

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

SCIENCE ON TV

An Interview with Melanie Wallace

Manuel Castellano-Muňoz

There is more than one science show on TV, but not so many when it comes to a 35-year lifespan. This is the case for NOVA, one of the most successful science documentary series in public television. As NOVA's senior series producer, Melanie Wallace leads the group that makes new shows possible. After her recent visit to The Rockefeller University, we talked to her about how to succeed in television while enjoying science.

Natural Selections(NS): What is NOVA? How did NOVA start?

Melanie Wallace (MW): Essentially it has been one-hour science documentary and single-subject stories since it started. NOVA started in 1973 by Michael Ambrosino, who was working at WGBH in Boston, a PBS station. In his 40th year, he wanted to take a sabbatical—go to England and work for the BBC to see what they did. That's how he got exposed to the science series on the BBC, which is called Horizon, and he thought, "Wow, it is a good idea. I'm going to come back to WGBH and start science documentaries on public TV in the United States."

When he came back, they said, "You're crazy. Nobody watches science on TV." Science wasn't on TV; science was in the classroom. Then he said, "no, we can do it. We can turn it into stories that will appeal to curious people." That's what he did. He got a small grant from the National Science Foundation and pharma corporations. They had money for one year, and it took them two years to prepare. They brought BBC producers over from England to train the Americans because our people in the US didn't know how to do this.

NS: How did you end up being a NOVA producer?

MW: I started out studying anthropology, and I wanted to make ethnographic films. After I got a master's degree and became a Ph.D.

candidate, I left to see if I could break into television. There was a new series being created at PBS called *Odyssey*, which was devoted to anthropology and archeology (it was in the early 80s). I started out as a production assistant. After two years that series lost its funding and I decided I wasn't going back to become a professor of anthropology, but I would continue being a filmmaker. I got into NOVA a f t e r that.



Image by Rossana Henriques

NS: What are the paths to make a successful show?

MW: NOVA tries to have variety, so people don't necessarily know what will be on every week, but they know there will be something that would be interesting, that will satisfy their curiosity. Therefore, we try to pick stories that cover a wide range of scientific disciplines. We have the editorial team, and we look at proposals and ideas and meet regularly and look for the strongest stories that are about new science. Why does NOVA telecast the story now? There has to be a good reason. It has to be something new; it has to be cutting edge; it has to be exclusive access. It's not just a story about fat people. If there is a cutting-edge understanding about what makes people fat and you can follow some kind of unfolded mystery that enhances our understanding about obesity, then maybe there is a story there. So we're always pushing the producers to come up with the story: you need a quest, you need obstacles to overcome, important science, good characters, and you need to know if there will be attractive visuals.

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NS: Do you need scientists in NOVA? How do you get in touch with them?

MW: I would say that people who work at NOVA generally come from a background of journalism or filmmaking. Occasionally, we have scientists with Ph.D. working with us, but mostly they are consultants and advisors. We look for the people who are top in their field and who care about communicating and popularizing what they do. Not everybody does. But we have been fortunate. When we do a research the producer goes and calls all the top people and starts finding out what they are doing, and slowly we identify the people who are the best ones to participate in a program.

NS: Who decides how successful a certain show is?

MW: Public TV in the US is lucky in that we don't live or die on ratings like commercial television does. We have a variety of yardsticks that we use that tell us whether or not shows are successful. It includes the ratings, the press clipping, and the e-mails that we get from viewers. For a while, NOVA was up against American Idol, which was watched by 33% of all Americans on Tuesdays at 8 p.m. Well, that had a big impact on us. Our audience is not exactly the same audience that watches American Idol, but in the winter there was an overlap and we could see a dip in our ratings. Sometimes you can't just go by ratings. We always try to think about what shows will be popular. You look back continued on page 2

