JULY AUGUST 2020

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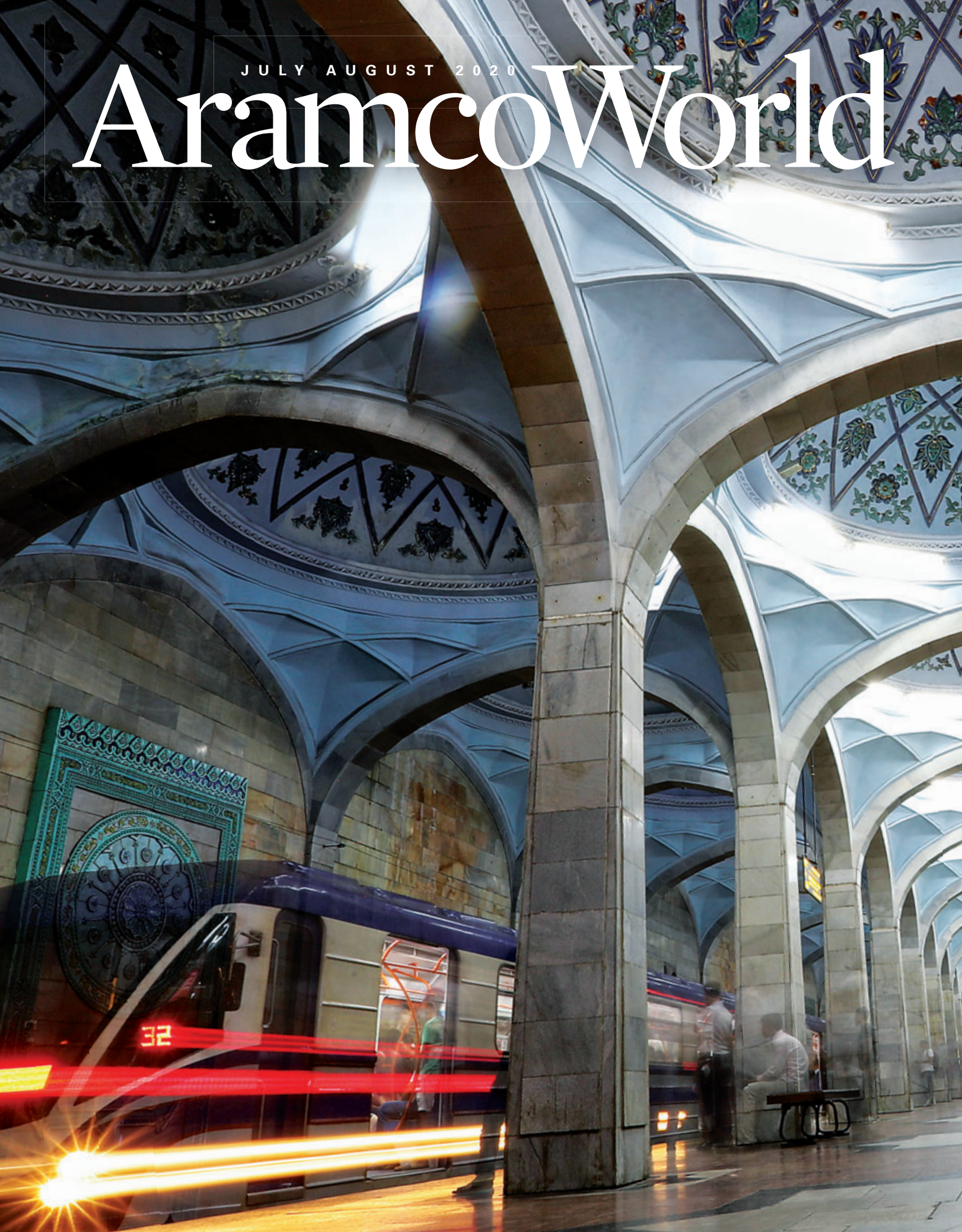

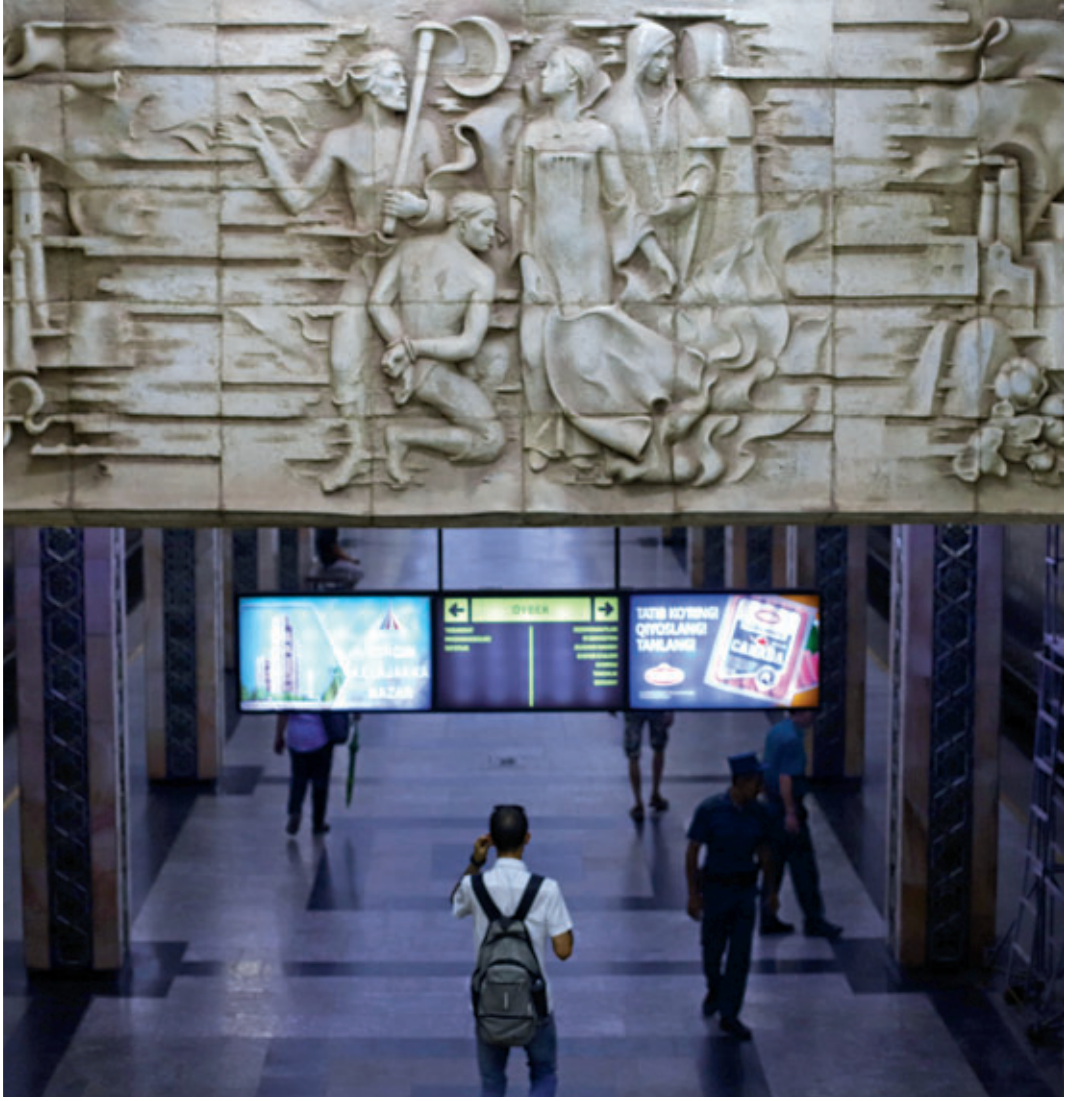

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We distribute *AramcoWorld* in print and online to increase cross-cultural understanding by broadening knowledge of the histories, cultures and geography of the Arab and Muslim worlds and their global connections.

Front Cover: Under the arcing vaults and delicately patterned domes of the station dedicated to the legacy of Alisher Navoi, the 15th-century founder of what became Uzbek literature, commuters prepare to board a metro train in Tashkent. Photo by Stephen Lioy.

Back Cover: With eye-catching zigzags on satin, fashion designer Mohamed Khoja plays with a stairstepped motif derived from Nabatean carved-stone architecture in and around al-'Ula, Saudi Arabia. Photo courtesy of Hindamme.

