

Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

Ten Minutes with... Leslie Vosshall

FERNANDO BEJARANO



Photo Courtesy of LESLIE VOSSHALL

Last year, gender inequality in science hit the headlines of numerous major scientific journals. Several remarks from notable scientists about their thoughts on women working in science brought up again the dearth of women in STEM (science, technology, engineering and math) fields to the public consciousness. According to the US Bureau of Labor Statistics, nowadays women make up almost half of the total US workforce and half of the college-educated workforce. However, women are much less represented in STEM fields, holding less than a quarter of the STEM jobs.

It is known that women hold a low share of undergraduate STEM degrees. It is curious that women with STEM degrees are less likely than their male counterparts to become STEM professionals. On the other hand, women with STEM majors are twice as prone as men to work in healthcare or education. One imagines that there are many factors contribute to this disparity of men

“
*Expect to fail often on the
Road to success—the easy
problems are rarely interesting.
Be resilient and don't give up,
especially if you are a woman.*

Leslie Vosshall

and women in STEM fields, such as gender stereotyping, lack of female role models, less family-friendly flexibility, motherhood or even gender biased hiring.

There is considerable research demonstrating gender biased hiring practice in a variety of fields, but do these practices also

CONTINUED TO P.2 ➡

What Else Inside? TRICK OR TREAT!

- 3** TURN ON and TURN OUT!
BY SUSAN RUSSO
- 4** Nobel Prize:
Roderick MacKinnon
BY JOSEPH LUNA
- 5** Culture Corner:
The Origins of Totalitarianism
BY BERNIE LANGS
- 6** For Your Consideration:
Ones to Watch, Vol. 2 Edition
BY BERNIE LANGS
- 8** New York City Dialect
BY AILEEN MARSHALL
- 10** CROSSWORD
Second Monday in October
BY GEORGE BARANY AND MARTIN ABRESCH
- 11** Life on a Roll: NYC Streets
BY QIONG WANG



Or rather some pumpkin spice?

plague the science field? A study published by Moss-Racusin et al. in PNAS (2012), tells us that these types of practices not only occur in science but they are more common than we imagine, happening frequently in a field where its members have been rigorously trained to be objective. You may be surprised to know that if your name is Jennifer your chances of working in science, technology, engineering or math are considerably lower than if your name is John. It won't make much difference if your name is Mary, Lisa or Amy. There is a disparity when you compare yourself with other male opponents such as Charles, James or Brian. You will also make less money for the same job, and if you ever get a tenure track position in an elite institution you will be surrounded by many male colleagues. Such is the worrisome situation of women in science presented by this study.

However, looking at the career of our guest, you could think that things would be different if your name was Leslie Vosshall. Success seems to follow her around. She managed to thrive in a challenging environment, while achieving a meteoric rise to excellence in science. Her career could be considered as a perfect illustration of gender equality pursuit in biosciences. Born and raised in New York City, Vosshall received her B.A. in biochemistry from Columbia University, and her Ph.D. in molecular genetics from The Rockefeller University (RU). After graduate school she returned to Columbia University for her postdoc under the mentorship of Nobel Laureate Richard Axel. Leslie Vosshall has made important discoveries in the field of olfaction since her early days in as a neuroscientist. She started by decoding the olfactory sensory map of the very cute fly *Drosophila melanogaster*. Her scientific discoveries continue to unveil the mysteries of the brain, covering a variety of models from insect to human. After a successful postdoc, she came back to RU as an assistant professor, where she currently holds the position of Head of the Laboratory of Neurogenetics and Behavior. She spent years having fun with pheromone perception, odorant receptors, chemotaxis behavior, odor memories, and building a molecular architecture of smell in flies, mosquitoes and vertebrates. In another era, she could have been the most prosperous perfume chemist in all of Europe. Let's say that with her proficiency, she would have blown away the sense of smell of Louis XIV! With the Sun King in her favor, I imagine her as one of the most influential people in the eighteenth century Versailles

Court.

Once again, knowledge is power and whether in the eighteenth or the twenty-first century, it is no doubt that she is an outstanding female role. As a sign of quality, we can observe a consistency in her publications in top peer-reviewed journals. She also manages to share time with her family, including two children. During her career she has been the recipient of many awards and honors: the Prize for Innovative Research in Neuroscience by Duke University, the New York City Mayor's Award for Excellence in Science and Technology and the Presidential Early Career Award for Scientists and Engineers (PECASE) among others. In 2015 she was elected to the National Academy of Sciences, quite an outstanding achievement reserved only for top leading researchers, and where every year only a few women are picked to be part of this select group of scientists.

I am certain that her career path was not easy; that it was hell until she got here; but also despite the draining effort, she enjoyed it all along. I assure you that she would not switch places with any male coworker, or have chosen a non-STEM career. Leslie Vosshall would do it all over again for gender equality in science, for a more family-friendly environment in STEM careers and for the future generations of women participating in life sciences.

This is what Leslie told us:

1. NS: Who, or what, inspired you to enter your field of achievement?

LV: My late uncle Philip Dunham—a physiology professor at Syracuse University who gave me my first big break in science when I was 16. I started spending summers at the Marine Biological Laboratory in Woods Hole, MA and worked in his lab up there. In the beginning I washed glassware, ordered chemicals from Sigma, and picked up packages and mail. A few weeks in, I started doing experiments. My first paper was published when I was 17, which seems crazy in retrospect. But it's not a great paper either to be honest.

2. NS: Explain what you do to a 5 year old kid.

LV: We study mosquitoes! These insects hunt us, bite us, drink our blood, and leave behind an itchy bite. In many places in the world, the mosquito bite can make people sick because mosquitoes can pass diseases along when they bite us. These diseases—malaria, yellow fever, dengue, chikungunya, and Zika—cause major health problems and kill hundreds of thousands of people every year. My lab