Life on a Roll

Alternative Transport



Line Drawing



Images by Daniel Andor

Natural Selections

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through history and you see, "oh, dinosaurs did very well," so you think that you will do a dinosaur show, but suddenly it doesn't do that well in terms of the ratings. Why? Because every cable channel has had a billion shows on dinosaurs, so you've got to come up with a different angle that will attract people to NOVA. For example, when we did the film about Percy Julian, the African American chemist, that was our classic NOVA subject. We had to pay for all the original research; there was no book that had been written about him. We did all the original research, we went back to the original sources, we met the witnesses, we talked to his family. We actually paid a researcher who spent six weeks in the garage of his son, going through boxes of photographs, cataloguing, digitizing, and making them available to the film and also to his son and his family. Who else would put on prime time television the story of a black chemist who is dead and nobody has ever heard of? But it was hugely successful. We got a lot of positive print reviews and emails. You know, it's a great opportunity for the people in the black community to see themselves as scientists. So NOVA sees that it is part of our mission to provide positive role models.

NOVA runs every Tuesday at 8 p.m. on public television, channel 13 in New York. ◎

Underground Brooklyn

JASON W. CROCKETT

For years, stories swirled about an abandoned railroad tunnel hidden below Brooklyn's Atlantic Avenue. People reveled in tales of river pirates, who supposedly used the passageway as a base for carrying out raids on the ships that filled New York Harbor in the nineteenth century. Some residents said that the tunnel held buried gold, while others claimed that it had been boarded up by counterfeiters, and still others insisted that it contained huge rats ready to attack any who dared to enter their lair. Despite such rumors, periodic police searches and amateur detectives failed to find the tunnel's entrance. Finally, in 1980, a determined college student named Bob Diamond persuaded the local gas company to let him explore what lay under an unmarked manhole cover at the intersection of Atlantic Avenue and Court Street. Crawling through a cramped passageway with a crowbar to fend off any giant rodents, Diamond smashed his way through a wall and rediscovered the world's oldest subway tunnel.

Built for the Long Island Railroad in 1844, the Atlantic Avenue Tunnel remains a masterpiece of engineering. An army of Irish immigrants dug a deep ditch in the middle of the road and reinforced the sides with tons of Manhattan bedrock. For the top, stone masons used a 50-foot-long movable wooden framework to construct a curved roof of interlocking bricks. Once complete, they covered the structure with dirt and street traffic resumed overhead. More than 2,000 feet long, the tunnel remains structurally sound today, with the deepest portion some four stories below the busy avenue. Workers laid a pair of rail tracks side by side within the tunnel to carry trains to and from a station at Red Hook. The terminal acted as a vital hub for a transportation route that began at the Erie Canal in upstate New York and ended in Boston. Once people and cargo crossed the ferry from Manhattan to Brooklyn, they traveled by rail across Long Island, boarded another ferry to Connecticut, and continued again by rail to Massachusetts.

Although the tunnel stood as an extraordinary engineering achievement, it did little to make the realities of rail travel in the middle nineteenth century more tolerable. The constant rumble of steam locomotives made conditions hot and smoky,



The Atlantic Avenue Tunnel, courtesy BHRA (www.brooklynrail.net)

and rail accidents occurred frequently; the station operated a liquor store to help people cope with the brutal conditions. After little more than a decade, changes in transportation spelled a quick end to the tunnel's usefulness. Construction of a rail route through Connecticut and Rhode Island to Boston meant that it was no longer necessary to ferry passengers and goods from Manhattan to Long Island. In 1861, Edwin C. Litchfield, whose mansion and land later became Prospect Park, obtained a contract from the city to completely fill in the tunnel. Instead, he pocketed most of the money and only sealed the ends, leaving a single inconspicuous manhole cover as the sole clue that a tunnel ever existed under Atlantic Avenue.

Today, Bob Diamond stands as the city's unofficial expert and caretaker of the Atlantic Avenue Tunnel. Soon after his discovery, Diamond formed the Brooklyn Historic Railway Association (BHRA) to help educate the public about the tunnel's history and uniqueness. Diamond and his group lead tours of the tunnel approximately twice a month. The manhole at the intersection of Atlantic Avenue and Court Street remains the only access point. Visitors must climb down a ladder into a slippery entry area before clambering through a concrete wall into the tunnel proper. Over the next hour and a half. Diamond directs a tour filled with stories of deception and intrigue. Though dark and damp, the tunnel is impressive in its scope and

design. The brick roof retains some of the original whitewash, intended to make the area seem brighter, and the rough dirt floor shows subtle signs of the iron tracks that once covered it.