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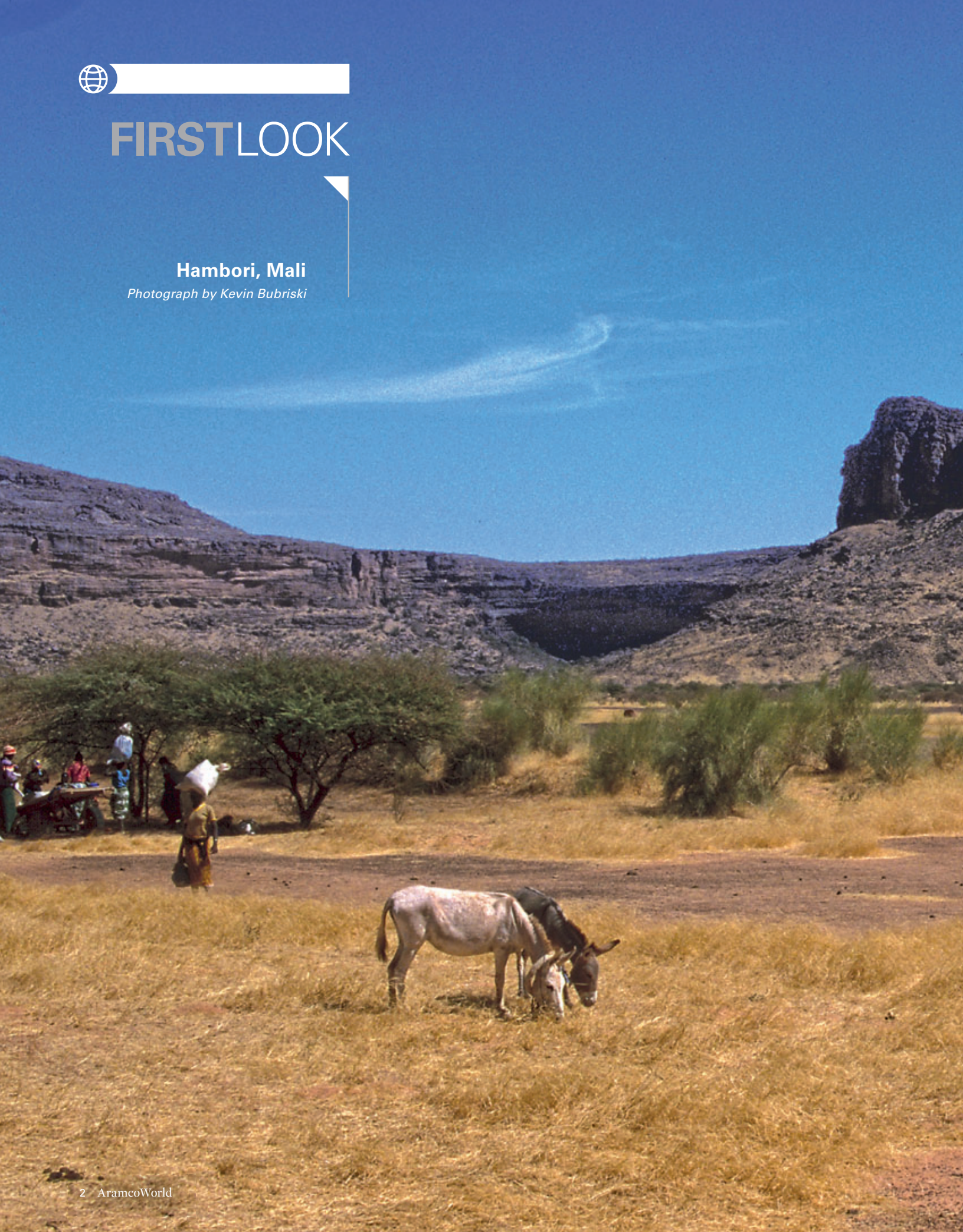
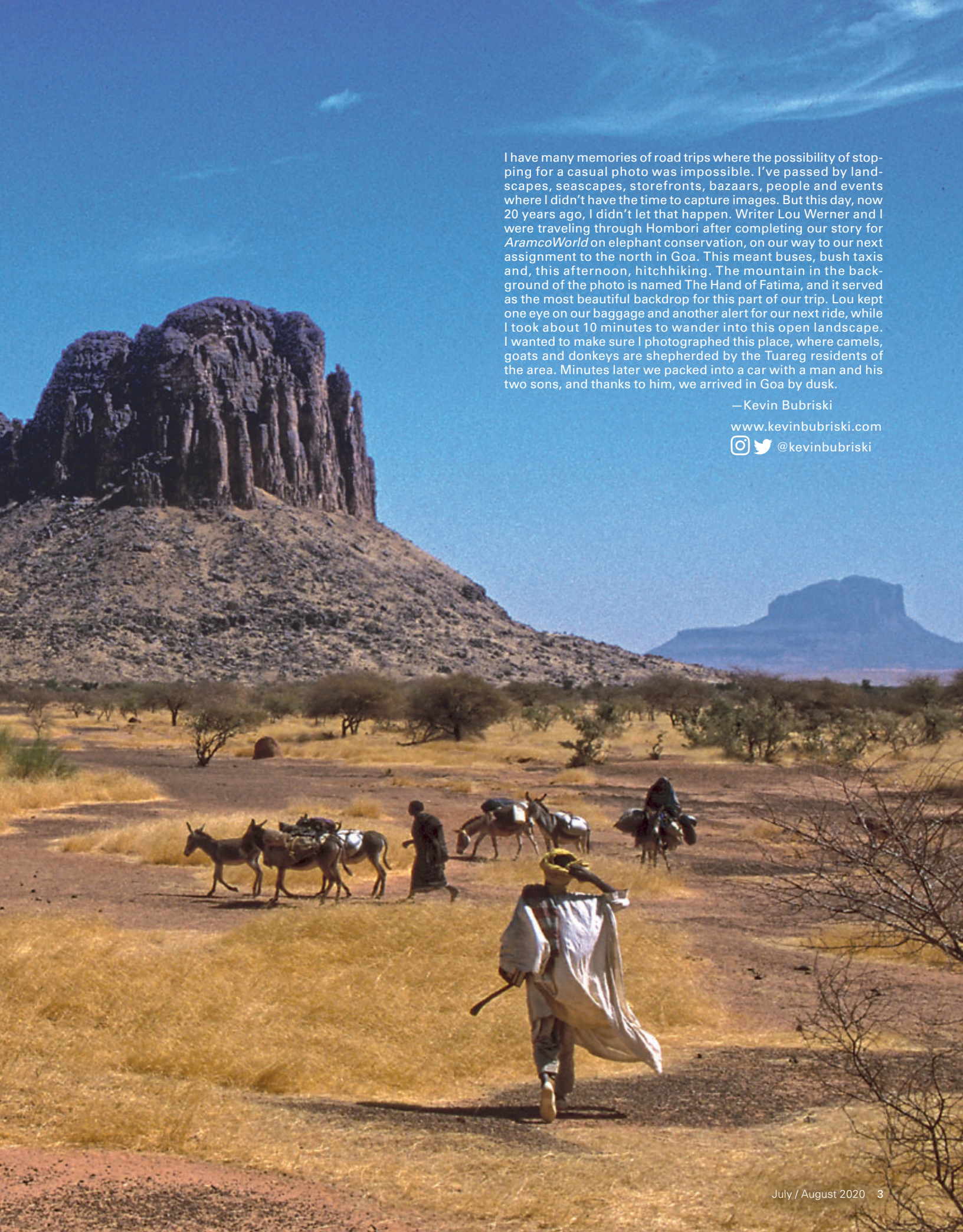
FIRSTLOOK

Hambori, Mali

Photograph by Kevin Bubriski





I have many memories of road trips where the possibility of stopping for a casual photo was impossible. I've passed by landscapes, seascapes, storefronts, bazaars, people and events where I didn't have the time to capture images. But this day, now 20 years ago, I didn't let that happen. Writer Lou Werner and I were traveling through Hombori after completing our story for *AramcoWorld* on elephant conservation, on our way to our next assignment to the north in Goa. This meant buses, bush taxis and, this afternoon, hitchhiking. The mountain in the background of the photo is named The Hand of Fatima, and it served as the most beautiful backdrop for this part of our trip. Lou kept one eye on our baggage and another alert for our next ride, while I took about 10 minutes to wander into this open landscape. I wanted to make sure I photographed this place, where camels, goats and donkeys are shepherded by the Tuareg residents of the area. Minutes later we packed into a car with a man and his two sons, and thanks to him, we arrived in Goa by dusk.

—Kevin Bubriski

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Cheese Parcels with Honey and Orange Reduction

Recipe by Fiona Dunlop

Photograph courtesy Hiltrud Schulz

Diego and his brother Moises are third-generation tapas bar owners—catering runs through their veins.

While studying for a diploma in tourism, Diego crisscrossed the entire province of Almería, in Andalusia, Spain, and as a result, there is very little he doesn't know about local specialties. This dish combines delicious textural contrast with subtle, sweet Moorish flavors. You need to complete the final stage just minutes before eating. Add whipped cream as an extra hit of sweet.

1 cup (250 milliliters) orange juice

Scant ½ cup (100 milliliters) clear honey

3 balls fresh mozzarella (each around 6 centimeters / 2 ½ inches in diameter), quartered

12 sheets filo pastry, 23 x 36 ½ centimeters / 9 x 14 inches (or cut larger sheets to size)

2 cups (500 milliliters) sunflower oil

1 ¼ cups (150 grams / 5 ½ ounces) chopped walnuts

1 ½ cups (150 grams / 5 ½ ounces) slivered almonds

2 tablespoons confectioner's sugar (optional)

First, make the reduction: in a small pot, combine the orange juice and honey and simmer over low heat, stirring occasionally, for about 30 minutes, until syrupy.

Prepare the cheese parcels by loosely wrapping each section of cheese in filo pastry, pressing the seams together. While working on assembling them, keep the pastry sheets and finished parcels moist under a damp tea towel to avoid drying out.

In a small saucepan, heat the sunflower oil over medium heat. When it is smoking, quickly plunge the parcels into the oil for 20 seconds or until the pastry turns golden. Using a slotted spoon, transfer to a plate lined with paper towels to absorb any excess oil.

Immediately transfer to a serving plate, drizzle with the reduction, sprinkle with nuts and dust with confectioner's sugar if desired. Serve promptly.

Recipe reprinted with permission from

Andaluz: A Food Journey through Southern Spain

Fiona Dunlop

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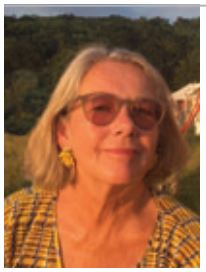


FIONA DUNLAP

Fiona Dunlop is a food and travel writer, blogger and photographer. She has globetrotted for decades from successive home bases in Paris and London while regularly retreating to her house amid the olive groves of Andalusia. After writing widely on travel, art and design, her passion for food led her to create her first cookbook, *New Tapas* (2002), followed by *The North African Kitchen* (2008) and *Mexican Modern* (2013). Her articles have appeared in the *Financial Times*, *The Guardian*, *The Telegraph*, *The Independent*, CNN.com and numerous magazines. She is the author of *National Geographic*'s guides to Spain and Portugal, and she has worked as a guest lecturer on its expeditions as well as other tours.

HISTORY *AND* HARMONY

Written by

Kate Hazell

Photographs courtesy of

Hindamme

With every stitch of Hindamme, his ready-to-wear fashion line, 32-year-old Mohammed Khoja inches closer to a global spotlight. Khoja launched Hindamme—an Arabic word he explains refers to "perfect form and harmony"—in 2016 for the youthful, playful and heritage-aware. His most recent streetwear collection blends contemporary textiles with bright patterns inspired by Nabatean architectural and epigraphic motifs, as well as other patterns now visually synonymous with the Arab world.

Self-taught (he gives YouTube credit for teaching him to cut patterns), Khoja was born in al-Khobar, in the Eastern Province of Saudi Arabia. At 6 years old, his family moved to Houston, Texas, and he returned to the kingdom with them at 13. His father's work relocated the family again during Khoja's teen years to Paris, where he enrolled in the American University of Paris and in 2011 earned a degree in business. It was there in Paris that Khoja received encouragement for some of his early concepts from the owner of a now-defunct boutique called CLVII.

"It was my first real taste of the industry, and I loved the process of taking an idea and making it a reality," he says, noting his desire to launch a fashion line was years in the making, something he dreamed about as a child.

