

Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

PDA Corner—2012 Postdoc Retreat

ASMA HATOUM

At a quarter to six on a crisp September morning, eighty-five of us eager Rockefeller postdocs lined up at the main gate to board the buses that would whisk us out for the retreat. Along the way, the rising sun revealed clear blue skies—the forecast held to its promise. By eight-thirty, we had arrived at the Interlaken Inn in the beautiful Litchfield Hills of Connecticut. Scenic landscapes and lush gardens welcomed us and provided the perfect backdrop for the intense scientific and social exchange that would follow over the next two days (September 12-13).

We gathered under a sun-lit pavilion to attend the symposium, during which we heard a variety of research talks from fourteen fellow postdocs. These ranged from hair cell regeneration to DNA replication, and from RNA interference to Babel fish, and more. The talks were delivered professionally and spoke to the high caliber of research being conducted at Rockefeller. All of the talks were well received and generated plenty of discussion.

The highlight of the first day was the panel discussion, led by our faculty guests. Joining us from Rockefeller, President Marc Tessier-Lavigne, along with Mary Beth Hatten and Sohail Tavazoie, sat on the panel with our Keynote speaker, hailing from Harvard, Pamela Silver. The discussion was packed with valuable insight on topics highly relevant to postdocs: open access, the power and perils of peer review, tips on publishing well, and the evaluation of faculty candidates from the perspective of the search committee. A good part of the discussion revolved around postdocs' concerns with publishing in *Science*, *Nature* or *Cell*, and how our publication record impacts our ability to land a faculty position in today's job market. We were met with reassurance and some solid advice:

"Committees look beyond headlines," says President Tessier-Lavigne. "How interesting is the proposal? How interesting is the individual?" According to him, one-third of this year's Rockefeller job candidates did not have *Cell*, *Nature*, or *Science* publications. Three components are integrated when evaluating a candidate: publications, reference letters, and the research proposal. "The proposal is very important. It needs to be exciting."

"It's not the end of the world if you cannot publish in top tier journals," reassures Tavazoie. He knows many people who did not publish in top tier journals, yet got great jobs. His advice: do the best science you can and then write it well. "We need to be realistic, set a timeline, send it to a journal, and then move on."



"It's extremely important to call the editor before sending in the paper, or craft a great letter," adds Hatten. "Sometimes you have to fight to get your papers into the journal. Stay focused on the work and the joy it gives you. Don't let any of the comments get you down."

"We should not be held hostage to any peer review process," Silver advises. "Remember that the purpose is to communicate science. Period." She encourages us to think of new models for peer review. "We need to be at the forefront of that change."

As one alternate model, the new online journal *eLife* was discussed. *eLife* is an initiative launched by the Wellcome Trust, the Howard Hughes Medical Institute, and the Max Planck Society. It aims to have a fair and transparent review process entirely run by scientists, a quick turnaround time, and an impact factor to be on par with *Cell*, *Nature*, and *Science*. All of the panelists seemed enthusiastic and supportive of *eLife*.

The afternoon of stimulating discussion was followed by an evening full of festivities: a banquet dinner, a bonfire by the lake with hot cocoa and s'mores, and a dance party! Many of us were on the dance floor till well past midnight.

On the second morning, Pamela Silver delivered her Keynote address titled, "Designing Biological Systems." One of the founding members of the Harvard Department for Systems Biology, Silver presented a series of vignettes in this relatively new field based on the ongoing research in her own lab. She spoke of designing yeast cells that can remember and report past exposure to DNA damage; engineering non-photosynthetic bacteria that

can fix CO₂; designing bacteria that can produce hydrogen, a potentially valuable fuel source; and engineering cyanobacteria that can use sunlight to produce large quantities of useful commodities such as sugar and gasoline. “Cells are better chemists than we are,” Silver asserts. One of the aims of Systems Biology is to take advantage of the modularity of biological systems (i.e. genes and operons) to assemble pathways that produce a desired outcome in a cost-effective and reproducible way. Systems Biology applications have enor-

mous potential benefits, and Silver’s research is a testament to that fact.

By the second afternoon, we were all ready for a well-deserved break. The afternoon agenda: rest, relaxation, and recreation! The temperature held in the upper 70s—needless to say, we made full use of the hiking trails and the lake. Our retreat ended with an outdoor barbecue under the setting sun. Although our trip home wore well into the evening, the buses were filled with invigorated postdocs and lively conversations. ◉

Natural Confections

CARLY GELFOND

For a food writer, fall can be a time of complicated emotions. Among the general population, fall is full of seasonal whimsy, all crunchy and leafy underfoot, smoke-scented, vested, and mittened. And to be sure, it is those things for food writers, too. Like normal people, we are susceptible to the irrepressible giddiness that comes with a season of apple-picking, pumpkin-carving, and nut-cracking. And of course it goes without saying that we are all over those apple pies and roasted pumpkin seeds and nuts that are the happy corollary to these activities.

