

# Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

## Zeena Nackerdien: From Rockefeller to Novelist

AILEEN MARSHALL

Not all Rockefeller University (RU) scientists have a traditional career path. Some go on to teach or continue research. But some expand their horizons while still keeping science in their life. One such Rockefeller alum is Zeena Nackerdien, a research associate in Joshua Lederberg's lab from 2000 to 2008, who went on to a diverse career in medical writing and who has recently published a novel, *The Heroine Next Door*, with a science theme.

Nackerdien is originally from South Africa. She got her bachelor's degree in biochemistry from the University of Cape Town. She then earned a Ph.D. in biochemistry at the University of Stellenbosch, in South Africa, studying chromatin structure.

In 1989 she was offered the position of guest researcher at The National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, and decided to take the opportunity. At NIST she helped to identify indicators in DNA associated with free radical damage, and learned to perform capillary electrophoresis of nucleic acids. She then worked as a post-doc at Memorial Sloan Kettering for a year. Nackerdien moved to RU in 2000, where she began her eight-year stint. "Like many post-docs, I had a series of stop-and-go experimental projects that ended in frustration," Nackerdien remembers. While in the lab she published a hypothesis with Professor David Thaler on the rearrangements of chromosomes in cancer and evolution. She also worked on bacterial growth. She described the experience as "tearing my hair out over an inability to explain the bursts of fast growth observed in rich media of a Gram-negative pathogen, *Vibrio parahaemolyticus*." *Vibrios* are a genus of bacteria that often cause infection from eating undercooked seafood. Some strains give off light. "We showed that the growth rates of the light-emitting *Vibrios* could be

impacted by bioluminescence-dependent and independent-components. However, the buried headline is that some bacterial strains can double very quickly in a manner that cannot easily be attributed to artifacts," Nackerdien said. She published a paper on this with Dr. Lederberg and Dr. Bonnie Bassler of Princeton University, an expert in quorum sensing. Nackerdien was working on cultivating other bacterial species of the microbiome not easily done by standard plating techniques. Sadly, Dr. Lederberg died in 2008. It was then that she decided to start a writing career, "I have always been a poet at heart. However, it has taken me many years, first as a medical writer, then a patient advocate, and now an author to come up with a blended style that articulates my unique spirit."

While at RU, she was also involved in the Postdoctoral Association and *Natural Selections*. When asked about her memories of Rockefeller, Nackerdien replied, "My favorite memories normally include food and music. So, summer barbecues with colleagues and Friday noon con-

certs are number one and two on my list."

She has since gone on to become a prolific science writer and currently writes for the Pernicious Anemia Society in New York. She has written about many science topics, from biomarkers in oxidative stress to a possible link to microbes in breast cancer. In her spare time, she has written science-themed poetry and helped write a blog for the Norwalk Museum in Connecticut. *The Heroine Next Door*, about a South African scientist living in New York who loses her fiancé during the attack on the World Trade Center, was published in February 2015. It follows the character's relationships with fellow Muslim immigrants and how she eventually goes back to South Africa to help fight AIDS. What spurs a scientist to write a novel? For Nackerdien, "Having lived through so many transitions—pre- and post-apartheid years, pre- and post-9/11 era, before and after the Internet (now I am dating myself)—I wanted to capture some of these questions in the form of a new immigrant's experience. The immigrants in this case happen to be



Image courtesy of Zeena Nackerdien

Muslim, but they come here believing to varying extents in the American Dream. Since it is purely a work of fiction and not my autobiography, I could tailor the series of vignettes in a way that I wistfully believe people should cooperate in order to seek practical solutions to issues of importance. My middle-aged heroine gets

to go home and help with the HIV/AIDS crisis in South Africa. Yes, it is fiction, but every good deed has to first spring from someone's imagination." Nackerdien is now working on another book, *Mist Over Peace*, with the themes of science, politics, and religion. ◉

## Tuning Attention and Focusing on the Moment

PENG KATE GAO

A few years ago, my friend and I took a road trip to the Blue Ridge Mountains. It was a typical mid-fall afternoon, when warm autumn colors began to paint the pastoral landscape of the Appalachian Highlands. The drive was not a difficult one; we had little fear of tumbling over the few cliffs we encountered. Nevertheless, the road was often winding and tortuous with plenty of unexpected curves. As the drive and the scenery captured our full attention, all our worries and work issues faded away. Suddenly, the vibrant foliage became much more lively, the afternoon sun shone more brightly than usual, and the air was sweet with the smell of fall. Years later, the colors, sounds and smells of this experience still play vividly in our minds.

