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Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

PACT WITH THE ANGELS

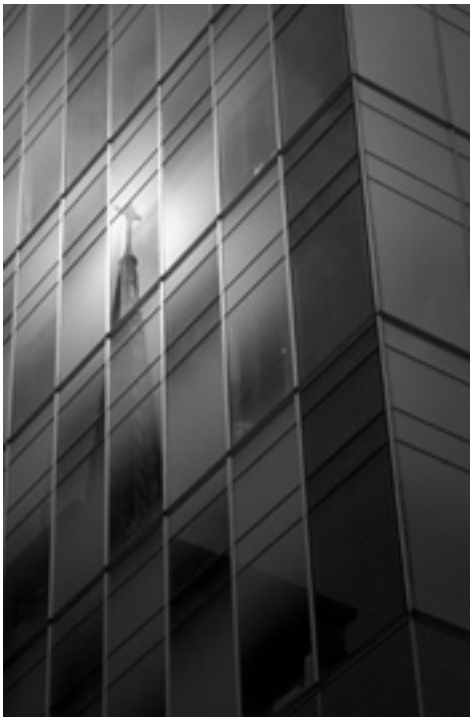
Jiabin Chen and Aileen Marshall

For years we have witnessed the busy construction on 68th Street between York and First Avenue. Now the new building, named the Mortimer B. Zuckerman Research Center, is finally there. Memorial Sloan-Kettering Cancer Center (MSKCC) has dedicated the new twenty-three-story laboratory structure to cancer research. However, among all the exciting research plans aimed at cancers, there is one area that must not be touched: human embryonic stem cell research.

For Sabrina Desbordes, who has worked with stem cells for years at MSKCC, the opening of the Mortimer B. Zuckerman Research Center has caused great inconvenience. She has been relying on high-throughput and cell-sorting equipment in the core facilities at MSKCC. Now that most of these facilities have been moved into the new Zuckerman building, she would have to bring all her cells across the street if she needed to use the same machines. However, she can't do that. It's not that the stem cells cannot stand the traffic on 68th Street. Rather, no human embryonic stem cells can be worked with or even be present in the new building. She is left with a few machines that can barely meet her needs. Fortunately, "I'm almost done with my project," she told *Natural Selections*. Unfortunately, however, "for people who will carry on with the follow-ups, this situation is going to be extremely inconvenient," said Sabrina.

Photos by Daniel Andor

The reason lies in the neighboring Church of St. Catherine of Siena at 411 E. 68th Street. The church used to possess the land where the Mortimer B. Zuckerman Research Center now stands, 415-417 E. 68th Street. *The New York Times* reported in 1995[1] that MSKCC bought the church's four-story rectory [priests' home and offices], at 411 East 68th Street, which still



housed a dozen priests at that time, for about $3.7 million from the Dominican Fathers. MSKCC also bought on the same site the church's school and convent—which were empty and had already been closed for a few years—in a sale worth $11.7 million[1]. Eventually, the rectory, school, and convent were demolished and the land was ultimately used for the Zuckerman Research Building. Part of the agreement made with the sale in 1995 was that if the rectory was demolished, MSKCC would build a new rectory[1]. This new rectory has been incorporated into the new research building. The New York City Department of Buildings Certificate of Occupancy describes the second and third floor of the 23-story building as consisting of "laboratory rooms" and "rectory."

Apparently it was agreed and signed by both sides that no human embryonic stem cell would be ever used in the Zuckerman Research Center, because "the property would not be used for things that are contrary to the teachings of the Catholic

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Church," said Joseph Zwilling, director of communications for the Archdiocese of New York.

One foundational principle of Catholicism is the sanctity of human life and the inherent dignity of the human person[2]. In Western thought, the sanctity of life is applied only to humans, contrasting with many schools of Eastern philosophy in which all lives are equal. Pope John Paul II wrote and spoke extensively on the topic of the inviolability of human life in his encyclical, *Evangelium Vitae, The Gospel of Life*. A human embryonic stem cell line is established from a blastocyst that is approximately four to five days old. The Catholic teaching holds that life begins at conception, a view that is shared by some others in the Christian world. Under this moral viewpoint, any action that destroys an embryo or a fetus kills a human being. Research on human embryonic stem cells, therefore, falls in their forbidden range. The Christian view on when life begins, however, is not shared in other religions. In the Islamic world, a general consensus is that the fetus is not a life until 40 days old, as described in a hadith, *Sahih Bukhari*, a collection of sayings and deeds of the Prophet Muhammad[3]. Egypt and Iran, for example, have conducted stem cell research.