Natural Selections
Editorial Board

EDITORIAL BOARD

Jim Keller
Editor-in-Chief, Managing Editor

Aileen Marshall
Assistant Copy Editing Manager

Susan Russo
Copy Editor, Distribution

Qiong Wang
Copy Editor, Webmaster, Public Relations Manager

<p style="text-align: center;">Juliette Wipf <i>Copy Editor, Webmaster</i></p> <p style="text-align: center;">Dane Lund <i>Copy Editor</i></p> <p style="text-align: center;">Johannes Buheitel <i>Copy Editor</i></p> <p style="text-align: center;">Chew-Li Soh <i>Copy Editor</i></p>	<p style="text-align: center;">Fernando Bejarano <i>Copy Editor</i></p> <p style="text-align: center;">Yvette Chin <i>Copy Editor</i></p> <p style="text-align: center;">Nan Pang <i>Designer</i></p> <p style="text-align: center;">Giadalupe Astorga <i>Designer</i></p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

selections.rockefeller.edu
nseditors@rockefeller.edu

is working to understand everything about these mosquitoes: how they find humans, why they like humans more than non-human animals, why some humans are more attractive than others, and why and how exactly they find us. We know that mosquitoes like human scent, the heat that our warm bodies give off, the carbon dioxide in our breath, and what we look like. We test the behavior of these animals, and make mutant mosquitoes that are missing one or more of the five senses to figure out what's important for a mosquito as it flies around looking for people to bite. The work is important because it tells us basic things about how animals use their senses to navigate the world. It has medical relevance because understanding the behavior of this most dangerous animal in the world may help us come up with ideas to stop them from biting us.

3. NS: If you could have to sum up the most important characteristics of a scientist in three words, what would they be?

LV: Creative, Relentless, Resilient

4. NS: How do you feel about the position women have in science? Female scientist versus male scientist.

LV: This is complicated. Opportunities for women in science get better every decade, but it's still an issue of great concern that we remain seriously underrepresented at the faculty level. Women are now getting PhDs in equal numbers to men, but participation in the enterprise drops off drastically between the postdoc and the first tenure-track posi-

tion. I think this comes down to a few issues, many of which can be addressed with simple interventions. There is still explicit sexism out there, but more insidious is the quiet implicit bias that makes people expect less from women than men. This has the effect of reducing the self-confidence of women, and makes us less likely to keep going, which in turn makes us look like less compelling colleagues. I see this all the time in job applications, because for candidates of equivalent achievement, letters of recommendation for women (from male OR female references) are measurably weaker and full of comments about helpfulness, baking cakes for lab parties, productivity in spite of having babies, etc. etc. The academic tenure-track career is viewed as a risky and stressful option, and unfortunately many great female scientists opt out as a result. The truth is that there is no more flexible and joyful job in the world than to run your own lab. I have been doing retail politics to encourage women to stay in science, with some notable recent successes of female scientists who thought about opting out but who are now tenure-track faculty!

5. NS: Scientists don't only focus on science. They are usually passionate people devoted to other extracurricular activities. Do you have any other passions besides science?

LV: I like art, fashion, and food, and spend about equal amounts of time and money on all three. I collect contemporary paintings, mostly figurative. Recently I commissioned coco144, our local graffiti artist celebrity and RU electrician, to do a large-scale work on my lab office floor. In NYC and when I travel for business or pleasure, I go to galleries and museums, but also consignment shops hunting for great designer loot, and I check out as many great restaurants as possible.

6. NS: What would you be if you weren't a scientist?

LV: Dead.

7. NS: Did you have any "big rejections" in your life?

LV: Lots of the usual rejections in science—papers rejected, rejected from faculty positions when I applied as a postdoc, prizes not won, etc. etc.—but rejection and failure in science are good. Any working scientist needs to develop an appetite for rejection, and use the frustration and anger caused by failure to keep trying again and again. That said, I still have not gotten over the humiliation of not

making the cheerleading team in my junior high school.

8. NS: Who, of all the historic or current personalities, would you most want to meet and why?

LV: Rita Levi-Montalcini, a legendary biologist with an incredible life story that always inspires me. Whenever I think things are frustrating or hopeless, I think of Rita losing her academic position due to Nazi racial laws, but continuing to do experiments in her bedroom at home and again when the family fled from the Nazis. She kept going.

9. NS: What's your idea of a perfect holiday/vacation?

LV: I was born in Switzerland and return frequently to the alpine valley where I spent time as a child. It is beautiful there, sparsely populated, quiet, with great hiking and of course cows, cheese, and chocolate. What could be more perfect?

10. NS: Do you have any advice for young researchers?

LV: The recipe for a successful and happy life as a scientist: pick problems that excite you, and find interesting ways to solve them. Expect to fail often on the road to success—the easy problems are rarely interesting. Be resilient and don't give up, especially if you are a woman. Women receive less encouragement and people expect less from us, but that should make you 100 times more motivated to prove them wrong. Listen to constructive criticism, but ignore those who would dissuade you from pursuing interesting and risky questions. Encourage other scientists around you and be an ethical colleague. Support open science: talk about your work, share your ideas and data, and consider publishing on a pre-print server such as bioRxiv! Don't forget to have a life outside the lab, be it a family, a hobby, a vacation, a passion that is separate from your life in science. ■

TURN ON and TURN OUT!

SUSAN RUSSO

The Pew Research Center has over the past few years collected data from the International Institute for Democracy and Electoral Assistance, the United States Elections Project, and other national and international election authorities to estimate voter turnout in thirty-five nations in each of their last na-

tional elections. The countries studied are the members of the Organization for Economic Cooperation and Development (OECD): Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

In six of these countries (Australia, Belgium, Greece, Luxembourg, Mexico, and Turkey), voting is compulsory, but the laws aren't always strictly enforced and the penalty for not voting may be modest. For example, in Australia the penalty for not voting is the equivalent of US \$20, which is waived if you can prove that you had no way to get to the polls or legally submit a ballot.

Of the thirty-five nations included above, the United States is thirtieth in this list (based upon the most recent national election and excluding the U.S. mid-term elections), with 53.6% of the estimated 241 million "voting-age" population voting in the 2012 Presidential election. However, we do rank above Switzerland, where the estimated turnout for the last national election was less than 39% (even though one section ("canton") in Switzerland does have a compulsory voting law).

The highest voting percentages were in Belgium (87.2%), Turkey (84.3%), and Sweden (82.6%). Of course there can be serious political divisions, loss of confidence, and economic and social factors (as now in the United States) in every country, which can alter the turnout over the years. For instance, in 1992 Slovenia's voting turnout was 85%, but was 54% in 2015. Japan, as well, had a high voter turnout (75%) in 1990, but fell to 52% in 2014. In addition, the voting-age population used to calculate these statistics includes people who are not eligible to vote (e.g. non-citizens) and the percentage of the population that is ineligible to vote may vary among the OECD countries.

