

# Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

## RUNNING WITH THE KID

JEFF SMITH

When it's over and people ask me how I trained for the 2011 Boston Marathon, I'll tell them I ran with my daughter. "Did she run it, too?" they'll ask. I won't tell them she was only fourteen months old at the time, or that she spent the entire training season being pushed in a BOB stroller. I'll let them wonder if she ran the marathon with me, let the image linger in their minds of the two of us running side-by-side. It's not necessarily untrue.

I ran my first marathon in 2002 when I was 30 years old. It

took me nine marathons to improve enough to qualify for the nation's oldest marathon in Boston and even then I qualified by a mere twelve seconds. Since that first marathon, running has become an important part of my life. Running centers me, grounds me, helps me think, and gives me time to sort through day-to-day craziness. I can work out problems or craft stories or plan my today or my tomorrow. Back when being a father was still just a dream, I envisioned running with my daughter, pushing her through Central Park. The vision came true within a month of bringing her home.

At first, running and pushing a stroller was hard. The stroller itself weighed eighteen pounds, the girl in it twenty pounds. Add to that the accoutrements that go along with a baby: diaper bag, food, formula, toys. That first day, I felt like a hippo trudging through a lake. My breathing was labored, my legs were lead rods, my arms ached. How could my arms hurt while I was running? It didn't take me long to realize I was pushing the stroller wrong, that I should push not with my arms but with my legs. It was still hard but I was building strength in my legs and my stomach and my arms.

Miralena loved it. She offered delightful cheers as we passed other runners and sometimes chided me when another runner passed us. She laughed at the water as we ran along the Hudson River and more often than not she'd fall asleep, a sure sign that she was comfortable in the stroller. When she started day care at

the Child and Family Center, I continued my tradition of running to work one day per week. It was easier to run with the stroller if only for the fact that I didn't have to plan my clothes in advance. I could just push what I'd need for the day.

As we continued to run together I found myself growing stronger. Pushing the stroller became easier every week. When I ran my first race in the fall, a short five miler in Central Park, my legs felt quicker, my back stronger. I sailed along the course

(sans child) as though my feet weren't even touching the ground. I beat my personal record by nearly a minute. Maybe running with a baby wasn't so bad after all.

There were other benefits to running with a child. Every time someone smiled at me or laughed at the antics of Miralena thrashing about in the stroller I got a little lift. I've started to give thumbs up and encouragement to other mother-runners or father-runners I see out there. That, too, lifts my spirits. I feel bigger than myself, feel as though I'm giving something back to all the runners who ever gave something to me, even just a little nod. We understand each other, we runners, and those of us who run with our children are a special breed of crazy runner.

The Boston Marathon will be run on April 18, 2011. Since January I've run to work at

least twice a week as part of my training, and where six months ago pushing her was a challenge, I now consider it an easy day. I run more slowly when I'm pushing her and together we enjoy the warmth of the afternoon sun on a cool spring day, or the snow drifts piled along the edges of Central Park's West Drive. She doesn't sleep in the stroller anymore, but now that the harsh winter is over she enjoys the feel of the air on her face as we cruise along the river or meander through the park. Sometimes she'll look up and catch sight of me over the canopy and she'll give me a two-toothed grin that tells me everything I need to know. ☉



Morning in Central Park with Miralena. Credit: Jeff Smith.

# The Perfect Vacation Day

BERNIE LANGS

Three times a year I like to take Fridays off from work to attend afternoon concerts at the New York Philharmonic. I buy the least expensive solo ticket available, so high up in Avery Fisher Hall at Lincoln Center that during one performance it threatened to snow. I've been doing this for many years and I've heard some incredible performances by this exacting and fabulous ensemble. But the last time I'd attended, I bolted during intermission, unable to endure the eighteenth century music, as I could only imagine courtiers in wigs dipping their donuts in their coffee in time to it. The program for Friday, February 11, 2011 seemed more my speed, with a Beethoven piano concerto and a Shostakovich symphony as the only two compositions to be performed.

I started the morning at the Metropolitan Museum of Art. Since it was early in the day, the small exhibition featuring a study of Cezanne's *Card Players* was fairly empty and I was able to take in the paintings and drawings from all kinds of vantage points. Cezanne was a brilliant turn of the twentieth century artist who bridged Impressionism and Cubism. His cool-toned colors and strong lines are deeply appealing. One study of a figure was only half finished, and the soul depicted seemed to emerge from a passage and gateway through time. While at the Met, I also viewed a large ancient Roman-period floor mosaic laid out in the antiquities gallery. Brought in from Lod, Israel, it was a stunning display. I've read many pages on the symbolic, spiritual, and mystical meanings of the animals, fruit, and the ships depicted on such mosaics and was disappointed that the placards gave no mention of that kind of analysis. Nevertheless, it's rare to see such

a work, and I was glad to have been given the opportunity.

