, New York, NY
http://www.boatbasincafe.com

From the proprietors of the Bohemian Hall, we get the hip Radegast Hall, in Williamsburg. It is not outdoors, but the garden area has a retractable roof. The hall is filled with long tables, although the main bar area has large, comfy booths, that contribute to a jovial but laidback atmosphere. Like every bar on this list, Radegast is the type of place where the concept of time is lost as you enjoy their great beer selection and advanced grill options. They serve sausages and burgers like every other beer garden, but take it up a notch with their Angus burgers and venison sausage. Their main menu offers up entrees such as braised rabbit and French rib steak. Although it offers more sophisticated beer and food options, Radegast is still a place where you can go when you want to have a simple, relaxing time with friends.

Radegast Hall & Biergarten
113 N. 3rd Street, Williamsburg,
Brooklyn NY
http://www.radegasthall.com ⊙

On Higher Ground: The High Line Opens in West Chelsea

Carly Gelfond

The year is 1980. After 46 years of operation, the last train ever to run along the raised railroad known as the High Line makes its way down the tracks, pulling three carloads of frozen turkeys.

Now turn the clock back to 1947. The City of New York has just authorized street-level railroad tracks down the West Side of Manhattan. In the years that follow, accidents between freight trains and traffic at street-level give Tenth Avenue the nickname "Death Avenue." A group of men on horseback known as the West Side Cowboys provides some degree of safety, riding in front of trains and waving red flags to keep people out of harm's way. 1929 becomes the year of the West Side Improvement Project, a joint effort between the City and State of New York and the New York Central Railroad, which comes after years of public debate about the conditions the railways have created. Included in the plan is the High Line, and the thirteen-mile-long project eliminates 105 street-level railroad crossings. Officially opening

in 1934, the High Line runs directly into factories and warehouses. Trains roll right inside buildings, carrying items like milk, meat, and produce in and out without encountering the street-level traffic below.

Yet as the 1950s roll in, so does the interstate trucking industry, which leads to a drop in rail traffic nationwide. Our story now includes a new victim: the High Line itself becomes obsolete.

But wait. The history books are not finished with the High Line. For brevity's sake, let's cue the high-speed montage: as we race through 1999, we see the community-based nonprofit group Friends of the High Line form to save the structure, which is under the threat of demolition. The group proposes its reincarnation as an elevated public park. Now it's 2002 and the City, partnering with the Friends, gains control of the High Line south of 30th Street. 2005 sees a design team of landscape architects set to work on the public landscape and in 2006, construction begins.

Which brings us right up to this moment. It is 2009 and I'm leaning against a metal railing atop the High Line's first opened section, which stretches through the Meatpacking District from Gansevoort to 20th Street, on a humid June afternoon. Because I live in New York, I've taken up the New Yorker's hobby of people-watching (the less euphemistic term perhaps being voyeurism). I look around and see a young woman in black flowing pants and a cuffed jean jacket, face obscured by enormous black plastic sunglasses, stoop to inspect a small shimmery piece of gravel (an urbanite's rare encounter with nature). She slips the pebble into her pocket. Elsewhere, boys in Ray Bans and slim fit cutoffs chatter in pairs as they gaze out at the tall grasses, like visitors to a gallery viewing a painting. Older men in crumpled cargo shorts and button down shirts, with wild gray hair and tortoise-shell glasses stroll about with pretty young wives. There are also Parks Department workers in taupe and green uniforms and the ubiquitous international tourist in long pants (despite the June heat) with camera in tow.

New Yorkers have long had a love affair with their green spaces, much in the way that inhabitants of other cities flock to their waterfronts. Central and Prospect Parks are abuzz with activity when the warm weather sets in, as the air above the manicured lawns becomes dotted with frisbees and kites, and cyclists and rollerbladers take to the paths alongside joggers and dog walkers.

But there is something different here in the air above the High Line. This is a park one visits in order to observe, in which one slows down and takes the time to become aware of what's all around. In this way, it is perhaps a park uniquely of its moment: as the "Slow Food" movement, which aims to counteract fast food and fast life, gains a fervent following among a small but growing segment of New York City-folks, slowness seems to be percolating into other facets of New Yorkers' lives. Geoff Nicholson, in his 2008 book The Lost Art of Walking, espouses a belief in pedestrianism as a method of discovering the world around us. Nicholson takes his cues from Baudelaire, who coined the term flâneur to describe a person who strolls the city streets in order to experience that city, taking in the spectacle of modern life.

The observant pedestrian who walks the High Line finds that the modern city experience can include an encounter with a rare type of coexistence: natural and industrial landscapes harmonizing in the same space. Upon ascending the slow stairs (yes, this is really what they have been called), where one gradually transitions from the busy street below to the quiet, elevated landscape above, one can stroll leisurely along meandering pathways lined with naturalistic plantings. Small birch saplings and sparse clumps of grasses look newly transplanted—guests, still, in their new home. The plantings, by landscape architects James Corner Field Operations and Piet Oudolf, are inspired by the "self-seeded" landscape that grew on the abandoned tracks during the years after the trains ceased operation. To echo this idea, planted grasses and wild flowers shoot up from between the rails, a celebration of nature regaining control. Of course, the casual pedestrian probably doesn't know any of this. He simply takes it all in as he strolls, watching bees scamper up the yellow cone-shaped blooms.