Khoja's latest collection of 23 pieces, *Al Ula*, was

Nabatean Multi-Motif Satin Blouson Jacket, *Al Ula* collection, inspired by Nabatean patterns and designs that can be found in the desert around al-'Ula and the nearby historic site of Mada'in Salih.

inspired, he says, by the history and desert colors around the city of that name in northwestern Saudi Arabia. There, starting in the sixth century BCE, Nabateans—most famous for their carved-stone architecture in Petra, Jordan—founded a trading center at Mada'in Salih and there, too, carved distinctively styled architecture into the desert's abundant and dramatic sandstone outcroppings. Early this year Khoja showcased the collection on Instagram in connection with the Winter at Tantora Festival and the exhibition Desert X Alula 2020.

Vogue Arabia Editor-in-Chief Manuel Arnaut is a fan. Writing by email, he says Khoja "creates designs that are connected with the times we live in" and "capture what is in the air, [not only] style-wise but also socially."

So where are you now?

I'm in the Eastern Province of Saudi, in al-Khobar. It's a small city, and I have a small studio in my own home, so that's where I basically work and design and prototype. I still live with my family—as you know, that's very common [here]. I was fortunate enough that we had this space, and they were like, "you can convert it to your studio." My production, unfortunately, has been disrupted. I currently can't produce anything. Everything's been put on hold.

When did you first know you wanted to be a designer?

It started off with painting, and looking back, I have old sketches of me attempting to design—not just clothes, but cars, homes and furniture—when I was really young. I was fascinated with the process of design and taking an idea and making it a reality. So I've always known I was a designer from a very young age. I grew up in different places across the world, so I wanted to challenge myself to create work that had elements that represented my culture but was also universal, something that could be worn by anyone in the world, that's contemporary but also had elements of my heritage.

Was studying business in Paris helpful when you started your own label?

It was, and just to put things into context, the fashion industry is relatively new in my region. It's starting to blossom now, but years ago it wasn't, and my parents never discouraged me from designing. It's competitive and risky, but it's definitely worth the risk. If you can do what you love, it never feels like a job.

You've mentioned inspiration from Mona Khazindar, who was both the first woman and the first Saudi to direct the Institut du Monde Arabe in Paris.

I met her when I was a student in Paris. She knew how to communicate Arab culture in a way that was very intriguing to so many different audiences. I felt like I wanted to do something similar with my fashion table. I wanted to create something that was inspired by something that I grew up seeing but wasn't represented or being angled or packaged in a way that was made for international audiences.

What challenges did you face when you first were starting out in 2016?

The main challenge was producing some of my concepts. I hate to use this word, but it was very DIY [do it yourself]. I learned everything I could. I Googled everything and tried to understand how to make a good pleat or how to color match the Pantone color with the printing. Production was also a challenge. Saudi is changing rapidly at the moment, so resources for designers such as factories will open up, but that still hasn't happened fully yet.

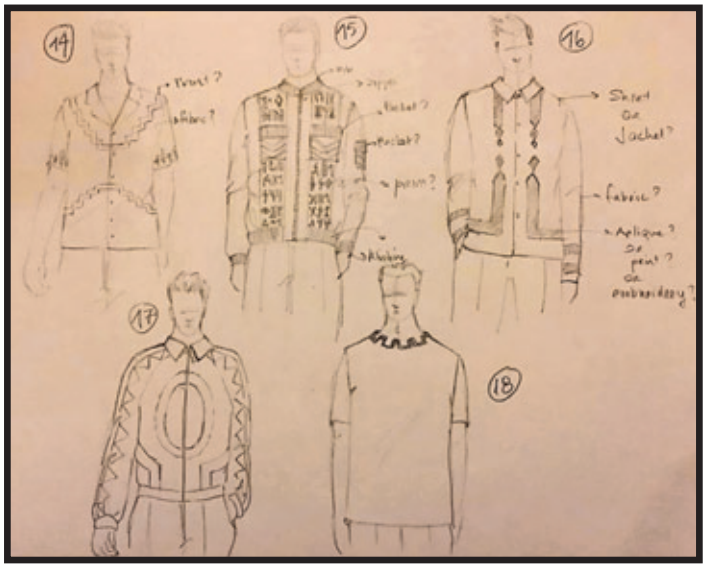
Nabatean Stairs Black-and-White Satin Blouson Jacket.

Did you initially want to produce everything in Saudi?

Yes, it would make things so much easier. But there are certain things that are hard to do here, like printing, and I use a lot of prints in Hindamme. We don't have the technology and machinery to do sublimation or digital printing yet. But it's going to happen soon because they're establishing different entities that are focusing on design. At the moment I produce between Istanbul and Portugal, and I've made a few local pieces that didn't require prints, so I think it just depends on the content I want to create.

When are you at your most creative?

That's a good question. With my last collection, *Al Ula*, I designed the collection within a week. So creativity for me comes in spurts. I need to be in a good place mentally to come up with ideas. It's important to surround myself with people that inspire and encourage me. Listening to different types of music and researching archival collections from different designers helps too. When I was in Paris recently, I got the chance to visit the Azzedine Alaïa studio.



Right: Nabatean Motif Souvenir Bowling Shirt. **Far right**: Khoja says his process often starts with simple mood boards, which lead to sketches such as these from the 2019 collection. Fabrics, patterns and samples follow.

I was able to see his archival pieces and touch them. Being able to see the work of someone as iconic as he was and looking at what he did was incredibly inspiring to me as a designer.

You've rejected the regular fashion cycle of two or four collections a year. Why?

It's been working out well for me so far, but I am looking to get on schedule. I think it's important. The industry is slowly changing, but in the past, fashion shows were shown to journalists, buyers and people in the industry six months in advance. Now a lot of people have the ability to quickly copy what they've seen so it doesn't make as much sense.

What do you think are the next big changes?

Sustainability and climate change, and the fashion-week model seems to be very wasteful. I don't think it's going to be as relevant anymore. I'm curious to see what will happen going forward. As people can't travel, then brands are going to have to do online or closed shows. It could change the industry completely.

What do you think of presentations, where models are stationary and positioned for the audience, versus runway fashion shows?

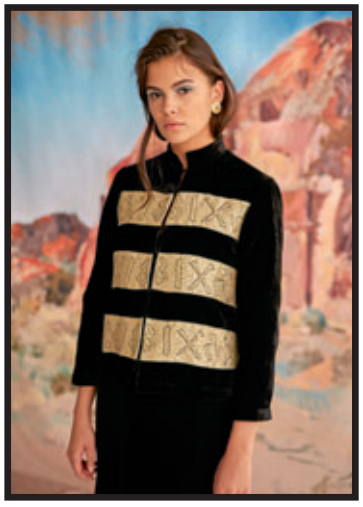
I like how presentations showcase the clothes as a form of art and form of culture. It makes it looks like an exhibition, and it's a museum setting. Fashion design is a very similar process to art in terms of generating ideas and translating them, and I love how presentations and exhibitions elevate the clothes. So far I've been focusing on presentations. I'm fortunate enough that some of my pieces have been acquired by museums. The V&A in London bought a jacket they plan to display, one of the driving jackets.

You're talking about one of the 2018 driving jackets featured in three colors, you made to celebrate women driving in Saudi. They were critically praised, weren't they, as an example of fashion breaking stereotypes? Is this something you'd like to explore more?

It was very organic. I was genuinely inspired. It wasn't something that I did for marketing. I wanted to create a tribute in my own way to mark the occasion. Funnily enough, a lot of the orders for this jacket came from the United States and the United Kingdom, which I was happy to see. There's another major exhibition that's going to be displaying the collection I recently launched inspired by *Al Ula*, but I'm not able to share the details yet.

Can you tell me about the inspiration behind the *Al Ula* collection?

Not a lot of us grew up knowing the [Nabatean] history of al-'Ula, and I think efforts like the Winter at Tantora Festival in December were incredibly important because they highlighted the area. I found it inspiring and I started studying. It took a while to read about the Nabatean civilization because there aren't too many sources on it. I contacted the festival, and a few researchers there were very helpful, and I decided I wanted to pay homage to it. I'm proud to say that a lot of the clients that bought into the collection were European and American. It's cool to see people around the world wanting to wear something inspired by al-'Ula in New York City. It's an East-meets-West moment for me.



What's the key to interpreting culture for people who aren't familiar with yours?

I want to emphasize the word interpretation. There is currently an argument surrounding cultural appropriation, so we need to

Top, right: Black Silk Velvet and Nabatean Gold Brocade Evening Jacket. **Right**: Gold Silk Velvet Nabatean Tapestry Jacket.

Counter-clockwise from above: "The Driving Jacket," on display at the 2019 Moscow Biennale of Contemporary Art; Nabatean Gold Brocade and Pleated Silk Evening Dress; Silk Velvet Black and Grey Chinois Robe; Black and Blue Nabatean Script Striped T-shirt; Qasr Al Farid Architecture Shift Dress, which features a Nabatean facade from Mada'in Salih; Nabatean Stairs Black and White Beaded Layer Dress; Black and Bronze Nabatean Script Paneled Bomber Jacket.

be mindful of that. As a designer I need to be very conscious, and I think that it's very personal. It's my perspective of how I'm inspired. I think you just need to be very respectful of it and you need to interpret it in your own view. You need to be genuine about it. I think the key word is interpretation.

Your work blends couture with streetwear. Where did this concept come from?

I'm very influenced by streetwear. Growing up, I wore the latest NBA Nike sneakers with Versace or Armani, and I love the idea of both those worlds. It's incredibly interesting to me. In my collection, *Season III*, I combined both, so I used a lot of sequins on bomber jackets. I wanted to create something that was current but also had an element of craftsmanship and luxury.

Have you incorporated sustainable practices?

I try not to overproduce because I don't want to be wasteful. As a business I want to sell, but your question brings me to a perfect point because I wanted to talk about my next collection I'm currently designing. With everything that's going on with COVID-19, I'm looking into becoming more sustainable by way of using different innovative materials. I've been looking at antimicrobial materials that are antibacterial. I was designing something completely different but then I shifted the theme.

It sounds like you think there's going to be some interesting art coming out of this time.

For sure. I think our global mindsets are going to shift. We're going to be more conscious of the environment and look to ways to create something more meaningful. I think now more than ever people are looking for value. That's incredibly important to me as a designer—to present value and have some kind of message, to create pieces that spark conversation.

Saudi Arabia is going through a rapid cultural transitional phase. How has this affected your creative process?

I'm definitely inspired. It's a glorious time to be in Saudi because there's such a growing appreciation of the creative field and of designers and artists.

What has been your proudest career moment so far?

