



Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

CREATING A LEVEL PLAYING FIELD IN GLOBAL HEALTH

TARI SUPRAPTO

Health is defined in the World Health Organization's (WHO) Constitution as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." In fact, the WHO's main objective is to obtain the highest possible level of health for all peoples (www.who.int). It is not unreasonable to consider health as a fundamental human right. Our health is extremely important to each one of us, and that is obvious from our efforts to alleviate symptoms of illness and to obtain treatment for ailments that we may be unlucky enough to suffer from.

There is so much active discussion here in the United States about the rising costs of health care, but have you ever imagined what it would be like to live in a developing country where medical care is basic at its best and where one has to choose between medicine and food? We know that even here in the U.S. there is a gap in health care formed by an economic gap; the wealthy have access to the best medical care while the poor may have to go to a clinic or hospital that is less well-equipped. A quick survey of global statistics, however, shows a dramatic gap in health and mortality rates between developed and developing countries. A report from The Rockefeller Foundation states that the average life expectancy in high-income countries now exceeds 78 years, while a child born in one of the least-developed countries may not expect to reach 50 (www.rockfound.org). Out of the 57 million deaths worldwide reported in the WHO World Report in 2004, 10.6 million deaths occurred in Africa and 7.6 million of those deaths were caused by communicable diseases, maternal and perinatal conditions, and malnutrition. Three of the biggest killers were HIV, tuberculosis, and malaria—collectively, they accounted for 40% of deaths caused by infectious diseases. Diarrheal diseases and respiratory infections also pose a significant threat to the developing world and contribute to infant mortality (WHO World Report

2004). There are other infectious diseases that leave nearly 1 billion people with a lifetime of debilitating illness and deformities; these include leishmaniasis and African sleeping sickness—diseases that are rarely, if ever, encountered in the U.S. or Europe.

What are the reasons for this evident inequality in health? It is clear that there is substandard health care in the poorer countries. If you think about it, it makes sense that there is a strong correlation between poverty and disease. From where we stand, a bad head cold or a case of food poisoning is enough to disrupt our activities, be it in class, in the office, or in the laboratory. Imagine not having access to clean water or adequate nutrition—how can you study to obtain an education or go to work to make a living? Without education and money, there is a lack of understanding about hygiene and very limited access to a clean environment and medicines, leading to a higher probability of being exposed to infectious diseases and not receiving proper treatment for them.

Another problem lies in the lack of funding and investment directed towards developing better drugs to treat and prevent these diseases afflicting the developing world, which are often referred to as "neglected diseases" (BioVentures in Global Health, www.bvgh.org). Very few public or private resources (i.e. funds in academia, governmental agencies, foundations, or companies) have been devoted to research on such diseases. According to the Global Forum for Health Research (www.globalhealthforum.org) and The Rockefeller Foundation, less than 10% of health research funding and investment is directed towards diseases that account for 90% of the global disease burden.

The main reason for this part of the

problem is the lack of purchasing power in developing countries and how this fits in with today's way of doing business. The market for these neglected diseases is a low-paying and unfamiliar one that is not attractive to companies, whose main goals are to obtain a profit and keep their stockholders happy, or to investors that expect a substantial return on their investment. In addition, the diseases of the developing world are still not fully understood by the scientific com-

Leading Causes of Mortality From Infectious Diseases (in millions)

	Actual Annual Deaths
Lower respiratory infections	3.9
AIDS	2.8
Diarrheal diseases	1.8
Tuberculosis	1.6
Malaria	1.3

source: WHO World Health Report 2004

munity, creating a higher risk of failure to develop effective treatments. From the perspective of both biotech and pharmaceutical companies this combination of high risk and low return raises the barrier for attracting funds to encourage research and innovation for the creation of better products to treat and prevent these diseases.

Another factor to consider is the multinational nature of the global health problem. Each country has its own regulatory system, thus increasing the complexity of obtaining approval for the drug or vaccine in the various countries that need it the most. To further complicate matters after the approval process, the weak infrastructure often found in developing countries is a significant impediment to the distribution process.

Why should we care about this incredibly huge problem when we are fortunate

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enough to live in a place that doesn't experience it? One reason is the world is getting smaller with the ease of intercontinental travel and information technology. Diseases travel just as well, if not better, than people. When you travel, wouldn't you prefer to go to a place that has a hygienic environment and a healthy local population? On a larger scale, there is the idea of social responsibility to do things for the betterment of humankind when we are equipped with the education and means to do so. If all the correlations hold true, a healthy population or nation would lead to improved economic development, and equity in health should promote both economic and social equity. It would not be unreasonable to think that reducing the gap between haves and have-nots could reduce the potential for international conflicts. In the last issue of *Natural Selections*, the cover article discussed the conflict ongoing in Sudan. The WHO posted an article on April 11, 2005 on its website stating that while the Comprehensive Peace Agreement provides an opportunity for the people of Sudan to have peace, they also need to be healthy so that they can preserve peace and contribute to ongoing prosperity in their country.