One thing is sure: researchers working on human embryonic stem cells at MSKCC will not be able to enjoy this new building and its facilities. When asked for comment, the public affairs office at MSKCC would only say, "stem cell research has been underway for several years at Memorial Sloan-Kettering Cancer Center in our Rockefeller Research Laboratories Building. There are no plans to move these laboratories and to conduct stem cell research in the Zuckerman Research Building." Aside from the prospects that many people will benefit from stem cell research, whether or not a religious teaching should define or dominate scientific development needs more discussion. What might be more interesting is why the Board at MSKCC accepted the condition in the beginning. ⊙

References:

1. http://query.nytimes.com/gst/fullpage.html?res=990CE2DD1131F933A2575AC0A963958260
2. http://en.wikipedia.org/wiki/Roman_Catholic_social_teaching
3. http://www.searchtruth.com/book_display.php?book=54&translator=1&start=10&number=422#430

NIH Funding to be Cut in FY2008

Zeena Nackerdien

Scientists are normally preoccupied with their research and obtaining funds to perform that research. Funding from the National Institutes of Health (NIH) is a major resource to train students and promote innovative biomedical research. Rockefeller University has been fortunate to receive $45 million over a funding period of 4 years and 9 months from the NIH for clinical and translational science.

The current federal budget proposal, if enacted into law, reduces NIH funding by 1.7% over the FY2007 joint funding resolution passed by both the House and Senate. In real world terms, it means a continued erosion of federal research support since the doubling of the NIH budget was completed in 2003. Roughly translated, since the doubling ended, the purchasing power of the NIH has been cut by 12.4%.

What can scientists do to stem the tide? The Joint Steering Committee for Public Policy (JSCPP), a coalition of four societies (American Society for Cell Biology, Genetics Society of America, Society for Neuroscience, and Science Service), is one of several groups advocating on behalf of scientific citizenship, in this case advocating for an issue that directly affects their pocketbooks. The JSCPP site contains a tool for finding the senator and house member for your area. Letters can be written to your representatives or suggestions posted online. The core message is simple and can be tailored to incorporate personal experience and other ideas:

- Request an increase in the NIH budget to keep pace with biomedical inflation, and emphasize that cuts have significantly affected the agency's ability to support cutting-edge research. Federal investment may reduce burgeoning health-care costs through prevention and early treatment of diseases afflicting Americans.

-Ask for aggressive support of NSF grants to train young scientists and mentor teachers. Investment at the front-end will reap long-term benefits for both science and education.

Convey your message in person by participating in the annual Capitol Hill Day program sponsored by the Congressional Liaison Committee of the JSC. This event takes place annually and is geared toward strengthening communication between scientists and their representatives in Congress.

The Joint Steering Committee for Public Policy (JSCPP) is hosting a Capitol Hill Day on Wednesday, June 20. You are invited to attend this event in which scientists meet with their elected officials on Capitol Hill. The travel award application can be found at http://www.jscpp.org/output.cfm?ID=203. Please contact Lynn Marquis at clc@jscpp.org for more information. ⊙

Reference:

1.http://www.jscpp.org

Policy Round-Up

Jeff DeGrasse

Congressman Nick J. Rahall (Democrat-WV) is planning "a sweeping review on whether politics is infiltrating decisions governing regulatory policies of endangered species"[1]. This stems from a recent report from the Office of Inspector General of the Department of the Interior[2]. The investigatory report contends that Ms. Julie MacDonald, the deputy assistant secretary for fish, wildlife and parks, and a Bush appointee, released internal documents and findings to industry lobbyists, in violation of federal rules. Beyond the report, numerous top agency officials have accused the secretary of manipulating scientific findings for the benefit of industry or personal interests. In one case, Ms. MacDonald, an engineer by training, insisted on reducing the protected nesting range of the endangered southwestern willow flycatcher from 2.1 to 1.8 miles, contrary to the scientific reports from field. Ostensibly, this change was to prevent the extension of the flycatcher's designated protected habitat into a family ranch in California. This and similar incidents have led to a considerable number of questionable policy recommendations that are inevitably challenged by environmentalists, flooding the court system. A courtroom victory requires that much, if not all, of the costly and time-consuming scientific studies and regulatory work be repeated, essentially grinding an already overburdened regulatory bureaucracy to a near halt.

Keep an eye out for the Scientific Communications Act of 2007 (HR-1453). Congresswoman Doris O. Matsui (D-CA) introduced the bill to provide communications skills training for graduate students in the sciences (via NSF funding). In a press release, Rep. Matsui stated that the "communications training provided through this legislation will better equip our scientists to articulate their expertise to help inform the American people and the decision making process"[3]. The bill may not escape the House Science and Technology committee, but it is encouraging that some in Congress recognize the need for improved communication between scientists and the public who funds their work.