Looking back, my memory of that distant afternoon seems so much clearer to me than many more recent Saturday afternoons I've spent aimlessly roaming the streets or watching TV. Recent psychology and neuroscience research helps to explain why this is so: our experience and memory is shaped by what we attend to. It is thus tempting to think that if we can consciously tune our attention and focus on the right things, life will feel less like a series of random acts but more like a work of art that we create.

Unfortunately, tuning attention is not always easy. Do you remember a time when you knew you were supposed to be working on a project or assignment, but somehow your mind started to wander and you felt the urge to check e-mail or Facebook? Focus slips, time melts away, and work is left undone. If this lack of focus becomes a habit, we face the real danger of drifting along in life—passively reacting to circumstances or whatever happens to us. This is certainly a life that most of us try to avoid.

Psychologist Mihaly Csikszentmihalyi, in his widely influential book *Flow: The Psychology of Optimal Experience* argued, "The best moments in our lives are not the

passive, receptive, relaxing times... the best moments usually occur if a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile." He named this fully engaged state as flow, during which the person feels "strong, alert, in effortless control, unself-conscious, and at the peak of their abilities." We usually associate flow with creative endeavors of scientists and artists, but Csikszentmihalyi argued that in fact it could be achieved in everyday life too, such as reading a book or tending a garden. Those moments lift our spirits and make us feel that life is worth living. The key to living an engaged life, then, is to find a way to maximize our time in flow and minimize drifting.

Is it possible to reign in our attention? Writer Winifred Gallagher in her book *RAPT: Attention and the Focused Life* proposed that we can deliberately train our ability to concentrate and focus, "like physical fitness, the mental sort that sustains the focused life can be cultivated." In other words, attention is like a muscle, the more we use it, the stronger it becomes. Gallagher referred to work by mid-twentieth century psychologist Nicholas Hobbs, who stated that the way to ensure calm but heightened attention and focus is to choose activities that push you close to the edge of your competence that they demand your absolute focus. "If an activity is too easy, you lose focus and get bored. If it's too hard, you become anxious, overwhelmed, and unable to concentrate."

This theory is supported by many subjects in Csikszentmihalyi's research, who reported least happy when they were at leisure, such as watching TV. This seems counterintuitive, but the fact is that our mind only comes alive when it is engaged in the activity at hand, and at those moments we feel more fulfilled and happier. When we lose focus and the mind wanders, it often turns inward. Before long, we find ourselves ruminating

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about our worries, troubles, and other negative thoughts. To avoid this trap, Csikszentmihalyi suggested spending leisure time on a challenging and engaging hobby, such as playing a musical instrument, which simultaneously expands our horizon and exercises the mental muscle of focusing.

On the other end of the spectrum, when the task is too difficult, we feel anxious and frustrated, and also have a hard time focusing. In these cases, we may try to break down the overall task into smaller, more manageable parts and focus on solving one at a time. In accomplishing each smaller part, our brain is energized and we start to think, "I can do this," and thus start a positive feedback loop that propels us to go further. In a way, it is like climbing a mountain: if the summit seems daunting and out of reach, it helps to have intermediate goals along the way, which eases our worry and makes us focus on the climbing business under our feet. The ability to tune attention and focus on the work itself, rather than being consumed by anxiety and frustration, seems to be the key in these situations, and is certainly a capability worth cultivating.

In a world overflowing with stimulations and filled with uncertainty, sometimes life can feel out of our control. In those moments, please remember that attention is a muscle that each of us possesses, and by tuning our attention, we can choose to focus on things that are worthwhile and valuable. What we attend to becomes the thin slice of our universe, which shapes our experience and imprints in our memory.