It is encouraging that there is a growing global awareness of the global health disparity problem and the commitment to solve it. The overall solution would be to increase the accessibility and affordability of existing interventions for neglected diseases, as well as encouraging more research and innovation to create new and improved diagnostic tests, vaccines, and drugs. This solution will require mutually beneficial partnerships between governments, academia, foundations, and the industry. Governments need to rethink their current funding mechanisms, which in turn influences academia. Foundations need to focus on the global health problem and raise funds to contribute to the efforts in finding solutions. Companies, typically secretive, need to allow free exchange of information on drugs or drug leads that may have been shelved due to profitability issues, and allow others to continue developing them.

A number of partnerships between the public and private sector to tackle the global health disparity problem have formed over the last several years, such as The Global Alliance for Vaccines and Immunization (www.gavi.org), The Institute for One-World Health (www.oneworldhealth.org), and the Drugs for Neglected Diseases Ini-

tiative (www.dndi.org) to name a few. Two examples of such public-private partnerships (termed PPPs) that have a presence in New York are the International AIDS Vaccine Initiative (IAVI; www.iavi.org) and the Global Alliance for TB Drug Development (also referred to as the TB Alliance). IAVI is a not-for-profit organization whose goal is to accelerate the search for a vaccine to prevent HIV and AIDS and to ensure that such vaccines will be accessible to those who need them. IAVI has formed partnerships with scientists in developing countries who work to study how a vaccine can be effective in their local populations. IAVI has also partnered with the Aaron Diamond AIDS Research Center (an affiliate of The Rockefeller University) to run a clinical trial to test a new vaccine for the prevention of HIV infection.

Also in New York, the TB Alliance was formed to develop new and affordable drugs for tuberculosis. Tuberculosis is a treatable infectious disease, but the current treatment involves a complex drug regimen lasting six to eight months that patients have difficulty complying with. It is therefore vital to develop drugs that also simplify and shorten the treatment period. The TB Alliance licensed a compound originally discovered at Chiron in order to develop it into a viable and improved treatment for tuberculosis. According to a recent press release on their website (www.tballiance.org), the TB Alliance will start clinical trials to test this new drug, which has the potential to both shorten the treatment period and effectively kill the bacteria.

A number of initiatives have also recently been established to encourage new drug development and to reinvigorate research and innovation directed towards reducing the imbalance in research on diseases in developing countries. One example is The Grand Challenges in Global Health, which is meant to direct investigators from multiple disciplines to use their knowledge and research capabilities to come up with a scientific or technical breakthrough to overcome a critical barrier to a solution to an existing global health problem (www.grandchallengesgh.org and Varmus et al., 2003). Examples include development of needle-less systems for vaccine delivery, vaccines and drugs that do not require refrigeration, rapid and accurate diagnostic tests, and drugs that minimize antibiotic resistance.

The continuing growth of awareness, commitment, and support for these efforts

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and the initiation of new ones will hopefully provide the desired solution to the disparity in access to adequate healthcare in developing countries. There are certainly other imbalances that are connected to this problem, such as the gap in technology and education between wealthy nations and poorer countries. Capacity building to help these countries develop their own innovations will promote their economic independence and facilitate the transition to becoming a developed country. Such efforts would include increasing the number of biomedical research labs in developing countries, providing greater financial support for the study of global health, and expanding professional training programs in global health. Next time you go from your doctor to the drug-store, just think what you would do if they didn't exist! ☉

Reading Recommendations and Websites:

- Varmus et al., 2003. *Science*, 302:398-399.
- Kidder, T. *Mountains Beyond Mountains*. (Random House, 2004)
- Farmer, P. *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. (University of California Press, 2004)
- Kim, J.Y. *Dying for Growth: Global Inequality and the Health of the Poor*. (Common Courage Press, 2000)
- Garrett, L. *Betrayal of Trust: The Collapse of Global Public Health*. (Hyperion, 2001).
- Partners In Health (www.pih.org)
- Global Health Council (www.globalhealth.org)
- Campaign for Access to Essential Medicines (www.accessmed-msf.org)

It's Summer! Oh No! It's Summer!

