

Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY

Resilience: Bouncing Back and Moving Forward

EMILY ATLAS

“To become a successful scientist you must be resilient.” A phrase like this may sound familiar or perhaps even trite. Most would agree that the path to a Ph.D. (or M.D.) requires the ability to cope with failure and to regroup, re-strategize, and reenergize after setbacks. However, is resilience a trait that can be learned? If so, how?

In mid-March, Sharon Milgram, director of the National Institutes of Health (NIH) Office of Intramural Training and Education (OITE) gave a talk about “Becoming a Resilient Scientist.” The event was cosponsored by two organizations at Memorial Sloan Kettering: The Gerstner Sloan Kettering Women in Science and the Female Association for Clinicians, Educators and Scientists (FACES).

Milgram was an extremely engaging and entertaining lecturer who used her story-telling skills to impress upon the large audience of scientists and M.D.s the importance of self-reflection and subsequent intentional action to become more resilient. The graduate students introducing Milgram opened up the talk with a lighter mood, sharing that when Milgram had first applied to graduate school (with goals of becoming a professor of physical therapy), she was not accepted. When she applied again, she ended up enrolling in a cell biology program. Then, she had to take her qualifying exam twice (and delayed taking it the second time for fear of failing again). But now she has her own lab and leads the NIH OITE, a testament to the fact that failures or slow starts can be more than overcome.

Milgram began by asserting that we are all life-long learners, particularly as scientists, since we are often learning new techniques and working on new problems that require entering semi-uncharted (and often uncomfortable) territory. Milgram adapted a summary of the four



Photo Courtesy of NIH OITE

Sharon Milgram

stages of learning a new skill from management expert Ken Blanchard. When we first embark on learning something new, we are “enthusiastic beginners,” and generally have low competence but are very confident. We then move on to the “disillusioned learner” stage in which we are more competent, but lose confidence, perhaps because at this point, we are aware of how little we actually know. When we are at the disillusioned learner stage, we generally feel very uncomfortable. Here, it is key to be resilient and move forward in order to reach the stage Milgram called “cautious performer,” where our competence and confidence have both increased, and finally the stage of the “high achiever,” where we have mastered the skill at hand and hence are much more confident. As scientists, we are often cycling through these stages and it is key to remember that each stage is only temporary.

In order to keep moving forward when we are experiencing a time of low

confidence, we have to acknowledge our emotions but not drown in them. Resilience is the ability to both adapt and grow through adversity. We must navigate through the obstacles with both “intention and skill.” Milgram emphasized that resilience can be learned, but only if we are willing to reflect on how we currently deal with adversity.

We need to learn to be resilient at a time when we aren’t facing major challenges, so that in the face of adversity we are prepared to tackle roadblocks. Milgram outlined a few steps we can take in order to become more resilient: First, we should try to learn from past experiences; journaling can be a good technique to reflect on times in which we have succeeded in moving forward and times we could have done better. Second, developing strong relationships with peers and mentors is key and helps to remember that

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Photo Courtesy of
American Psychological Association

Pathway to resilience.

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we are part of a larger community; we are not in this alone. Third, it is crucial to use resources and be proactive. Every institution has resources available and we need to learn how to ask for help when we need it. In some cases, counseling is also an important resource for people to utilize. Finally, we should be thoughtful about how we approach setbacks in our lives and careers and become more mindful of the “self-talk,” often negative, that we engage in during times of setback.

Milgram then elaborated more on negative self-talk. Inspired by Marshall Rosenberg’s techniques of non-violent communication, Milgram asked us to imagine both jackals and giraffes (jackals conjuring up the image of vicious creatures, and giraffes, peaceful, graceful ones). After we fail at something, we often tell ourselves stories in “jackal” language, rather than “giraffe” language. Furthermore, the stories we tell ourselves are often far more negative than the situation warrants. We may experience cognitive distortions or automatic negative thoughts that make us feel hopeless. Our brain has a negativity bias, because being anxious and on high alert has evolutionary advantages, keeping us safe from danger. However, negativity can be harmful when we are not in danger, but are doing something new and uncomfortable.