I often think of this quote by botanist Liberty Hyde Bailey, "A garden requires patient labor and attention. Plants do not grow merely to satisfy ambitions or to fulfill good intentions. They thrive because someone expended effort on them." Our life is a garden; let's take very good care of what we choose to grow there. ◉

# Twenty-four visits to Stockholm: a concise history of the Rockefeller Nobel Prizes

## Part VII: Edward Lawrie Tatum, 1958 Prize in Physiology or Medicine

JOSEPH LUNA

It started, on paper at least, with butter. The chemical microbiology of dairy products was “certainly getting hot” as one professor dryly wrote to George Beadle, who in 1937 was starting his lab at Stanford University. Beadle, a plant geneticist who had recently switched to the fruit fly *Drosophila melanogaster* as a model organism, was looking for a good biochemist to join him with genetics research. He offered the job to 28-year-old Edward Tatum, a University of Wisconsin-Madison Ph.D. who had just spent a year in Utrecht, Netherlands, to study the odd mix of genetics in flies and the chemistry of butter. Tatum had come from a science family (his father was a chemistry professor) and was interested in genetics, but both father and son were concerned with the hybrid role of Beadle’s offer: amongst microbiology, biochemistry and genetics, Tatum stood a good chance of ending up an academic orphan, disowned by each discipline. But with jobs scarce in 1937, there were few options, and Tatum, his wife June, and their toddler, Margaret, headed to California.

What we would now call classical genetics was in full flower at the time. Pioneered at the turn of the century by Thomas Hunt Morgan, the fruit fly was (and still is) a powerful model organism to study inheritance, a concept just rediscovered through the long lost works of Gregor Mendel and his famous pea plants. Fly researchers at the time were interested in uncovering mutants, either natural or induced, that were different from normal flies, just as Mendel had done with peas. By crossing mutants with normal flies, or mutants with other mutants, early geneticists were able to track how a trait was transmitted from one generation to the next. In this manner, they figured out that inherited traits corresponded to physical entities on chromosomes, which they called “genes.” But what exactly a gene did was anyone’s guess. Things that could be readily observed or phenotypes such as changes in eye-color were clearly controlled

by genes in the sense that they were inherited in predictable ways, they had genotypes. But for other, absolutely necessary things, like proper metabolism, there was really no path forward, since mutations were usually lethal. As a result, geneticists were thought of as having only uncovered how a subset of trivial phenotypes, like pea shape and fly eye color, were linked to a genotype. Whether critical traits like metabolism played by the same rules was an open and very contentious question.

Into this world, Tatum and Beadle (“Beets” to his friends) set up shop. They set their sights on *Drosophila* eye color, where they aimed to extract the pigment found in normal flies to characterize it biochemically. Using mutant flies that lacked the pigment, they wanted to perform what we would now call the rescue experiment, where the pigment could be restored in genetically deficient flies. It would have been a powerful demonstration of phenotype correction, were it not for problems encountered seemingly at the get-go. Tatum found that correcting the pigment defect could only work when cultures carried a bacterial contaminant, which presumably made a hormone or small molecule to get things going. They spent four years trying to isolate this hormone, only to be scooped by the competition. It was a major blow for such arduous work, but more importantly, it startled the young researchers as to how complex biochemical genetics would be with flies.

In the world of start-ups that now occupy the 21st century Stanford area, would-be entrepreneurs often deploy what’s called a “pivot,” where when faced with stalled progress or the dawning realization of faulty premises, they radically reorganize. They throw out the idea and start again, usually in a completely new realm. It does not get more drastic than the Ur-pivot Beadle and Tatum undertook in 1941: they tossed out the flies, the staple of genetics

research for decades, and took up a lowly bread mold called *Neurospora crassa*.

This didn’t entirely come from nowhere. Burned by their experience with flies, Beadle and Tatum were on the hunt for a better genetics system, and while teaching a graduate course on comparative biochemistry, they found it. As a much simpler organism, *N. crassa* seemed all but tailor-made for the genetics of metabolism. Each spore it produced was a separate genetic mutant, and importantly this fungus only required a source of carbon and biotin for growth, it could make everything it needed from such a minimal media. It could also grow well on a complete media, chock full of vitamins and amino acids. By mutagenizing *N. crassa* cultures with X-rays, Beadle and Tatum took clones and grew them on both complete and minimal media. If a clone grew in the former and not the latter, they then started supplementing the minimal media with one factor at a time to see if they could rescue the mutant.