The Atlantic Avenue Tunnel's existence is no longer a mystery, but Diamond hopes that it still holds a few secrets. Early in his search for the tunnel, he heard about an old steam engine buried under Atlantic Avenue. Some say that inside that steam engine lies a portion of the diary of John Wilkes Booth, Abraham Lincoln's assassin. Armed with new funding and a documentary film team, Diamond and his companions intend to lead a search for the lost steam engine and diary later this year, hoping that the missing pages will contain a complete account of everyone involved in the conspiracy to kill the president. In addition to their archeological and detective pursuits, Diamond and the other members of the BHRA are working to recreate a historically accurate trolley line in Brooklyn, eventually using the Atlantic Avenue Tunnel as the centerpiece of its route. But even if no trains ever rumble through the tunnel again, it remains a fascinating and enlightening part of New York's incredible history.

The BHRA holds a regular tunnel tour every few weeks, typically on Sundays. To find out about their next tour and later events, visit http://www.brooklynrail.net/. ©

Growth on Roosevelt Island Brings Both Culture and Conflicts

A community tries to balance development with affordability JENNIFER BUSSELL

The Church of the Good Shepherd on Roosevelt Island will be home to a new concert series this summer designed to benefit the community both artistically and tangibly, as donations will be collected for the church's food pantry at each event. The concert series caters to those seeking Manhattan-style cultural fulfillment while at the same time recognizing that the island is not (yet) 21st-century Manhattan. Instead, Roosevelt Island is an explicitly mixed income community just across the river, where for over 30 years the state has maintained affordable housing. The affordability of Roosevelt Island has allowed for large numbers of working class, elderly, and disabled residents to call it home. The island has a small-town feel, with a relatively large number of community organizations for its small population of around 12,000 residents.

However, continued development of the island has recently brought an influx of more affluent residents who are looking for cultural amenities more typical of the rest of New York City. "When I moved to Roosevelt Island last July, I moved from Lower Manhattan where there was much happening culturally—with music and the arts," said Marianne Labriola, the concert series' artistic director. "I met a number of residents... and found that they were craving more arts on the island, especially music... People want to be able to go out their door (without crossing over to Manhattan) and do something interesting."

The new residents have contributed more than just increased demand for cul-

tural events; they have galvanized new businesses on Roosevelt Island, from a Starbucks and Duane Reade drug store to more upscale restaurants. The new businesses are concentrated in the southern part of the island, known as Southtown, where the recent development is occurring as the second phase of the original master plan. Even those who are enthusiastic about the new retail options contrast the improvement in Southtown with the situation in older Northtown. "We have a revitalized commercial situation," said Opher Pail, the co-chair of the Westview Task Force, which is fighting rent increases in the Westview building in Northtown. "The problem still is if you walk along Main Street in Northtown, the commercial environment is very empty, and you see closed storefronts."

The island's development as a residential community began in 1968, when New York City Mayor John Lindsay organized a committee to find uses for what was then known as Welfare Island, having served for decades as a site for city prisons, asylums, hospitals, and nursing homes. After the committee agreed on a residential community, the city signed a 99 year lease with the New York State Urban Development Corporation, which was charged with developing the island following a master plan created in 1969 by architects Philip Johnson and John Burgee. The plan calls for mixed income housing for approximately 20,000 residents.

Development proceeded in phases, with most of the housing designated "af-

fordable" being built first to avoid the risks associated with developing market rate housing, according Stephen to Shane, the current president of the Roosevelt Island Operating Corporation (RIOC), which now

land. In 1989, developers built Manhattan Park, which provided the first market-rate housing on the island. Rockefeller University's housing on Roosevelt Island in Manhattan Park.