My work being taught at universities, because I've always wanted to inspire other people, and my pieces being acquired by museums. I've always wanted to bridge the gap between fashion and culture. I don't want fashion to just be a consumable retail business. I want to be able to generate business, but I try to balance that with something that's meaningful.

Kate Hazell (kate-hazell.com) is a British writer, editor and fashion director based in Dubai. Hazell was the editor at *Sorbet* magazine, fashion director of *Esquire Middle East* and fashion features editor at *Harpers Bazaar Arabia*. She is now freelance and regularly contributes fashion, art and culture pieces to *Vogue Arabia*, *Vogue.co.uk*, *Condé Nast Traveler* and *The National* among others.

Related articles at aramcoworld.com
Al-'Ula: Jul / Aug 2007

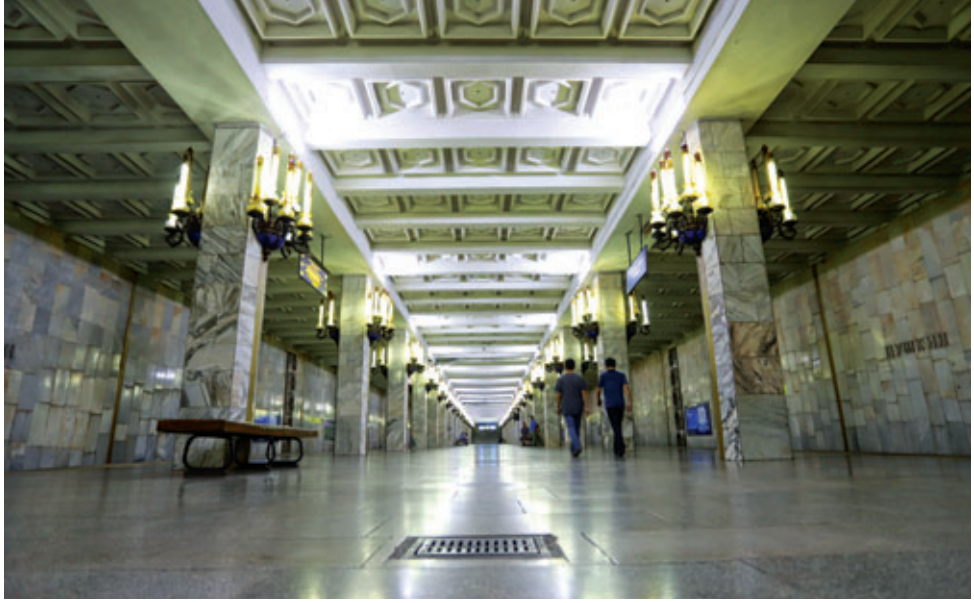
TASHKENT'S UNDERGROUND *Masterpieces*

Written by PINEY KESTING *Photographed by* STEPHEN LIOY

Posing alongside a sign proclaiming "enthusiastic *selam* to the subway builders," this photo of conductors and a new railcar was made to celebrate the opening of Tashkent's Metro in 1977. A similar commemoration appears on a brass plaque, **left**, in Chilonzor station. **Top**: Passengers wait for the doors to close at Alisher Navoiy station, named after the 15th-century founder of Uzbek language and literature. **Opposite**: A sculpted panel over the stairs at Toshkent (Tashkent) station, built in 1984, celebrates the city's founding 2,200 years ago.

LOWER RIGHT: TOSKENT METROPOLITENI

In the heart of Tashkent, capital of the Central Asian Republic of Uzbekistan, a group of tourists follow their guide into the Kosmonavtlar (Cosmonauts) subway station. Its modest street entrance gives little hint of what awaits them inside. Glittering ranks of dark teal columns straddle the station's wide platform, their tops supporting the high, dark ceiling, from which a long band of countless oblong-shaped "stars" dangles and shimmers, replicating the Milky Way. Along either wall, which fade from white to deep blue, large ceramic medallions pay homage to cosmonauts and early space explorers, including Uzbekistan's 15th-century astronomer and



writer Mirza (noble leader) Ulugbek, creating a mesmerizing effect of deep space.

Kosmonavtlar is one of 29 stations in the capital's nearly 43-year-old subway system, called Toshkent Metropoliteni. Each station delivers a uniquely impressive, themed tribute to the heritage of a country whose roots date back to the second century BCE. In recent years as Tashkent's metro has become a traveler's destination, the city's own commuters, as well as the tourists, are taking a new look.

Building a subway that would meet the needs of Tashkent's growing population began in 1964 as the brainchild of then-First Secretary of the Communist Party of Uzbekistan Sharof Rashidov. He envisioned more than a utilitarian transportation system: He wanted a metro that could reflect the history and culture of the Uzbek people and literally cement their cultural legacy.

During the 1960s this was a daunting challenge. Captured by Russian forces in 1865, Uzbekistan, along with its four Central Asian neighbors (Turkmenistan, Tajikistan, Kazakhstan and Kyrgyzstan), had been ruled since 1917 by the Union of Socialist Soviet Republic (USSR), and approval for all projects ran through Moscow. Rashidov persisted through 18 trips back and forth between Tashkent and the Soviet capital before finally securing the necessary permissions. Gradually, all of Moscow's requirements were fulfilled, including studies of seismic activity, hydrogeological factors, geodesic and soil conditions. Tashkent's population had just topped a million when on September 26, 1967, Decree #495, "On the Design and Construction of a Metro in Tashkent," was signed.

"He did everything possible to get permission to build the Metro, and this should never be forgotten," insists Elmira Akhmedova, director of the Centre for National Arts in Tashkent. "He wanted the Metro to be ours with

Uzbek national art [displayed] in each station."

Most of all, she adds, "he wanted our people to be proud of the Metro."

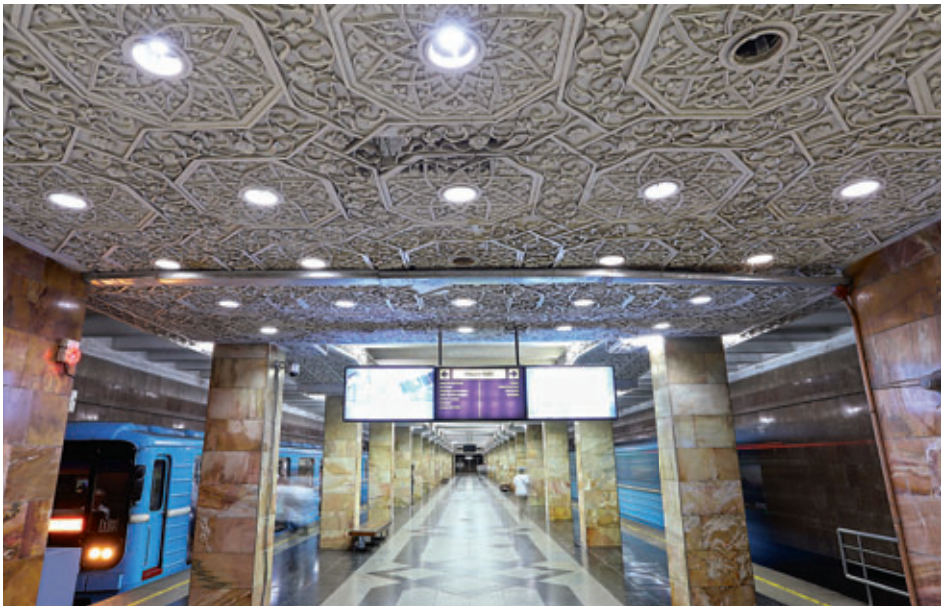
Rashidov personally supervised the selection of prominent Uzbek artists, sculptors and architects who would design the murals, artworks and architectural elements for the individual stations. The best young engineers from the Polytechnik Institut in Tashkent were employed, and all work was overseen by Metrogiprotans, the Soviet planning agency responsible for the design of the 1935 Moscow Metro, and Toshmetroloyiha, otherwise known by its English equivalent, Tashkent Metro Project.

In 1972 construction began in Chilonzor, the most densely populated district in Tashkent. Five years later, on November 7, 1977, to help commemorate October Revolution Day, the 10.5-kilometer Chilonzor line, with nine stations, opened.

"It was a huge event," recalls Tashkent resident Ilhom Miliyev. "The opening was covered by all the media, and suddenly everyone from around the region wanted to come to Tashkent and see the first metro built in Central Asia."

That historic day cemented Tashkent's role as the economic and cultural center of the region. Moscow's own metro, built in 1935, with its crystal chandeliers, wide, elegant platforms and murals depicting historic events and Soviet nationalism, had clearly set a standard. Between 1955 and 1975, five other cities would follow with their own metros: Leningrad in Russia, Tbilisi in Georgia, Baku in Azerbaijan, and Kiev and Kharkov in Ukraine. But Toshkent Metropoliteni became Central Asia's first.

After its construction, Toshkent Metropoliteni continued to expand as Uzbekistan transitioned from a Soviet Republic to an independent country in 1991. Between 1984 and 2001, two



From top: Bodomzor (Almond Orchard) station, 2001; Milliy Bog' (National Park), 1977; Yunus Rajabiy, 2001. **Opposite, from top**: Pushkin, 1980; Hamid Olimjon, 1980; Beruniy, 1991.

additional lines, O‘zbekiston and Yunusobod, connected the city even more, and the number of stations climbed to 29—each one, as Rashidov had hoped, portraying a different aspect of the country’s ancestry.