On March 19, the committee on Oversight and Government Reform convened to examine the "evidence and allegations of political interference with the work of government climate change scientists under the current administration"[4]. It has been established that this administration has distorted scientific results, especially climate-related science, by selectively emphasizing scientific uncertainties and downplaying mainstream scientific conclusions[5]. This latest hearing detailed one of the most glaring examples—the muzzling of NASA's leading climate scientist, Dr. James Hansen. In sworn testimony, Mr. George Deutsch, former NASA public affairs officer, referred to e-mail messages in which he and senior officials balked at National Public Radio's *On Point* interview request with Dr. Hansen. Instead, the Office of Public Affairs offered other, less vociferous, scientists more in line with the agency's "message." Congressman Chris Van Hollen (D-MD) pointed out that "this is the very definition of political interference with the communication of scientific information." Following this incident, NASA changed its media policy on March 30, 2006[6]. It remains to be seen whether the other government agencies will follow suit. ⊙

References:

1 *The New York Times*, March 29, 2006: http://www.nytimes.com/2007/03/29/washington/29environ.html?ex=1176091200&en=84110437ef7d910e&ei=5070

2 http://www.biologicaldiversity.org/swcbd/programs/esa/pdfs/DOI-IG-Report_JM.pdf

3 For the full press release, see http://matsui.house.gov/SupportingFiles/documents/070321_-_Scientific_Communications_Act_Introduction_2007321.pdf

4 For video and statements, see http://oversight.house.gov/story.asp?ID=1214

5 Chris Mooney, *The Republican War on Science*, (New York Basic Books 2005)

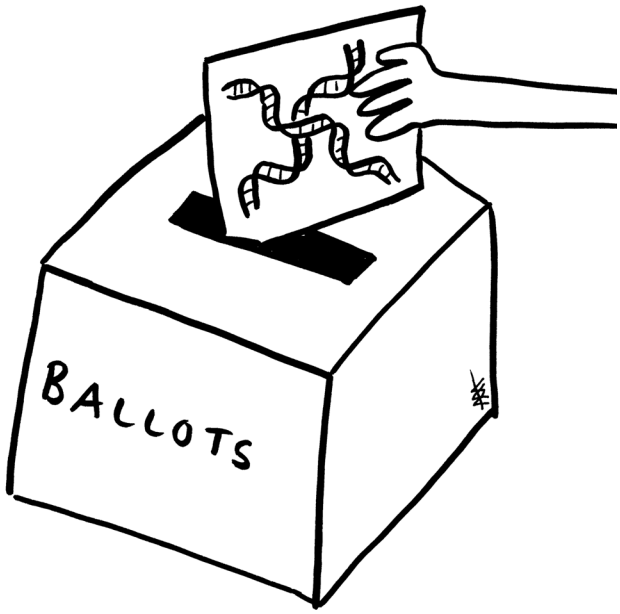
6 For the full press release, see http://www.nasawatch.com/archives/2006/03/internal_briefi.html

Politics in the Cover

Manuel Castellano-Muñoz

To visualize and create linkages between the search for scientific truth, and the desire to achieve justice in our society, the scientific community must seek to establish a new contract with policy makers, based not on demands for autonomy and ever increasing budgets, but on the implementation of an explicit research agenda rooted in social goals.

—Representative George E. Brown, Jr.



Scientists are compelled to deal with politics as part of their daily labor. However, each researcher, teacher, or scientific organization must decide to what extent politics ought to be part of their day-to-day work. Recently, we have witnessed *Nature*'s commitment to politics. In a recent issue (16 April, 2007), the international journal included ten pages on the (at that time) imminent French elections. With that, *Nature* attempted to make known the diverse scientific policies that the three main candidates would carry out if elected, critically comparing their proposals. On the other hand, the journal's deep analysis of the French scientific circumstances, together with the fact that the authors gave their own opinion on the matter, may be seen as a way of bringing pressure to bear on the candidates. Whether all this could have a real effect on the future government is open for debate. In any case, the scientific journal's involvement in politics for the benefit of science is worthy of admiration. Will *Nature* and other top scientific journals dedicate similar efforts to look at the difficult scientific situations in other countries all over the world? ⊙

Fixed-Gear Biking and Commuting in the City

Patricia Sung

I love fixed-gear biking in the city. It's an efficient form of exercise, a great feeling that one is part of the city, and it provides freedom from having to wait for the subway or bus. When I started working at MSKCC, it became apparent to my co-worker and me that I had an incredible opportunity to commute to work by bike. At the time, I had been living on the Upper West Side. The perfect commute would bring me into Central Park at 86th Street, down the Central Park Loop, through the 72nd Street transverse to Park Avenue, left on 68th Street, and finally, with some against-traffic maneuvers, to Rockefeller Research Labs. At about the same time, we had been talking about exploring the city by bike and discussing the phenomenon of fixed-gear biking. After some research, it became obvious to us that we needed this kind of bike.