According to Shane, an agreement for Weill-Cornell Medical College and Memorial Sloan-Kettering Cancer Center each to pay for a building to house their staff galvanized the second major phase of development, which includes the Riverwalk projects in Southtown and the Octagon, a luxury condominium development featuring the octagonal rotunda of a 19th century hospital on the north side of the island. It is these developments which have brought in more affluent residents. "It's an interesting dynamic," Shane said. "It's ripe for socioeconomic study because of the timing differences as to when people came here. There is an older and graving population from more modest means and newer people arriving in the market rate units."

The new developments have met with controversy, as other island residents allege that they violate the terms of the master plan. The Octagon, in particular, was not included in the General Development Plan (GDP), the master plan adopted by RIOC in 1984, and offers only market rate condominiums. The Roosevelt Island Residents Association (RIRA) unsuccessfully sued the state to block its construction.

Island residents also allege that the developers of Riverwalk, the Related Companies and the Hudson Companies, have used the Weill-Cornell and Sloan-Kettering employees as a way to bypass the GDP's affordable housing requirements. "What we have seen in the development of Southtown is that the promises made within the GDP [to maintain a] ratio of low to high-income residents have been utterly abandoned," said RIRA president Matthew Katz. "The premise of the original organizers has simply been violated. The island has been becoming a high income gated community."

Local blogger Rick O'Connor agrees that hospital staff may not be the lower income residents originally envisioned in the master plan. "They fit the affordable housing component, but that's not really what 'affordable housing' is meant to con-



Construction is underway on the final stages of Riverwalk, a new development on Roosevelt Island. runs the is-

New York State of Mind



This month, Natural Selections features Karen Wei, Research Assistant in the Rout Laboratory **Country of Oriain: USA**

1. How long have you been living in New York? On and off for almost 10 years.

2. Where do you live? Currently in Hoboken (but I've lived in Greenwich Village, Union Square, Sutton Place, and Stuyvesant Town).

3. Which is your favorite neighborhood? Probably not very original but Greenwich Village-plenty to do and see. The best mix of activities in one centralized area. Bars, nightclubs, comedy clubs, cafes, restaurants, theaters-there's something for just about everyone.

4. What do you think is the most overrated thing in the city? And underrated? Overrated: Manhattan real estate. Yes, living on the island is fantastic, but it's so expensive and you end up living in a matchbox.

Underrated: The people of NYC. I've met so many non-New Yorkers who think that the residents of NYC are mean, spiteful, rude, and dangerous. And it's simply not the case.

5. What do you miss most when you are out of town? The 24 hour convenience of delivery. There's always some deli open and willing to deliver food after a long night on the town.

6. If you could change one thing about NYC, what would that be? How incredibly dirty it is; the city is so beautiful and it's disappointing to see how many people treat it as their own personal toilet/garbage can.

7. Describe a perfect weekend in NYC. A sunny day that's warm enough so a jacket is not necessary, but cool enough that you're not sweating a storm. Meet a friend for dim sum in Chinatown. Then head up to midtown to find a random street fair. There's never anything really great to buy but I love just walking through and looking at all the stands. Dinner at a great French restaurant (currently I'm a big fan of Metro Marche's Mussels Dijonaise) followed

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vey," Rick said. "They may fit the income requirements, but from the point of view of someone who has been living here for 25 years and may be on disability or retirement, that really doesn't help them."

Developers of the newer buildings see the influx as positive, bringing in active residents and consumers needed to bolster the island's businesses, and maintain that they are following the development plan. "The new residents are already getting involved in all the Roosevelt Island civic organizations. Having more people live on the island helps make the retail stores more successful," said David Kramer, a principal at the Hudson Companies. "Riverwalk was always intended to be built by the master development plan, and until we started building in 2002, the island was under-populated. We still have a 40% affordability require-

ment for Riverwalk."

Authorities maintain that the newly installed state government as well as local officials are committed to keeping the island affordable. "Most of us who are here now believe that affordable housing is a public resource," Shane said. "We are doing whatever we can to ensure that it stays a mixed income community and maintains its character that way."