DR. MOM

Aren't your kids in heaven now that it's hot? They don't care that it's 100 degrees outside, and they will happily play in the blistering sun next to a water sprinkler or they will be just as happy playing without one. I always make sure they are covered with SPF1000 sunscreen, but I can't help worrying that their daylong frolicking in the sun on a regular basis can't be that good for their skin or their hydration (they never drink nearly as much as they should, do they?). Because summer weekends are meant to be carefree, it's easiest to let them go outside in the sun all day long; especially when you are in the city, shuttling back and forth from the lab, and don't have your vacation planned until the end of the summer. However, I've discovered that even the littlest getaways can be very exciting for children. It can give their day some extra flavor that need not involve being directly under the sun all that much. With my kids for instance, I know that spending the night in a hotel (any hotel, as long as they have a swimming pool!) is a very big treat. So, quite often, when we have a day trip planned someplace close (e.g. any of the NY/NJ state parks), we will turn

it into an overnight trip and thus a grand event for the little ones. You can get some great deals on car rentals and hotel rooms (through your usual Hotwire or Expedia websites) with minimum planning ahead. You don't have the added stress of making the most of visiting some precious tourist attraction (unless you consider the beauty of a state park to be beheld in awe); you can absolutely do this at the last minute.

After a Saturday afternoon of picnicking and Frisbee, for instance, our kids can't wait to head to the 'grand' hotel to splash into the pool before dinner, and we always gladly join in. I highly recommend looking for places that have complimentary breakfast too, even if it's just cheap cornflakes, toast, and coffee. This is yet another treat of immeasurable pleasure for the kiddies. Even without any alarm, my kids actually wake up, brush their teeth, and get dressed while desperately trying to get us to do the same a little too early in the morning on Sunday. The upside of this early start is that, immediately after breakfast, we all hit the pool again for a lot of splashing before it's time to come up to the room and promptly

checkout. This way, the children get a great deal of water, sufficient outdoor time, even some much needed rest time (How can home beds EVER compete with any kind of hotel bed? Not possible), and a sense of coming back from a mini vacation. On the parent end of matters, we come back feeling ready to take on Sunday evening laundry and maybe a quick run to the lab, if only to reassure ourselves that we are indeed back home!

Your kids hate hotels? You've already covered the Botanical Gardens and the Aquarium? Do not give up on your city just yet. A \$19.95 annual membership to www.gocitykids.com may well save your unplanned summer weekend. The site offers a nice list of both indoor and outdoor activities for children of various ages to do all year long. Be ready for crowds at some of these events though, and buy tickets early if you can!

Well, whatever you are doing this summer, in or out of the city, remember to stay cool, stay hydrated, and for these few precious summer nights, do try to stay away from that #@*! lab! Cheers!! ☺

Greek Seafood at Estiatorio Milos

MOISES PULIDO

If you want to blow your entire income tax refund in one evening of culinary indulgence, head down the street to Estiatorio Milos at 125 W. 55th St. for the best Greek cuisine in New York. Really. I was lucky enough to have my friend treat me there. I wasn't sure what to expect, as the patrons' reviews I'd read online ranged from one to five stars, but those can't be taken seriously. Milos was so crowded—that is, popular—we had to wait twenty minutes even with reservations. All to make us even hungrier as we sipped a glass of Chardonnay at the bar.

Finally, the host escorted us to our table, which gave us a view of the entire restaurant and all its boisterous patrons. My friend and I started off with toasted bread, which I dipped in olive oil covered with fresh herb leaves that gave a bite to the rich olive oil. We enjoyed a white wine from the Greek island of Santorini. For water, the waiter did not bring us the ubiquitous Pellegrino. Instead, we were presented with Sourati, a sparkly, more subtle-tasting water all the way from Greece. Next came Greek salad with vine-ripe tomatoes that half-melted in my mouth, and the famous Cypriot cheese Haloumi. A second appetizer we tried was calamari, so tender, lightly fried, and served with parsley sauce, though on my next visit I'll try the octopus appetizer, a mollusk I've never had.

Our entrée was *loup de mer*, a white fish freshly imported, which according to the menu is the most sought-after fish in all of Europe. In a word, awesome. It was accompanied by a side order

of grilled vegetables composed of squash, asparagus spears, and zucchini sliced paper-thin, all of which had the power to make a vegetarian of any carnivore.

Instead of ordering one dessert each, we ordered two to share. One was yogurt topped with honey, which according to the website at www.milos.ca is Greek-style, artisan-made goat's milk yogurt with thyme honey from Kythera. Again, scrumptious. This was not your plastic container of Dannon. We also ate the baklava, a layered phyllo pastry with almonds, honey, and cinnamon. Milos' baklava is reputedly the best in the city. I don't know about that, but it was one of the top two I've ever tasted (and I always order baklava when I go out), the other being at Pasha at West 71st and Columbus. Milos' baklava has a variety of textures and went divinely with my espresso, which was not at all bitter, as espresso usually is. My friend ordered thick Turkish coffee, which I will try the next time I am fortunate enough to visit Estiatorio Milos, which I wish were this very evening.