The statisticians at Pew found that in the US, in 1996, when President Bill Clinton ran for his second term, the voting percentage was 48%, and in 2008, when Barack Obama was elected for his first term, the percentage rose to 57%.

A US Census Current Population Survey calculated statistics from the 2012 election, which report that the percentages of voter turn-out by region were Northeast 58%, Midwest 62.7%, South 55.7%, and West 53%.

SO GET OUT AND VOTE!!!! ■

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

Part XXII: Roderick MacKinnon, 2003 Prize in Chemistry

JOSEPH LUNA

In the early 1950s, two English physiologists named Alan Hodgkin and Andrew Huxley wrote a five-part magnum opus of papers formally describing the electrochemical basis of action potentials, those short lasting impulses that travel along nerve cells. Starting with electrophysiological measurements of squid giant axons, they formulated a precise mathematical model of how action potentials arise and propagate based on the movement of small charged atoms called ions, across a cell membrane. Hodgkin and Huxley made their way to Stockholm in 1963 for this work, having achieved a true breakthrough in neuroscience. Yet such a complete synthesis was more of a molecular starting point founded on a key assumption: the Hodgkin-Huxley model critically relied on the idea that the cell membrane underwent transient changes in ion permeability. In other words, the cell membrane possessed a highly optimized border control system that would permit some ions in (or out) at one specific time and place, but not at others. How such a system actually worked at the molecular level could only be guessed at. For their part, Hodgkin and Huxley dryly wrote that the “details of the mechanism will probably not be settled for some time.” Their assumptions turned into predictions—the richest of guides for future scientists, among them Roderick MacKinnon.

One vital element of the Hodgkin-Huxley model that captured MacKinnon's fascination centered on potassium ions (K^+) and the heroic feat they needed to pull off to escape the cell. With a radius of 1.38 Ångströms, these water-loving ions manage to cross a cell membrane that resembles a great wall of grease, over 40 Ångströms thick. This would roughly translate into a barrier eight stories tall for a human sized potassium ion—scalable perhaps by Superman, were the building not made of solid Krypton. K^+ ions can't manage such an exploit alone. To get around this, Hodgkin and Huxley postulated the existence of a channel that would ferret K^+ ions out of the cell. Despite the idleness implied by the name, the channel they predicted was no ordinary hallway for K^+ ions. For the Hodgkin-Huxley model to work, this channel needed to be a complex machine capable of differentiating K^+ ions from among scores of other (often smaller) ions, and it also needed to open and close at precise moments. In other words, it was a very selective gate.

For MacKinnon, this presented a tantalizing puzzle to determine the molecular basis of ion selectivity. How did the channel conduct



Photo Courtesy of THE ROCKEFELLER UNIVERSITY

potassium ions, but not others, such as physically smaller sodium (Na^+) ions? After undergraduate thesis research in Chris Miller's laboratory at Brandeis University, MacKinnon took a slight detour to go to medical school, before finding himself back in the Miller lab, thirty years old and feeling behind as a scientist, for post-doctoral work. He quickly caught up, and found himself amidst exciting times for ion channel research in the late 1980s. As a postdoc, MacKinnon worked out the mechanism of how a scorpion venom toxin blocked K^+ channels in skeletal muscle (it plugged the pore). The first K^+ channel called *Shaker* was cloned from fruit flies around the same time. Performing a “let's see what happens” experiment, MacKinnon determined that the scorpion toxin also blocked the *Shaker* channel. This was fortuitous, since it meant that the specific amino acids that interacted with the toxin could be mapped to help define the pore of the channel. It was a solid first step that harnessed the power of molecular biology to explain potassium selectivity. Over the next few years, MacKinnon with his newly established lab at Harvard, determined which amino acids were essential for potassium conductance, and in broad strokes, worked out what the channel ought to look like. They imagined a tetramer of protein subunits encircling a central pore that could open and close, and where each subunit contributed a loop of amino acids whose job it

was to discriminate K^+ ions. And yet, despite a wealth of biophysical and biochemical data, a satisfying explanation of how the channel conducted potassium much better than smaller sodium ions remained elusive. MacKinnon sought to “see” an ion channel.

So enthralling a problem was ion selectivity that MacKinnon took up the idiosyncratic and often temperamental branch of biophysics known as X-ray crystallography to solve the atomic structure of a potassium channel. It was a bold move, and one that a place like Rockefeller, then under Torsten Weisel's guidance, was eager to support. Now in a new field and in a new place, MacKinnon and his team got to work on solving the structure of a membrane protein. That prospect alone would make most crystallographers shudder. But a more pressing problem was making enough protein to crystallize. Because K^+ channels conduct so rapidly, not many are required for normal cellular function, which means that they tend not to be very abundant and thus difficult to purify to high levels. Fortunately, by the mid-1990s enough sequencing evidence had accumulated to suggest that certain species of bacteria might encode potassium channels that could be readily grown to high levels. Moreover, many of the key sequence features were shared between bacteria and the fruit fly *Shaker* channel. Within two years of arriving at Rockefeller, MacKinnon and his team reported in 1998 the structure of a K^+ channel called KcsA from the bacterium *Streptomyces lividans*. The structure at long last helped reveal the mechanism of potassium selectivity in the pore: the amino acids that lined the pore precisely mimic the way that water molecules surround, that is *hydrate*, a potassium ion. It is as if the channel, when open, is invisible to potassium. Sodium, however, has a harder time. Because the fit for sodium in the pore isn't perfect, it attempts to drag in a water molecule to remain properly hydrated and the channel simply will not permit the extra baggage.

This was but a start. The structure of the potassium channel opened the door to understand a multitude of fascinating molecular features of these machines, from further studies of the pore, to details of gating to channels of other organisms. The exciting portraits of these proteins verified many key predictions of the Hodgkin-Huxley model. In a gracious gesture, MacKinnon wrote to an ailing Sir Alan Hodgkin, telling him of the news, in atomic detail. ■

Culture Corner

Hannah Arendt's *The Origins of Totalitarianism* and the 2016 Presidential Election

BERNIE LANGS

I am close to finishing a masterpiece of historical and philosophical discussion written by Hannah Arendt (1906 – 1975), *The Origins of Totalitarianism*. My purpose in writing about this book is not to convince anyone to read it, because it is an extremely dense and difficult nonfiction tome. I subscribe to my belief in a “trickle-up” theory, that if certain opinions get into the public sphere, perhaps they will rise not only to the level of a wider public discourse, but eventually reach someone who has influence somewhere in the chain of actual political power.