But fall for a food writer also has its distinct challenges. How to add something new to a cache of perfect—and even not so perfect—pumpkin bread recipes? How to innovate the formula for tried and true cranberry scones? Or roasted root vegetables? Is it really possible to reinvent the humble apple pie? It is, and twenty food bloggers have already done it.

At this point in the conversation, one food writer feels the impulse to throw her hands up, head for the door, pitch herself into the nearest pile of leaves, and hibernate until spring.

Leaf piles being scarce in New York City, however, there is nothing to do but stop the hand wringing, get to work, and make something delicious happen.

Here I should pause and acknowledge something: I don’t presume that every food writer is like this. I do believe there are lots of perfectly sane food writers out there who do not get their panties in a knot about fall. Those writers are also probably not the ones who, as children, eschewed the Halloween witch costumes to dress instead as parkway exits, or brought their pet ferrets to class for show-and-tell, or showed up to a high school



semiformal in colorful tights with pictures of fruit on them.

If you think I’m implying that I did all of those things in a youthful attempt to be innovative and unique, well, I won’t correct you. My point, though, is that not every food writer suffers from the debilitating combination of being creative and also an overachiever.

Which reminds me! We are supposed to be talking about food and cooking, and I realize that I seem to be subtly implying that a recipe that is at once the very essence of fall and also somehow new and thrilling is about to be provided. Well, it is. Sort of.

So let’s talk about squash.

Squash?

Squash.

But not just any old squash. Spaghetti squash. People, this squash is totally wacky (as wacky as fruit tights, you ask? Well, no, not quite.) Wacky because it is cut in half, roasted, and then scraped with a fork so that it is transformed magically into yellow noodley strands

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that tumble easily into a bowl with abandon. While recipes calling for pumpkin and butternut and acorn squashes are absolutely everywhere, spaghetti squash is deserving of far more love than it gets, the little-known underdog of squashes. It is buttery and textured with just a hint of sweetness. I have tweaked it so many times—adding caramelized onions and garlic and scallions and cheese—but find that, truly, it resists reinvention. It pushes back against my tinkering. It is just perfect in its simplest form.

SIMPLEST SPAGHETTI SQUASH

Ingredients:

1 3½- to 4-pound spaghetti squash (a pale yellow, oblong winter squash)

Olive oil, for brushing squash

3 tablespoons butter, cut into pieces
salt and pepper, to taste

Roast squash: Preheat oven to 400 degrees. In an incredibly, super-duper, excessively careful way, use a sharp knife to cut the squash in half lengthwise. (I like to consider myself a strong, though little, person, and getting the knife through the squash was very difficult for me.) Scoop out the seeds and discard. Brush or drizzle the interior of the squash with olive oil and place both sides face down on a foil-lined baking sheet. Roast for about 40 minutes. The underside will be just starting to caramelize when lifted up.

Remove squash from the oven and let cool slightly. Working over a bowl, scrape squash flesh away from the skin with a fork. Toss with the butter, salt, and pepper.

Some optional additions can include dried cranberries and almonds, or minced fresh herbs. ◉

CULTURE DESK Reviews: Various Art Exhibitions and an Evening at Carnegie Hall

BERNIE LANGS



Gerhard Richter Installation View. Courtesy of the Marion Goodman Gallery.

On a much too hot and humid Thursday in early October, I was determined to see as many top notch art shows in Manhattan as I could and succeeded beyond my expectations. I began the day at the Metropolitan Museum of Art to see the exhibition, “Regarding Warhol: Sixty Artists, Fifty Years” (through December 31, 2012—suggested donation \$25), which is billed as a forum to explore the wide-ranging influence of the pop artist Andy Warhol. I’ve always enjoyed Warhol’s art and am taken by the unexpected seriousness and depth to his work, despite his own life-long presentation of himself as almost lacking in substance and, let us say, having a banal philosophy of “show for the sake of show.” At the Met, one is treated to Warhol’s use of color in his Marilyn Monroe series, his introspection, as in his 1967 *Self Portrait*, and social commentary in his works on civil rights and his silk screens of the electric chair.

I didn’t have high hopes of enjoying the artists influenced by Warhol on exhibit, given that many reviews in the newspapers were negative and many of his peers are not artists I respect. I am pleased to report that, although there are several forgettable artists in the show, the bulk of them are represented with a variety of interesting pieces. Luckily, several major pieces by the German Gerhard Richter are on display (see below for more on this artist). There are works I have dismissed in newspapers or magazines that come alive in person, in particular the over-the-top porcelain statue, *Michael Jackson and Bubbles*, by Jeff Koons. Sigmar Polke and Cindy Sherman are also nicely represented. As I happily strolled through the galleries, I recalled a fond memory of being at a small concert venue in the late 1970s and seeing Warhol sitting at a table and enjoying the music.