Estiatorio Milos (212-245-7400) offers an *à la carte* menu. Appetizers: \$13-\$24, Entrées: \$28-\$40 (also fish and seafood by the pound), Desserts: \$10-\$15. There are also the following *prix fixe* options: 2005 lunch menu (\$20.12 for three courses; \$26.12 with a glass of wine), a business lunch menu (\$35 for three courses) and a pre/post-theater menu for \$45 (three courses) that is also available all evening on Sunday. ☺

Reports from Cambodia: Part II

KATIE HISERT

Katie Hisert, a Tri-institutional MD-Ph.D student, is researching infectious diseases in Cambodia. Her first report appeared in the May 2005 issue of Natural Selections.

Twice a week I attend meditation practice at a local *wat* (I am silently grateful every time the monks refer to the one-hour sessions as “practice,” because I have been a relative failure so far at trying to clear my mind). *Wat* is the Cambodian word for a Buddhist pagoda or temple, but it can also refer to the entire compound surrounding the Pagoda. It thus also means monastery. As a place of religious worship, it is not surprising that there are many *wats* in Cambodia; however, it is unusual to my American eyes to see so many men committed to the monastic life.

To gain a better understanding of the role of monks in Cambodia, I have gotten to know young monk

farm. Seven years ago he left his family to become a monk so that he could pursue an education. Education, particularly at the university level, is not free in Cambodia. Everyone, including monks, needs to pay for classes, even at the Buddhist University. T told me that he used to venture forth in the mornings from the *wat* to collect alms in hopes of receiving enough donations to attend school in the afternoon. Often, he would use some of the money he would normally spend on food to pay for a few hours of class. Fortunately for T, he has a god-mother in France who occasionally sends him money for school.

According to T, the main role of monks in Cambodian society has always been to instruct the people, both about Buddhism and about basics such as reading and writing. Now, at this moment in history, T feels that educating his fellow Cambodians about political issues is crucially important. He spoke with vehemence about the current government of Cambodia, disgusted with the fascist practices of the prime minister and the military. As a general rule, he says, Buddhist monks support democracy and an egalitarian society because as social ideals these are most in harmony with the principles of Buddhism. Though most people in the Phnom Penh area are aware of the corruption and self-serving policies of the current administration, many people in the countryside have been manipulated into

believing that the prime minister supports the common man. When visiting the provinces, T spends time teaching the community about democracy and educating them about the political situation in Cambodia.

When a man becomes a monk (there is no equivalent for women in Cambodia, although there are female Buddhist monks in other Southeast Asian countries), he is not necessarily making a lifetime commitment.

The monk is welcome to remain at the *wat* only so long as he adheres to the monastic rules outlined by the Buddha. T thinks that he may someday leave the *wat* in order to get a job with an NGO (Non-Governmental Organization) where he can work more actively to help effect change in his country (monks are not allowed to hold jobs). He will need to continue his education, especially of spoken and written English, in order to achieve this goal. It is dangerous for Cambodians to speak out against the current administration as individuals. Partnering with foreign NGOs not only increases funding, it also provides a certain level of protection.

The longer I spend in this country, the more I see the tragedy that has evolved over years of colonialism, corruption, genocide and tyranny. Recently, a friend of mine who is a lawyer visited me here, and together we met with people, both Cambodians and foreigners, working in the legal sector in Cambodia. We learned that the Cambodian justice system is woefully inadequate, particularly in the face of government corruption. How can the current situation be reversed when the majority of people are poor and uneducated, when such financial disparities exist between the few in power and the rest of the population?

People like T are a start. I have seen his courage, albeit not so politically oriented,

in many of the Cambodian people I have met. It's a simple determination to strive towards something better without sacrificing kindness and generosity. Many guidebooks about Cambodia stress that the warm and welcoming spirit of the Cambodian people has remained intact, despite years of oppression and civil war. As contrived as that statement seems, it is true. I'll give you two examples from my own life.



photo by Katie Hisert

A monk on his way to meditation at the wat

L'Institut Pasteur du Cambodge (IPC), where I live and work, is on Monivong Boulevard, a four-lane road that is always choked with heavy traffic. It's veritable chaos most of the time, especially at rush hour: cars cruise along, tuk-tuks and cyclopedes roll slowly in the outer lanes, and motos (mopeds) and bicycles weave through the larger vehicles in both directions, on both sides of the road. In my first week here, I was still anxious about crossing the street, especially at night. I was standing on the shoulder of the road one evening, overwhelmed, when two older women walked up beside me. They looked at me and smiled and pointed to the other side of the road. It was clear that they spoke no English, but before I had a chance to pantomime my situation, one of them took a firm hold of my wrist and

pulled me out behind her into the road. She held fast to me all the way across the street, not letting go until we were safely on the other side, at which point she dropped my wrist, smiled again, and walked away.