Dr. Arendt's book is a painstaking view on how Hitler and the Nazis and the likes of Joseph Stalin could create the totalitarian states in Germany and Russia, which depended on cooperation and coercion to their purposes of the existing political and military structures and personnel, along with crafting an agenda that would attract and integrate their general populations to their ideologies. I think that many of us believe we know how this happened. My personal narrative went something like this before I picked up this book: Hitler rode a tide of German resentment after its defeat in World War One, taking advantage of the harsh terms of the Treaty of Versailles, economic calamities such as monetary inflation and unemployment, and utilizing as “scapegoats” the Jewish population with relentless propaganda and attacks. The choice of the Jews for Nazi hate and annihilation, I believed, was the remnant and culmination of medieval Christian anti-Semitism which basked in physical attacks on Jews for hundreds of years.

Aristotle wrote in his work, *Politics* “... it is evident that the state is a creation of nature, and that **man is by nature a political animal**...Nature, as we often say, makes nothing in vain, and man is the only animal whom she has endowed with the gift of speech...And it is a characteristic of man that he alone has any sense of good and evil, of just and unjust...and the association of living beings who have this sense makes a family and a state.” I have always instinctively fought against and disliked this idea, mostly because I sense that if man is a political being, unlike the Greek's belief that it leads to the common

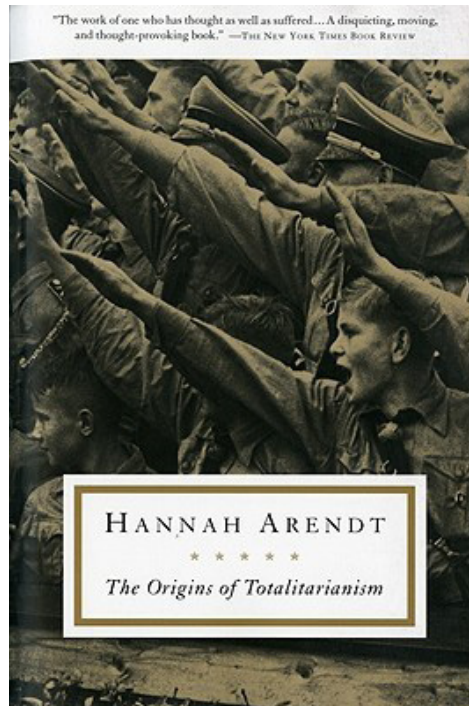


Photo Courtesy of HARCOURT PUBLICATION

good, it is political nature that leads the species down the path to horrific events such as the Second World War and the Holocaust. And it was the “gift of speech” that was the incalculably helpful ally in the rise of the Nazis and the Bolsheviks that unleashed terror on the world that left countless millions dead.

After reading just the first few pages of *The Origins*, my idea of what caused the war (and why Hitler chose the Jews to attack) was shamefully exposed not only as overly simplistic, but downright ignorant. The first edition of the book appeared in the late 1940s and was revised over the next few decades for subsequent publications. I went in thinking I would take what I could from it, given that it is half a century old, and that in this current age of information, this is only Dr. Arendt's view, and there are most likely many historians and social scientists who carefully refute her claims and ideas. But the real point is that Dr. Arendt doesn't just study the post-Great War European climate to get to the causes of the unspeakable and well-organized slaughter, but meticulously traces it back to the late eighteenth century revolutions and the societies of the nineteenth century, showing how the situation slowly simmered to the boiling point of carnage. In this book we

journey through France's Dreyfus debacle and relive the nightmare of British imperialism. We follow both large and small political and social movements that are racist, jingoistic, hateful, and so on, some of which resonated with the populace of Europe, some that had no success, but all of which set the table for the rise to totalitarianism as practiced by Hitler and Stalin. There is an in-depth study of post-World War One stateless peoples of the European continent, noting how this sense of limbo experienced by millions gave rise to the horrific solutions offered by the Nazis. The Nazi ideology also finally gave an inclusive purpose to the listless masses of not only Germany, but other European nations as well, the breadth of which I had previously not been aware of.

In addition, Dr. Arendt examines how the American and French revolutions begat a seismic shift to the idea of individual rights for humans, in that people were no longer inherently at the mercy of either a King or of God and the Church, but had an innate freedom beholden to none. But these rights, as intellectually promising and philosophically attractive as they may seem, offered nothing to displaced people who could claim no physical country, and this became a way of defining them as less than human in the eyes of the Nazis.

The rub is that to get to the kernel of any kind of truth, you have to read and dig, you can't just easily summarize on a whim. And of course you can't go through two centuries of documents and emerge with an *absolute* truth of the causes of events, which would only leave you waving your findings like Chamberlain boasting “Peace for our time” just moments before the ensuing bloodbath. But Dr. Arendt's approach is remarkable and encourages meticulous, difficult, and time-consuming study to get to the heart of an idea of cause.

Finally, although the situation in the 1930s offers similarities to current American political events, it is not a mirror and one of the lessons of *The Origins* is that there are no absolutely predictable historical outcomes, which was one of the terrible ideas promoted by the Soviets and

CONTINUED TO P.6

Nazis. However, Dr. Arendt does warn that the ramifications of the unique totalitarian systems that arose in Russia and Germany in the twentieth century irrevocably changed the nature of international states and politics, giving rise to unexpected new forms of national instabilities and destructive political qualities.

The flaws on display of American democracy in the 2016 Presidential election, especially given the autocratic nature of Donald Trump and his appeal to the so-called “disenfranchised masses”, can in no way be compared to Bolshevik

Russia and Nazi Germany. Those governments had at their epicenters a crazed lone leader constructing a system to support their wild ideals, and Hitler and Stalin depended on the structure of an intricate secret police to facilitate their terror. Even at its worst, American secretive government agencies would never go to the extremes of the totalitarianism societies that planned the deaths of groups of people in advance. Yet, U.S. citizens do quietly acquiesce to certain methods that arose in the last century, such as growing surveillance and the surrender of other rights of privacy. Stalin liquidated enemies who potentially could have just a thought of turning on his crazed governing apparatus, and at times, Americans experience “profiling” by the police well ahead of any actual transgression. But it’s a long distance between the two.