My next stop was down the street to NYU’s Institute for the Study of the Ancient World to see *Echoes of the Past: The Buddhist Cave Temples of Xiangtangshan* (through January 16, 2013—admission is free). I had read that the works on view were sculptures from a cave temple dating back to the sixth century and expected to find an exhibit of a couple dozen worn statues from the period. Instead, I was surprised to be greeted in the gallery by just a handful of finely crafted, monumental, limestone Buddhist images that were detailed, and well-preserved. Three full-length Buddhist-canon figures in particular merit the trip. There was also a virtual video cave that the curators put together, using impressive technology on three screens to bring the viewer in.

Staying with the Asian theme, I bounded over to Japan Society to view *Silver Wind: The Arts of Sakai Hōitsu* (1761-1828) (through January 16, 2013–\$15, free Fridays 6-9 p. m.), the first American retrospective of this interesting artist. The show consisted of various

scrolls, painted fans, lacquers, wood-block prints, and exquisitely painted screens that can only be described as sublime. The artist’s wonderfully crafted, silver-tinted screen *Waves*, is exhibited next to the almost mystical *Rough Waves* by the earlier influential artist Ogata Kōrin (1658–1716). This pairing alone is worth the admission. I also enjoyed the sparse landscape work of Sakai Hōitsu, such as the screen *Maples and Cherry Tree*, which conjured up past readings of Zen philosophy. The artist’s most important pupil, Suzuki Kiitsu, is also nicely represented in the exhibition.

My personal list of the world’s great living artists includes Gerhard Richter, who was on view with new abstract works at the Marion Goodman Gallery (unfortunately the exhibit has closed). These pieces are a mixture of painting and digital tricks and are best shown by the photo above, which doesn’t do them justice. I don’t think I’ve ever reacted to an exhibit the way I did when seeing these new pieces. It was a mixture of joy, confusion, and visual excitation coupled with visual irritation. *Strips* plays with your mind in many different ways, unfolding away from you then emerging from the surface on different planes. It vibrates and bubbles and at one point caused my heart to rhythmically pulsate. Richter is a master of ambiguity, yet he brings viewers to a meditative place. Meditating on one work, I thought it became an electric beach, carrying me out to a distant body of blue water on the horizon.

From the Goodman Gallery, I met a friend at Carnegie Hall to take in a masterful concert by the Chicago Symphony Orchestra featuring maestro Riccardo Muti. I was wondering how I’d react to hearing Wagner’s *Overture to The Flying Dutchman*, having just read an article in *The New Yorker* about the continued debate on whether the composer’s work should be performed in Israel given the history of anti-Semitism associated with him. Fearful of being distracted, I was glad to have been taken captive by the grand sounds of the *Overture* and thought more on ideas of mythology, the European countryside, and the grand symphonic tradition brought on by Beethoven. There’s nothing like a full orchestra energetically bringing to a crescendo a nineteenth century European composer’s vision.

Also on the program was a new work by Mason Bates that was having its New York premiere. *Alternative Energy* ebbed and flowed like many modern compositions and then stunned when the traditional orchestra was joined by the blare of modern techno-beats from several speakers placed around the stage. Despite that—or perhaps because of it—the piece gathered thunderous applause at its conclusion and the composer came out from the wings to thank the audience and orchestra. The concert concluded with Franck’s *Symphony in D Minor*, which was played fabulously with many nuances by the Chicago troupe. I enjoyed the piece with my eyes closed so I could bring a spatial dimension in placing the various musical colors and concurrent themes in a wider universe of thought and perception.

I left Carnegie Hall to head home and discovered at Penn Station that there was limited train service. My train however, arrived on time. It had been that kind of lucky day. ◉

For Your Consideration—Ones to Watch Vol. 3 Edition

JIM KELLER

In this final installment of the series, we take a look at the leading men. Not surprisingly, it's a bit easier to gauge those that might fall within the Oscar wheelhouse—given that it's later in the year and approaching crunch time. But who of these will have the gusto and the endurance to make it in a top five slot? After all, I need not remind you, it's a long road to the Academy Awards.

The done deal: Joaquin Phoenix—*The Master* (director: Paul Thomas Anderson):

FYC: Phoenix should have no problem securing a nomination for his role as Freddie Quell—an unsettled naval drifter lost on the currents of life, who discovers The Cause in 1950s America, and is swept up by its charismatic leader and his wife. For one, the film was directed by Anderson, who helmed 2007's *There Will Be Blood*, which earned ten nominations and won Best Cinematography and Best Actor. But Phoenix is the star after all, and after having been nominated twice in 2001 for *Gladiator* (Supporting) and in 2005 for *Walk the Line* (Lead)—the latter, which he lost to his *Master* fellow cast member, Philip Seymour Hoffman—it's not rocket science that we should see his name appear once again. What's more, this role seems hand-cut for Phoenix and could be just the ticket to clinch him the gold. Perhaps the only thing that can keep him from it is Daniel Day-Lewis or if he were unable to walk the campaign trail without infamous antics. Update: Shortly after the writing of this section, Phoenix made a statement about not wanting any part of the Oscars.