About a month later, I was meeting a friend at a restaurant, The Boddhi Tree, where I hadn't eaten before. For some reason, my motodop (moto-taxi driver) dropped me off a block or two away on the main road, pointed down the side street, and drove off. After I walked one block, I discovered that there were no more streetlights and the neighborhood was very dark. I had no idea where the restaurant was, and I was reluctant to wander into a dark, unlit street. I was standing in the intersection, at the edge of a circle of light cast by the solitary street lamp, unsure what to do next,

when suddenly, another motodop who had been lounging atop his moto called out to me: "Boddhi Tree?" I nodded. He smiled and pointed down the road to a distant lamp about 50 yards ahead.

Yes, these are examples of simple events; they are no big deal. The old woman and the motodop didn't go out of their way, but they did volunteer their assistance, unprompted, to an obviously confused foreigner, someone who probably didn't even speak their language. Despite a massive gap in culture, appearances, and wealth, they demonstrated a gentle wish to make me feel safe and welcome in their country. The cynic might interpret these deeds as attempts to please tourists and thus increase foreigner spending and investment in the country; however, I interpret the acts of the woman and

the motodop as manifestations of a system of belief, strongly influenced by Buddhism, that it is worthwhile simply to be kind and generous.

I don't anticipate that Cambodia will purge the corruption and injustice from its midst and rise to its feet in the immediate future, but I see ample hope and vibrancy despite the people's struggle. It makes me want to ally myself with these people, and support their efforts, both for the sake of their future and mine. I feel there is much for me to learn from their resilience, hospitality, and patient persistence to improve their world. I am greatly encouraged by the spirit of T, and I am eager to hear more from him about his passions and aspirations during my remaining weeks in Cambodia. ☉

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Getting High in Chelsea

MARTIN LIGR

Who would guess how many thrills one can experience in Manhattan? To experience the excitement of discovery, thrill-seekers make pilgrimages to Amazon forests, Antarctica, or climb Himalayan mountains. To get kicks from the feeling of danger, bungee-jumping or a solo sailing trip around the world is the way to go. And if tasting forbidden fruit is what you are after, I have heard that car racing in the middle of the night in empty parking lots in Brooklyn or Queens is *en vogue*. But there is a place right here, on Manhattan island, where all thrill-related urges can be satisfied at once. This place is called the High Line.

The High Line is a reminder of Manhattan's industrial past. It is a stretch of elevated railway track running alongside 10th Avenue between Gansevoort Street and 34th Street. It was completed in 1934 as a solution for the dangerous mix of railway, car, and pedestrian traffic on 10th Avenue. The High Line trains were shipping merchandise and food to and from the city for almost 50 years, until the rise of trucking pushed them gradually out of business. The final freight train carried three carloads of frozen turkeys down the High Line in 1980.

The downfall of the High Line ushered in its rise as Manhattan's final frontier. After its closure, trains left and grass and weeds moved in. In the middle of the

bustling city, a curious ecosystem started to develop. Largely undisturbed, except for periodic threats of destruction from humans who lost control over their cre-

But how would I know? The High Line is on private property and trespassers will be chased down by Jedi Knights of the Railway Empire and brought to justice. Just



photo by Martin Ligr

ation, the High Line is now a place where the man-made coexists with the natural in self-defined balance—a lofty expression for decay. High above the din of the streets, it is a quiet platform to view industrial architecture of the neighborhood, punctuated with the Empire State Building towering far and behind.

getting up on the elevated platform is not easy; most of the access points are fenced off. But Manhattan thrill seekers seem to find ways around, as results of my Google search suggest. Once the trespasser is up there on the rails, moving around is not easy either, since numerous metal walls

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Ssshhhh.... Got Potty?

TARI SUPRAPTO

New York City is a wonderful city to walk around in and explore. This city has numerous restaurants, cafés, bars, shops, and sights to take in, and every New Yorker has their favorite recommendation. One very important topic is rarely discussed openly, however, despite the fact that it is inextricably linked with the human condition. Here's the burning question that needs an answer sooner rather than later: If I'm walking around and nature calls, where do I go without putting my health and safety at risk or buying something that I don't



Opulent restrooms on Weiss first floor

need? Yes, knowing where there is a clean public restroom with little to no lines is actually useful information and people will be incredibly grateful to you for knowing and sharing it.