I then headed over to Lincoln Center and found my seat in the third tier, next to a very lovely woman from Queens who advised against listening to the music with my eyes shut lest my mind should wander to "La La Land." This was interesting to me because I once attended a practice press conference for Maestro Kurt Masur where he strongly advised letting the mind roam free while listening to live classical music.

Though I attend these concerts regularly, I'm not extremely schooled in classical music, so I wasn't quite sure if I'd ever heard Beethoven's *Piano Concerto No. 3*. The performing pianist was the 31-year-old Jonathan Biss and the guest conductor was Andris Nelsons. From the very first note, the music was rich, finely textured and crafted, and during the masterful rendition there were many high and deep moments of an almost luxurious beauty. Biss's playing was powerful and precise. I took Masur's advice and allowed my mind to wander where it might (often with my eyes shut). I was glad that the rest of the audience was as pleased as I was, and the final ringing notes were met with thunderous applause. The second piece, Shostakovich's *Fifth Symphony*, was a complete shift of gears. Composed during the 1930s, one could actually feel the weight of Stalinist Russia and sense the oppressed history of the Russian people. The orchestra had added additional players and the stage was filled to the brim with two harps, a piano, and many percussion stations in addition to extra violinists, horn players, etc. The range of tempos of the music and the subsequent emotions that followed in their wakes was astonishing. This piece was met

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with a great ovation as well, and as I departed the Hall, I felt as if I was walking on air.

I decided to finish the day at the Museum of Modern Art. There was a new exhibition centering around Picasso's Cubist works on the subject of the guitar. When I reached the exhibit's entrance, there was a sign stating that there was a museum "members only" preview. I asked the attendant if Rockefeller's corporate membership would count for entry and to my relief I was ushered inside. I wandered around as if in a dream, taking in collages, drawings, and wonderful paintings by the master.

When the Shostakovich symphony had finished and we headed for the exit, the nice woman I'd sat next to laughed and said, "Now back to our lives." Back to our lives indeed, so much the more enriched by music and art. ©

## Who's on Sixth?

AILEEN MARSHALL

This is an update of an article previously published in 2006.

When the elevator doors open on the sixth floor of Weiss, have you ever wondered, "Which lab is this?" Have you ever heard of the Population Council? Not too many people at The Rockefeller University have, although the two groups share similar roots.

Officially, the Population Council is an international, nonprofit, non-governmental organization that conducts biomedical, social science, and public health research in 70 countries. The organization employs more than 500 people with expertise in biomedicine, gender and family dynamics, HIV/AIDS, infants and

children, quality of care, reproductive health, social science, strengthening local resources, and transitions to adulthood. The Population Council is headquartered in New York at Dag Hammerskold Plaza and has seventeen other offices in Africa, Asia, and the Americas.

John D. Rockefeller 3rd founded the Population Council in 1952. He was impressed by the intricacies of population growth, which was a major issue at that time. Under the sponsorship of the National Academy of Sciences, he gathered a group of scientists to discuss the consequences of population growth. After two and a half days, they agreed on the need for a new organization to study this issue scientifically, and provide this data to governments

and individuals. John D. Rockefeller felt this would fill a need to "improve the quality of people's lives, to make it possible for individuals everywhere to develop their full potential." He established an endowment of over \$1 million in original financial support and became the Council's first president.

Four years later, the Council obtained funding to set up its own biomedical research laboratory at The Rockefeller Institute for Medical Research (which later became The Rockefeller University) to study reproductive physiology and fertility regulation. This biomedical division of the Council was later renamed the Center for Biomedical Research (CBR) in 1976. During the 1960s, scientists in

the biomedical division helped develop new contraceptive methods, including the intra-uterine devices known as the Lippes Loop and the Copper-T. In the late 1970s, an increased emphasis was placed on basic and applied research, including male physiology. In addition, with partial funding from the Rockefeller Foundation, they established an international network to develop new contraceptive methods—the International Committee for Contraception Research (ICCR). In 1990 the Council received approval from the FDA for their Norplant® contraceptive implants. Approval for Mifepristone for medical abortion and Mirena®, a progestin-releasing intra-uterine system (IUS), was received in 2000. In 2001, the study of HIV/AIDS was incorporated into the research program, directed by former Rockefeller University Investigator Melissa Pope.