The square jaw: Daniel Day-Lewis—*Lincoln* (director: Steven Spielberg):

FYC: By now, with the election season coming to a close, you've all heard of this film based on Doris Kearns Goodwin's Lincoln biography, *Team of Rivals: The Political Genius of Abraham Lincoln*. Likewise, you're familiar with Day-Lewis—the Irish actor who has inhabited such roles as an oil tycoon, a gay man, and who has won two Best Actor Oscars in 1990 for *My Left Foot* and in 2008 for *There Will Be Blood*. Now Day-Lewis tackles the role of the 16th President of the United States as he clashes with the men of his cabinet en route to abolition and the Civil War's end. When the trailer for the film hit, many critics were groaning about the most meticulous of details, Lincoln's voice. Many were nonplussed

to hear Day-Lewis affect Lincoln's somewhat high register voice instead of his own. This negative, and frankly, annoying chatter, has now been quashed after a surprise screening of the film at this year's New York Film Festival—which announced the film's arrival as a major awards player and laid any speculations from the naysayers to rest. I don't like to say anything is a sure bet, but the only way Day-Lewis won't be nominated is if the other performances discussed here blow what is being heralded by some as his best performance to date out of the water. He could very well take it home this year.

The Ken doll: Bradley Cooper—*Silver Linings Playbook* (director: David O. Russell):

FYC: Yes, you read that right. Our fun-loving, smoldering American icon best known for his role in the *Hangover* film franchise is currently in the hunt for Oscar. The vehicle that may get him there is not a sports car, but the protagonist in Matthew Quick's novel, *The Silver Linings Playbook* (note the film chopped “the” from the title). In the novel—which this writer highly recommends—Pat Peoples (Solitano in the film) is a bipolar man released from a mental institution into his parents home, where he resumes his place as Philadelphia Eagles fan extraordinaire and attempts to rebuild a lost life. Through his journey, he meets Tiffany, a young woman with troubles of her own. Cooper has no Oscar priors and should he earn the nomination, likely will not win due to the sheer star power and pedigree that he will face. Nevertheless, he is said to be outstanding in this role and what's more, the film is on a Best Picture trajectory with multiple nominations expected—including Best Actress for Jennifer Lawrence, who plays Tiffany.

The indie hero: John Hawkes—*The Sessions* (director: Ben Lewin):

FYC: When this film based on the true story of Mark O'Brien—a man in an iron lung who hired a sex surrogate to lose his virginity—premiered at this year's Sundance Film Festival, the raving began and hasn't stopped. People fell for its combination of comedy and drama finely wrought by Hawkes' indelible performance as they followed O'Brien's plight, made possible by his therapist and priest. He was previously nominated for Best Supporting Actor for 2010's *Winter's Bone* and some say narrowly missed a second nomination for

his work in 2011's *Martha Marcy May Marlene*. Given the film's ability to sustain awards chatter throughout the year, it's looking very positive for Hawkes. The one thing that could derail his nomination is if audiences don't see the film and it doesn't generate enough revenue—two factors in Oscar that shouldn't be overlooked.

The constant: Denzel Washington—*Flight* (director: Robert Zemeckis):

FYC: When other Oscar Prognosticators began penciling in Washington for his role as an airline pilot who successfully thwarts a plane crash in Zemeckis' first live action film since 2000's *Cast Away*, I had my doubts. As the months passed, I cast a discerning eye on my trusty predictions spreadsheet, all but sneering when I spotted his name at the very bottom of a list of about 40 men. To be fair, Washington has quite the pedigree, having won two Oscars for 1989's *Glory* (Supporting) and 2001's *Training Day* (Lead)—the latter, for which he beat out Russell Crowe in *A Beautiful Mind*. He also earned three other nominations for 1987's *Cry Freedom* (Supporting), 1992's *Malcolm X* (Lead), and 1999's *The Hurricane* (Lead). For this reason, when I said he appeared at the bottom, he was really at the bottom of my Middle Ground section—unlike *The Fray*, which consists of those on woebegone Oscar Prognosticators lists that I couldn't fully discount out of the realm of possibility and films that may be pushed to next year. So, there he sat from July to September, when he skyrocketed to a place in the Contenders section after the trailer's release. *Flight* closed out this year's New York Film Festival and with that, Washington proved to be a major contender. As for my list, he's currently hovering just outside the top five after he was hedged out in October when the season's biggest curveball was thrown in the form of *Hitchcock* being pushed up to this year, thrusting Anthony Hopkins into the race.