There's a phenomenon of fixed-gear biking in urban cities. Some people walk through New York without ever noticing the existence and beauty of fixed-gear bikes. One typically notices the fixed-gear bike by a couple of features—they are aesthetically sleek, and the biker maneuvers with speed. Fixed-gear bikes are minimal road or track bikes lacking derailleurs, extra sprockets, shift levers, and back brakes; a fact that makes these bikes very light. Handlebars can be road or track drops; sometimes bullhorns, flatbars, or risers. Fixed-gear biking often occurs with breath-taking grace and style. Good fixed-gear bikers take to streets like a slalom course, where cars are like gates to be swerved around. We would spot these bikes, as children would Volkswagen Beetles, gasping with delight. We talked about them with exaggerated enthusiasm and admiration, describing them as angelic visions in a world of regularity.

Fixed-gear bikers come in all types—from lone tattooed bike messengers, to trendy hipsters riding in packs, to unassuming bike enthusiasts. Fixed-gear biking in the city probably originated with messengers who realized the utility and simplicity of the fixed-gear bike and adapted the bikes to their world, creating a specific aesthetic and style, and then kids and bikers, who noticed the messengers and their functional aesthetic. Fixed-gear bikes can be track bikes outfitted for the streets, but also road bikes from the 70s to 80s, with horizontal dropouts, that have been easily converted to fixed-gear status. To avoid the mashing of knees, the gear-inch—the distance covered by one revolution of the pedals—is carefully chosen. The gear-inch determined by chainring and sprocket sizes, is usually high-60s to low-70s, the perfectly average gear-setting—high enough to be great for acceleration on flat terrain, low enough to be suitable for moderate inclines.

The nature of the fixed-gear bike lends itself to forward motion. Technically, the gear is fixed because the sprocket is secured to the hub by a reverse-threaded lockring, which means that the pedals are always moving directly with the wheel. Therefore, in motion, one cannot "coast"; one must continue to pedal. By virtue of this fact, one feels immediately "connected" to, or aware of, the conditions and variations of the road. In addition, this fact makes fixed-gear biking an extremely efficient form of exercise. Since the gear is fixed, braking can be achieved without hand-brakes, but instead by applying backward pressure on the pedals, or in other words, by pedalling backward. Therefore, braking is an unnatural act. Yet, speed can be decisively modulated with backward pressure. With rapid enough locking up of the back wheel, the act of skidding allows for quick stops or slowing down. The fixed gear bike is perfectly suited for the stop-go nature of the streets and evasion of red lights and vehicles.

One can, with not too much luck, catch a fixed-gear rider, who is stopped at a light, performing a "trackstand." The biker appears to at a magical standstill, with feet on pedals at 9-3 or 10-4, but in reality, the biker rocks between tiny forward and backward motions, perfectly balanced, avoiding putting his foot on the ground. Fun to watch, this feat is challenging because the road is not flat, but at an angle, especially at intersections and different at every intersection, so the correct balance has to be quickly found by the rider and also held for several minutes.

Commuting and exploring the city by fixed-gear have been a great workout and moreover, a lot of fun. My new commute is still a reasonable distance—not too long or short. It brings me up Park Avenue and at Grand Central diverts me up First Avenue. I find it extremely convenient to commute by bike when the roads are dry and the temperature is above 40°F. The heart-pounding thrill, demand for concentration, and adrenaline of riding with traffic are undeniable and exhilarating. Though great for shorter rides, I've also taken this bike on longer rides as far as Coney Island and back and even a metric century. One soon adapts to the bike and the level of fitness that the bike demands. Of course, biking can be enjoyed on all types of bike, not just a "fixie." With reasonable biking skills and awareness of traffic hazards, the avenues and streets of the entire city and beyond can be ridden by bike. But in my opinion, the ultimate bike for the city and its vicinity is the fixed-gear bike. ⊙

PDA Events in June

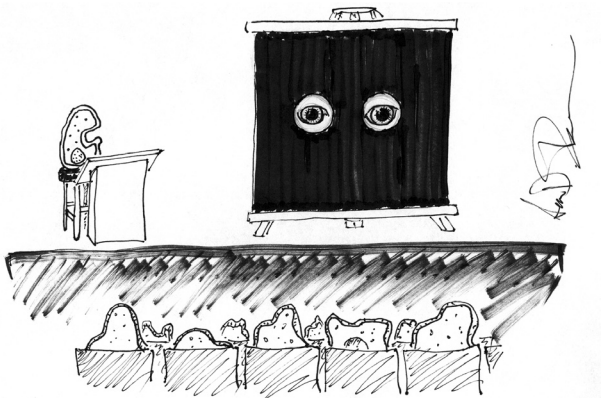
Tuesday June 12
Alternative Careers Seminar Series
4 p.m., Weiss 305

Friday June 22
PDA Spring BBQ
6 p.m., Faculty Club

Monday June 25
PDA Poster Award Seminar
4 p.m., Weiss 305

Tuesday June 26
Open Meeting
4 p.m., Weiss 305

Academia Nuts



cartoon by Sean Taverna

"Since these stars seem to blink in tandem approximately every four seconds, we posit they represent a new type of dual pulsar."