Today, CBR carries out basic research on reproductive processes and develops contraceptive, hormone therapy, and AIDS-prevention products. One major focus of the basic research program is the cellular and molecular mechanisms of androgens. There are also

projects studying the development and physiology of Leydig cells, genetic mechanisms of androgen action, germ cell dynamics, including environmental factors, the physiology of Sertoli cells, and sperm maturation and function. Other research projects include studying the role of dendritic cells in HIV infection. These include work on activating dendritic cells, dendritic cell infection by HIV at the mucosal surfaces, mucosal innate and adaptive immunity and HIV, and transmission of HIV.

In addition, there are labs that focus on product research and contraceptive development. There are a few progestins used: levonorgestrel, a synthetic progestin, is found in three Council products: Jadelle®, a two-rod contraceptive; Norplant, a six-rod subdermal contraceptive; and Mirena®. Another synthetic progestin is Nestorone®. Council research includes finding ways to deliver the hormone transdermally, using a skin-gel, patch, or spray for contraception and hormone therapy. Nestorone® is also used in a contraceptive vaginal ring, along with ethinyl estradiol, recently licensed by a pharmaceutical company. A single rod implant is under development

for lactating women. A progesterone receptor modulator (PRM) is being explored for potential use in a contraceptive vaginal ring, IUS and hormone replacement therapy. A testosterone derivative, MENT® (7 $\alpha$ -methyl-19-nortestosterone) is used in the development of hormone replacement therapy and contraception in men via subdermal implants and skin-gels. Carrageenan, a substance derived from seaweed, is being researched along with zinc acetate and an antiretroviral as a potential vaginal gel to prevent the transmission of HIV and other sexually transmitted infections. A dual ring with both a progestin and an antiretroviral is being developed.

The Population Council runs the Endocrinology, Reproduction, and Immunology Seminar series at RU. It occurs at noon in Weiss 301 on select Thursdays from September through May. It is listed in the RU Calendar and signs are posted around campus.

The Council offers fellowships in physiology and biochemistry of reproduction. Anyone wanting to know more about the Population Council can go to its Web site at <http://www.popcouncil.org>. ◊

## The Town Hall Meeting with Marc Tessier-Lavigne

JEANNE GARBARINO

At 3 p.m. on Monday, March 21, Marc Tessier-Lavigne addressed the Rockefeller community for the second time. However, in this instance, the focus was not on his research. Rather, Dr. Tessier-Lavigne discussed his vision for RU, including how we can further build upon the one-of-a-kind foundation laid down by the incredibly talented scientists and staff who came before us. And, this was all done town hall-style.

After sharing his admiration for Sir Paul Nurse, Dr. Tessier-Lavigne told us a little about his professional history. Dr. Tessier-Lavigne is no stranger to NYC, having completed a postdoc in the laboratory of Thomas Jessell at Columbia University. While he had been successful in the Jessell lab, his time as a New Yorker was short lived. After his postdoc, Dr. Tessier-Lavigne made his way to the west coast, taking up a faculty position at University of California San Francisco and then Stanford. However, he is probably most known for his role as executive vice president at Genentech, an iconic San Francisco-based biotechnology company. This legacy and long-time association with the warmer and (sometimes) sunny climate of the Bay Area begs the question: why Rockefeller and the very cold and snowy winters of NYC?

In his answer to this question, Dr. Tessier-Lavigne began by reiterating the mission of our university: to advance biomedical research, to apply this knowledge to society, and to continue this tradition by training scientists of the highest quality. There is no question that Rockefeller is among the most successful scientific institutions. Staying true to this mission while simultaneously being able to re-invent itself time and time again has been key to maintaining this sustainability. Quoting F. Scott Fitzgerald, Dr. Tessier-Lavigne stated, “There are no second acts in American lives.” He goes on to compare RU to Apple Inc. and says that, like Apple, RU has become a recognizable brand, second to none, in both the scientific and local community. This made the decision to become our university’s 10th president a no-brainer.

“Science thrives best where research is in the air,” he said quoting Simon Flexner.

Dr. Tessier-Lavigne acknowledged Sir Paul Nurse for reaffirming Flexner’s vision and rekindling the interactive environment. Dr. Nurse commissioned the building of the Collaborative Research Center (CRC), encouraged scientific discussion among different laboratory members by reinstituting the

Monday Lecture series, formatted academic councils, and increased the transparency of the open search process for faculty recruitment. Dr. Tessier-Lavigne understood that our community has been defined by both our century-old legacy and these recent initiatives and he plans to keep this momentum while moving forward.