The dark knight: Anthony Hopkins—*Hitchcock* (director: Sacha Gervasi):

FYC: It's been a long time since Hopkins has been shown any love from Oscar—14 years to be precise, when he was nominated for *Amistad* (Supporting). Of course, he's no stranger to Oscar, having won in 1990 for *The Silence of the Lambs* (Lead) and earning Lead nominations for 1993's *The Remains of the Day* and 1995's *Nixon*. That's why Hopkins



New York State of Mind

This Month Natural Selections interviews *Dáibhid Ó Maoiléidigh*, postdoctoral associate in the Laboratory of Sensory Neuroscience.
Country of origin: Ireland.

1. How long have you been living in the New York area? Although I'm originally from Dublin, I lived in New Brunswick, New Jersey for six years and during that time I'd come into New York City a few times a year by train. I still remember the shock when I came out of Penn Station for the first time as the wave of humanity hit me. I've been living in Manhattan for about two and a half years, and it's only now that I'm really getting to know the city.

2. Where do you live? In Rockefeller University housing on the Upper East Side. You just can't beat living in the city within walking distance from work. The view and size of the apartments are nice too. The noise from the FDR Drive is the only thing I don't like about the location.

3. Which is your favorite neighborhood? I'll have to pick a combination of the East Village and the Lower East Side, as I often find myself in the East Village during the day and on the Lower East Side at night. I'd go to something like the Dance Parade or have a quiet drink in St. Dymphna's on St. Mark's Place during the day. At night I might end up at Darkroom or Mehanata.

4. What do you think is the most overrated thing in the city? And underrated? Well I'd have to say shopping, but then again, I never

liked shopping. The diversity of experiences from one neighborhood to another always surprises me. Going from the Upper East Side to Times Square to Alphabet City is like visiting three different cities.

5. What do you miss most when you are out of town? I miss the number of different things to do, especially being able to go to karaoke, or to a club, or to a bar, or to eat at two in the morning. There's always the possibility of doing or seeing something new. I really want to see the installation around the Columbus statue, for example.

6. If you could change one thing about NYC, what would that be? I'd remove the highways on each side of Manhattan, which ruin the experience of being close to the rivers. Riverside Park would be much nicer if the parkway didn't go right through it.

7. Describe a perfect weekend in NYC. There are so many possibilities! In no particular order dinner/coffee/gelato at Eataly, drift through the Metropolitan Museum of Art, go to an Off-Broadway play, brunch



at Veselka, relax, read, and recover in Sheep Meadow, walk The High Line, clubbing on the Lower East Side, wander around The Strand bookstore, Shakespeare in the Park, lunch at the South Street Seaport's Cubana, drinks at The Delancey.

8. What is the most memorable experience you have had in NYC? One of my favorite experiences was going to see the New York Philharmonic in Central Park.

Although it only happens a few times during the summer, I've managed to go twice. Wine, cheese, great music, and fireworks! I highly recommend it.

9. If you could live anywhere else, where would that be? In the US, it would have to be San Francisco. I've been there twice and there is a lot to do and see. I wouldn't mind living in Paris for a while, but in general I like any city that offers a large selection of cultural events, restaurants, and nightspots.

10. Do you think of yourself as a New Yorker? No, but my friends in Ireland might disagree with me. ◊

For Your Consideration, continued

could enter this race at any time in his role as acclaimed director and eccentric Alfred Hitchcock. The film specifically focuses on the relationship between Hitchcock and his wife, Alma Reville (played by Helen Mirren), during the filming of *Psycho* in 1959. If the film hits the right balance as the trailer suggests it might, Hopkins will have no problem securing a nomination and the film itself could find itself in the thick of the Best Picture race. But with a stacked deck this year in the Best Actor race, will he make the cut? There are a couple of things to consider. For one, director Sacha Gervasi isn't an Oscar alum by any stretch and the majority of the other contenders are culled from films with accomplished directors. On the other hand, the screenplay is based on Stephen Rebello's book *Alfred Hitchcock and the Making of Psycho*, and was written by John J. McLaughlin, who wrote the screenplay for *Black Swan*. Having a strong writer on board can work wonders for a film, even in the shad-

ow of a less known or skilled (yes, in that order) director.