It was painstaking work, but on the 299th try, they isolated a mutant that had lost the ability to make vitamin B: it could grow in minimal media only when vitamin B was added. Crossing these mutants as they would flies, Beadle and Tatum observed that this vitamin B deficiency was inherited—it behaved just like a mutated gene. Most importantly, this work linked a defect on a gene to a problem with a protein for the first time. Published in *PNAS* in 1941, this work became the opening salvo for molecular genetics, where their formalism “one gene - one enzyme” was, in essence, the founding tenet of the central dogma of molecular biology.

Tatum joined the faculty at Rockefeller in 1957. Joining Beets in Stockholm the following October, it must have occurred to them: good thing they dropped that butter project! ◉

## Culture Corner

**Theater Review: "LOVE" performed by Cirque du Soleil at the Mirage Hotel, Las Vegas, Nevada, February 16, 2015**

BERNIE LANGS

When I told a musician friend of mine that I would be in Las Vegas for a few days in February, he insisted that while there I check out the Cirque du Soleil troupe's interpretation of the Beatles' music entitled "LOVE" that he had found to be an astounding theatrical tour de force. I knew some of the music from the show from the soundtrack released some years back produced by George Martin and his son, Giles. I'd even chanced upon a cable television airing of the film documentary chronicling the making of the show, but had quickly turned it off after witnessing the late John Lennon's wife making strong suggestions to the show's director during early rehearsals. Yoko Ono had already made far too many suggestions for Beatles' affairs, in my opinion. Yet, I knew the music for "LOVE" to be a brilliantly conceived mash-up of Beatles' tunes, taking a snippet from one song and tagging it to another or several others. In the case of the late George Harrison's "While My Guitar Gently Weeps," they added a lovely string arrangement to his melancholy demo of the song.

But Cirque du Soleil? Wasn't it just high wire, trapeze tricks by pantomiming performers? I told my friend, whom I've known since the time when the Beatles were an active band, that I'd pass on going to the show. Knowing how highly I regarded the Beatles, he replied, "You will love it. If you do not go, I will find you and I will hurt you. You have to go."

Thus so gently persuaded to attend, I am glad to say I have escaped that threat of bodily harm and even happier to report that "LOVE" as performed by Cirque du Soleil is a beautiful, exciting, musically profound, and dare I say, loving phenomenon. It is more than a show, it truly is an experience to behold in many ways. George and Giles Martin were instrumental in designing the sound system for the Beatles' amalgamated music and I've read that there are over 100 speakers placed around the theater, including three in each of the individual, cushioned, high-back seats. I would sometimes

shift in my seat to play the sound in my chair to the best effect. Beyond any studio album recorded by the group, beyond their television performances, or even the ball-park house speakers at their Shea Stadium show in 1965, this is the way Beatles' music should be heard. The volume was loud, but not too loud. It surrounded one and became all encompassing, but not uncomfortably overwhelming, and for any Beatles' fan, it could only lead to a state of bliss. It was like receiving wave after wave of pure joy.

How wrong I was about the mechanics of a live show by Cirque du Soleil. The performers are modern dancers, often undertaking straight out dance moves in various styles or doing their tasteful acrobatic feats in incredibly difficult fashions, including the use of high wires and trampolines. They are in complete tune not only to the beats and rhythms of the Beatles, but to their essence and soul, and very much on target with their original spirit. I was seven years old when the Beatles hit US radio and television, and thirteen when they split up. I was witness to their living spirit, which can never be completely captured again by anything produced since 1970. "LOVE" is as close to a witness of their time and unique manner as I have ever experienced.

Some of the best musical mash-ups for me were the superimposing of the guitar solo of "Tax Man" onto the middle section of "Drive My Car" while the latter tune is mixed with "What You're Doing," and "The Word." I also enjoyed the splattered sound bites that pepper the show's opening number "Get Back" where the troupe, on the \$100 million stage built in the round, did a joyful burst of great rock 'n' roll dancing with blissful abandon. I found the triumphant song to be the mixing of two of Lennon's tunes, "Being for the Benefit of Mr. Kite" and "I Want You (She's So Heavy)," the latter with its haunting, lengthy finale of overlapping guitars, combined with the chilling primal screams of Paul McCartney isolated from his agonizing song "Helter Skelter." I don't think that even the cho-



A Hofner bass guitar signed by all four Beatles displayed outside the "LOVE" theater at the Mirage Hotel (photo: Bernie Langs)

ral wall of sound of the final movement of Beethoven's Ninth Symphony can compare. "Ode to Joy" indeed.