Given that he had only been on campus for a very short time before this town hall meeting, it would have been premature for Dr. Tessier-Lavigne to present us with a detailed strategy for the future of RU. He recognized that it is crucial to first understand the inner workings of RU, including how operations are performed both within and between each division of the university, before setting a course. Therefore, Dr. Tessier-Lavigne has planned to meet with every department, allowing students and staff to engage in conversation regarding their current concerns and/or support of university initiatives. Although he was not able to comment on the precise approach, the general message was that the new plan would involve forward thinking, not just for the next ten years, but also for the next century.

Dr. Tessier-Lavigne did comment on some of the topics that he felt were most im-

portant, namely, faculty recruitment, faculty retention, and the RU graduate program. Building on the open search model, it was the general sentiment that RU needs to focus on junior faculty recruitment while at the same time assessing the need for mid-career faculty hires. In terms of strategy, he presented two options: to hire based on opportunistic circumstances (i.e. the enlistment of a talented individual) or, alternatively, to determine the areas of research that are underrepresented at RU and strategically recruit faculty who would be able to fill these niches. It remains to be seen in which direction the new hiring will occur. However, regardless of hiring strategy, Dr. Tessier-Lavigne recognized that the strength of the graduate program goes “hand in glove” with faculty recruitment and, therefore, he will continue to implement the necessary policies to fortify the already rigorous graduate curriculum.

In thinking more broadly, Dr. Tessier-Lavigne raised the following question: “Where is biological research going and where do we want [RU] to go?” We are currently in the midst of a “golden age” for translational research and it is important to identify the best routes when going from bench to bedside. From his talk, it seemed obvious that Dr. Tessier-Lavigne would like to put a greater focus on our Center for Clinical and Translational Science program, adding to the successes of our hospital. Additionally, he touched on other important topics such as our current breakdown of faculty in terms of gender. Given that females represent just 13% of the faculty, Dr. Tessier-Lavigne would like to find ways to

remove obstacles in order to make RU more attractive to female researchers. This also holds true for underrepresented minorities. Dr. Tessier-Lavigne also (very briefly) mentioned the “unsung heroes” of laboratory research—the postdocs. While he did not provide any specifics, he did state that postdocs often “fall through the cracks.” Lastly, he praised the RU staff as a whole, stating that the excellent operations at RU “reflect the quality of the staff.”

It is clear that Dr. Tessier-Lavigne is passionate about keeping RU a great place to work, for all employees, and a major factor in doing this is our financial situation. The global recession has led many universities and research institutions to take drastic financial measures and, unfortunately, RU was not immune to the financial crisis. The budget cuts that RU has endured, including the reduction in endowment funds and resulting freeze in employee pay and 5% reduction in the research budget, have been necessary in order to maintain stability. Luckily, these cuts have been deemed effective and we will not immediately see any more cuts. In fact, a 3% salary increase and a 4.4% increase in the student stipend has just been approved. However, RU still needs to close a \$10M gap and steps are being taken to improve the financial conditions, such as increased fundraising efforts.

During the last portion of the town hall meeting, Dr. Tessier-Lavigne addressed the role of RU in the local community. There is no doubt that the effective communication of science to the general population is beneficial to scientists as it helps to generate the appropriate public policy. As a result, Dr.

Tessier-Lavigne would like to evaluate our current science outreach programs and public lecture series (and, hopefully, improve them so that RU can be a leader on science policy and funding discussions). In addition to providing scientific programs, he also highlighted the importance of spreading a cultural richness within the community by continuing our concert series. Lastly, he commented on the emergence of China and other nations as research powerhouses and the importance of creating collaborations with research facilities in these countries.

Aside from one rogue comment from a postdoc in the audience, which was handled extremely well by Dr. Tessier-Lavigne, the general concern seemed to surround topics such as the student research budget and an elaboration of how we can improve postdoc conditions. As a postdoc at RU, I am slightly biased with regard to this topic. Although I feel Dr. Tessier-Lavigne will continue to uphold the integrity and pioneering science associated with RU, I felt a bit slighted by the disproportionately small amount of time dedicated to addressing postdoc-related issues. After all, if a major concern is to uphold the strength of the graduate program, then one must also uphold the strength of the postdoctoral body, as it is more often the case that graduate students are trained and mentored by postdocs. However, I am one of the many RU employees who consider it an honor to enter the Rockefeller gates each morning and I am confident that, under the leadership of Marc Tessier-Lavigne, our university will continue to be a world leader in conducting science for the benefit of humanity. •

## Dreaming to Run—or Walk Briskly, at Minimum: Part I

RICH TEMPLETON

*I injured my left knee nine months ago. My recovery has not proceeded as planned. I find solace in writing about—and laughing at—the mental frustration and physical comedy of battling an injury whose rehabilitation has gone awry.*

### September 3: Hotel Recovery

“Rich, are you serious?” Merrill giggles in astonishment. She puts down her luggage and gestures towards the lower half of my body. I look ridiculous. Ice bags are tethered to my knees. My armpits rest atop crutches. I am wearing anti-embolism socks and a Goldschläger tee-shirt.