The boy from Oz: Hugh Jackman—*Les Misérables* (director: Tom Hooper):

NYC: Rounding out our group of award hopefuls is Aussie actor Jackman, who has never been nominated. In this adaptation of the stage musical based on Victor Hugo's classic novel set in nineteenth century France, Jackman plays Jean Valjean—a paroled prisoner turned mayor who watches over Cosette, the illegitimate daughter of Fantine, while avoiding recapture by the police. It's clear he has a lot to work with here, but what's more, for the first time Hooper has employed live singing for the film's duration, which could push the film further as it allows the actors a new freedom in expression and delivery. Jackman is a proven singer, having starred in the 2004 Broadway production of *The Boy from Oz*, for which he earned a Tony award—a

skill that will certainly serve him well in the film. It will be interesting to see how he stacks up against the other contenders in this year's race—especially since more recent musicals have a history of falling short when it comes to Oscar, i.e. 2006's *Dreamgirls*.

At present, I'd say this is the most exciting of the major category races. If you need more proof, note that I haven't even discussed Clint Eastwood and Jamie Foxx who helm *Trouble with the Curve* and *Django Unchained*, respectively, and who should not be underestimated nor counted out of this race. Likewise, I didn't discuss the pedigree behind the directors of the films discussed here; after all, their names say it all. Next time, we'll take a look at the roles examined throughout this series and identify which of those have serious playing power and which have fallen by the wayside. I'll also give my first predictions in all of the major categories. ◊

Transgressing the Boundaries: Towards a Marxian Neuroeconomics

BENJAMIN CAMPBELL

Either the Devil has come amongst us having great power, or there is a causal explanation for a disease common to economics, science and art. Christopher Caudwell, *Studies in a Dying Culture*

Throughout the 1970s, it became common to refer to cultural productions as postmodern, a term applied to such divergent forms as Thomas Pynchon's *Gravity's Rainbow*, David Bowie's *Low*, and the Sony Building on Madison Avenue. Yet, it was, and remains, very much an open question to what extent these forms represented a unified phenomenon. That is, what exactly is postmodernism, if it is anything at all?

In 1984, Fredric Jameson published what remains the most influential theoretical account of the subject: *Postmodernism or, the Cultural Logic of Late Capitalism*. In an attempt to understand the vastly disparate forms of cultural production that had been grouped under the same label, Jameson put forth the unapologetically Marxist periodization that the postmodern was the cultural expression of an underlying economic shift in the dynamics of capitalism.

To Jameson, the postmodern was characterized by a cultural "schizophrenia" of pastiche, depthlessness, and a loss of historicity, a fusion of high and low culture that could be seen as the cultural expression of the multinational turn of globalized commodification. Using the economic periodization of Ernest Mandel, "late capitalism" was a return to a purer regime of capitalist accumulation, succeeding industrial or monopoly capitalism and its modernist cultural period, just as this earlier stage had succeeded a mercantile capitalism and its cultural logic of realism.

As science exists as part of our culture, it is interesting to inquire as to the extent Jameson's periodization applies to our current scientific epoch of intellectual production. Yet postmodern science seems an unsuitable terminology, with postmodernism so strongly associated with the caricatured relativisms of the great Science Wars of Science Studies (those disputes that so few in science actually noticed, with the notable exception of Alan Sokal). We could, of course, speak of post-industrial science, to emphasize the extent to which capitalist science, having previously served military conquest and industrial production, now serves to conquer new frontiers of accumulation for a corporate class of intellectual rentiers, who, having subjected the entire planetary surface to primitive accumulation have moved on to the conquest of new informational spaces in which to stake out "intellectual property." However, in keeping with Jameson's periodization, I will refer to the current subject (and our collective endeavor) as the science of late capital, just as we might speak of an earlier science of industrial capital, a modernist analog perhaps best exemplified by early cybernetics.

We will eventually return to this earlier period, but for now, let us simply note that the last several decades have seen a quantitative, yet qualitative, change in the scientific enterprise, characterized by a vast commodification of research, and a corresponding collapse of use value into exchange value and/or impact factor. Indeed, we could begin with the *Nature* paper, as

Marx does the commodity, and trace out scientific analogs for much of *Capital* (such as the abstraction of labor, the production of surplus-value, the prolongation of the working day, the scientific reserve army of unemployed, overproduction crises, and so on). But our focus here is not on the economic base, as the reader is likely a scientific proletarian who understands the productive process all too well. Rather, we are interested in the effect of the productive process on cultural output, which we will take as the scientific ideas that are generated and disseminated.