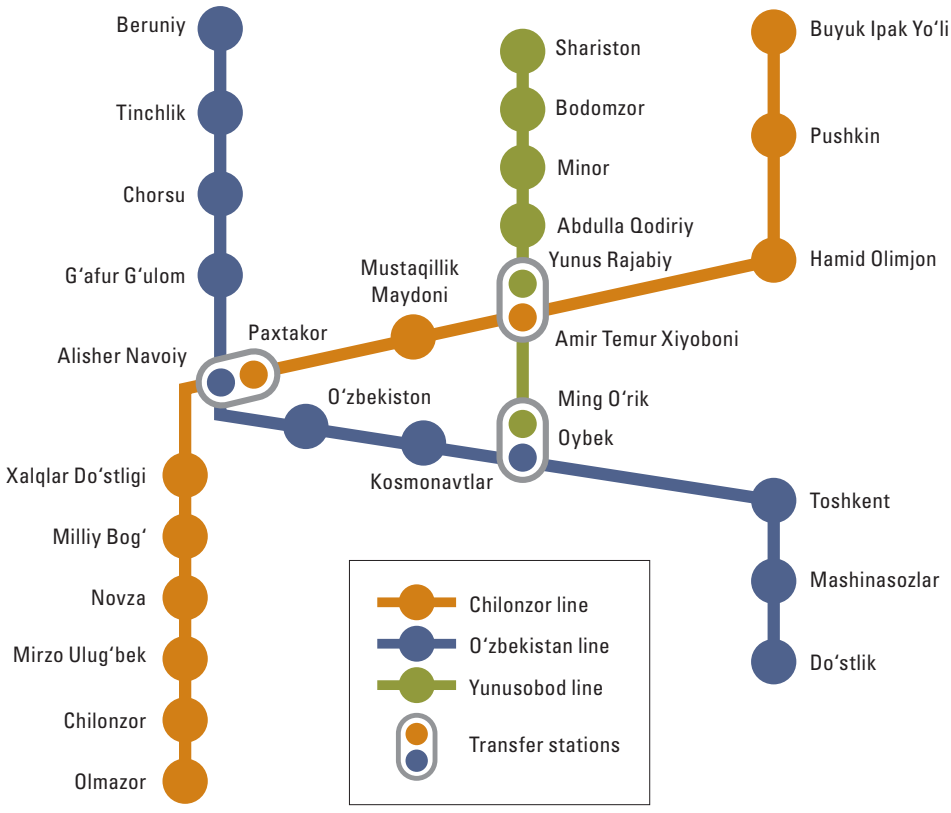
“This work was the greatest test of our skills,” says Uzbekistan National Artist Vladimir Burmakin, 81. “We wanted to make the Tashkent Metro even better than the one in Moscow, which was like a fairy tale.”

Burmakin recalls how he and fellow artists were instructed to incorporate traditional Uzbek designs into their work. It was essential, he remembers, that each station with its combination of angular Soviet elements and graceful Islamic designs should have its own distinct character.

Burmakin, whose works have been exhibited internationally, designed the massive copper relief that hangs above the entrance to Paxtakor (cotton farmer) station. A crop dating back 2,000 years, cotton is known as *oq oltin* (white gold) because of its critical role in the country’s economy. It was also cotton that aided Rashidov’s negotiations with Moscow for the Metro: At the time, Uzbekistan provided more than 70 percent of the USSR’s cotton production. Rashidov increased Uzbekistan’s offering to 5.5 million tonnes annually, an increase of two million, to sweeten the Metro deal.

“The Metro played a critical role in Tashkent’s transformation into a capital city,” emphasizes Burmakin, who says he feels honored to have been a part of the historic process.

As a child growing up in Tashkent, he used to watch



Hearkening to Uzbekistan's national legends, literature, heritage, achievements and aspirations, each station's themed art was commissioned from a different artist. Expression of the themes often appears on wall panels made from tiles, ceramic bas-relief, metal and other media as well as dramatic murals. **Above, from opposite left to right**: At Chilonzor, a panel alludes to the music of a nomadic past with a young man dressed in an Uzbek *cholpan* (traditional robe) playing a *doira* (frame drum). At Halqlar Do'stligi (Friendship of Peoples), a bas-relief panel displays Uzbekistan's medieval Islamic center of Bukhara, with its Kalyan minaret front and center. At Kosmonavtlar (Cosmonauts), commemorations of those who led the way to modern space exploration begins with a portrait of Mirza (noble leader) Ulugbek, the 15th-century Timurid poet, sultan and astronomer. At Alisher Navoiy, a framed bas-relief panel reflects a scene from the writer's epic of Alexander the Great within his multivolume *Khamsa*. At Milliy Bog' (National Park), openwork copper of a flag-bearing soldier memorializes Uzbekistan's involvement in World War II as part of the Soviet Union. At Toshkent, a ceramic panel shows three modern students walking arm-in-arm through what appears to be an apple orchard, with cotton below them—both national symbols.

camel caravans, as well as herds of sheep and cattle amble along rough, stone-paved streets. He had never envisioned he would one day be working on mural designs for an underground subway system.

"The Metro facilitated the growth of a new, modern citizen and evoked a sense of national spirit," Burmakin remembers. "It inspired our belief in Tashkent and its potential for growth. The educational part of the Metro as an underground history museum played an important role in that."

After the fall of the Soviet Union in 1991, changes in the Metro reflected the newly independent country's desire to reclaim its national identity. Seven stations with Soviet names were changed, including V. Lenin, which became Mustaqillik Maydoni (Independence Square); Oktabr Revolyutsiyasi, commemorating Russia's October 1917 Revolution, became Amir Temur Xiyoboni, in honor of the 14th-century Chagatai leader. Construction slowed due to economic conditions throughout the 1990s, and it took 10 years before the six newest stations opened in 2001.

Muhammad Ali, former Chairman of the Writers' Union of Uzbekistan, recalls how before independence Amir Temur Xiyoboni station had a portrait of Karl Marx as well as murals

This mural at Tinchlik (Peace) is one of two that stretch the length of the rails on each side of the platform. Its simple, bold geometrical elements and warm, earthy hues evoke dynamic, yet harmonious relations among nations.

Alisher Navoi, represented **left** in this bas-relief at the station named in his honor, and his memory provides a powerful impetus to the development of several Turkic languages and literary traditions. Nearly 580 years after his birth, Navoi's prominence is still felt.

depicting Russian and Soviet history. Those were removed as were other murals with Soviet themes.

"Today the Metro has an important role," explains Muhammad Ali. "It is teaching our younger generation about their heritage. Before the Soviets left in 1991, we never had a chance to openly embrace or learn about our rich history, which goes back 3,000 years. Now whenever I walk into the Metro, I am inspired by the art."

Muhammad Ali likens Tashkent's subway stations, its art and architecture, to entering a museum where one can view history and culture exhibited on the walls.

"People should feel like they are walking into the history of Uzbekistan," he says.

Nargis Kasimova, a Tashkent journalist, remembers when her father first brought her and three of her siblings from their hometown of Jizzakh, 200 kilometers southeast of the capital, to see the Metro. Only 12 or 13 years old then, she remembers the stations as palatial, majestic.

"The Metro unconsciously promotes a love of country," explains Kasimova. "Every design, every mural, whether it is depicting the significance of pomegranates or almonds, or the history of the cotton harvest, has a meaning in our culture."

Uzbeks are proud their Metro is not just a transportation interchange, Kasimova says, commenting on the beauty of each station as symbolic museums. Each station honors Uzbek heritage, most named after Uzbek poets, writers and composers, as well as other notable figures in the nation's history. They are essentially a popular destination offering lessons in history, she asserts.

Since its inaugural run in 1977, more than four billion passengers have used the Metro. Today, about 220,000 daily commuters, young and old, residents and tourists, purchase blue plastic tokens for 1,400 soms (about US$.15), descend into their station and

Internationally acclaimed architect Sergo Sutyagin, 84, **left**, stands in Kosmonavtlar station, which he designed nearly four decades ago. Historian and Distinguished Writer of Uzbekistan Muhammad Ali, **middle**, stands at the center of the platform of Alisher Navoiy station, in which ornamented vaults with floral patterns make it, with Kosmonavtlar, one of the most popular stations for tourists. **Right**: Sculptor Ahmet Shaymuradov and artist Chingiz Akhmarov discuss one of the sketches that would become a panel at Alisher Navoiy station.

"It has been a tradition among Uzbek poets and writers to strive to be scholars and public servants ... healers and advisors," Ilse Laude-Cirtautas, the renowned Turkologist, once noted.

They follow the heritage of the poets and singers of the nomadic Turkic past, and for this reason: Turkic peoples tend to hold their writers in high esteem. In Uzbekistan's capital, Tashkent, this is demonstrated in the naming of subway stations after its literary figures. Below is a list of the seven writers eponymously honored.

1. Mirza (noble leader) Ulugbek (1411–1449), sultan, astronomer and mathematician, followed Turko-Mongol conventions by composing eloquent poetry.
2. Alisher Navoi (1441–1501), a poet, philosopher and statesman, is considered the founder of modern Uzbek language and literature.
3. Alexander Pushkin (1799–1837), considered the greatest Russian poet, also composed plays and novels, with many translated into Uzbek.
4. Abdulla Qodiriy (1894–1938), founder of the Uzbek novel. His novel *O'tkan kunlar* (Days passed) is considered the first Uzbek novel.
5. Oybek (1905–1968), a writer and scholar, began his literary career with poetry, following the Uzbek centuries-old tradition.
6. G'afur G'ulom (1903–1966), poet, novelist and scholar, whose most famous poem, "Sen yetim emassan" (You are not an orphan), was adapted into a film in 1962.
7. Hamid Olimjon (1909–1944), poet and public figure, is best known for the lyrical quality of his poetry.

encounter the history of Uzbekistan.

At Mustaqillik Maydoni station, rows of sparkling chandeliers dangle over an immaculate platform lined with grand marble columns stretching upward to a gilded, patterned ceiling. At Alisher Navoiy station, which honors the 15th-century founder of Chagatai literature, turquoise blue bas-reliefs line the entrance. Renowned sculptor Ahmet Shaymuradov spent four years creating the intricate details of the ceramic murals, each one depicting scenes from Navoi's epic *Khamsa*.

"I am very proud of this work," says Shaymuradov, 84. "Everything I did was for the people of Uzbekistan, and now thousands of people see my work every day in the Metro."

Shaymuradov is also pleased his work will be preserved for posterity.

"I am old now, but my work remains for the young people, and I think they learn a lot from the murals," he says.

Alisher Navoiy station is Diana Khaydarova's favorite. The 18-year-old artist commutes daily on the Metro, and she says she observes something new each day.

"We have so many beautiful stations, and each one has its own story, all of which are connected to our history," Khaydarova says.

As an artist, she is particularly fascinated by the Kosmonavtlar station, designed by architect Sergo Sutyagin. Today, it's regarded by many tourists and residents alike as one of the most beautiful of all.

"I wanted to recreate all the stages of exploring space," the 84-year-old Sutyagin says, recounting the challenges of finding just the right materials for his designs. Everything he created for Kosmonavtlar station bears traces of Uzbekistan's past.

"Our work," emphasizes Sutyagin, "should feed the present generation and give birth to the future."

Khaydarova encourages younger subway riders to look up from their cell phones every now and then in order to pay more attention to the murals and architecture in the Metro.

"It's one of our nation's greatest accomplishments," she says. "I feel closer to our history when I am traveling underground in the Metro than when I am walking along the streets of the city."

The history she learns during daily commutes also helps with one of her new goals—to educate the tourists she meets in the Metro about Uzbekistan's heritage.

Her goal is easier now: Since 2018 photography has been permitted in the stations. Prior to that, it was forbidden, as the subways were considered strategically important because they doubled as nuclear fallout shelters.