This is not my apartment. It is a hotel room that sits just seven blocks from my five-floor walk-up.

“What are you talking about?” I wonder aloud. The thing is, I injured myself three and a half months ago. No surgery. So how on earth did I end up here on Labor Day weekend?

Last May I twisted my left knee playing squash. Nothing too painful, but I got it checked out anyway: doctor’s examination, MRI, and x-rays were

clean. The diagnosis was chondromalacia patella (“runner’s knee”), a fancy and outdated term for patellofemoral pain. The injury, I was told, should resolve itself with ample rest and diligent physical therapy.

Unfortunately, despite my best efforts to get better, I got much worse. By the end of my first month of physical therapy (PT), both knees ached. I could not walk more than a few blocks without sharp pains shooting behind and around my kneecaps. To be sure, the doctor did some blood work. After testing negative for Lyme disease, rheumatoid arthritis, and other systemic maladies, my diagnosis was upgraded to “really pissed-off knees.” Thank goodness for clarity!

So I spent the rest of August resting as much as possible, taking Non-steroidal Anti-inflammatory Drugs (NSAIDs), and doing light stretches. Yet the pain kept increasing. Desperate, I tried all sorts of stuff: stability braces, tracking braces, therapy tape, kinesiology tape, scotch tape, ice bags, ice gel, Smirnoff Ice, ice foam, foam-rolling, As-Seen-On-TV orthotics, motion-controlled shoes, meditation, Gregorian chants, etc. I even took advice from



# Music Review: Brooklyn Qawwali Party

CARLY GELFOND

One of the last places you'd expect to discover a new band is in *The Wall Street Journal*, but that's where I first encountered the Brooklyn Qawwali Party (BQP). In an article that appeared this past February, Martin Johnson, who writes about jazz and popular music for the *Journal*, spoke with BQP founder and percussionist Brook Martinez. Martinez explains how he came to adapt the Sufi devotional music of a legendary Pakistani singer to make it the repertoire for his 11-piece big band, composed entirely of jazz musicians. The article noted that the band was scheduled to play in Park Slope, Brooklyn during the upcoming weekend. Because I live in the neighborhood, and because my interests had been piqued by Johnson's article, I decided to go.

Now, here are two distinct possibilities: the first is that I might just be the worst person to write this music review. I've never had particularly sophisticated taste when it comes to music. I fully confess to having played Jack Johnson's *Curious George* soundtrack on my iPod every day for an entire summer on my walk to the office. I think I get my musical narrow-mindedness from my dad, who is satisfied driving to work with a rotation of talk radio and the two CDs he keeps in his car—a Christmas album from Mannheim Steamroller and the soundtrack to the Broadway musical, *Spam-a-Lot*.

The second possibility is that I might just be the perfect reviewer, or at least an acceptable one. I am certainly not a music critic, but I do know what I like when I hear it. It was with the hope for this second possibility that I went to see the Brooklyn Qawwali Party.

That Saturday night, I slid along the back wall of the tiny performance space at Barbès, the bar and music venue in Park Slope. Under a red painted tin ceiling with bare bulbs for lighting, I peeked over the shoulders of those in front of me to get a glimpse of the band, a large group of Caucasian men and one Caucasian woman.

The sound was like nothing I had ever encountered, although comparisons have been made with a Brooklyn-based Afrobeat ensemble called Antibalas. BQP's repertoire is adapted from the music of the legendary Pakistani vocalist Nusrat Fateh Ali Khan in a unique blend of jazz and Qawwali. Of course, it probably goes without saying at

this point that I really don't know my Nusrat from my Ratatat (though I suspect I may not be alone here). Yet it was immediately clear to me that the band had a deep understanding of, and appreciation for, the spirit of the original musical repertoire, even if they didn't understand the original words.