"LOVE" lends itself to many visits since there are several easy plot lines that come and go, often concurrently. The complex stage and video screens also have so much action most of the time, that if you went each night for a week, you probably could never view the same thing twice. Of course, the price of the ticket is pretty steep, and in addition, you have to fly all the way out to Las Vegas to attend the show! In any case, I would venture to say that it's truly an experience that shouldn't be missed by fans of the Beatles and music fans in general. From the feats of the performers to the mix of the music, one sits back with a smile and wonders "How did they do that?" Pretty much what I often wonder about the Beatles themselves, both technically when listening to their songs and their enduring positive persona and fabulous depth of soul. ◉



INTERVIEW BY MELVIN WHITE

**How long have you been living in the New York area?**

Three and a half years. I grew up in the Philadelphia area and have visited NYC many times over the years, so I wasn't wholly unfamiliar with it before moving here.

**Where do you currently live?**

220 E. 70th Street. Three cheers for Rockefeller housing!

**Which is your favorite neighborhood? Why?**

The East Village, with its abundance of interesting restaurants, bars, and markets is probably my favorite neighborhood to hang out in, though I'm happy I live somewhere a bit more laid back.

**What do you think is the most overrated thing in the city?**

**And underrated?**

Overrated: The hustle and bustle, which is really only noticeable in Midtown or touristy areas and is basically a clear negative where it does crop up.

Underrated: So many great small and medium-sized parks besides Central (and Prospect) Park.

**What do you miss most when you are out of town?**

Probably the energy and sense of opportunity, like you could do or buy or learn or accomplish almost anything just around the corner.

**If you could change one thing about NYC, what would that be?**

Not so much a new change as wishing for the realization of a change already underway: the completion of the 2nd Avenue subway would do so much for Rockefeller's neck of the woods, both in terms of accessibility and vibrancy. Its existence might even improve the 6 train!

**What is your favorite weekend activity in NYC?**

If the weather's nice then long walks across several neighborhoods and park or riverwalks, randomly stopping off in interesting little



shops or bars or restaurants. If the weather doesn't cooperate, then wandering around inside the Metropolitan Museum of Art or Museum of Modern Art.

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

Seeing lower Manhattan blacked out after [Hurricane] Sandy and all the daisy-chained extension cords and phone-chargers being provided by the first line of storefronts with power around 39th Street.

**If you could live anywhere else, where might that be?**

Another one of the cities in the northeast or Chicago, San Francisco, or San Diego. I probably wouldn't turn down Hawaii, either, especially after this winter we've had.

**Do you think of yourself as a New Yorker?**

In some ways yes, in some ways no. I think you have to have either grown up in the city or lived here for a long time before you feel wholly of New York—there's just so much to it.◊

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## Quotable Quote

“I tried to drown my sorrows, but the bastards learned how to swim.”

Frida Kahlo, quoted in *The Independent* (U.K.)

*Send in interesting quotes to be included in future issues to [nseditors@rockefeller.edu](mailto:nseditors@rockefeller.edu).*

*Quotes can be philosophical, funny, clever, anecdotal - but NOT too salacious or outright unpublishable - and short enough not to need copyright permission.*

# Free Spring Breaks in New York: An April Calendar

SUSAN RUSSO

## Manhattan

Macy's Flower Show

When: April 1-4

Where: 34th Street and Seventh Avenue

Central Park Tour

When: April 4, 12-1:00pm

Where: 72nd Street and Fifth Avenue

Central Park Tour

When: April 4, 2:00-3:00 pm

Where: 110th Street between Fifth and Lenox Avenue

Central Park Tour

When: April 5, 10:00-11:30 am

Where: 110th Street between Fifth and Lenox Avenue

Central Park Tour

When: April 5, 2:00-2:45 pm

Where: 61st Street and Fifth Avenue

Easter Parade and Bonnet Festival

When: April 5, 10:00am-4:00 pm

Where: 49th to 57th Streets on Fifth Avenue

Fort Tryon Park Garden Walking Tour

When: April 5, 1:00-2:00 pm

Where: Cabrini Boulevard and Fort Washington Avenue

El Museo del Barrio-Super Sabado! 2015 "A, B, Cuentos!"