The bluster of Donald Trump in his speeches on refugees and the immigration system are incredibly reminiscent of the way post-World War One peoples facing similar situations were spoken of at that time. Those peoples were given no home of their own, and were bounced around Europe, eventually giving the strongmen of Germany and Russia the chance to step in as nationalist ideologues with carte blanche to fix the problem. And that led to the total surrender of rights, soon to be followed by wide-spread murder. It is not realistic in America to fear that Donald Trump will round up immigrants or refugees for extinction. But just the idea of someone running on a platform of rounding them up in any way should be a cause for great concern. ■



Photo Courtesy of SONY PICTURES

Billy Lynn’s Long Halftime Walk

For Your Consideration Ones to Watch, Vol. 2 Edition

JIM KELLER

The storm of film festivals galore began at summer’s end with the one-two punch of the Venice (August 31 – September 10) and Telluride (September 2-5) film festivals. In recent years the former has been credited with birthing our eventual Best Picture winner into the world and so begins the Oscar race. In the second of a three-part series, we discuss the performances that are likely to feature in the Best Actor race.

This year’s race feels peculiar in that at September’s end the festivals have not yielded any consensus of frontrunners. By this time last year we had already seen the performances of Michael Fassbender (*Steve Jobs*) and Eddie Redmayne (*The Danish Girl*) by way of Telluride and Venice, respectively, and Matt Damon (*The Martian*) via The Toronto International Film Festival (TIFF). Currently, we have little to go on because the films that have been shown have centered on a female, not a male, lead. Considering the Academy’s history of mostly nominating films for Best Picture that have a male lead, this is a very good problem to have. One thing is certain: in the wake of the #OscarsSoWhite controversy, there are high hopes for Denzel Washington (*Fences*) and Dev Patel (*Lion*). This isn’t to say that there aren’t performances already out there that could become consensus decisions (Casey Affleck, Joel Edgerton, Ryan Gosling), just that it’s too early to tell what critic groups might circle back to.

Before we get to this year, let’s recap last year’s awards.

Of the eight roles that were discussed here, three went on to secure Best Actor nom-

inations. The biggest story was that after 22 years, the Academy finally broke down and awarded the top prize to Leonardo DiCaprio for his searing performance in *The Revenant*. There really wasn’t much of a competition, given how overdue DiCaprio was for a win. But outside of Fassbender’s performance in *Steve Jobs* and Redmayne in *The Danish Girl*, Bryan Cranston (*Trumbo*) and Damon (*The Martian*) managed to sneak in. There was a short snub list comprised of Johnny Depp (*Black List*) and Michael Caine (*Youth*) as Fassbender’s other performance (*Macbeth*), and Ben Foster’s in *The Program* were not able to find early footing. Mark Ruffalo, the last actor discussed here, wound up being nominated in the supporting actor for *Spotlight*.

THE HEE-RO: Joe Alwyn – *Billy Lynn’s Long Halftime Walk* (director: Ang Lee):

FYC: Based on the novel of the same name by Ben Fountain, this drama concerns infantryman Billy Lynn (newcomer Alwyn) who recounts at a Thanksgiving Dallas Cowboys halftime show that he and his squad members made an appearance in during the final hours before the soldiers return to Iraq. Alwyn is as green as they come, with only a single screen credit to his name for the TV series documentary short, *A Higher Education*. As one of Lee’s many directorial strengths is getting brilliant performances from his actors (see *Sense and Sensibility* and *Brokeback Mountain*), there is reason to expect the same here. Having been shot at 120 frames per second, the highest frame rate for a film to date, all eyes will be on Lee’s film when it bows at New York Film Festival later this month.

THE TRAVELER: Dev Patel – *Lion* (di-

CONTINUED TO P.7

rector: Garth Davis):

FYC: Based on Saroo Brierley's non-fiction book *A Long Way Home*, the drama chronicles the journey of Brierley (Patel) who was separated from his family on the streets of Calcutta at the age of five and was later adopted by an Australian family. At 25, he finally finds his parents using Google Earth. This is the second high profile performance from Patel this year, next to *The Man Who Knew Infinity*. While Patel has yet to be recognized by major awards groups outside of his Best Leading Actor nomination by the British Academy of Film and Television Arts (BAFTA) and Best Young Actor/Actress nomination by the Broadcast Film Critics Association (BFCA) for *Slumdog Millionaire*, the reviews out of TIFF are strong and as I mentioned, the #OscarsSoWhite backlash is at a fever pitch.

THE LOVER: Joel Edgerton– *Loving* (director: Jeff Nichols):

FYC: The drama tells the true story of Richard and Mildred Loving (Edgerton and Ruth Negga), an interracial couple who were sentenced to prison in Virginia in 1958 for getting married. While he has been the recipient of several critics' group awards, most hailing from his home country Australia, Edgerton is the third leading man here that has yet to garner Academy acclaim. Still, his work in US films, such as 2011's *Warrior* and the aforementioned *Black Mass* has shown that he is capable of currying their favor. After the film premiered at this year's Cannes Film Festival, Negga's performance has been the one on everyone's lips. While Edgerton's performance has been said to be more controlled and less showy, if the film does well across the board, he could be swept along for the ride.

THE RECORD HOLDER: Denzel Washington – *Fences* (director: Denzel Washington):

FYC: This American drama, based on August Wilson's play of the same name, follows African American father Troy Maxson (Washington) who struggles with race relations in the US while raising a family in the 1950s and coming to terms with the events of his life. Washington is no stranger to the Academy. Having earned the first of two supporting actor nominations in 1988 for *Cry Freedom*, he won for *Glory* two years later. His string of Best Actor nominations began in 1993 with *Malcolm X*, followed by *The Hur-*

ricane in 2000, and a win for *Training Day* in 2002. He was last nominated three years ago for *Flight*. Washington holds the record for most nominations for an African-American actor. In any given year Washington has a lot going for him. However, with the specter of #OscarsSoWhite looming large over the Academy, it would be surprising if he didn't make the cut this year.