Qawwali music has its roots in Sufi mystical poetry dating back about 700 years ago, in regions of South Asia that had a distinct Muslim presence. "The melodies



Credit: Jacob Blickenstaff for bqpmusic.com

are virtuosic yet soulful, technically astounding yet emotionally concentrated," says BQP trumpet player Jesse Neuman. "Despite its mystical themes, exotic harmonies and twisting Urdu incantations, the essence of Qawwali music is both approachable and universal." As with all things one wishes to appropriate, you have to respect where those things come from before you can take them in a new direction.

While Qawwali music dates back hundreds of years, Brooklyn Qawwali Party's origins were born in the mind of the now 33-year-old Martinez. The Park Slope-based jazz percussionist was first introduced by a friend to the music of John Coltrane as a freshman at the University of Pennsylvania. The spiritual element that Martinez heard in Coltrane's music and that of other jazz greats captivated him more than any pop music ever had. His interest eventually led

him to transfer to New York University, where he studied jazz and contemporary music. In New York, Martinez began to regularly take part in free jazz collectives, but something about the performances was lacking for him; the music wasn't connecting with the audience, he recalls. Martinez took a part-time position at the World Music Institute, a leading presenter of traditional dance and music, and it was there that something important happened to him.

In the Institute's library of discs, he discovered the work of Nusrat Fateh Ali Khan (1948-1997). Khan had been known for the way he transformed and modernized the traditional devotional music of Islamic culture. His music captivated Martinez. With access to an enormous catalog of the artist's work, Martinez began to create mix tapes for himself and for musician friends. Noting that others seemed to share his enthusiasm for Khan's music, an idea began to take form. In many ways, the Eastern devotional music he had discovered was a perfect, if seemingly improbable, complement to the Western jazz he was familiar with. As Martinez describes it, each form consists of a simple melody enhanced by artistic improvisations. In Qawwali, this melody is expressed in song, typically in the Urdu and Punjabi languages. Lacking the language of the traditional music, the melody could alternatively be expressed with instruments.

In 2004, the Brooklyn Qawwali Party was born. With five horns, guitar, bass, harmonium, and three percussionists, the music is vibrant and exciting. The solos are passed around from instrument to instrument. The hand clapping of the audience, too, is treated almost as another instrument. Hand claps are not incidental to the music, but are integral to its energy. According to Martinez, the group actually has dedicated clappers, an element apparently shared with Qawwali.

Above all, the musical scene I witnessed was one of communal joy that seemed almost celebratory, an unlikely mix of music and musicians that just seemed, happily, to work. And then there was me, having made my way into the crowd on that frigid night in February, glad to be an unlikely audience member among them. •



# Book Review: *The Professor, the Institute and DNA: Oswald T. Avery, his life and achievements*, by René Dubos

JOSEPH LUNA

"Go to the microbe, thou scientist, consider its ways and be wise."  
*Oswald T. Avery, 1941*

It has been 35 years since René Dubos, already a Pulitzer Prize winning Emeritus Professor of The Rockefeller University, authored a biography of his former mentor and colleague, Oswald T. Avery. The resulting document is still revealing, not least because one giant of microbiology wrote intimately of another, but for the parallels drawn between Dubos' two proclaimed heroes, Avery and The Rockefeller Institute. Avery's story, Dubos argues rather convincingly, is the story of the Institute, whose mission to cement a science of biomedicine in the first half of the twentieth century was writ in Avery's scientific quest that started with a disease-causing microbe and ended with the monumental discovery that DNA is the molecule of heredity.

That journey, as Dubos skillfully highlights, was not an easy or intuitive one. At the turn of the twentieth century, medical science was considered something of an oxymoron. Few were convinced that abstract investigations in the laboratory could have any bearing on medical practice in the hospital. Yet some, among them John D. Rockefeller, became convinced that it might. The establishment of The Rockefeller Institute was thus a gamble; it was a place where for the first time, physicians and researchers who believed that the scientific method could be applied to human disease were free to explore unknown frontiers. In these early years, the Institute, most notably the hospital, sought to recruit medical doctors who dared to believe that greater therapeutic potential existed in laboratory studies over rounds at the hospital ward. Avery was one such individual.

We are in expert hands as Dubos tells Avery's story and frames the medical problems of the day, in part because Dubos was a member of Avery's laboratory from 1927 to 1941. As a result, Dubos is a sensitive and intuitive biographer of his beloved colleague, tracing Avery's origins as the son of a Canadian Baptist minister transplanted into the raucous Lower East Side of 1890s New York, to his scientific training at the Hoagland Laboratory in Brooklyn as a young M.D. that led to his eventual appointment at The Rockefeller Institute in 1913.