The science of late capital is notable for an extreme division of labor resulting in a great atomization of knowledge, so self-evident that periodic attempts at systems science must continually be re-launched, like the recurring sequels of the latest Hollywood franchise. As a consequence, many of Jameson's characteristics of the postmodern can be identified in contemporary science, with the effects most pronounced where the theoretical spaces are under constrained. This is most evident in the cognitive sciences which, having now dropped even their nominal and hexagonal pretension of unity, are indeed characterized by a fragmentation, lack of historical consciousness, pastiche of theoretical forms, and a narrowing of the gap between high and pop culture (think the academic seminar as TED talk). Thus, to Jameson's examples of Warhol's *Diamond Dust Shoes* and Doctorow's *Ragtime*, we can add Douglas Hofstadter (more so in form than content) and Steven Pinker (more so in content than form) as emblematic of the cultural logic of late capital. While Hofstadter's postmodernism is readily apparent, Pinker's cognitive science is similarly delivered in sprawling and disjointed postmodern tomes, featuring a motley amalgam of evolutionary, computational, and linguistic themes pasted together for popular and professional consumption alike. Here, the fragmentation of intellectual production, and hence theory, has led to a synthesis that does not synthesize at all, but merely revels in the heterogeneity of mental functions, with natural selection (the theorist's ultimate escape hatch) given credit for the great accentuation of theoretical difference, reflexive as it is, of the fragmentation in the underlying base of intellectual production. Perhaps the quintessential example is Marvin Minsky's interpretation of the mind as loosely connected "society" of "agents"—Minsky's *The Society of Mind* is the mind of (late capitalist) society.

Importantly, the current analysis, like Jameson's of the postmodern and indeed Marx's analysis of capital, must not be interpreted as an opposition to its subject out of an atavistic preference for a bygone era of cybernetic tortoises and homeostats. Rather, just as Marx sees capitalism for its unrealized (and unrealizable) potential, we have no choice but to marvel at the wonders of the contemporary sciences in all of their diversity, while yet recognizing the opposition of the productive base to a unified collective project. Thus, while Minsky and Pinker were not incorrect in presenting the brain as a collection of heterogeneous modules shaped by natural selection, the question remains that faced by an earlier generation: how to forge the "identity of identity and non-identity?"

In parallel to this Jamesonian analysis, I have previously sug-

gested that the work of the cognitive revolution and early cognitive science was fundamentally Kantian, with the introduction of cognitive schemata serving as a reaction against a behaviorist empiricism. So let us return now to Kant's intellectual era.

The German Ideology

While Immanuel Kant lived a quiet life in Königsberg, the same cannot be said for his time, with the French Revolution and its aftermath providing a political parallel to the Enlightenment's intellectual apotheosis and crisis. Thus, the German Romanticism arising from the Enlightenment was born from an intellectual milieu of unprecedented disunity. As the poet Friedrich Schiller described: "Always chained to a single little fragment of the whole, man himself develops into only a fragment; always in his ear the monotonous sound of the wheel he turns... he becomes nothing more than the imprint of his business or science."

Conspicuous in this fragmentation was Kant. While his philosophy can be seen as a reconciliation of opposing schools, it was a reconciliation founded not on unification but on a grand bargain. The rationalist Kant was awoken from his dogmatic slumbers by the barbarians at the gates of philosophy, and surrendered the world itself in order to retain his "forms of thought." However these were seen by his successors as little more than dualist barricades that did little to address the threat of a radical skepticism. For how could we claim to have any knowledge of the external world if we can only observe "things-in-themselves" through forms of our own construction? In attempting to defend rationalism, Kant appeared to have trapped it behind its own fortifications. Kant's immediate successors thus set out to address the crisis by transcending the intellectual fragmentation of the day and all of its dualisms. The culmination of this grand project of German Idealism would be found in the system of Georg Wilhelm Friedrich Hegel.

In his *Encyclopedia of the Philosophical Sciences*, Hegel appraised Kant's work as "a very important step," thus agreeing with the later Chomskyan position that the "forms of thought must be made an object of investigation." However, Hegel cautioned: "Unfortunately there soon creeps in the misconception of already knowing before you know." In other words, how do we decide on the forms of thought with which to represent the world, before we have observed the world through those forms?

What is notable and important about Hegel is his refusal to rest his philosophy on axioms, and as a result the static forms of Kant's thought adopt dynamism in Hegel's hands. In attempting to represent the object, the subject must continually strive to resolve contradictions between the object and the always-incomplete forms of thought used to represent it, as form approaches content. This is the "action of thought, which will hereafter be specially considered under the name of Dialectic." It was via this dialectical process that Hegel completed Kant's project of reconciling the rational with the empirical, transcending the great dualism of how the subject could come to know the object.

I have only roughly sketched Hegel's epistemology (that is, his theory of knowledge), and unfortunately we must again defer our discussion of its relation to contemporary developments in the cognitive sciences, in order to touch upon the rest of Hegel's philosophy. Because, from a purely epistemological standpoint,

it seems unclear why Hegel's dialectic would prove so controversial.