When: April 18, 11:00 am-6:00 pm (event repeats on May 16)

Where: E. 104th Street and Fifth Avenue

Union Square Earth Day Celebration

When: April 18, 12 pm-7:00 pm

Where: 14th to 17th Streets between Broadway and Park Avenue South

Central Park: 59th Street Pond Discovery

Walk When: April 19, 10:00-11:30 am

Where: mid-park south of Sheep Meadow - enter at 66th Street (register at Chess and Checkers House 15 minutes before start of the walk - maximum three children per parent or guardian)

Tribeca Family Festival Street Fair

When: April 25 (schedule to be announced - check internet)

Where: Greenwich Street between Chambers and Hubert Streets

## Bronx

Poe Park Shape Up Zumba

When: 9:00-10:00 am (event repeats every Saturday in April)

Where: 2640 Grand Concourse

Poe Park Arts, Crafts, & Games

When: 10:00 am-12 pm

Poe Park Paper Arts & Crafts

When: 2:00-3:00 pm (event repeats every Saturday in April)

Poe Park Arts, Crafts, & Games with Princess for Lifetime

When: April 18, 10:00 am-12 pm

## Brooklyn

Prospect Park Audubon Center Bird Watching

When: 12-1:00 pm (event repeats every Saturday in April)

Where: near the Lincoln Road/ Ocean Avenue entrance

Prospect Park Audubon Center Spring Break

When: 1:00 pm Blooming Naturalist

3:00pm Nature on the Go

4:00pm Animal Encounter (events repeat on April 5 and 11)

Tree Giveaway Red Shed Garden

When: April 18, 10:00 am-12 pm

Where: Kingsland Avenue at Maspeth Avenue

Puppetry Arts Festival of Brooklyn performances

When: April 25, 11:30 am-5:00 pm

Where: 4th Street and Fifth Avenue, Park Slope

## Queens

Hands-on History: Roads and Rails (trains)

When: April 18, 12-3:00 pm

Where: King Manor Museum - Rufus King Park at 153rd Street and Jamaica Avenue. ☉



# "Now He Belongs to the Ages"

GEORGE BARANY AND MARCIA BROTT

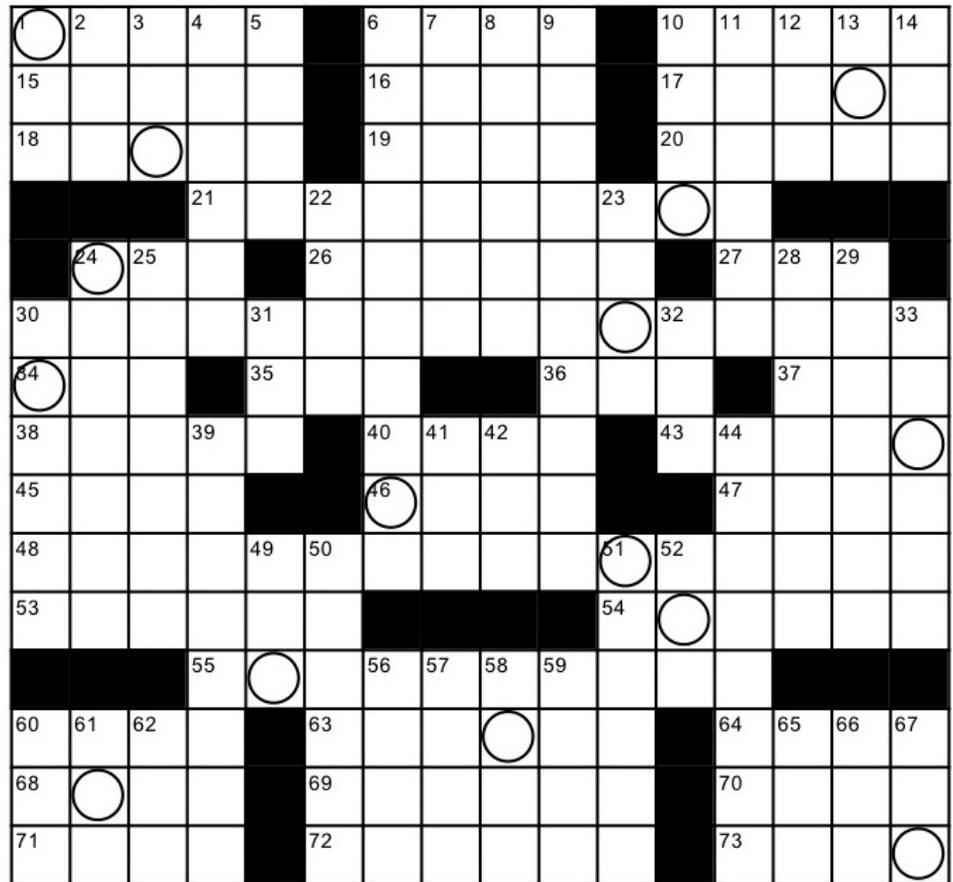
George Barany is a Rockefeller alum (1977). Marcia Brott is a human genome researcher by day, wordsmith by night. Both are currently at the University of Minnesota. For more about this specific puzzle, including a link to the answer, visit <http://tinyurl.com/april1865puz>. More Barany and Friends crosswords are at <http://tinyurl.com/gbpuzzle>. **After completing the puzzle, read the circled letters from top to bottom, one per row, to learn a bonus answer.**