"We realized how important it is to show the beauty and history of our country to outsiders, so we changed our tourism law," explains Zarina Mansurova, head of marketing for Toshkent Metropoliteni.

As a result, Khaydarova and other commuters often encounter enthusiastic groups of international tourists taking photographs as they huddle around local guides in some of the

OPPOSITE, LOWER LEFT: SOPHY ROBERTS; LOWER RIGHT: TOSHKENT METROPOLITENI

Do'stlik (Friendship) opened in the mid-1980s. The station's arched ceiling is painted turquoise, and the aluminum-clad lights were designed to evoke rainbows against the sky to symbolize the nation's bright future. **Opposite, top**: Metro stations are not the only public commemorations of the legacies of literary and other heroes in Tashkent: Under a gazebo overlooking the heart of the city, a statue of Alisher Navoi serves as both a reminder and an inspiration. **Lower**: A mosaic panel enlivens the facade above the stairs exiting Toshkent station with a design that symbolizes a diverse multitude coalescing into unity.

most popular stations.

"I once met a German tourist at Alisher Navoiy who told me she had been to Tashkent twice before and returned as soon as she found out that she could finally take photographs in the Metro," Khaydarova recalls.

Khojaev Muminjon was a newly minted Polytechnik Institut engineer in 1973 when he was hired to work at the Metro. Nearly five decades later, he is still employed at the Metro, which he uses to commute daily to and from work. Whenever he sees groups of tourists taking pictures, he notes, he is filled with pride. "I really am tempted to stop and tell them that I helped build the Metro," says Muminjon, smiling.

His pride is shared by many of the older generation, who remember what a momentous occasion it was when the Metro opened. Mansurova recalls how her grandmother made a point of taking her to the Metro when she was only 6 years old.

"It was very prestigious during the Soviet era for Tashkent to have the first Metro," explains Mansurova. "My grandmother took me to every station and taught me about the history of our country as well as the history of the Metro construction. It was very important to her."

"And look at me now," she says. "I am the spokesperson for the Metro."

Mansurova oversees programs intended to increase local use of the Metro, especially by the younger generations.

"We want to make the Metro a friendlier place so that commuters will be encouraged to use it every day," she explains.

This means comfy reading nooks with mini libraries have been set up in some stations along with kiosks that offer snacks and drinks; cash machines are available, as well as limited WiFi service, which is planned to expand.

Even more enticing are the cultural events held in the Metro throughout the year. On May 9, 2019, a military marching band performed to honor Uzbekistan's Memorial Day. Art stations for children had already been set up in Alisher Navoiy and Paxhtakor stations, and their paintings were later exhibited in the Metro for International Children's Day. In August 2019, 12 of the Tashkent Philharmonic Orchestra's younger musicians visited the Alisher Navoiy station and played several classical compositions of Johann Sebastian Bach. It was the first concert in the history of the Metro.

Today, as Tashkent's metropolitan population exceeds 2.5 million, new metro stations are under construction and plans call for a total of 74 stations by 2025, nearly four times its current size. Yulduz Saidova one of the Metro's original engineers hired in 1972, is working on the massive construction. She says the new stations will be as culturally and architecturally distinct as the first 29: Local artists are now submitting bids for the designs.

"I feel closer to our history when I am traveling underground in the Metro than when I am walking along the streets of the city."

—DIANA KHAYDAROVA

For the first time, one of the stations will include a mural of the Turkestan region, which, like Tashkent, was once an important trading center along the historic Silk Roads linking Europe and China. In 1918, before the creation of the Uzbek SSR in 1924, the Soviets designated Tashkent as the capital of Turkestan, expanding the city's footprint in Central Asia's history. "It's so important for the next generation to keep learning about their history," asserts Saidova.

Beyond functionality, the Metro has

tunneled its way into the heart of the nation, which is approaching the 30th anniversary of its independence.

"The Metro helped change Tashkent's future," says Sutyagin. The sense of national pride it instilled in the people of Uzbekistan at a time when it was most needed has inspired generations.

More than 40 years later, Sutyagin still commutes daily on the Metro to and from his workshop in the city. It is a cherished reminder of all those who came together to build a culturally relevant, transportation-efficient city.

Smiling, he says, "Every time I see tourists taking pictures in the Metro, I say to myself, 'What a good job I did! What a good job we all did!'"

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Renowned sculptor Ahmet Shaymuradov passed away in March 2020. We honor his memory.

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MAPPILA RHYTHMS, Monsoon Connections

Written and photographed by ROLF KILLIUS

Down a muddy road shimmering with puddles, voices chanting in a temple mix with a nearby drummer's pulsing *thakita thakita* beats, all while rain patters on the bamboo roofs in Arangottukara, a village in the southwestern Indian state of Kerala. As if in randomly playful accompaniment, children run by lilting, "Rain, rain, go away, come again another day!"

Such mixtures of musical sounds can at times seem to infuse the very landscape in this village and throughout Kerala, reaching 600 kilometers up India's west coast nearly from the subcontinent's southern tip. Renowned for its coastal, beach atmosphere, plush greenery and abundant rivers, it is also one

of India's most culturally and religiously diverse regions, resulting in communities where mosques, temples and churches can often appear on the same street. For anyone interested in vernacular musical traditions throughout the world, Kerala is sublime.

India as a whole is a symphony of sounds, and among the best known are those heard from the country's north: the plucking of a sitar, the rhythm of the two-part tabla drum and the hypnotic woodwind shehnai, all often played together. In Kerala, however, and particularly among the mostly Muslim villages along and around the 250 winding kilometers of the Bharatappuzha River, the music uniquely shares much with that of the Arabian Peninsula: Here it's a fusion of percussion, wind and string instruments in which tonal and vocal structures evoke moods and emotions in each transitional octave.

It was to this part of Kerala that Islam came in the seventh century, and the music of the region has since been one of traditional chants, both secular and sacred, reminiscent of the Arabian Peninsula, together with the hallmark percussion of classical Keralan music. The results are exciting even to the most novice of ears, an amalgamation of tones and improvised rhythms developed over centuries.

This musical tradition was made possible by the spice trade that serviced ports in what is now Oman, the UAE, Saudi Arabia and more. Mariners largely followed coastal routes to traverse some 3,000 kilometers of the Arabian Sea, and some

Top: Master singer of all three main Mappila musical genres—*Mappila pattu, kolkali* and *duff muttu*—Mohamed Haseeb performs with the Kerala-based music and cultural preservation group Vayali in the village of Arangottukara as part of Vayali's documentation of music along the Bharatappuzha River. **Left**: In a village near the Port of Ponnani, residents take shelter from the monsoon rains that come to India's west coast on the same winds that have brought centuries of maritime trade that link Arabs and others to Kerala.

stayed on in the fertile deltas of Kerala, much of which was then known as Malabar. With them they brought music, religion, cuisine and other aspects of culture. Today Kerala is comprised of around 25 percent Muslims, 20 percent Christians and 55 percent Hindus. It's a diversity not seen in other states of India, where Hinduism remains dominant by larger margins.

Of the Muslims who do live in Kerala, however, most comprise the Mappila community, a name that means "the great child" or "son-in-law." Originally a respectful title given to foreign visitors, it came to be applied to members of the local population who became Muslims. As they maintained their ties with Arabia and points west through commerce, they evolved into a regional Muslim community known for its sophistication in trade. While Muslim communities exist throughout India, the Mappila remain prominent in Kerala, and most Muslims in the state identify as Mappilan. And like others in Kerala regardless of background, all speak the common Sanskrit language, Malayalam.

It was across the Arabian Sea, **above**, that early Arab traders came to Kerala, where some stayed on, bringing culture—including music—with them. **Right**: Fishing remains an occupation along the Keralan coast, where near the Port of Ponnani, four fishermen posed for a portrait.

Mappila villages are mainly settled in the northern part of Kerala, many along the coast, where occupations in trade, farming and fishing endure. Because Kerala's landscape is so lush, it can feel a world apart from other faster-moving, more crowded parts of India. Here the land is forest green, dominated by coconut and areca nut palms, banana bushes and nut plants, especially the famed Kerala cashews. The "black gold" of the *Piper nigrum* vines—black pepper—did more than anything else growing here to inform the region's history, ever since Alexander the Great is said to have carried some back from India. In the 14th century, the Moroccan traveler Ibn Battuta described Kerala's coast as the "pepper country."

"With tiny wooden ships called dhows, the traders arrived in June and July and returned to their own places in December and January using the changed wind direction caused by the monsoons."

—T. V. Abdurahimankutty, historian

Vayali, a Kerala-based music and cultural preservation group, is now working to map distinct cultural expressions along Kerala's rivers, from their sources in the state's Western Ghats (hills) to the coast. Vayali's online resource shows cultural connections among communities, regions and even nations, with a particularly musical focus on the towns of Arangottukara, Ponnani, Tirurangadi and Kondotty—all Mappila cultural centers.

Where the estuary of the river Bharatappuzha meets the Arabian Sea, Ponnani's dilapidated waterfront warehouses, well-worn fishing boats, and simple houses and sheds characterize one of Kerala's oldest ports. Town historian T. V. Abdurahimankutty says the importance of Ponnani grew with the rise of trade in local spices, most significantly pepper.

"With tiny wooden ships called dhows, the traders arrived in June and July and returned to their own places in December and January using the changed wind direction caused by the monsoons," he says. "Many Arabs or Persians created families with

Left: Combining dance with intense percussive rhythms, kolkali (stick dance) involves performers swaying, swinging and interweaving while clacking heavy sticks in complex musical patterns. At more than 250 kilometers, the Bharatappuzha River, **above**, is the longest in the state, and it flows through the heart of Mappila regions in north-central Kerala.

local people, and some stayed on permanently."

Abdurahimankutty says it was during the traders' long stays on the coast that they developed music "combining the laments of the Arabs with the percussive elements prevalent in Kerala."

In addition to the music, the 600-year-old grand mosque in Ponnani shows how Arab sailors and residents merged their culture with a new environment and local architecture. The mosque is made of natural stone and intricately carved wood, and it resembles one of the early royal palaces of the region.

Mohamed Haseeb of Ponnani is a master singer of the three main Mappila musical genres: *Mappila pattu, kolkali and duff muttu*, which all combine storytelling lyrics, hymns and poetry with intricate percussive patterns—but each for distinct purposes and each using distinct musical forms.

"I have played this exciting music from childhood onwards," Haseeb says.