THE SLAVE: Nate Parker – *The Birth of a Nation* (director: Nate Parker):

FYC: In this drama, Nat Turner (Parker), a former slave, leads a liberation movement in 1831 to free African-Americans in Virginia resulting in a violent retaliation from whites. The film premiered at this year's Sundance Film Festival where it won the Audience Award and Grand Jury Prize in the US Dramatic Competition. Then, Fox Searchlight Pictures bought worldwide rights to the film in the largest deal in the fest's history (\$17.5 million). But it wouldn't be the Oscar race without a little controversy. On the cusp of the fall festivals it was widely reported that the woman who claimed that she was raped by Parker and his roommate Jean McGianni Celestin in 1999 while the three were students at Penn State had committed suicide. Parker and his publicity team made no effort to hide his past, leaving anyone who sought the information able to read all about the case and subsequent acquittal on his [Wikipedia page](#), but the suicide was something they were not aware of. Suffice it to say, the case has now been exhumed, leaving the media and many critics to pour over the minutiae of it like vultures, and many Academy members to vow not to see the film. An interesting question is raised: should one's artistic work be evaluated purely on merit or should one's past have the ability to overshadow one's achievement? Before the controversy hit, Parker's film seemed unstoppable as a Best Picture contender, now the film's chances have become a big question mark. But the framework for this story has played out twice before with [Woody Allen](#) and [Roman Polanski](#). Both directors, both white, both highly regarded by the film industry. Is it possible for an African-American director to rise above such character assassination? I would say that if he doesn't, racism is most certainly to blame.

THE FATHER: Casey Affleck – *Manchester by the Sea* (director: Kenneth Lonergan):

FYC: In this drama an uncle (Affleck) is forced to take care of his teenage nephew after the boy's father dies. The film premiered

at Sundance to high critical acclaim and US distribution rights were acquired by Amazon Studios, who beat out Sony Pictures Classics, Universal Pictures, Lionsgate, and Fox Searchlight. If there were a frontrunner at this stage, it would probably be Affleck, who was nominated for Best Supporting Actor in 2008 for *The Assassination of Jesse James by the Coward Robert Ford*. The role, which won him the National Board of Review and the National Film Society of Critics awards in 2007 and 2008, respectively, also earned him BFCA and Golden Globe nominations in 2008. Since then, Affleck has steadily built his repertoire with memorable roles in *Gone Baby Gone*, *The Killer Inside Me*, and *Ain't Them Bodies Saints*. For now, he's the closest thing to a favorite, but is the Academy likely to ignore #OscarsSoWhite for the third year in a row?

THE BRIT: Hugh Grant – *Florence Foster Jenkins* (director: Stephen Frears):

FYC: This British-French biographical comedy-drama film tells the story of the titular character (played by Meryl Streep), a New York heiress with big dreams of becoming an opera singer, despite having a terrible singing voice. Given Streep's ability to slide in and out of a wide range of roles like a chameleon, on paper the film appears to be a shoo-in for Streep to earn her twentieth nomination. But what I certainly didn't bank on was Grant holding his own as Jenkins' paramour. Upon further digging, I'm a little less surprised having learned about his Golden Globe win for Best Performance by an Actor in a Motion Picture - Comedy or Musical and subsequent nominations for *Four Weddings and a Funeral* (1995), *Notting Hill* (2000), and *About a Boy* (2003). It seems certain that Grant will be recognized this year by BAFTA, but will he also impress the Academy? After all, he has yet to catch the eye of some of the precursor award shows along the road to the Oscar.

These are just a smattering of performances from actors with the pedigree to earn a nomination as Oscar season gets underway. Other performances from leading men this year that could make their way down the winding road to the Oscars include those that have been seen (Miles Teller in *Bleed for This*, Jake Gyllenhaal in *Nocturnal Animals*, and Ryan Gosling in *La La Land*), as well as those yet to premier: David Oyelowo (*A United Kingdom*) and Brad Pitt (*Allied*). The New York Film Festival will be the next to weigh in from September 30th – October 16th. Until soon Oscar watchers! ■

New York-ese, or a Guide to the New York City Dialect

AILEEN MARSHALL

People come to New York City for different reasons. Many come as tourists, others come to live and work here, not only from other parts of the United States, but from every corner of the globe. American citizens study standard American English in school. Visitors from other countries usually learn British English. Then they come to the city and hear phrases like “Hey, watcha doin?” or “Aw, fuhgeddaboudit”. Confused? Studies in standard English do not always prepare someone to interpret the New York City dialect. With that in mind, *Natural Selections* will be providing a new service. For the next few months, this column will give lessons in New York-ese. Each month will have a few new vocabulary words. Hopefully by the end, non-native New Yorkers will have a better idea what that man pushing past you on the subway is saying, or what those two hot dog vendors you just passed are fighting about.

Where did the New York City accent come from? Like the city itself, its origin is diverse. It was first studied and documented in the 1890s. The first influence was the Dutch. That’s why we refer to the stairs in front of a building as a stoop. Then the Irish, Scottish, French, German and Scandinavian groups came in and influenced our language. The term deli, used for a store where cold cuts, salads, and other prepared food is sold, is short for delicatessen, a German word. In the early twentieth century, Eastern European and Italian waves of immigrants added to the dialect. Yiddish words are often incorporated into the speech of a native New Yorker.

Linguists say it is the most recognizable accent in the world. Some famous speakers of the New York dialect include Woody Allen, Tony Danza, Fran Drescher, Robert De Niro, Cyndi Lauper, John Leguizamo, Rosie O’Donnell, Rosie Perez, Bernie Sanders, and Jerry Seinfeld, among many others. Sadly, this accent is slowly disappearing. It is not heard in Manhattan as much as in earlier generations. Recent immigrants usually cannot afford Manhattan housing. Middle- and upper-class professionals from other areas of the country, who speak standard American English, make up most of the population of the main island. The dialect survives among working class natives of the metropolitan area, but linguists say there is a tendency among the millennial generation to try to drop the accent because of a perception of an association with a lack of education.



Photo Courtesy of DANIEL SCHWEN

Sign on the Gowanus

Lesson 1

In the New York City dialect, the letter T is pronounced like a D. The most common example is the word “the.” Here it is pronounced “[da](#).” Some examples of it used in a sentence, written phonetically:

I am going up to *da* Bronx.

I take *da* subway to work.

Here are our vocabulary words for this month:

[Dem](#) them

Example: When *da* Dodgers were in Brooklyn, *dey* were known as *dem* bums.