While many local residents are excited by the prospect of more to do on the island, there are concerns about how gentrification will affect island residents with less disposable income. "[Pricing out residents is] an issue which does exist here, as it does in any gentrifying New York City neighborhood," O'Connor said. "The difference with Roosevelt Island... is that it's very, very small... It's geographically isolated because we're

by drinks and dancing somewhere with great music and no velvet rope. The following day, head into Central Park with some friends for a picnic and some people watching/conversation. 8. What is the most

memorable experience you have had in **NYC?** There is a tie for me. 9/11 is of course one and the other is



the (Northeastern) Blackout 2003. What I remember most is sitting outside my apartment building with some of the tenants, the doorman, and maintenance guys of my building. Someone brought out a crank operated radio and others brought some beer (that was starting to warm) and we all just sat in the entry way chatting. It was an incredibly random (but in the end fun) way to meet the people of my building.

9. If you could live anywhere else, where would that be? Hong Kong. I've traveled to several different metropolitan cities and this one was the only one where I felt at ease-much the way I do when I'm in NY.

10. Do you think of yourself as a New Yorker? Why? Not really. I was born and raised in NJ and whenever I'm asked I always tell people I'm from there-guess it's the Bridge-and-Tunnel part of me coming out. ⊙

> surrounded by water, so any change is magnified more."

> However, despite the large number of community organizations, Labriola had trouble getting them to sponsor her concert series. In the end, she partnered with the Episcopal Church of the Good Shepherd. The partnership will allow residents of all economic backgrounds to attend the concerts as well as benefit the food pantry. The Episcopal congregation, which expects to continue its growth with parishioners new to Roosevelt Island, is one of several users of the Good Shepherd building, which is also home to a much larger Catholic congregation and the island's community center. "People on Roosevelt Island don't know about us," said Pastor Lewis Johnson. "We're hoping this concert series might make us a little more visible on the island." •

Summer's Approaching: Basic Bike Maintenance

PATRICIA SUNG

With the arrival of warm, spring temperatures, I returned to riding my bike for purposes of commuting, exercising, city exploration, and simply the pure joy of riding a bike in good weather. I was soon reminded, however, that my commuter bike squeaked and that my road bike was in need of some

new parts; it was about time that I equip myself with some practical bike knowledge, including basic maintenance. I found the perfect opportunity in May, which is "Bike Month" in New York City. Some of the highlights of Bike Month are: the "Five Boro Ride," the "Bike Film Festival," and a host of other rides, events, and activities for bikers of all ages.

Among the activities were free "Bike Repair Workshops" offered by TIME'S UP!, a New York Citybased not-for-profit direct-action

environmental group whose mission is to use "events and educational programs to promote a more sustainable, less toxic city." The Bike Repair Workshops comprise either informal lectures or sessions involving hands-on bike repair. The lectures are a recurring monthly series, with weekly lectures covering "Basics," "Cables and Housing," "Cups, Cones, Bearings," and "Wheels and Spokes," held not just in May, but also throughout the year. In the hands-on bike repair sessions, participants practice freely on their own bikes, with supervision by volunteer mechanics.

The informal lectures were held at the TIME'S UP! Lower East Side location, in a basement workshop. Each week, there were about twenty people in attendance, listening to volunteer mechanics speaking about specific bikes held up on bike stands. The mechanics also demonstrated on the bikes of attendees, which resulted in those bikes getting tune-ups for the topic spoken about. The atmosphere was casual, with much useful information conveyed during question-answer periods.

For the recreational bike rider, I will briefly relate what I learned at the first lecture, which covered the basic maintenance of a mechanically sound bike. The following lectures covered all the parts of the bike that can be overhauled (brakes and gearing, hubs/bottom bracket/headset, and wheels and spokes). The summary misses on the visual aspects, detailed explanations, including physics and mechanics, question-answer interaction, and humor, which is gained from attending the actual workshop.

There are three main ways to keep a working bike in good running order. 1, Pump tires to the recommended pounds-per-square-inch (psi). Check the specification for your tire on the Internet, or check your tire sidewall. Either



the recommended psi or the maximum psiwhich is a little higher than the recommended psi-is listed. Keeping your tires pumped to the recommended psi prevents flats and unnecessary tire wear and allows you to go faster. Inflation of tires to the recommended psi requires a floor pump with a gauge. Road bikes require a pump that can accommodate Presta valves; mountain bikes and hybrids use Schraeder valves (same as those on car tires). Most pumps can handle both types of valves. The mini-pump will not typically allow the tire to be inflated to the recommended psi; it's really only for fixing emergency flats on the road and providing enough air pressure to enable you to return home.