Mappila pattu (song) is the most important genre performed in Tirurangadi, a town just north of Ponnani. Ethnomusicologist Amy Catlin-Jairazbhoy, adjunct professor at the University of California, Los Angeles, has described Mappila pattu's characteristically responsorial songs supported by handclapping as "reminiscent of their ancestors from the Arab world."

Haseeb says the genre may be more diverse.

"In this genre the topics vary from an invocation to God to one that marvels at the beauty of women," he says. "The song lyrics also deal with Mappila food, the anticolonial struggle and wedding celebrations. Each performance has its specific time and space."

As is common nowadays, the singers in Tirurangadi accompany themselves on instruments of the north, mostly tabla and the pumped-reed harmonium. Haseeb says these were introduced through the film industry of Mumbai, where together with western instruments, they support many of the singers in the Bollywood film scene.

At Pocker Sahib Memorial Orphanage College in Tirurangadi, students also learn the music and moves of the intricate

On stage in the town of Tirurangadi, **above**, performers present a duff muttu, a devotional genre that celebrates God and the Prophet Muhammad, using voices and hand-held drums. **Right**: A group of young women perform a wedding song and dance called *oppana*, ("Clapping together").

kolkali (stick dance). It is performed by young men wearing traditional loincloths, white T-shirts, broad green belts and white knotted handkerchiefs on their heads; in their hands they hold stout wooden sticks.

The songs start with an invocation, after which performers whirl around, stamp their feet and bang sticks toward each other. The rhythm gets faster and faster, the steps more and more complex, and it ends in a crescendo. If in Mappila pattu the tabla is merely an accompanying instrument, the sticks in kolkali dominate the fast-changing rhythms. The intensity and seemingly wild patterns, and the ever-increasing speed, are typical for Kerala's drum orchestras too. If Mappila pattu is closer to Arab culture, kolkali belongs more to the Dravidian south Indian musical realm. Stick dances are performed in many villages along the coast of the Arabian Sea from Kerala to the north Indian state of Gujarat.

Later at the college, a group of seven dancers, each robed in white, joins the drummers: They are to perform duff muttu.

"This musical genre is truly devotional," says Haseeb. "It nearly always celebrates the life of the Prophet Muhammad and praises the almighty God."

The performers kneel, and they begin with an invocation. Then they beat their small, round frame drums, held in the left hand, and slowly sway as the rhythm accelerates.

"The lyrics of this genre are only in Arabic, and no other language is used," he says. "It is entirely religious."

"To my experience the Mappila have astoundingly well-maintained their specific Indo-Arabic traditions and belief system. This is mainly due to our strong fondness for music and dance."

—Master Ahmet

A clear dichotomy of cultural influences exists in Mappila music: The Arabic language, the *duff* (frame drum) of Arab origin and the lyrics expressing Islam all point directly to the relationship and influence of immigrants from the Arabian Peninsula. The duff, with its rather broad wooden rim, is similar to the frame drum *mirwas* played in many Arab countries.

Mappila pattu teacher and harmonium player, Master Ahmet, left, offers instruction at the Mappila Academy in Kondotty, one of Kerala's largest cultural centers specializing in music education.

On this day of performances, each corner of the school building reverberates with Mappila songs, and students practice dance in several audience halls and classrooms. Dozens of girls and boys 7 to 18 years old arrive, then disappear, chatting in one of the nearby classrooms as they prepare for their performance. They emerge, and soon there are songs, clapping, drumbeats and roaring harmoniums.

In yet another town, Kondotty, north of Tirurangadi, the Mappila Academy is one of Kerala's leading cultural centers, and it emphasizes music and dance education. Here, seven teenage girls rehearse a fourth, more specific tradition: the *oppana*, a wedding dance whose name means "clapping together." The girls' teacher is Master Ahmet, who explains that when oppana is performed at a wedding, a girl is bedecked with gold and remains in the center of the dance, symbolizing the bride before marriage. She is lavished with all the attention. The other girls, each wearing a long, plain white sari and headdress, spin and dance around her as three vocalists position themselves to the left of the women, singing of the love and joy between husband and wife. Today, Ahmet's dancers are dressed in everyday clothes: jeans, long skirts and loosely knotted headscarves. Apologizing, he explains this is a dress rehearsal. In the past, he adds, all Mappila villages had oppana groups, but they are on the decline.

Ahmet, who is also the school's teacher for Mappila Pattu and a player of the harmonium, says the arts remain central to Mappila identity.

"To my experience, the Mappila have astoundingly well-maintained their specific Indo-Arabic traditions and belief system. This is mainly due to our strong fondness for music and dance," he says, noting it's important to carry on traditional music in Mappila schools, especially, he emphasizes, since much is now mixed with, or entirely replaced by, the popular sounds of Bollywood.

In Arangottukara, the rain continues its soft background rhythm as the members of Vayali, who participated in the exploration of music in Mappila villages, decide to include this village's songs and rhythms into their own group's repertoire. Without hesitation, Haseeb and his friends join the effort.

"We are excited to work with the bamboo band," he says.

On its own, Vayali's percussion group sounds like the rain becoming a thunderstorm, interrupted only by long lyrical sequences foreboding the next downburst. The bamboo xylophone and flute provide the melodies, while a huge wooden drum and tuned bamboo tubes provide bass and rhythm. The beats and sounds are so dense one can no longer distinguish individual instruments: Sound collages are their specialty. Although the instruments are new inventions made of bamboo, the music is entirely Keralan—just the latest fusion among traditions that continue to connect cultures and continents.

"I knew it would work," Haseeb says.

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DISEASE DETECTIVES OF LEBANON

Written by LARRY LUXNER
Photographs courtesy of HUMAN LINK

As if a descent on ropes into a bat cave isn't challenging enough, Ghazi Kayali is doing it in a full-body Tyvek hazmat suit. His respirator and N95 surgical mask dull some of the sharp stench of ammonia from the bat droppings, and the lamp on his hardhat lights his way down. Two assistants, similarly protected, follow. They are also carrying what look like longer, stronger butterfly nets. They are in this cave on the north side of Beirut to examine as many bats as they can. Kayali and his team orally and rectally swab each bat, collecting secretions to take back to the lab in Cairo, where the samples will be tested for coronaviruses.

"When we do this, we also cover our shoes, and when we leave the caves, we destroy everything we had on," Kayali says. "It all goes into biohazard bags."

It's an expedition that, as an epidemiologist, Kayali has carried out at least once a month until the COVID-19 pandemic.

"Whenever you go sampling bats, you know you're going to come back with a positive sample," he says. "You can go into a bat cave and all the bats look healthy, but when you examine them in the lab, you find viruses."

Kayali, 44, is cofounder and chief executive of Human Link, a nongovernmental organization based in Lebanon and devoted to discovering the sources of viruses capable of spreading to humans.

Now, "in the coronavirus world," says Dr. William Karesh, an executive vice president of the New York-based EcoHealth Alliance, which has worked jointly with Kayali over the past four years, "Human Link is very highly respected, and at a regional scale, they're best in class."

Together the organizations assess the ongoing and future risks of spillover of infectious diseases, such as Middle East Respiratory Syndrome (MERS), from animals to humans.

"We did anthropological studies to understand why some people are at more risk of catching disease than others. We tried to peel away the layers of the onion to understand what causes these diseases, and why not everyone gets sick," says Karesh, who calls Kayali an "ultimate professional" among a handful of world experts on both coronaviruses and influenzas. "His science is first-rate cutting edge," he adds. "People trust him."

Trust is, of course, a key element in worldwide efforts to encourage social distancing, wearing face masks and cooperating with contact tracers attempting to limit the spread of COVID-19, he says.

Human Link is currently part of the global search for a COVID-19 vaccine, a role similar to the one it played in 2012 when MERS emerged in Saudi Arabia. Because Kayali is somewhat of a disease-expert

Searching for strains of avian flu with potential to make a jump to humans, a Human Link research team visits a bird market in Phnom Penh, Cambodia. **Right**: In Lebanon, Human Link cofounder Ghazi Kayali leads a search in a fruit bat cave, looking for bats that may carry the novel coronavirus.

TOP: ERIK KARLSSON / HUMAN LINK

celebrity, he is often invited to speak or appear on disease-related documentaries and news segments. Earlier this year he was featured in the Netflix docuseries, *Pandemic: How to Prevent an Outbreak*, which aired mere months before COVID-19 spread worldwide. In the film he spoke about measures virologists and epidemiologists had in place to combat the next global disease outbreak when—not if—such an event occurred. He was one of the many epidemiologists around the world predicting the imminence of a catastrophic pandemic. Kayali also appeared in a March segment of the ABC program *20/20*, examining global efforts to identify sources of COVID-19.

Human Link's work has always been significant, Kayali says, but now its efforts

to investigate and secure a vaccine are paramount.

Becoming an expert on infectious disease was not on Kayali's radar growing up. Lebanon's civil war erupted in 1975, the year he was born, and it made survival and "new normal" part of the daily conversation. It also stirred a feeling inside that he one day would serve his people, to help those who lost much, to leave the world a better place.

"My initial idea was to go into medicine, so when I was picking majors for my undergraduate degree, environmental health caught my attention," he says, remembering how he then felt a larger calling to serve large populations. "I started learning about public health, epidemiology and biostatistics, and then I thought that was a better way to go."

Kayali earned a master's degree in public health from the American University of Beirut, and he then served in the Lebanese army for several years. In 2008 he earned a doctorate in epidemiology from the University of Iowa, and he joined St. Jude Children's Research Hospital in Memphis, Tennessee, which was receiving funding from the National Institutes of Health (NIH) to research avian flu in the Middle East. At St. Jude, Kayali's mentor was infectious disease specialist Richard Webby, director of the World Health Organization's Collaborating Center for Studies on the Ecology of Influenza in Animals.

> ***"Conducting my line of work is very expensive. We're not only working with the virus but with thousands of samples."***
>
> ***–Ghazi Kayali***

"I came back from the States and set up a virology lab in Cairo with the Egyptian National Research Centre because at the time avian flu was a big thing," he recalls. "We studied how frequently H5N1 [avian flu] can jump from wild birds to poultry to humans. Then in 2012, when MERS emerged in Saudi Arabia, we started working on that too."

Human Link also collaborated with a group of Dutch disease detectives who proved that archived camel serum had antibodies against MERS. Kayali says the joint effort led to key findings and more trips into the field.

"We got the hint that camels might be involved and went out sampling. We were the first to show the virus in contemporary camels," he says.

The discovery allowed medical authorities to identify people exposed to camels as an at-risk population and go on to create targeted public health campaigns.