Milgram delineated five types of negative self-talk, asking the audience to raise our hands if we identified with any of the five. The audience was filled with giggles at this time, as most people found themselves strongly identifying with at least one or two of the categories that Milgram described:

1. **All or nothing:** We tell ourselves that if anything goes wrong, the whole endeavor was a failure.
2. **Catastrophizing:** We exaggerate the implications of a failure and how it may affect a much bigger part of our lives or career.
3. **Mindreading:** We make assumptions about what someone else is thinking (perhaps for example, after a conversation with a Principal Investigator). Milgram calls this a “special kind of fortune telling.”
4. **Minimizing:** We downplay the importance of our accomplishments or positive qualities. This can also play into “imposter fears”—we tell ourselves “it was just luck.”
5. **Over-Generalization:** We apply one negative event to others, assuming that because one thing went wrong, others will too.

To overcome these types of negative self-talk, the first step is to recognize and acknowledge them and then to talk back to them. Milgram suggests trying to think about our negative thoughts at a distance, thinking about how logical or scientific our fears and anxiety are, i.e., what evidence do we have to really back them up? Then, try to find inspiration from something positive, be it an affirmation, a phrase, even an image that strengthens you. Journaling and talking about our fears and anxieties is also very useful.

The second part of Milgram’s talk focused on imposter fears, which are very common among students. People who fear failure, have perfectionist tendencies, and

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compare themselves to others are more likely to have imposter fears. External factors (such as messages from friends and family, or organizational culture) can also feed into imposter fears. Imposter fears are normal, but if unchecked they can seriously increase stress over the course of a career and ultimately result in self-sabotaging behavior, such as not applying for new opportunities or not studying. To overcome imposter fears, we need to normalize them by reminding ourselves that they are a common response to new situations, but we also need to find meaning in other aspects of our lives, so we are able to move forward and not let these fears hold us back. It is crucial to think about “what brings meaning to our days, months, years,” and ideally, we should find meaning in relationships or activities separate from our work; this helps us stay resilient. At this point Milgram addressed what she calls the “elephant in the room,” the fact that the culture in science and medicine doesn’t always value self-care, but she challenged us to fight against the culture and try to change it. At the end of her talk, Milgram summed it all up by reminding us that in order “to do well, we have to be well.” ■

Culture Corner

The Piero Tour in Italy

BERNIE LANGS



Piero della Francesca, *"The Legend of the True Cross" (details), c. 1452-1466, Basilica of San Francesco, Arezzo*

While familiarizing myself over the years with the pictures painted by the Masters of the Italian Renaissance, I have found that one artist stands out as singularly enigmatic in his body of work, Piero della Francesca (c.1415-1492). I have read various summaries about della Francesca in art history books and enjoyed Kenneth Clark's detailed study where he analyzes how the artist's few surviving works leave the viewer in a state of dumbstruck awe. I became deeply interested in the artist, after reading an essay by art historian Michael Baxandall which focuses on the visual tricks utilized by della Francesca in the "Resurrection" fresco and other ideas about its creator.

I first heard about "The Piero Tour" in early 2018 while vacationing in London. My wife and I had gone to see a performance of Oscar Wilde's "An Ideal Husband" where we were glad to be among an audience mostly filled by natives of London or the United Kingdom, including to our delight the famous actor, Sir Ian McKellen. After the production, I spotted an impeccably dressed gentleman striding by holding the program booklet in his hand. I called out, "What did you think of the play?" initiating a twenty-five minute, robust discussion covering a wide range of cultural topics. When I mentioned the sublime collection of della Francesca's major paintings I'd viewed that day at the National Gallery, the gentleman agreed that there is a mysterious quality to della Francesca like no other artist and he insisted that we must take The Piero Tour around Italy, centering on the city of Arezzo and surrounding smaller towns where the Master's finest works are concentrated. In late 2018, my step-sister, Jen, was visiting New York from Milan with her Italian-born husband, Gui, and when I told them of our London conversation, Gui nodded and said, "Of course, The Piero Tour. I've done it and you have to go as well!"

Months later, I read a fascinating scholarly book by Professor Carlo Ginzburg who is currently teaching at University of California Los Angeles. In "The Enigma of Piero: Piero Della Francesca," Professor Ginzburg combs through the historical record like an art history Sherlock Holmes to identify specific portraits embedded in della Francesca's frescoes and paintings and makes countless, detailed discoveries on the meanings of such masterpieces such as "The Flagellation," which has defied narrative understanding for centuries. Professor Ginzburg also undertakes a complex deconstruction of the fresco cycle in Arezzo known as "The Legend of the True Cross."

This March, my wife and I took a vacation in Italy, staying thirty minutes outside of Pisa in a quiet hillside area. We drove to Lucca, Siena, San Gimignano, and Pisa and enjoyed the art, food, and wine of Tuscany. When I had emailed Jen prior to the visit, she and Gui said they would meet us in Arezzo for a day trip, the plan being that they'd give us the truncated version of The Piero Tour.