2, Lubricate the chain frequently, since several pieces of the chain move and rub against each other as the chain moves. A squeaking chain is good indication that the chain needs lubricating. How do you lubricate a chain? Drop lubricant onto the chain as you spin the wheel, allowing the lubricant to "get inside" the chain. After generous lubrication, it is important to get rid of excess lube on the outside of the chain (hold the chain with a rag as you spin the wheel) since ironically, lube also attracts dirt, accumulation of which inhibits mechanical movement. (Incidentally, lubricating the chain on my bike solved the "squeaking" issue; it now rides smoothly and quietly.)

3, Clean your bike after each ride. Wiping off dirt from the frame and moving parts prevents rust, extending the lifetime of your bike. In addition, removal of dirt buildup due to infrequent cleaning requires more effort than frequent cleaning. It is also very helpful to keep your bike indoors, away from the elements.

Finally, one key basic skill is the ability to change a flat. For this, you need a pump, tire

levers, and a patch kit. The basic steps are: remove the wheel from the bike; remove the tire from the rim; pull out the tube; find the hole; patch the hole; clear the inside of the wheel (in other words, check the inside of the wheel in case the object that caused the flat had pierced the tire and is still lodged within); replace the tube (with a little bit of air) inside the tire; replace the tire onto the rim; pump the tire; reattach the wheel.

To find the hole, pump air into the tube, and either listen or feel

for escaping air. To patch the hole, first rub the area around the hole with the tiny square of sand paper provided in the kit. Patch kits come in two types—permanent patches utilizing vulcanizing fluid and temporary sticker patches. If you are using the former, apply the vulcanizing fluid, let it dry, and then apply the permanent patch; if using the latter, just apply the temporary sticker patch. Applying a permanent patch requires only a few minutes longer, the time it takes for the vulcanizing fluid to dry.

Removing the wheel is the only tricky part since some tires are extremely rigid. The air valve is a convenient guidepost for tire removal and replacement. It is easiest to start removing a tire off the rim on the side opposite the air valve, and easiest to start putting a tire back on the rim by starting at the air valve and moving away from it. To remove the tire, insert the tire lever between the tire and the rim, and then run your other lever around the wheel, essentially peeling the tire off the rim. Sometimes it's possible to pop the tire back on the rim simply by stretching it over the rim; if not, use the lever to pop the tire over the rim.

In summary, I had a lot of fun attending TIME'S UP!'s bike repair lecture. I was exposed to a lot of new information, learned some better ways of doing things, and found it a good refresher for the basics. Last, it left me curious to read up on some aspects in more detail, eager to keep my bikes in good shape, and mostly, just wanting to spend more time riding my bike in the city and beyond. \otimes

Coffee, From Blossoms to Beans

REVATHY U. CHOTTEKALAPANDA

Coffee is a member of the family coffea of the genus Rubiacea, first grown in Africa, and now in Southeast Asia, South America, and Central America. The coffee plant grows as evergreen bushes with shiny, dark green, and spear-shaped leaves. When fully grown, a coffee plant can reach to a height of fourteen to twenty feet. However, the commercial coffee plants are rarely allowed to grow to their full height, as they are pruned and trimmed routinely. Tropical climate is one of the most important elements for quality coffee. The soil must be rich in potassium and other nutrients, and the plantation must have a good drainage. Shade is important for coffee; hence shade-plants are coexistent in a coffee plantation. Therefore, a plantation is also a good source for timber such as teak, rose, sandal, silver oak, etc. Spices such as cinnamon, pepper, cardamom and innumerable fruit trees such as orange, mango, vanilla, lemon, jackfruit, avacado, papaya, grapefruit, banana, guava, pomegranate, and sapote are conducive to be grown in the nutrient rich environment of a coffee plantation.