## Across

1. First name in virology
6. Clear the field
10. Lines that break the fourth wall, perhaps
15. Like some wit
16. Prefix used with some hormones
17. Element in the spotlight?
18. Upside-down "e," in pronunciation
19. Amor \_\_\_\_ (stoic philosophy espoused by Nietzsche)
20. Swearing words
21. "New York Times" headline of April 15, 1865, Part 1
24. Like some wit
26. When most kids are in first grade
27. Andrews or Edwards: Abbr.
30. "New York Times" headline of April 15, 1865, Part 2
34. El Al hub city
35. Pekoe or Darjeeling
36. Letter from Greece
37. Bollywood actress and one-time Miss World Aishwarya
38. Continental currency
40. Tolled
43. Maker of Zocor and Fosamax
45. 1957 Balanchine-Stravinsky ballet
46. Lake where Perry met the enemy in 1813
47. Zaire's Mobutu Sese \_\_\_\_
48. "New York Times" headline of April 15, 1865, Part 3
53. First name shared by Signores Bugatti and Maserati
54. Goes down or lets up
55. Religious observance coinciding with the news item described in the headline
60. Ready to eat
63. Aristocratic address
64. Backscratcher target
68. Thames school since 1440
69. Crazed Muppet drummer
70. Pop, by another name
71. Like a real vixen
72. Nary a soul
73. Sector with startups

## Down

1. Law firm hires, for short
2. Middle Earth menace
3. Kabuki ancestor
4. Irving Berlin classic from 1925



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5. It might come with a club
6. Wildlife preserve, for example
7. West Coast wellness retreat
8. Bear witness
9. Exclusive rights
10. Nerve cell projection
11. Alaska Airlines hub city
12. 1099-\_\_\_\_ (tax form sent by a bank)
13. Homer Simpson's contribution to the O.E.D.
14. "Uncanny" trio
22. One way to end a scene
23. Where to get off
24. "What hath God \_\_\_\_?" (early demonstration by Samuel Morse)
25. Medicinal herb named for its colorful base
28. 1994 Oscar-winning role for Tom
29. Nickname of Eric Clapton's iconic Stratocaster
30. "What do you say?" response
31. Often-mispunctuated pronoun
32. Object of a boomer's protest
33. Coolpix cameras, for example
39. Origin and development of an organism
41. Keats praised one
42. Long in Hollywood
44. Lamb or Bacon
49. "Don't tase me, \_\_\_\_!"
50. "Star Trek" extra
51. Piece of Silver wear?
52. Court org.
56. Rat Pack nickname
57. Act the butterfly
58. Cowboy quarterback Tony
59. Farsi-speaking nation
60. Whistle blower?
61. Midori on ice
62. "A \_\_\_\_ on both your houses!"
65. Stocking stuffer
66. Org. concerned with Ebola
67. "As if!"

# Life on a Roll

ELODIE PAUWELS

<http://elodiephoto.wordpress.com>

Scenes from in and around Lisbon, Portugal During the day or at night, shades and shadows offer so much contrast. They create an atmosphere so powerful that you immediately feel charmed and bewitched at the same time. ☺