Before we get into the big city, let's look closer to home, which is our beautiful campus. Obviously there are restrooms on the floor where you work, so we can skip those. Whether they're clean or not, is mainly your responsibility. The point is, there are public restrooms on campus that are worth knowing about. One of my first discoveries as a graduate student was the "powder room" for women in Caspary's coatroom. The wooden door leading to the coatroom is cleverly hidden and the signs are quite small, but once you're there, you get three stalls with hardly any lines. It also saves you a trip downstairs to use the ladies' room near Faculty Club (which unfortunately only has one toilet!).

The most spectacular restroom find is the restroom on the first floor of the Weiss building, underneath the cafeteria. I never gave them much thought because I'm usually in a rush to get off that poorly lit floor and assumed that the rest of the place was just as unpleasant. My visit to the ladies' room revealed three large shiny marble

rooms; a well-lit mirrored room just for primping, a large sink area (black granite counter with three sinks), and four toilet stalls (including one for handicapped access). The handicapped stall is quite large—almost the size of my office! All the flushes and faucets are equipped with motion sensors. I was too shy to visit the men's room, but I've heard that they are very similar. I've also heard that the reason why the bathrooms are so luxurious is because they were built to accommodate the special functions held in the Weiss Dining Hall.

Moving off-campus, I'd like to share a few places I've found while walking around the city. I can't cover all neighborhoods and regions in Manhattan, but I can recommend places in areas frequently visited by New Yorkers and tourists. Starting nearby on the Upper East Side, Bloomingdale's on 60th and Third Avenue has a good restroom but it is difficult to find. Borders Bookstore on 57th and Park Avenue has a very clean restroom as well and you don't have to buy anything to use it. In fact, I find Borders has bigger and cleaner restrooms than Barnes & Noble.

The best public restrooms in Central Park are the ones by the Central Park Boathouse restaurant (recently modernized with motion-activated flushes) and the ones by the Recreational Center in the North Meadow. A friend of mine who is a runner also swears by the restrooms at the Delacorte Theater off the Great Lawn. While window-shopping along Fifth Av-

enue, the "lounges" (i.e. restrooms) in Tiffany's (57th Street and Fifth Ave) are large and clean. They are located on two floors, so the lines are minimal.

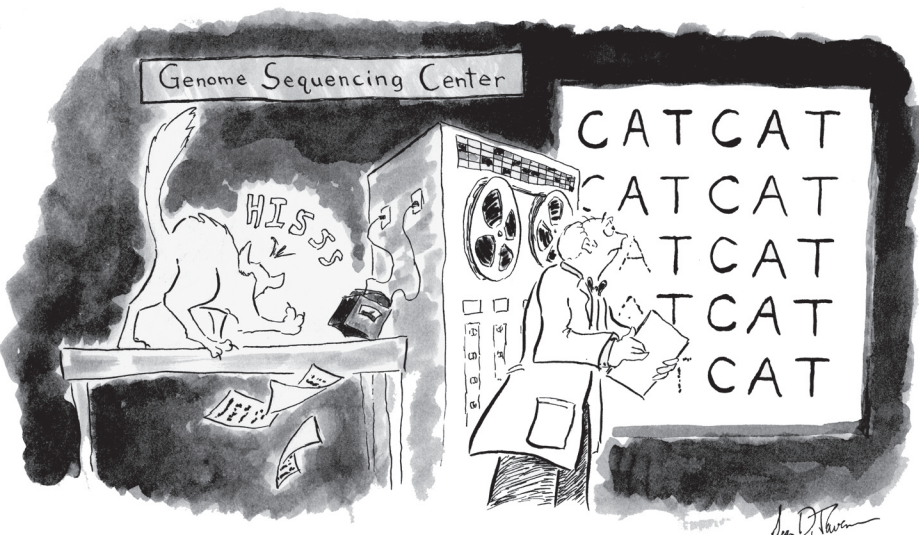
If you're enjoying a play or musical in Times Square, either get to the theatre early to use their facilities or use the restroom at your pre-theatre restaurant—otherwise the lines are a nightmare. If you're just sightseeing or accompanying tourist friends or relatives, the Marriott Marquis Hotel at 45th and Broadway has good bathrooms in the lobby area above street level. In fact, I'd recommend checking out most hotel lobbies—the Four Seasons hotel at East 57th and Park Avenue has a great restroom in the lobby, but act like you belong there.

In Union Square, don't bother with Virgin Records or Barnes & Noble as they are small and not cleaned frequently. The best public restroom in the area is in Circuit City (14th Street and 4th Avenue)—more than five toilet stalls and no lines. Around NYU, most of the public access buildings have restrooms—act like you belong there, and you can use them. Otherwise, you might have to resort to the Barnes & Noble at Astor Place, which is good enough when you need it. In SoHo, Old Navy has a good restroom as does the SoHo branch of Bloomingdale's (both located on Broadway). Chinatown is mainly known for good eating, and all restaurants have a restroom, but Green Tea Café on Mott Street (between Bayard and Mosco Streets) has one of the cleanest ones.