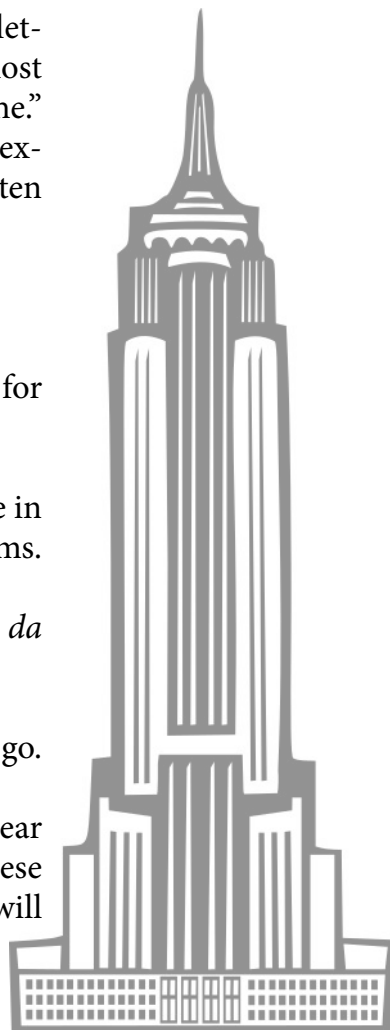
[dese](#) these

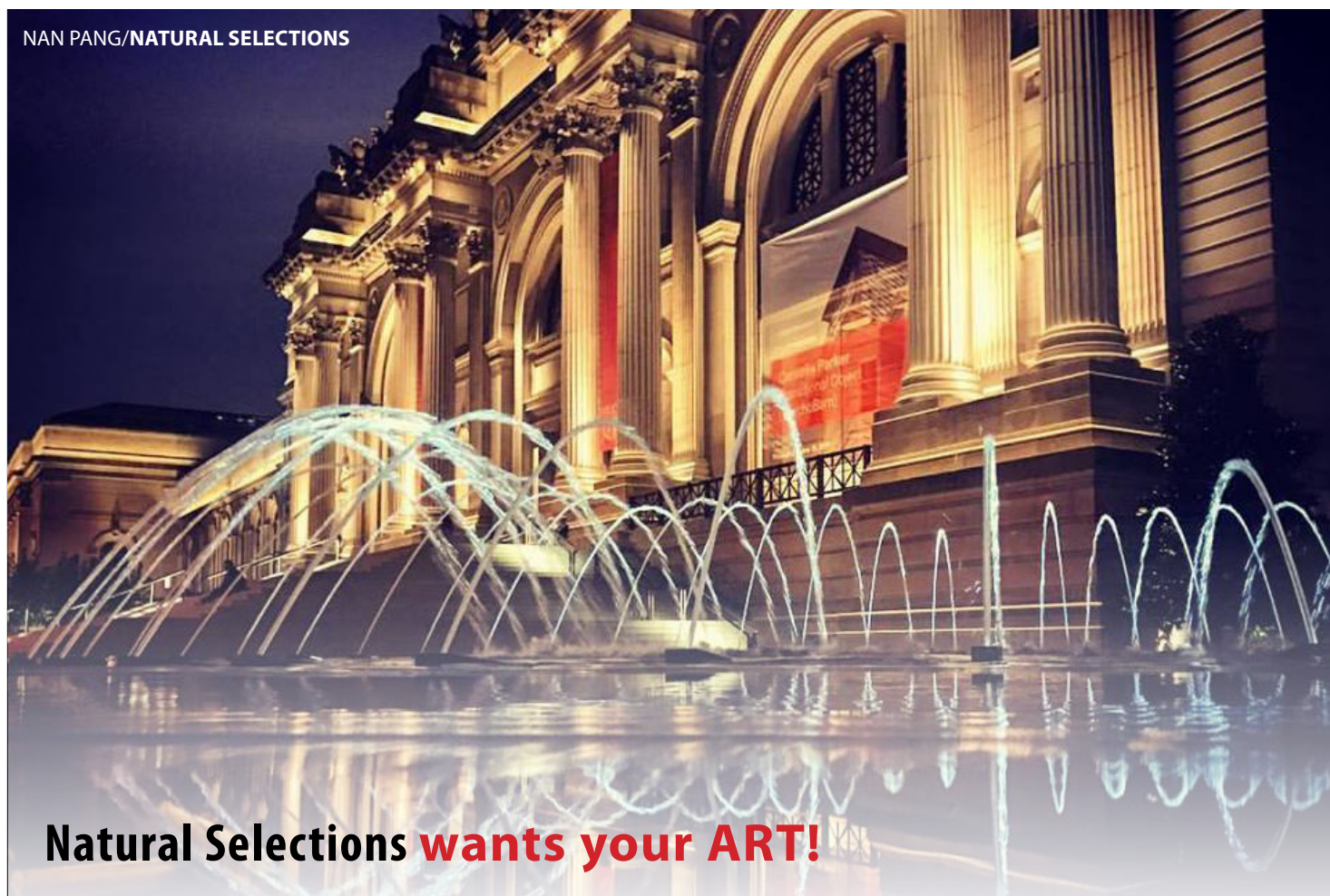
Example: *Dese* bagels are from *da* corner deli.

[dose](#) those

Example: I will take *dose* slices to go.

Click on the blue links above to hear the words pronounced. Practice these on your own, and next month we will have more vocabulary words for you.





Natural Selections **wants your ART!**

Whether you can't stop drawing while waiting for the bus, or taking a walk around the city; if photography is your passion, or if you're more of a painter, this is your chance to share your art.

Beginning in 2016, Natural Selections will publish a picture of the art we receive every month. To take advantage of this opportunity, email us your work with a title, a brief description, and your name. We'll make sure to include it in a future issue. We hope to receive several images to create an open space for art!

We'll be delighted to receive your artwork, please email hi-res image or vector files to: **nseditors@rockefeller.edu**

QUOTABLE QUOTE

"It is no easy task to be good. Anyone can act: get angry, give money, speak to friends, and so on. But to do something to the right person, to the right extent, at the right time, with the right motive, and in the right way, that is not easy."