Arriving in Arezzo on a brisk morning, the four of us made our way to the church of San Francesco to view della Francesca's large set of frescoes, the above mentioned "Legend" cycle. The four of us stood in the uncrowded chapel space in awe, raising a pointed finger now and then to share the discovery of an unexpected detail. Most of our time in San Francesco was spent silently ingesting the power and beauty of this wonder of the world.

"The Legend" frescoes are a high point of Italian Renaissance art. The cycle is centered a thirteenth century tale of how the wood from the Garden of Eden was eventually used to construct the cross on which Christ was crucified. The Bacci family in Arezzo commissioned it in the mid-1440s and it was most likely completed in 1466. Scenes depicted in the upper registers include "The

Queen of Sheba in Adoration of the Wood," "The Meeting of Solomon and the Queen of Sheba," "The Death of Adam," "Exaltation of the Cross," "The Dream of Constantine," and "Battle between Heraclius and Khosrau." Professor Ginzburg's book on della Francesca explains the meaning of these works, noting that the frescoes display events with Old Testament figures as well as those who lived in the pagan world at the rise of Christianity, such as Constantine the Great prior to his conversion to the new faith. Ginzburg also describes how the Legend cycle depicts tensions, both religious and political, in the mid-fifteenth century Eastern and Western worlds of Europe and beyond, by pointing out in one example, that the portrait of Constantine the Great in the frescoes is none other than John VIII Palaiologos who served as the penultimate reigning Byzantine Emperor, ruling from 1425 to 1448. The emperor's portrait is used to similar ends in della Francesca's painting of "The Flagellation." It is suggested by Ginzburg that those in the circle of della Francesca's patrons knew and had met with Palaiologos.

Ginzburg explains why della Francesca chose certain real-life individuals for portraits strategically placed within the frescoes, discovering that these faces recur in other smaller paintings by the artist and with similar discrete intentions. But much of what I'd read slipped away from me while marveling at the art in San Francesco that morning. The beautiful colors of the landscape, garments, and skin tones are muted and reassuring, especially the blues and reds. Later in the day as we drove around the area, the cloud cover receded and the blue sky overhead taught me more about della Francesca's eye and brushstrokes than anything one could read in a book. The sublime skies of his paintings singularly match

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those viewed in Arezzo.

The men and women depicted by della Francesca in “The Legend” frescoes exude an inner quality of delicate grace and refinement. As we continued through the day, I noticed this aspect in other paintings by him and many others of the region. Regardless of whether you buy into established Christianity or not, the paintings often teach a lesson on the finest qualities of mankind’s soul. Depictions of the so-called “higher” human attributes through the brush or by the chisel in statues, make them more than a fanciful display of the talent of an artist. This art acts to encourage us all to do better, be better people, and to think better of each other and our higher potential in life. Centuries-old divine attributes displayed by posed, static, artificially-created individuals, stories, or landscapes, can offer nothing short of essential life lessons that even my fellow hardened agnostics and atheists should gladly embrace, stripping away the religious context and retaining the best of the rest.

Leaving San Francesco, the four of us made our way to Arezzo’s cathedral, where Gui led us briskly down an aisle to stand before della Francesca’s more obscure fresco from 1460 depicting Saint Mary Magdalene. Mary’s garments are painted with simple, subtle tones, and her features, though individual, display della Francesca’s standard facial physiognomy, the broad nose, full lips, and heavy-lidded eyes, which may express anything from fatigue to resignation or perhaps a quiet inner state of enlightenment. “The Magdalene” was an overwhelming joy to behold and it felt very special to be in its presence in the magnificent cathedral.

We next drove to the Museo della Madonna del Parto located in the nearby town of Monterchi. della Francesca’s “Madonna del Parto” was most likely produced after 1457 and it only survives as a fragment. The fresco survived an earthquake in the late 1700s and has moved multiple times. The Museo has a nicely presented short film explaining the complex meaning of the work and gives detailed geometric graphics of how the master’s placement of the Madonna and two attending angels are set with mathematic precision. The “Madonna del Parto” is on view in the Museo as the only work in a small, white-walled room. It’s a beautiful painting of the pregnant Virgin, yet I was very much distracted by the modern setting. Much of its power and meaning was lost to me by not seeing *in situ* in a Gothic or Renaissance church among other surviving statues, frescoes, altar works, and



Piero della Francesca, The Polyptych of the Misericordia (detail), c. 1460-1462, Museo Civico di Sansepolcro



Madonna del Parto (after 1457), detached fresco, Museo della Madonna del Parto, Monterchi

paintings from the time period. I couldn’t make total sense of the art in its fragmented state, and could not coalesce an aesthetic or emotional reaction into some kind of whole.