Have a great time exploring the city and be sure you know where the restrooms are! ☺

photo by Tari Suprpto

cartoon by Sean Taverna



*This month, Natural Selections features Zoran Janković, Lab Assistant II in the Nussenzweig lab
Country of Origin: Serbia*

- 1. How long have you been living in New York?** I have been living in New York with my wife and two daughters for ten and a half years.
- 2. Where do you live?** We now live on 63rd St in "Sutton Terrace," 450 building. We moved there from the 1161 building five years ago.
- 3. Which is your favorite neighborhood?** Since we bought a dog (a black Labrador) four years ago, I'm on the streets of this city at least two hours every day. That means lots of miles under my soles and many neighborhoods walked through. During these four years, I have learned to respect our own neighborhood more. The Upper East Side is a bit sterile, but for a family man with a dog that means peace of mind, security, and clean streets (which are never too much). People are somewhat distant behind their smiles, but not alien and cold. I wish I could live in one of those townhouses between Second and Lex Avenues. Too snobbish? No, remember we have a big dog...
- 4. What do you think is the most overrated thing in the city? And underrated?** Overrated... Like in any other city in the world – politicians. Underrated... The fact that you don't have to jump into your car and drive five miles if you need a carton of milk at 11 pm. You just walk down to your friendly Pakistani deli, which also offers a great variety of beers in case of a party going well, but is in risk of collapse after the last bottle has been pulled out from the fridge.
- 5. What do you miss most when you are out of town?** Babylonians! The people of this city are irreplaceable.
- 6. If you could change one thing about NYC, what would that be?** The noise! I support every action to reduce unnecessary noise such as idiotic honking, artificially enhanced mufflers, and loud pipes.
- 7. Describe a perfect weekend in NYC.** Fresh start of the summer (75°F) in Central Park, a basket with some cheese and biscuits, a bottle of Pinot Noir, and glasses in one hand and leash with dog at the end

in the other. My family is carrying the rest of the stuff (blanket, sports gear, water, etc.). A bit of arguing while we are walking to the Park, but everything is at ease when the blanket is thrown on the grass and the dog starts chasing a ball. Cork is out and ants are in. Life is not perfect, it's only beautiful.

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

Once, nine years ago, when twenty dollars was a lot of money for me, a homeless man approached me and asked for two bucks to buy breakfast. I told him that I only had a twenty dollar bill and couldn't leave the van to break it into smaller bills. Then he said that he was going to do that himself at the deli across the street. I thought for a moment and then gave him the \$20. He ran over and disappeared into the store. Two minutes later he was back with coffee, a doughnut, and \$18 change. He blessed me and I left. I still remember that man and how honest he was.

9. If you could live anywhere else, where would that be? I can only go back where I am from, Belgrade.

10. Do you think of yourself as a New Yorker? Why? I love this city and it's easy for me to live here, but I don't feel that I should think of myself as a New Yorker. I guess one must be born in New York and live your childhood on the streets of this city to be a real New Yorker. I was born in Belgrade forty-six years ago and I am a Belgrader. When we moved to New York, I became a citizen of the world. ☺



photo by Martin Ligr

Fireworks 101

SRIRAM

On the 4th of July, thousands of people gathered along the East River will witness a fireworks display unlike any other. The Macy's 4th of July Fireworks Spectacular promises to be just that: a visual spectacle. For starters, the organizers claim that the event uses 55 times more fireworks than the average show in the United States. But what is the technology behind the carefully orchestrated pyrotechnics?

Light and color production in fireworks is no different than the glowing of metal loops when placed in a flame. A mixture of a fuel and oxidizing agent produces intense heat that makes metal flakes glow. Different colors are produced by using salts of different metals. Sometimes, magnesium is also used, its oxidation producing dazzling sparks. Pellets comprising fuel, oxidizer, and metal flakes are called "stars." These are arranged in specific shapes in an explosive-packed shell. When the shell explodes, the "stars" get distributed in the sky and produce spec-

tacular patterns of light and color.

Aerial fireworks have to be projected into the sky. Shells of fireworks are hurled much like cannonballs. In fact, the black powder (also referred to as gunpowder) used to generate the necessary force is a mixture of potassium nitrate, sulfur, and charcoal that is presumed to have been invented by the Chinese about a thousand years ago.