The coffee plant produces a red or purple fruit, the "drupe" that has two seeds, also called the "berry" or the "bean" (though coffee is not a bean). A few berries are sowed in small plastic bags, and the stronger ones that grow into plants are then re-planted. Although there are different species of coffee plants, they can be broadly classified as the Arabica (from Ethiopia, known since the pre-historic times) and the Robusta plants (from Congo, known since 1898). Robusta is more resistant to disease and needs less maintenance than Arabica and hence popular among the farmers. The Arabica plants normally grow at altitudes of 1600 to 6000 feet and produce coffee beans after five years of re-planting whereas Robusta can grow at altitudes of about 1500 feet or less and can be harvested in two to three years. The beans in higher altitudes mature in about six months, at least two to three months faster per cycle than those grown in lower areas. The mature trees produce coffee for about fifteen to twenty years. Coffee obtained from higher altitudes are preferred since they are well-flavored. The flavor of Arabica is more popular in the Americas, but the strong coffee lovers in Europe prefer Robusta. Arabica is more

expensive and used for blending.

The intensity of the rains decides the fate of the coffee crop. Initial showers called the pre-monsoon showers are required for the coffee flowers to bloom. For supplementing blossom showers, irrigation/sprinkler systems are employed. The blossoms are white clusters of flowers formed at the base of the paired leaves as white tufts where the berries form. Tufts have eight to fifteen elements and each element comprises five to six petals forming a bunch that illuminates the whole plantation, and imparts distinct contrast and beauty against the dark green background of the coffee shrub/tree. The shape and scent of the coffee flowers resemble that of jasmine and hence the coffee tree was called "Arabian jasmine" in the sixteenth century. The blossoms bloom for a few days and they wither when fertilized, and soon after more flowers appear. It is not uncommon to see leaves, flowers, and berries at the same time. As the blossoms dry and darken, the tiny green coffee beans/berries appear. The beans are small, hard, and dark green to begin with and then they grow in size, and the ripe berries turn red and crimson like a cherry. They are then picked, sun-dried, deskinned to get out the beans, roasted, and then powdered, giving the form which we all are familiar with. The coffee picking begins in November with Arabica harvest and goes on till March since the Robusta beans ripen later. Coffee harvesting is labor dependent. There are two methods of harvesting: i) hand-picking, where berries can be sorted in parallel, and ii) shaking, where berries are stripped off by shaking the tree.

A good cup of coffee depends on good roasting. Today we enjoy coffee in many forms. Espresso, the darkest roast of the *Arabica* bean, formed by forcing hot water through finely ground coffee under high pressure. The others are Cappuccino, Ristretto, Latte, Machiatto, Mocha, Aulait, and Coretto with a shot of brandy or lithese are the Arabica-derived Mocha and Java that are roasted for a short time before brewing. For most part of its history, coffee roasting was part of a cottage-industry. In 1864, Jabez Burns invented industrial coffee roasting to meet the increasing cost and demand of coffee. In 1900, when gas replaced coal and when heat became more controllable, he modernized his invention with the "thermalo process" by blowing hot air at high speed through the roasting cylinder. Heat is applied evenly to the bean at the lowest temperature possible for shortest periods of time, and the beans are cooled quickly after roasting. Temperatures range from 380°C for lighter, 400°C for medium, to 420°C for darker roast, where high temperature burns the bean and too low temperature bakes the bean. The caffeine component of coffee does not vary significantly with roasting, although coffee acidity is highest with lighter roasts. Coffee roasting shrinks the bean to about 12-15% in weights for darkest roasts, but doubles the volume as the beans crack and expand. The darker the roast, the greater the volume of coffee is. Some coffee beans taste better after aging (three to eight years) as acidity reduces.