New York State of Mind

This month,* Natural Selections *features Dr. Bonnie Kaiser, Director of Scientific Outreach in the Science Outreach Program
Country of Origin: USA

1. How long have you been living in New York? Our family moved here from Chicago in the fall of 1982. We lived in Faculty House while the co-op we were to move into was still being built. We moved with minimal furniture so our daughters could start in their new middle and elementary school. That Thanksgiving, I returned to Chicago to move the rest of our furniture, my father-in-law, and our summer home stuff—all into our new apartments.

2. Where do you live? Yorkville—a short walk to work.

3. Which is your favorite neighborhood? Can I have three favorites for different reasons? 1. Yorkville—it's my neighborhood, I live and work here. 2. TriBeCa—my daughter and her husband live there. 3. Upper West Side—lots of stuff to do.

4. What do you think is the most overrated thing in the city? And underrated? Nothing is overrated. Everything is bigger here. We're a lot of people squeezed onto a rather small island after all. New York City teachers are the most underrated. Of course, I'm fortunate to work with highly self-motivated K-12 teachers in public, independent, and parochial schools, and over the years we've seen amazing improvements in student learning and in the professional growth of our nearly 100 teachers such that many are now principals of their own schools.

5. What do you miss most when you are out of town? I'm never away that long and usually am visiting family or friends somewhere, so I don't think about it.

6. If you could change one thing about NYC, what would that be? I'd improve public transportation.

7. Describe a perfect weekend in NYC. Having my other daughter and my son-in-law's parents come in from out of town and all of us getting together. We'd all have brunch, then we girls would do mani/pedis and go walking/shopping in SoHo, do Mommy & Me yoga, and then all join up for dinner.

8. What is the most memorable experience you have had in NYC? It has to be 9/11. One daughter had just moved back to NYC and had just started working at the World Financial Center. It took her several hours to walk home. I was so relieved when she rang the bell of our apartment. My other daughter, who had just graduated from law school and had just passed the bar exam was celebrating by traveling around the world. It was four days before she connected on a 24-hour odyssey–truly trains, planes, and taxis–for us to welcome her home waving little American flags at JFK for her safe arrival from Bangkok. We were all so happy to be reunited after the 9/11 ordeal.

9. If you could live anywhere else, where would that be? La Jolla—we used to spend summers there from '83-'87.

10. Do you think of yourself as a New Yorker? Why? Certainly. Why not? ⊙

SRC News: Lost in Transition

Maurizio Pellegrino

If you ever wondered what to do with your Ph.D. (once you receive one), or at the end of your postdoc, you should know that a variety of options are lining up for you. How to know what they are? How does one reach for them? As our faithful *Natural Selections* readers know, there have been several articles describing alternative careers in science and the job market outside academia (December 2004, April 2005, June 2005, and September 2006).

As part of a better understanding of our campus needs, an SRC sponsored survey was also sent to students, postdocs, and alumni to ask about the interest for a possible career service on campus. Well, if you are curious about the results, here they are!

First of all: 186 between students and postdocs, and 194 alumni completed the survey. This is per se a big success, reflecting how much interest people show in this topic.

While most students and postdocs plan to pursue a research career in academia (62%), more than a third of them wants to take a different path. To reach their final destination, a good percentage of our sample would consider their mentors as the best source for advice, but a career service is also seen as a valuable source of information, especially as a tool to be educated on possible career options and job search assistance.

Similarly, alumni referred to their PI as a source of career advice, but would have welcomed an external source of information. The complete survey results are published online at http://selections.rockefeller.edu/content/SummaryStudentsPostdocs.html and http://selections.rockefeller.edu/content/SummaryAlumni.html.

At a meeting between the administration and the SRC, the issue of hiring an external careers officer was discussed, but the importance of better utilizing available resources was stressed before taking other steps in a different direction. The Dean's Office and the PDA have been organizing seminars for career development and speakers with alternative career paths have been visiting Rockefeller to share their experience with us. Moreover, the Dean Sidney Strickland and the Assistant Dean Emily Harms are available to give one-on-one advice on career paths to students and postdocs. This could be complemented by direct contact information with alumni who chose non-academic careers and are willing to advise current students and postdocs.

Furthermore, as part of building up a common repository of information, the Dean's Office and the SRC are trying to gather useful resources on alternative career paths in science and life after a Ph.D.. If you read or know about brochures, Web sites, or books that you found interesting and would like to make available in a public repository, please share the information with us sending an e-mail to mpellegri@rockefeller.edu along with some details and comments about the resource you are suggesting.