A crucial aspect of any fireworks display is precise timing. Shells have to explode at the right height for maximum effect. Shells that explode at low altitude might also create safety hazards. Altitude control is achieved by having a fuse that burns at a known rate, the height of explosion being governed by the length of the fuse. Pattern shells, which generate patterns like heart shapes require that the different "stars" burn at the same time. The synchronization of fireworks to

music requires that different shells be fired with accurate timing. This requires an elaborate network of wiring to fire each shell. In fact, the Macy's Fireworks Spectacular will use about 10 miles of wiring.



Thus, modern fireworks are a synthesis of old chemistry with cutting-edge electronics. On this 4th of July, as you see thousands of shells exploding, spare a thought for the pyrotechnicians who will

have laid 10 miles of wiring just to see their efforts go up in smoke within 30 minutes. ☺

Macy's 4th of July Event <http://www.macys.com/campaign/fireworks/index.jsp>

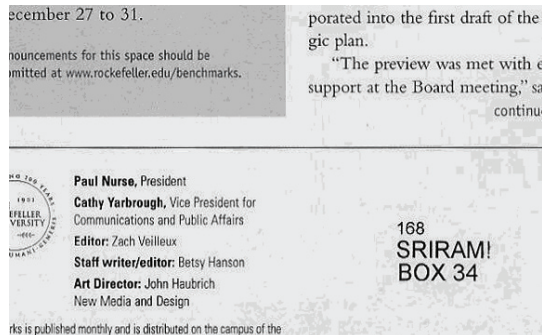
How Fireworks Work <http://people.howstuffworks.com/fireworks.htm>

Fireworks History and Technology <http://www.elitepyrotechnics.com/fireworks.asp>

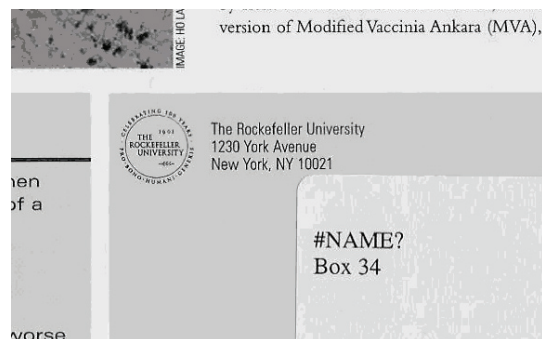
The Power of *Natural Selections*

SRIRAM

In the December 2004 issue of *Natural Selections*, I had written an article describing my travails having only one name ["Surely You're Joking Mr. #Name?"]. I had complained about receiving copies of *The RU Scientist* addressed to "#Name?, Box 34". Perhaps in response to my whining, and to my great surprise, the December 17, 2004 issue of *Benchmarks* that arrived on my desk was addressed to "Sriram!, Box 34". I guess the exclamation mark is proof of the power of *Natural Selections*. Unfortunately, the process is a bit slow. I still get issues of *The RU Scientist* addressed to "#Name?, Box 34." ☉



Surprise response: *Benchmarks*, December 17, 2004



Slow Adaptation: *The RU Scientist*, March 18, 2005

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'Getting High in Chelsea' from page 5

have been erected across the Line just for that purpose. So if you are a chicken like me, is there any legal way to get a taste of what is up there?

We mortals can experience the High Line vicariously thanks to a group called Friends of the High Line. They started working with the owner of the rails and set out to save, document, and revive it as a public space. After a successful campaign in 2001 to save the High Line from yet another threat of demolition, the first palpable result of their efforts was *Walking the High Line*, a book of photographs by Joel Sternfeld, with an essay on the history of the Manhattan's elevated railway by *New Yorker* writer Adam Gopnik. Next on the program is to let people in. The group raised \$3.5 million in private donations and managed to convince the City of New York to pledge \$43 million to revitalize the space. Recently, a competition was held to select a plan for making that happen. The winning project foresees a landscape resonant with the current feral state of the High Line: paths made of concrete planks will mix with old metal of the original railway, patches of autochthonous vegetation, but also a wetland biotop, a pond, and public spaces. The first phase of development, scheduled to begin in Fall 2005, is concentrating on the 1.5 mile section of the High Line from Gansevoort Street to 15th Street. The design model, together with photographs and a video documenting the current state of the High Line are on view at the Museum of Modern Art (53rd Street between 5th and 6th Avenues) till October 31 2005. The entry to MoMA is free with your Rockefeller ID card. ☉

Friends of the High Line <http://www.thehighline.org/>

Museum of Modern Art—The High Line <http://moma.org/exhibitions/2005/grasslands.html>

Joel Sternfeld, *Walking the High Line* <http://www.amazon.com/exec/obidos/tg/detail/-/388243726X/102-2466324-2420963?v=glance>