We continued the tour by driving to the town of Borgo Santo Sepolcro (Sansepolcro), where della Francesca was born and where we later toured his unexpectedly large family home in the city. Sansepolcro was alive with Medieval and Renaissance reverberations all over its joyful streets. Two major works by the artist are on view at the Museo Civico de Sansepolcro, “The Polyptych of the Misericordia” and the extremely famous “Resurrection.” The oil painting of the former centers on the motif of the Virgin of Mercy. The Museo Civico is a more traditional museum than the one housing the “Madonna del Parto” and the “Misericordia” maintains an incredible power and force on viewing. After studying the painting for a long period, I suddenly recognized from Professor Ginzburg’s book the figure kneeling



Piero della Francesca, Saint Mary Magdalene, 1460, Duomo, Arezzo

on the far left beneath the Madonna as della Francesca’s patron, Giovanni Bacci, who also commissioned with his family “The Legend” cycle in Arezzo. The mystery of della Francesca and his overwhelming power was stronger in the “Misericordia” than in any other we viewed that day. The central panel and its surrounding smaller pieces, as well as the predella (the smaller panels at the base of an altarpiece) and the tympanum (the pediment panel pictures above the main images) sweep deep to the mind’s interior defying translation into words or emotional adjectives.

“Resurrection” was painted in the 1460s for the city’s Town Hall, which is now

the Museo Civico where it remains, though not in its original room. The detached fresco is displayed on a wall in a large space, which was undergoing renovation. It was the only work of art on view besides two small fragments that were reproductions of frescoes that are out on loan. I'd waited decades to see the "Resurrection" and although it was remarkable, once again, to view it in a white-walled space and not in a church or even with its artistic "family" of paintings in a museum, distorted my attempted meditation. In any case, it was incredible to actually see in person the well-known sleeping Roman soldiers, including a supposed self-portrait of the young della Francesca. The mysterious landscape background, half-alive in foliage and half-dead, is haunting. The image of Christ, climbing out of the sarcophagus in defiance of death elicited an odd reaction from me. Perhaps through a fault of memory of the reproductions in books, I had expected Christ to look fatigued and weak, but found his large body muscular in tone and in an almost inappropriate state of power given his recent trauma. I hope to return one day to the Museo to take more time studying this invaluable work of art.

During our visit, we took a detour to visit a small church built on the remains of the building where Saint Francis of Assisi retreated at times for meditation in the thirteenth century. The complex is embedded in the mountains of the area and in contrast to the countryside my wife and I had driven through during our stay near Pisa; with manicured, rolling hills speckled with graceful cypresses and other trees, this was a semi-wild, rolling forest and the view from the church revealed no other structures in sight. There were a



Piero della Francesca, Resurrection and detail of possible self-portrait of the artist, center, Museo Civico di Sansepolcro



Mountain retreat near Monterchi visited by Saint Francis in the 1200s with his "ghost" appearing as a friendly cat

couple of cars at the site, but we saw no other person inside or outside the tiny buildings. The view was spectacular, and out of nowhere we were joined by a friendly cat, who later accompanied us up the hill and back to our car. I joked that it was the ghost of the Saint, noting the irony that the man who had famously preached to the birds was now a feline.

After a relaxing dinner in Arezzo, we walked the dark streets towards the arches in the old walls leading to the car park. The wind and cold picked up and we were the only four people on the last cobblestone street lined

with old stone buildings from the Middle Ages. Flags flying above rippled and cracked in the wind, and as we passed a sculpted display on the walls depicting the coats of arms of the old families of Arezzo, I mused that these statements of civic pride had stood there for hundreds of years and would be there for hundreds more. As my wife and I parted with hugs and smiles from our gracious guides, Jen and Gui, I was warmed by the idea that I'd had one of the best days of my life. ■

All photos by Bernie Langs

Natural Expressions

MUSIC

On May 10th, Collette L. Ryder of the Office of Sponsored Programs Administration at The Rockefeller University will be performing Rachmaninoff Vespers (*All-Night Vigil, Op. 37*) with the NYCHORAL group at St. Bartholomew's Church. The New York Choral Society describes Rachmaninoff's 1915 work as "quiet, reflective, and deeply moving...a majestic work that elevates the spirit by its expressiveness and captivates the listener with its sheer beauty." The

performance begins at 8 p.m. and discounted tickets (\$35) are available by contacting Collette (cryder@rockefeller.edu / x8054). Visit NYCHORAL for more information.