The SRC believes these to be steps toward an open and commonly available source of advice. We don't want anyone to get lost in transition. ⊙

Rockefeller Scientists in the Spotlight

Prerana Shrestha

It goes without saying that behind great science lie the minds of brilliant scientists. However, we often do not fully acknowledge the contribution of personal experiences that shape the career of promising scientists and inspires leading scientific discoveries. *Natural Selections* recently talked with an array of Rockefeller researchers at different stages of their scientific career regarding personal anecdotes and experiences that helped them grow as scientists. Highlights of the interview are presented here. This is the final part of the two-part series of conversations carried out with Rockefeller scientists; the first part was published in the April issue of *Natural Selections*.

NS: **Can you tell us about how you decided to choose a scientific career?**

Elaine Fuchs (EF): In some ways, I was destined to become a scientist—at a young age, my mother made me a butterfly net and she was the only non-scientist in the family.

Hironori Funabiki (HF): My father was a chemist who seemed to enjoy his work, so it was a natural choice to pursue science. However it was during high school that I got allured into a spiritual science fiction, that later turned out to be propaganda of a cult religion, and I spent much time contemplating questions such as how conscience is formed. I remember in college when my professor for aesthetics asked me, "Can molecular biology tell you how we can feel beauty?" it triggered my interest in the field, especially because there were a number of fundamental questions in the field that seemed reasonably approachable compared to the philosophical questions.

Leslie Vosshall (LV): I was exposed to experimental science in high school by having the opportunity to spend my summers in my uncle's lab in Woods Hole. Science struck me then and now as a way to pursue creative inquiry at the frontiers of knowledge but not starve while doing so (as opposed to music or art).

David Solecki (DS): Choosing a science career has been an organic process since I was young. The space program was a big thing when I was a child in the seventies and it sparked a very strong interest in science. As my education progressed, I found that science was not only fun but also something I excelled in, especially the biological sciences. It was a no-brainer to pursue a research career given that combination.

Megan King (MK1): My parents and three of my four older brothers are engineers. Thus, the world was always presented to me in a very logical way, as if anything could (and should) be deconstructed and understood. I decided at fifteen to become a biochemist—chemistry being too sterile but at a scale that appealed to me. Not surprisingly, here I am.

Martin Kampmann (MK2): Life is the most fascinating phenomenon in our universe—to study it certainly seems a worthy pastime. And nothing quite compares to the feeling of being the first person in the world to discover something. In past centuries, numerous aristocrats and men of wealth dedicated a considerable part of their time and fortune to scientific experiments. Today, I have the opportunity to do science and even get paid for it—now that's an irresistible privilege.

NS: **What aspect of science excites you the most?**

Cori Bargmann (CB): I love learning new things and discovering the patterns between apparently unrelated things. I love the company of intelligent people.

EF: What excites me most is the freedom and challenge of addressing scientific questions that excite me the most!

HF: I am awed by the history of scientific accomplishments, which have been trying to explain how this world works, instead of myths, and I would feel really excited if I could contribute to this process.

Anon1: My concept of biology is a giant puzzle without a solution. Like Heisenberg's uncertainty principle, the pieces of the puzzle move around independently of each other to really fit rationally into a certain position. Still, as biologists we hope to put some pieces in appropriate compartments and contribute to the understanding of the puzzle.

DS: In the end, discovery is what captivates me about science. There's something irresistible about new insights into how biology works, whether it's something I find myself at the bench, read about in a paper, or discuss with other scientists at a meeting.

Massimo Hilliard (MH): One of the most exciting aspects of doing science is the continued feeling of living at the edge of several of the unknown and unexplored areas of the natural world.

Anon2: I love being on the cutting edge of knowledge for something and having strange wonderful conversations with other scientists about things that nobody else cares about.

NS: **Being a woman, have you felt there are gender issues to becoming or being accepted as a good scientist?**

CB: The big hurdles were gone by my generation (but just barely gone—can you believe that Yale College first admitted women in 1969?). The biggest remaining issue for young women is combining children with a demanding and unpredictable career. The other remaining problem is subtle disparagement that undermines women's confidence and achievement. Old attitudes can take a long time to change.

LV: The issue of gender in science is complicated and I find it has both helped and hurt me professionally to be female. On the one hand, some universities and professional societies are working hard to have female representation on editorial boards, seminar programs, and faculty committees, so good women scientists are highly sought after for these opportunities. On the other hand, it feels strange to be the only woman in the room at many professional gatherings. I think a profession functions optimally when the genders of the participants are not too skewed toward male or female overrepresentation. Unfortunately, in science the proportion of women actively involved declines at each career step. This means that while half of my graduate colleagues were women, only one in ten of my faculty colleagues are female. Despite the strange sociology of science, I still like to think that the quality of all of our science is judged in a gender-blind fashion.