Fresh air is a true enemy of coffee, so storing your beans in the controlling chamber of a freezer is ideal to restrict contamination from unwanted flavors. Watch out! Freshly brewed coffee stays flavorful and aromatic for only an hour. \odot

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http://www.nationalgeographic.com/coffee http://www.coffeeresearch.org http://en.wikipedia.org/wiki/coffee



quor. Ancient among Coffee blossoms

Correcting the Blueprint of Life

A Historical Account of Discovery of DNA Repair Mechanisms¹ Zeena Nackerdien

Fifty-five years have passed since Jim Watson and Francis Crick first described the doublehelical structure of DNA. The unshakeable dogmas that preceded and postdated the discovery of DNA were that genes were made of proteins and that DNA was inherently a stable molecule. Friedberg takes us on a worthwhile trip down memory lane to examine the personalities and experiments of the scientists responsible for refuting these dogmas and unraveling the mysteries of DNA damage and repair. New York institutions feature prominently in this book, along with anecdotes regarding the eccentricities of known and unknown scientific path breakers. Rockefeller University students will immediately recognize the story of Oswald Avery et al., providing experimental proof that DNA was the transforming principle responsible for the re-activation of the pneumococcus bacteria first observed by the British physician, Frederick Griffith, in the 1920s. Ruth Hill's (Columbia University, New York) discovery of a UV-sensitive E.coli mutant inaugurated an era emphasizing genetic analysis of mutations. The first UV-resistant E.coli mutant was isolated by then-Columbia University graduate student, Evelyn Witkin. She gained fame in later years as a leader in the

In Our Good Books

The reading suggestions have been kindly provided by staff members of the downtown bookstore McNally Robinson.

Rising, Falling, Hovering, by C. D. Wright

I thought there would never be a book of poems as simultaneously timely and timeless as C. D. Wright's previous collection, One Big Self. This is that book. From the US-Mexico border to Fallujah, this book opens a space in which we can begin to feel the realities of our time.

Outlander, by Gil Adamson

Unearthly silences, living specters, profound expanses, and a primitive solitude billow through this story of a young widow on the run. A turnof-the-century North American landscape wafts and thunders past as Adamson's prose heaves and sighs trickling out answers to gnawing questions just as we feel the tingle of new ones on our skin. As a work it feels like a living thing embodying the elegance, urgency, and uncivilized beauty of a wild creature. @

field of DNA damage and repair, e.g., by first identifying the SOS response, an *E.coli* system triggered by DNA damage. Together with NYborn scientist, Seymour Benzer (who, along with Sydney Brenner, inferred an instructional relationship between genes and proteins) and others, these scientists paved the way for the development of key concepts in DNA single and double strand-break repair.

It seems that great discoveries inevitably provide fodder for good stories. The famous Salvador Luria-Max Delbruck fluctuation experiment, demonstrating that mutations were stochastic events in bacteria, is no exception. Friedberg relates how Luria was observing a slot machine when he hit upon the idea that mutations occurring early on in small bacterial cultures would yield large payouts or "jackpots" in the population. Hence, the title of Luria's 1984 autobiography is A Slot Machine, A Broken Test Tube. Another scientist, Albert Kelner, received his payoff only after tremendous perseverance. Of humble beginnings, he joined a Cold Spring Harbor Laboratory research initiative geared towards mutating bacteria into antibiotic-producing variants. His years of failure and frustration were finally rewarded when Kelner showed that exposure to visible light influenced the recovery of UV-irradiated *Streptomyces griseus* spores. Renato Dulbecco, one of Luria's students, subsequently demonstrated the same phenomenon, photoreactivation, using irradiated phages.

The stories describing Meselson's identification of DNA methylation in strand discrimination during mismatch repair and the famous Meselson-Stahl experiment are only touched upon here. So are accounts of Richard Setlow's work on the excision of UV-induced lesions in E.coli DNA and Jane Setlow's work on a bacterium first discovered in irradiated meat, Deinococcus radiodurans. Subsequent reviews and books have discussed the work of Setlow and others in more elaborate detail. What sets this tome apart from later writings is the fact that the author (a scientist and educator) has infused the early history of DNA repair with personal stories that will resonate with the current generation of scientists. •

References:

1. Correcting the Blueprint of Life—A Historical Account of the Discovery of DNA Repair Mechanisms, E. Friedberg, CSHL Press, 1997, Plainview, NY

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