DIGITAL EVENTS

Bernie Langs of The Rockefeller University Development Office announces the release the music video, "Yeast Cell Growth Meets The Beatles." This video, presented by John LaCava's Sounds of Science and featured in

the Imagine Science Film Festival, is a fusion of art and science, with laboratory films taken by Andrej Ondracka and music by The Beatles (composed by John Lennon/ Paul McCartney with a coda by Chip Taylor) performed by Bernie Langs. The video can be found on Bernie Langs' [YouTube](#) page.

Email Megan E. Kelley at mkelley@rockefeller.edu to submit your art/music/performance/sporting/other event for next month's "Natural Expressions" and follow [@NatSelections](#) on Twitter for more events.

Pets of Tri-I

POOJA VISWANATHAN

For this issue, *Natural Selections* interviews Malu, the dog who lives with Tiago Siebert Altavini (Gilbert Lab, The Rockefeller University) and Patricia Saletti. Malu speaks Portuguese and I only know 10 words of it, but her parents were willing and capable translators for our interview. I love animals, please write me at pviswanath@mail.rockefeller.edu if you have pets!

Pooja Viswanathan: How old are you? In human years?

Malu: I'm 5, which in human years is about 36 years old.

PV: Is there a story behind your name?

M: Malu is actually short for Maria Luiza, which my parents only use when they are mad at me. That doesn't happen often though.

PV: What is your first memory?

M: I'll never forget the day I met my best friend, Nina. She lives with my grandparents and we spent much of our childhood together. We used to play a lot in the backyard. Unfortunately, I don't see her much anymore because she lives in Brazil and I live here.

PV: Who are your parents? When did you meet them?

M: I live with Patricia and Tiago, my mom and dad. I met them in August 2013 when I moved in with them.

PV: How do they belong in the Tri-I community?

M: My dad works in the Gilbert lab as a postdoc. My mom is also a postdoc but works far away in the Bronx, but she has many friends in the Tri-I community.

PV: Where do you live?

M: I live in Scholars Residence, the tall building close to the university where my dad works.

PV: What are your favorite smells of New York City?

M: Oh, I love to smell everything. My mom always complains that we take too long when we go for a walk. I guess that's why my dad does most of the walking with me.

PV: If you could live anywhere else in the world, where would you live?

M: Definitely in Brasilia so I could be close to my best friend, Nina. But I have to say I would be tempted to live closer to the beach. I love the beach, it's like a huge dog park with all that sand.

PV: What are your favorite foods?

M: Chicken and carrots! Not necessarily together. I usually get chicken flavored dog food and whenever my dad is cooking I cry by the kitchen countertop to see if he'll give a little piece of vegetable. If I hear him cutting carrots, I come running. I also like to eat fruits.

PV: What is your favorite weekend activity in New York City?

M: Going to the dog park. I don't care much about the other dogs to be honest, but I get to play "catch the ball" a lot, which is my favorite game. I don't go much anymore though. I got sick after going to one of these parks and now my parents are afraid of taking me again. I also like going to Central Park and to the beach.

PV: Besides your human roomie, who is your favorite human in the Tri-I community?

M: I have many friends in the area, but if I had to choose one, it would be Sofia from the Freiwald Lab. We used to be neighbors and I would play with her all the time. I usually stay with her when my parents are out of town. We play a lot and she teaches me Spanish.

PV: Do you have a funny story to share with us?

M: I tend to get very excited after my morning walk. When I come back from walking, I run around the house, play with my toys and try really hard to get everyone's attention. One day I was particularly agitated and decided to jump on the bed. Now, the bed is too tall for me, but on that day I was feeling so energetic I was sure I could do it. I took some distance, ran towards the bed, jumped and hit the side of the bed with my chest and fell to the floor on my back. I didn't get even close. I didn't find it too funny at the moment but my parents laughed the whole morning.