Huidong Wang (HW): I don't really think there are gender issues in terms of being accepted as a good scientist. Maybe it is a little more difficult for a female scientist to become a good scientist since women tend to be involved more in family issues such as having children and taking care of children and additional responsibilities in the home.

NS: **What role do you think a scientist should play in bridging the gap between science and society?**

DS: I feel that scientists must accept a role as teachers to bridge the gap between science and society. Obviously, there are multiple levels to this responsibility. We

train the next generation of scientists, but we have also have to teach the public the importance of our work in a way that lay people can understand. Not all of us are charismatic, so the teaching role is well suited for most scientists, especially since it is an integral part of any job in academia.

Joseph Dougherty (JD): I think that each person should play whatever role they would like to. I do believe there is a need for better communication between scientists and society in general. I think that there are a lot of misconceptions about our work in general as well as about specific issues such as evolution or stem cell research. Having "scientific ambassadors," such as pop-science writers or speakers, who can effectively translate research into a language digestible to laymen is very important for us. At a smaller level, I think that participation in the education system—such as volunteering to judge science fairs or mentor in after school programs could have an impact on the next generation's understanding of science. Not everyone is interested in or suited to each of these things. I do think that at a bare minimum we should all be willing to talk to the people we know personally, our friends and our family, about what we do and about current science-related stories, especially when people are discussing teaching evolution, climate change, or animal research.

Graphic by Doruk Golcu

MK1: Most of us (and our research) are paid by tax dollars courtesy of our society. My brother is fond of asking me what I'm doing with "his money" these days (I have an NIH fellowship). The way most of us enter into science, we take this support for granted. I think we are realizing that communicating with the public about what science is, how we think it should be done, and why they should support it, is becoming an imperative, not a luxury. We are all busy with the many other aspects of science, but especially those of us who are citizens here need to contact their representatives on a regular basis. Join the Joint Steering Committee for Public Policy (http://www.jscpp.org)! We can all make time to send a few e-mails.

Anon2: A scientist should discuss science with others in a language that is accessible to them. Every time President Paul Nurse does a *Charlie Rose* show, I get a call from my grandma way over yonder, all excited to discuss whatever topic was aired that day.

Jaclyn Novatt (JN): The ability to communicate science both to other scientists and the general public is crucial. I actually attended a conference on this topic in Boston last January. The conference focused on different ways of communicating science, such as collaborations between scientists and artists of different types, television programs like *NOVA* or *Horizons*, exhibits at science museums, science cafés, etc. I think scientists should be involved on many different levels—reaching out to large audiences (though TV and film) and smaller audiences (though science cafés and other small group discussions).

Omar Ahmad (OA): The scientific community should foster research programs that address important humanitarian problems, and that enrich human culture with fundamental insights about nature and society. Researchers should work with educators and journalists to inform policy makers and the public about important scientific and technological issues.

***NS:* Would you like to share any eye-opening experiences that you may have had during your scientific career which helped you become a better scientist?**

EF: I spent a major fraction of a year in graduate school rigorously pursuing what turned out to be an enzyme produced by a bacterial contaminant in my sepharose used for column purification. This experience taught me the importance of conducting well-controlled experiments and being able to work hard to arrive at an unequivocal answer, but it also taught me the importance of testing for reproducibility by repeating experiments from start to finish with a completely new set of reagents.

HF: Shortly after I joined the Yanagida lab, a student—Kazuhiro Shiozaki—gave an impressive, but very sad presentation at the group meeting. His project was to investigate roles of DNA topoisomerase II (topoII) phosphorylation. Using topo II purified from fission yeast cells, he found that dephosphorylation of topo II by a commercial alkaline phosphatase inactivates the topo II activities, so he spent much time mapping these phosphorylation sites and obtained a topo II mutant that cannot be phosphorylated. But he found out that unphosphorylatable topo II had full enzymatic activity, and then he further found that a self-prepared acid phosphatase that dephosphorylated topo II did not alter topo II activities at all. In the end, he showed that the commercial phosphatase was contaminated with ATPases, which consumed the ATP required for the topo II assay. I learned how important it is to

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In Our Good Books

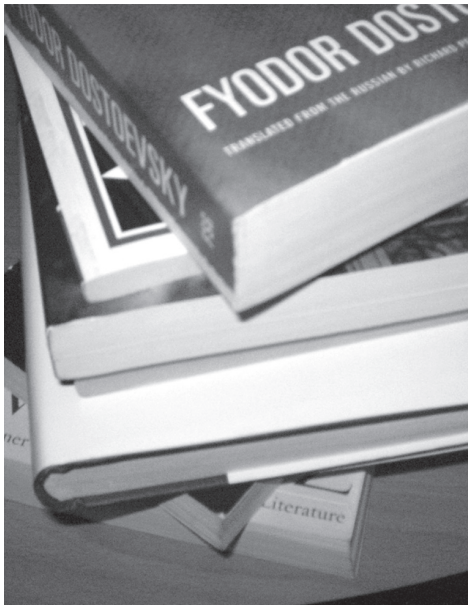
Some reading suggestions have been kindly written by staff members of the downtown bookstore McNally Robinson.