Dubos' subsequent rendition of Avery's scientific life can be considered definitive, and is a fascinating read. Avery's study of lobar pneumonia, caused by pneumococcal bacteria, led him to delve deeper into the inner workings of the bacterial cell. Here he made seminal observations with A.R. Dochez of a specific soluble substance of bacterial origin that could be detected in the blood and urine of infected patients. With Michael Heidelberger, Avery went on to show that this soluble substance was composed of polysaccharide, a surprising finding when many thought it would be a protein. In Avery's subsequent search for how the polysaccharide worked to promote virulence, one can glimpse founding moments of cellular immunology, immunochemistry, and a slew of other disciplines that came in his wake.

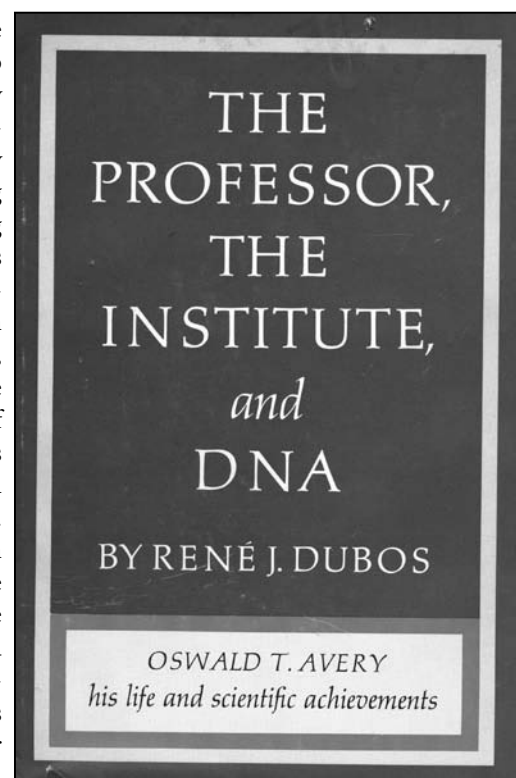
Whereas many biographies of scientists by scientists (most usually in the form of eulogies) focus exclusively on their professional work, Dubos plumbs his personal memories of Avery to offer the reader an insightful and intimate view of Avery's personality as a driving force behind the science, and of the institute he made his home. We rejoice in Avery's triumphs and taste the bitterness of his failures on the

sixth floor of the hospital. We also witness a steady and characteristic tenacity towards asking and answering big questions in microbiology, whether on polysaccharides, the first viable antibiotics (of which Dubos played a central role), or of DNA. Here was a man who did what he loved, and in the process helped craft The Rockefeller Institute as a premier center for biomedical research.

Dubos gracefully addresses the subsequent debate regarding Avery's notable omission from receiving a Nobel Prize for his pioneering DNA work. Yet, the biography remains focused on Avery the man, whose work, while expertly and accessibly described, is ultimately a reflection of the strengths and limitations of Avery's character. Dubos' Avery is a complex figure, at once fearless in his pursuit of scientific truth but cautious in its broader interpretation. He is charming, affable and a showman among his peers, but intensely private and at times a thoroughly lonely introvert. Nevertheless, Avery is unambiguously a genius. Dubos' portrait is of a man of extraordinary talent, unquenchable scientific resolve and a limitlessly creative mind within the humble frame of a man who sought, with almost puritanical zeal, to restrain from speculation beyond experimental fact.

All these years later, Dubos' biography of Avery leaves many timeless questions for the modern researcher to ponder. What is the ideal scientist? Does the scientist seek only to carve out a series of facts by experimentation, eschewing excessive interpretation as to the significance of his or her discovery? Or is open speculation and active engagement required of scientists to defend, popularize, and otherwise market their ideas and results? Avery of course, practiced much more of the former, in stark contrast to Dubos who spent much of his later career as a very public figure in the American environmental movement. Both were titans of biomedical science, but it is tempting to speculate that Dubos, as Avery's mentee, learned from Avery's example that one's science, however brilliant, may not always be enough to garner the recognition it deserves.