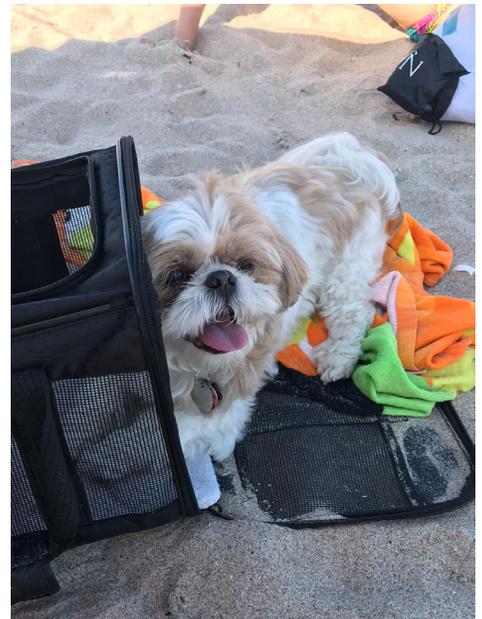
PV: Is there some way we can see more pictures of you on the interwebs?

M: No, my parents say I'm too young for social media.

PV: If you could have any human ability, what would it be?

M: To open the door and go out by myself.

I love going out, to the park, to parties, to trips. The problem is sometimes my parents don't take me with them and I have to stay home by myself until they come back. ■



Photos Courtesy of Tiago Siebert Altavini



Life on a Roll
Perspective

ELODIE PAUWELS

<https://elodiephoto.wordpress.com/>

Perspective makes parallel lines look like they will join somewhere in the distance. The laws of geometry seem thrown into disorder! This distortion however only exists when the scenery is observed from a particular point of view. These kinds of pictures are an invitation to discovery and travel for me. What about you? ■



Life on a Roll

The Majesty of Cathédrale Notre-Dame de Paris

JIM KELLER AND DOM OLINARES

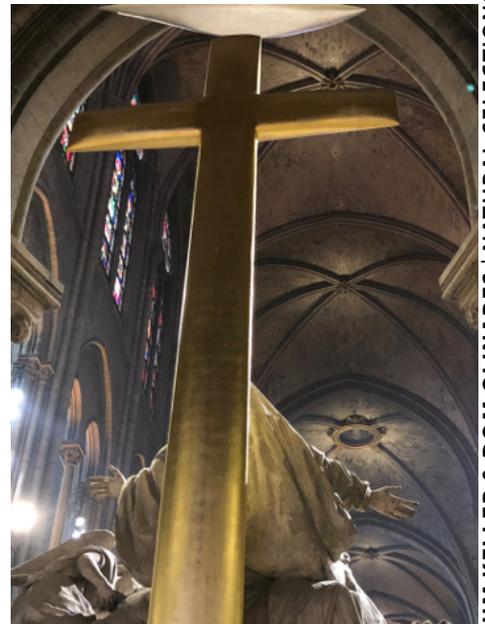
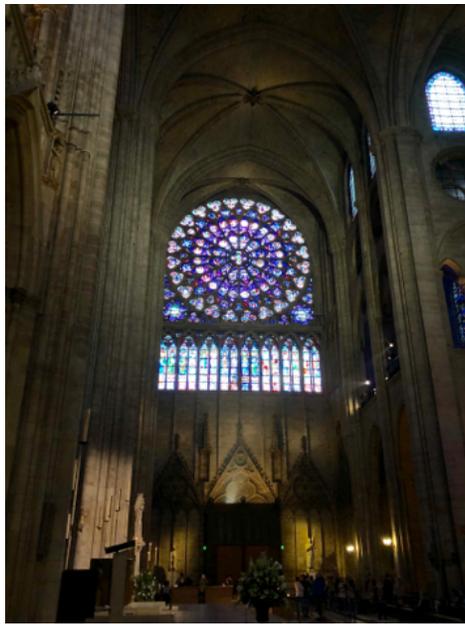
Following the devastating fire on April 15th, let's take a minute to remember how the Notre-Dame Cathedral in Paris was meant to be seen, in all its magnificent glory. These photos were taken during our trip to Paris last year.

As we watched the flames engulf the Cathedral on the news, including its timber central spire, we felt helpless. Our hearts ached for France and for the world.

Although the cause of the fire is still unknown, on April 16, the Paris prosecutor said that nothing his office had learned suggested a deliberate act. The investigators most strongly suspect a case of "accidental destruction by fire," but they have not ruled anything out at this early stage.

Whatever the cause may have been, in the words of French President Emmanuel Macron: "We will rebuild Notre-Dame together." Less than 24 hours after the fire had broken out, over €800 million had been pledged for the Cathedral's reconstruction. True to his word, an international fundraiser was launched by Macron the very next day.

Please visit <http://www.notredamedeparis.fr/> for more information. ■



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