Alongside the pathways are a number of modern wooden peel-up benches, supported by a sloping concrete support that appears to lift directly out of the walkway. The benches direct the sitter's gaze, willing him to notice what he might otherwise overlook. On one bench, my eyes fall upon a mesh wire fence guarding a construction site, draped with a fraying plastic blue tarp that's making a soft noise as it ripples in the breeze. On another, grids of scaffolding obstruct the brick walls of buildings that abut the High Line. In the distance, cranes and high rises can be seen on the New Jersey side of the glimmering Hudson River. A little further down the path, there is a series of wide wooden sundeck chaise longue chairs, where sunbathers recline with books and magazines. One could almost believe he were poolside in the privacy of his own backyard were it not for the chattering Russian tourists on the seat beside him. Lying on a vacant chair, I note that I can see the pale-bricked facade of the Marine and Aviation building at Pier 57, and the Department of Sanitation not far off. A man in dark business attire carrying a leather bound portfolio smiles at me as he passes by. I smile back.

Other points along the High Line seem deliberately constructed to encourage the voyeuristic gaze, including a wide overpass that provides a fantastic view of the frantic milieu down on 14th Street. West Chelsea, I have recently learned, contains the world's largest concentration of art galleries, and there is a stretch of pathway that takes the walker directly past the windows of the global headquarters of Phillips de Pury & Company. Further along the walk, there is even an odd little elevated square structure with steps and ramps that visitors can inhabit. Seated on the steps, one can gaze out of the wide windows and peer down Tenth Avenue, as cars and trucks rush out from below.

The High Line has no shortage of other notable features: a City Bakery rickshaw sells baked goods and refreshments. Enter the semi-enclosed former loading dock where the High Line runs through the Chelsea Market building and you'll encounter a large-scale site-specific art installation, which currently features an impressive work by the artist Spencer Finch.

And yet, as I (slowly) descend the stairs at 18th Street back into the mess of cars and joggers and parking garages below, I think to myself that one of the loveliest things about the experience I have had up on the High Line is the absence of too much activity. I have merely been on a stroll, which has afforded me a close look around. As Nicholson rightly observes, "You can dress it up any way you like, but walking remains resolutely simple."⊙

In Our Good Books

Meg West

The Speed of the Dark

Elizabeth Moon

Pantheon Books, 2008

The Speed of the Dark, a Nebula-award-winning novel written by Elizabeth Moon, the mother of a teenage autistic son posits a near future in which autism has been eliminated by in utero gene therapy. Lou Arrendale, the main character, was born before these treatments, but went through extensive early childhood therapy, so that with special modifications he and a group of other autistic people do informatics work that takes advantage of their skills in pattern recognition.

Under circumstances that would never pass Rockefeller University's Institutional Review Board (IRB), Lou is given the chance to become "normal," possibly at the expense of his entire personality and certainly at the expense of changing everything about the way he perceives the world. The rest of the book deals with how Lou and his autistic friends make their decisions about whether or not to take the treatment.

This novel deals humanely with the always difficult question of what is normal enough. There is currently a growing movement to accept autism and other mental diseases as an alternate, rather than an incorrect way of thinking (a movement sometimes called "mad pride"). This movement is reflected in the characters' half joking reminders to each other that "normal is a dryer setting" and in the depiction of a future in which the autistic worker's differences are not merely tolerated but are actually vital to performing specialized functions.

As do many advocates of mad pride, Lou struggles with fundamental questions about his own identity. What is he, outside of how he processes information and thinks about the world? If, as he has been told since childhood, the way that he thinks is truly good and even necessary, why did his family and an army of therapists spend so much time trying to teach him to act like everyone else?

Many people have compared this work to *Flowers for Algernon*, but that connection is merely superficial. Unlike Daniel Keyes' profoundly impaired protagonist, Lou is able to truly consider the implications of permanently altering his brain function. He doesn't know what will happen to his personality after the treatment, but then neither would anyone else. The scientists' guarantees about the future have a ring of falsehood, and certainly don't improve Lou' s opinion of baseline humanity; he knows, and admits, his own ignorance. More than anything, the story-telling is much closer to *The Curious Incident of the Dog in the Night-Time*, by Mark Haddon, in which the autistic narrator uses his unique perspective to solve a mystery. Lou uses his unique perspective to solve the mysteries of his work, his future, and the strange ways of the "normals."

Lou' s dilemma seems to resonate with the problems faced by parents putting their children on Ritalin, or psychiatric patients who have to give up creative highs in order to conquer crashing lows. Just how much can we change our brains before our essential selves disappear? Is the sacrifice worth it for a normal life?

A note on realism: To a moderately well informed lay reader, the science in this science fiction novel, which involves increasing the plasticity of the adult brain and retraining it to operate along conventional lines, seems satisfying enough to keep the story moving. Your mileage may vary. ⊙

Welcoming pots on the Camino*, Pomps, France* by Elodie Pauwels

Looking for the horizon, Sainte-Luce, Québec, Canada by Elodie Pauwels