The story of Oswald T. Avery's life is beautiful because it speaks for itself. And with René Dubos as a biographer, Avery's story is all the more radiant. ◊



## RUArt

### A series highlighting the extraordinary art on the Rockefeller campus

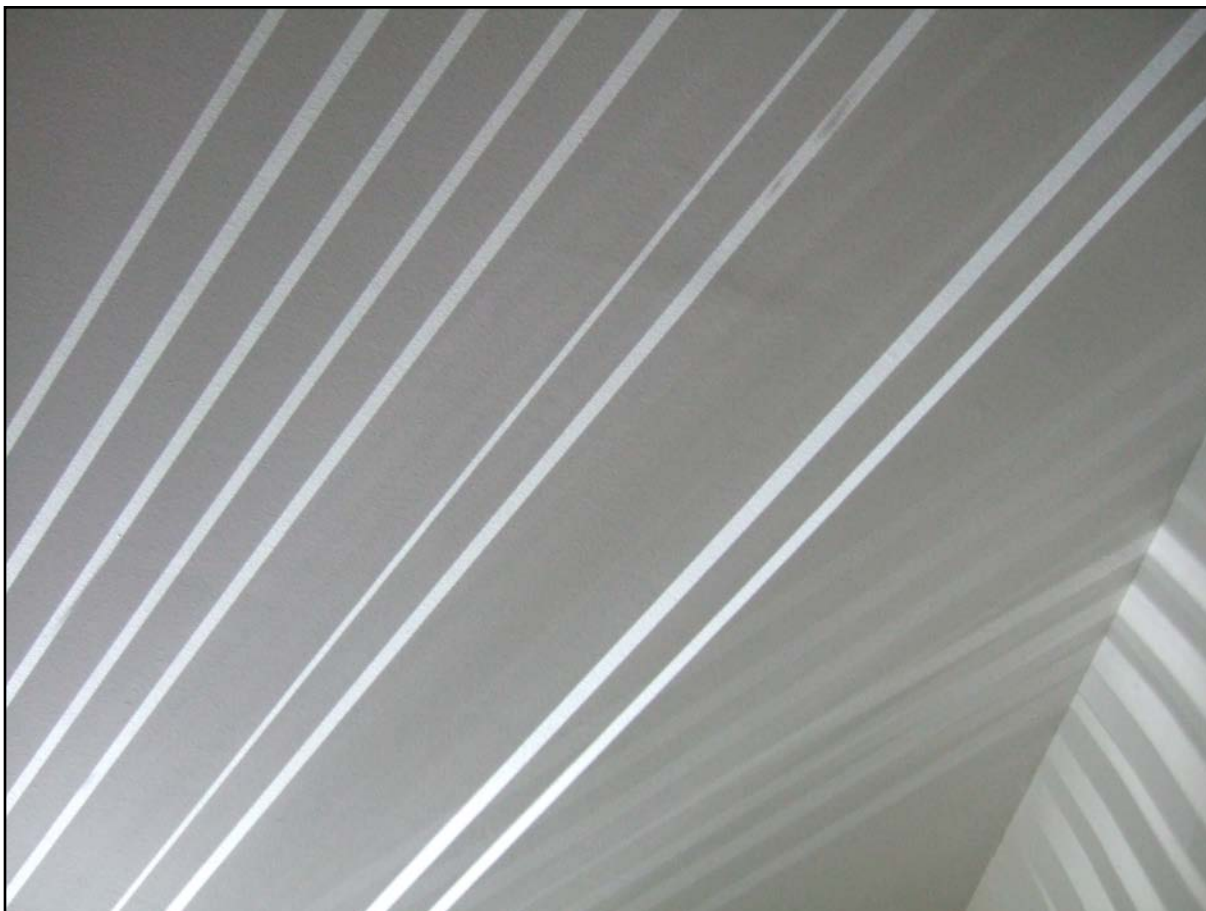
JEANNE GARBARINO

When entering the Rockefeller Research Building, it is near impossible to miss the colossal and somewhat sultry painting of the French chemist, Antoine-Laurent Lavoisier, and his collaborator wife, Marie-Anne Pierrette Paulze. Having replaced the giant leaf painting at the commencement of Welch Hall construction, this piece is a reminder of the rich cultural history of the Rockefeller family.

In 1788, Lavoisier commissioned Jacques-Louis David, a student of the one and only David, paying him 7,000 livres (the livre, a currency established by Charlemagne, was used by the French until 1795). In 1836, this portrait was left to Paulze's great-niece, who kept it in her family's collection until 1924, when it was purchased by John D. Rockefeller. Gifted to our university, then called The Rockefeller Institute for Medical Research, in 1927, it graced the walls of Welch Hall until it was acquired by the Metropolitan Museum of Art exactly 50 years later. The portrait upon which we set our gaze is actually an ultra-high resolution replica that Sir Paul Nurse presented to RU as a gift and will now forever symbolize the end of his presidential legacy. The replica will be moved back to its original home in Welch Hall once construction is complete. ©



### *Life on a Roll*



*Light* by Elodie Pauwels