Hegel's mixed reputation owes itself in part, of course, to his notorious obscurantism, his writing seeming in many places undecipherable. But the truly contentious issue with Hegel is his metaphysics--that is, his speculations about the nature of seemingly everything. For Hegel did not content himself to bridge the dualist divide of Kantian epistemology, but rather attempted to unify his philosophy with what are now deemed the properly separate subjects of history, politics, science, and theology. Hegel introduced an intersubjective spirit, or Geist, and a conception of God that in contemporary parlance might be described as an emergent property of the universe. Indeed, one of the goals of Hegel's philosophy was to transcend the limits of existing religion with a rational civic religion founded in the immanent, rather than the transcendent. As a result of this apparent philosophical overreach, many sympathetic readers have thus attempted to separate the good Hegel from the mystic (while many unsympathetic readers have stressed the latter). Indeed, Marx famously tried to preserve from Hegel "the rational kernel within the mystical shell."

Yet, before attempting to salvage Hegel's epistemology by tearing asunder his grand system, we should take Hegel's justification for his project seriously, even if we ultimately reject his metaphysical views (self-consciously reflecting as they did the spirit of his age). For Hegel would have argued that all knowledge, including science, is inseparable from philosophical assumptions about the way the world is, and that the role of the philosopher is to make the implicit assumptions of the age explicit and unified.

Indeed, any scientific conceit of objective science preceding mere philosophical speculation must clearly be dismissed as untenable. The history of science is replete with examples of metaphysical speculation (priors, in contemporary Bayesian) preceding, and indeed guiding, scientific confirmation (for instance, speculations about the atomic composition of matter). More importantly than listing historical examples, it could not be otherwise, for as Alfred North Whitehead put it, "induction presupposes metaphysics"; that is, one cannot make any inferences about a system absent speculation of how that system operates. Hegel's dialectic would thus seem a mere recognition of the scientific method, a more accurate rendering than that of his critic Karl Popper, with the Hegelian dialectic emphasizing what is now known as the Duhem-Quine thesis: that hypotheses cannot be isolated from the totality of theory in which they are embedded.

It is because of this view of knowledge as an interdependent totality that Hegel confronts us as the most important philosopher of the past for understanding the fragmented present. Jameson has remarked that every generation has attempted to reimagine the dialectic. As I have previously suggested, this is currently being done through our "emerging conception of the brain." But the mere notion of an emerging conception implies a certain Zeitgeist, which raises an interesting question about the fragmented science of late capital: if there were a postmodern scientific revolution, would we even recognize it?

Next, we will finally explore this Hegelian turn of the cognitive revolution. ◉

Sounds of Science: Can Music Help Bring Science into Pop Culture? An Experiment in Public Communication

JOHN LACAVA

With this short article, I'd like to re-introduce the campus community to a project I started a few years ago: The Sounds Of Science. In February 2010, I penned an article for *Natural Selections* introducing the project and participants at the time. We made our music, launched the website www.soundsofscience.net—and the project was born. The group was the result of a diverse collaboration; it was never intended to be enduring—this is New York City—people come together, they execute a project, and ride off into the sunset or surf another wave, and so it goes. The music had been made, much to my satisfaction, and the goal was to just make something damn cool that could highlight research as both hip and creative; the way in which it should honestly always be portrayed, but often isn't. The second main goal of the project, aside from production, was to launch a public repository of science and engineering sounds—I believe, the first of its kind. That is precisely what we have now done. It can be accessed through the main website above, or directly at www.sosdb.net. Any scientist can record their favorite research sounds and lodge them with our repository, and likewise, any artist or producer could use those sounds in a work, and we would happily host that work. In time, a vibrant and diverse community could grow, and foster give-and-take between disciplines too. At least, that is the hope: that, with good music and good source samples as a draw, science can be well communicated in popular culture. This is an experiment in the public commu-

nication of science and technology—a form of outreach really—and that is the topic of an article I've written for the *ASBMB Today* magazine. It will run in the November issue, so please look for it in the mag, or online (<http://www.asbmb.org/asbmbtoday/>). In addition to re-acquainting the campus with this project, I'd like to call out for new collaborators. The project needs love and care from diverse people, in numerous ways, to proliferate. So, if this interests you in any capacity, please do get in touch with me. One of our major goals for 2013 is to have a concert on campus—if you like this idea and want to help make that happen, then please get involved and pass the word on to anyone you think may be interested. Currently, I owe big thanks to Dustin Gerding, who helps me administer the website and Facebook page—which, incidentally, has the most up-to-date collection of music tracks—<https://www.facebook.com/soundsofscience.net>, where we also post news about science, society, and fun stuff. Many thanks also go out to Bernie Langs, who continues to produce catchy new songs about research and incorporates our samples collection into his work; Jesse Ausubel, who continues to support our project financially and in spirit; and to the campus IT department, including Anthony Popowicz, George Lee, and Kwan Yu Ng, who did an amazing job of getting our database up and running on our very modest budget. I've several more GB of samples data to upload, which I do in spare time, when I find it. It's a labor of love. ☺

Life on a Roll



Nafplio, Greece, 2006 by Christina Pyrgaki