Aristotle, 384 – 322



Second Monday in October

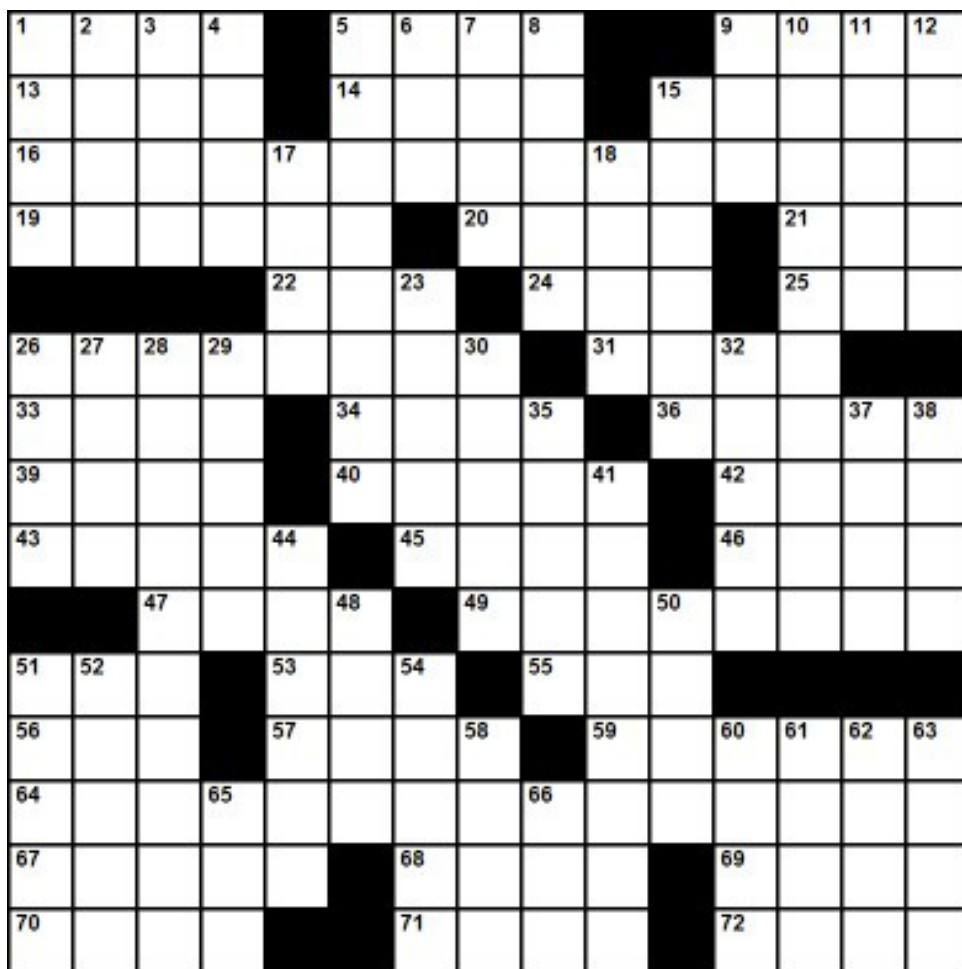
GEORGE BARANY AND MARTIN ABRESCH



Across

1. Name hidden by Hirschfeld
5. Piece of Gail Collins' mind
9. Candy launcher?
13. Like jelly beans
14. Nice old man?
15. Ballerina Tallchief
16. Thorpe and Alexie, for two, and peoples honored by California and South Dakota with an October holiday
19. Pushkin dandy who kills his friend in a duel
20. His final game in pinstripes marked the only time during the 2016 season that he played 3rd base
21. Mid-sized?
22. Winter time in NYC
24. Symbol for viscosity or index of refraction
25. They're gained by RBs, WRs, and TEs
26. Beauty, it's said
31. Mighty companion
33. Perfect
34. It's spun about
36. Attic, perhaps, to bats
39. Long-time host of "Scientific American Frontiers"
40. Nick name?
42. No-win situation
43. Nation formed from a successful slave revolt
45. "Quit it!"
46. Site of Nobel Peace Center
47. Sonorous disc
49. Some Rio 2016 competitors in sitting volleyball and wheelchair basketball
51. West who said "I used to be Snow White, but I drifted"
53. ___ Jones
55. Word before diem or capita
56. Coffee vessel
57. Largest dwarf planet in the solar system
59. One who will stop watching ... after just one more episode
64. 18-Down's first book ... and a possible wish for the name of an October holiday
67. Astronaut getup
68. Place for lovers?
69. Absolute ___ (temperature at which all molecular motion ceases)
70. Rural agreement
71. Scott in an 1857 case
72. Fr. holy women

George Barany is a Rockefeller alum (1977) currently on the Chemistry faculty of the University of Minnesota–Twin Cities. Martin Abresch is a graduate of the University of Wyoming, currently living in Seattle, and this is his first published puzzle. For more information, including a link to the answer, visit [here](#). More Barany and Friends crosswords can be found [here](#).



© October 2016 for "Natural Selections"

Down

1. Pitching gem accomplished 7 times by Ryan, informally
2. ___ the Terrible
3. Election prognosticator Silver
4. Character with the tagline "Booyakasha!"
5. New horizons for 15th century explorers
6. Research subject, to Mendel
7. Bombeck who wrote "Never go to a doctor whose office plants have died"
8. Steel plow inventor
9. Air bladder, for one
10. Little Bighorn warrior whose memorial is the site of celebrations of an October holiday
11. Having prongs
12. Arrangement holders
15. Where trapeze artists connect
17. Got in the game
18. Author of 64-Across
23. Gulf Coast state
26. "___ mat" (Farsi phrase that led, etymologically, to "checkmate")
27. Caffeine nut
28. From where they're found, as peoples

- honored by numerous US cities on an October holiday
29. "Spiffy!"
30. Galapagos island that was home to Lonesome George (anagram of PAINT)
32. Play title character who has no lines
35. Put one's foot down
37. Closer object
38. Terrible ___
41. Made an overture
44. Seeing red?
48. Bloodstained
50. Language that gave us "pajamas"
51. Hot and humid
52. Came to light
54. Handle
58. Chicken pox reminder
60. Baseless plots, for short
61. "As if!"
62. Medical breakthrough
63. General ___ chicken
65. Turn down, in a way
66. The loneliest number, according to a 1969 song



Life on a Roll

QIONG WANG

One amazing thing about New York City is that it is never the same experience whenever you step out onto the streets. You will always witness different details, even if you are walking on the same street, at a different time of the day, on different days of the week, and in different seasons of the year, such as brand-new street arts that appeared overnight, new décor from fashion store windows or random moments of a New Yorker that fit beautifully into the city backdrop. It is like you are going on a date with a different city at different times. Here are just a few examples of these city moments on a roll. ■

All Photos by QIONG WANG



Natural Selections is not an official publication of The Rockefeller University. University administration does not produce this newsletter. The views expressed by the contributors to this publication may not necessarily reflect views or policies of the University.