Capital, by Karl Marx
I know, some of you are rolling your eyes as you see this on the staff picks, but you know what—you should read it! Why? Because the major social relation that you function with/by/for/under is capitalism. Marx deconstructed this relation like no one else who ever lived. It is a piece of scholastic investigation to the highest of degrees, and is on par with Darwin's *The Origin of Species* as the most important nineteenth century nonfiction. One should not judge this in the context of *The Communist Manifesto*, as it is not a diatribe, but it should be judged as being the earth-shattering project that it is. Warning though: your life will never be the same after reading this.

Bright Earth: Art and the Invention of Color, by Philip Ball
Oh, sweet micro-history! Take me behind the scenes of my very life and show me how it all came to be. With *Bright Earth*, Philip Ball adds his engaging investigation of color's role in art to the genre that brought us *Salt*, *Birth*, *Cod* and many others. Travel with Ball through the studios, laboratories, factories, and mines that brought us our current rainbow, and thrill at all you didn't know you didn't know.

The Stray Dog Cabaret: A Book of Russian Poems, translated by Paul Schmidt
Is it more telling of my tastes, or of the lasting worth of the poetry contained, that I prefer this new collection from pre-revolution Moscow to many more recent anthologies? From Mandelstam's prefiguring of the mid-century American voice, to Akhmatova's bold lyricism, and Khlebnikov's resolute Modernism, this slim book highlights the wealth of talent that had arisen in late-tsarist Russia. Try to read them without letting foreknowledge spoil your palate too much.

The Emperor's Children, by Claire Messud
This is a work written in such fluid prose,



the story seems to tell itself. The skin of the apple is a gossipy, WASPy, New York society story. Once you bite into *The Emperor's Children*, the flesh offers a rewarding and informing tangle of morals, loss, misdirection, friendship, and emotional turbulence. An excellent pick to pack into your picnic basket and take to the park on a sunny day. Messud's novel is a welcoming voice behind a haughty facade. If you don't trust me, trust *The New York Times*, which named it one of their ten best books of 2006.

Special Event: Take Authors Out of the Book
On Friday June 15, McNally Robinson booksellers will host a screening event at Two Boots Pioneer Theater at 6 p.m. The film to be shown is about Ian McEwan's latest novel, *On Chesil Beach*, and will include an interview of the author and commentary about the book, which concerns a newly married couple—both virgins—in 1962. A panel discussion will follow. For details on the event, check McNally Robinson's Web site: http://www.mcnallyrobinsonnyc.com/2007/05/15/film-screening-out-of-the-book-ian-mcewans-on-chesil-beach/ ⊙

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

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critically consider all sorts of possibilities. Never rely on the data sheet provided by companies!
DS: The most eye-opening experience that I have had has been going on the job market for my first faculty position. While my search is still ongoing and I'm sure there will be other surprises along the way, the most exciting aspect is the chance to meet great scientists most of whom are critically evaluating your work. As a postdoc you may get the chance to discuss your work at a meeting, but the level of scrutiny on the job market is much higher. If you keep an open mind, the job search itself can be a mirror to see how others view your work. Another perspective can be invaluable to shape the way one thinks about their work.
Anon1: When I was working as a lab technician, the routine use of lambda gt11 libraries had just been started. I thought perhaps one could screen for DNA binding proteins using double strand oligo hybridizations. I shared my thoughts with my professor and his response was "(it) can't work." Then I asked another professor down the hall and he said, "that is a great idea, and in fact I just read a manuscript about how someone got this to work." Moral of the story is trust your intuition and don't be afraid to think creatively about a problem, even if no one else likes the idea. But don't get married to your ideas. It is just an idea!
MK2: As an undergraduate, I tried to crystallize complexes of DNA with reverse gyrase (RG), an enzyme from hyperthermophilic organisms known to positively supercoil DNA. I could not get crystals, so I studied RG-DNA complexes in the electron microscope and noticed that RG tends to coat continuous stretches of DNA. This gave me the idea that RG may protect DNA from thermal damage in hyperthermophiles by coating damaged DNA to prevent further nearby lesions and fraying of DNA ends. Indeed, biochemical experiments that I did subsequently confirmed a protective activity *in vitro*. I did not have the possibility to do experiments *in vivo*, and referees dismissed my hypothesis as a "red herring." Still, we were able to publish the results, and later *in vivo* studies by other groups supported my model. I think this experience has made me more confident about thinking "outside the box." ⊙