It was in 2014 that Kayali, along with longtime friend and colleague Jimi Goldstein, launched Human Link. Although its headquarters is in Beirut and it has a lab in nearby Zahle, most of its lab research is carried out in Egypt, where Kayali supervises 50 employees in the Cairo district of Dokki. In addition, Human Link also has done fieldwork in Morocco, Algeria, Tunisia, Saudi Arabia, Iraq and Jordan, as well as Togo and Benin.

At present, the NIH provides 95 percent of Human Link's funding through a research contract under the umbrella of the NIH's Centers for Excellence for Influenza Research and Surveillance. The research also overlaps with the World Health Organization on efforts to develop pandemic preparedness for the Eastern Mediterranean.

"Conducting my line of work is very expensive. We're not only working with the virus, but with thousands of samples," says Kayali.

But Kayali and his team suspended field work in late January. On their last outing, they extracted virus samples from snakes, lizards and tortoises in the Cairo suburb of Giza.

"Right now, because of the restrictions, we're not going out to the fields," he says. "But as soon as the restrictions are lifted, we'll be hitting the field, because we have lost valuable time."

Justin Bahl, an associate professor of epidemiology and biostatistics at the University of Georgia, has worked with Kayali since 2015 on avian influenza viruses. Much of Bahl's work focused on Kayali's field research in Egypt, when Bahl was enrolled at the University of Texas. More recently, the two have been looking at how MERS emerged and comparing findings to both SARS and the current novel coronavirus.

"One reason our collaboration works so well is that Ghazi [Kayali] is trained as an epidemiologist, whereas with virologists, the science is very reductionist. So if

On a research trip in Tunisia, Kayali leads "disease detectives"—epidemiologists—in reviewing and identifying local bat species. Human Link's fieldwork often takes researchers throughout the Middle East, North Africa and Asia—work they hope to resume when it becomes safe again to do so. Human Link maintains laboratories in both Lebanon and Egypt.

In Cairo, Kayali regularly swabs secretion samples from ducks and other poultry, **left**, while in the lab there, graduate students carry out the tests, **lower**.

you're a virologist working on influenza, you often work on one virus and one host," Bahl explains. Kayali, however, "is focused on how viruses transmit and persist within a population. Therefore, his strategies for surveillance and collection are really well-informed, with a solid study design."

Epidemiology fieldwork is not for the squeamish, Kayali says. Though bats rarely come into direct contact with humans, people are more likely to be exposed to the potentially lethal diseases they carry through remnants of urine and feces. And with fruit bats, like the ones Kayali researches, exposure to saliva on partially eaten fruits is another risk. The relationship among bats, viruses and the spread of disease, Kayali says, is "very intimate" and can begin in food markets.

Coronaviruses have already caused two major epidemics in the last two decades.

"We've seen this happen multiple times before. People go into the field hunting for bats as food. In Africa as well, flying foxes are sold for meat in the markets. This is definitely how Ebola got started," he says, mentioning that while bats are not on the menu in the Middle East, they are in some areas of China, for example. The diseases they carry cause no problems for the bats, "but when you hunt for bats and you're exposed to their blood and carcasses, you're providing a chance for exposure."

All viruses that have caused trouble in modern times—Ebola, MERS, H1N1 or Swine Influenza (SIV)—he says, have already existed in wild animal reservoirs.

"Before H5N1, it was wild birds, and coronaviruses existed in bats. The virus jumps species occasionally, from bats to another animal reservoir," he adds.

Coronaviruses have already caused two major epidemics in the last two decades. In 2003, Severe Acute Respiratory Syndrome (SARS) infected 8,098 people and killed 774 around the world; in 2012, MERS infected 2,506 people and 862 died.

"In SARS-1, it jumped into civet cats, and in MERS, camels. In COVID, it jumped into some other animal, but we're not absolutely sure which," he says. "In the Middle East, and especially in the Arabian Peninsula, we have an intimate relationship with camels, which are treated more as prizes and pets. For COVID-19, it would be something similar."

These experiences explain in part why, this time around, the Middle East appears to be somewhat better prepared, Kayali says. In Lebanon the COVID-19 infection rate was relatively low, in part due to the government's swift closures of schools, restaurants and other public venues, according to the Arab Center Washington DC. In June Lebanon reported 1,495 cases of the virus and 32 deaths, according to Worldometer.

"Because they took people off the streets at an early stage and banned all gatherings, the virus didn't really have a chance to spread," says Kayali.

For now, Human Link's labs are working daily toward a vaccine for COVID-19—as it did for MERS—while looking at general immunity in the population.

"We're working with the Egyptian Ministry of Health," he says. "The initial steps start in labs like mine. You develop a vaccine, you test it in your lab animals, and if you see potential there, you produce a bigger batch and start human testing. Hopefully, we'll have some results in a couple of months."

Freelance journalist and photographer **Larry Luxner** (larry@luxner.com) is a regular contributor to *AramcoWorld* who writes frequently about Middle East news and cultures.

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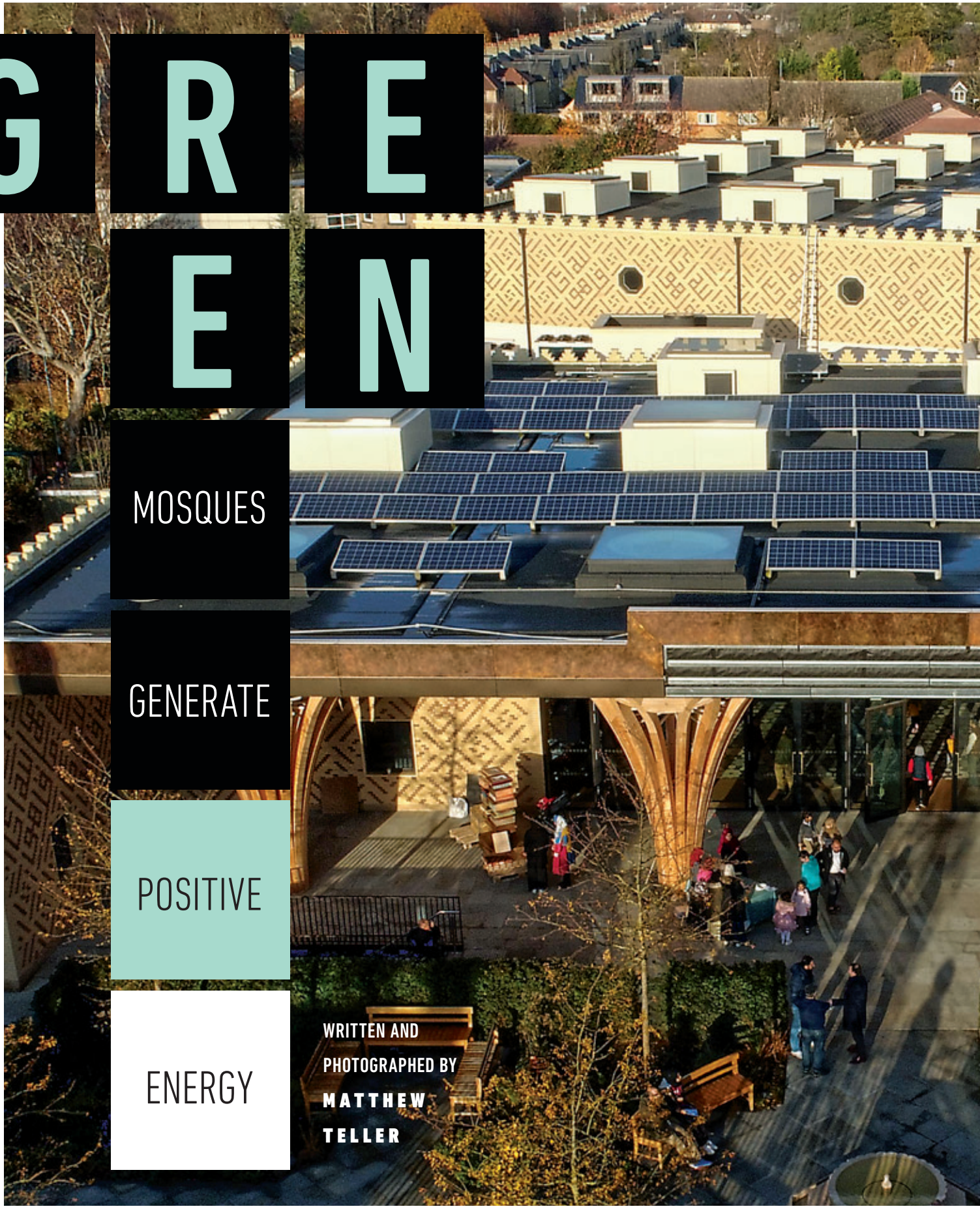
GREEN

MOSQUES GENERATE POSITIVE ENERGY



WRITTEN AND PHOTOGRAPHED BY **MATTHEW TELLER**

Left: The first purpose-built eco mosque in Europe, the Central Mosque in Cambridge, England, opened last year. With space for 1,000 worshipers, its rooftop photovoltaic (PV) panels generate enough power to meet a third of the mosque's energy requirements. **Above**: In Tlaa al-Ali, on the northwest side of Amman, Jordan, Yousef al-Shayeb proudly regards an array of PV panels that, since installation in 2013, have cut Masjid Abu Ghuweileh's electricity bill to zero. By 2019 about 500 mosques in Jordan were running on solar power, and the Jordanian government has plans to extend PV to all but the smallest of the country's 6,500 mosques.

OPPOSITE: EMRAH ALI MANDARUN / ANADOLU AGENCY / GETTY IMAGES

Up on the roof of Masjid Abu Ghuweileh, Yousef al-Shayeb looks around and smiles, gesturing to an array of solar panels tilted south toward the sun. The masjid, or mosque, is located in Tlaa al-Ali, a thriving district in northwestern Amman, Jordan, where he heads the building's management committee.

"This was stage one—44 panels. Over there was stage two—64 panels. Now we are all set—for the next 20 years at least," al-Shayeb says, mentioning the pride he feels for leading the project to install the solar panels. "I served the military, and now I serve the community, this house of God and everyone in this neighborhood."

An electrical engineer by trade, al-Shayeb spent 22 years with the Royal Jordanian Air Force before retiring in 1990 as a brigadier general. Then he transferred his professional and technical expertise to his community in Tlaa al-Ali.

Masjid Abu Ghuweileh is not a large building. A recent extension allows up to 650 worshipers for the Friday midday congregational prayer, though average attendance is fewer. The mosque is a mainstay of the neighborhood, says al-Shayeb, who moved to the area in 1986; even then it was a cornerstone of community life.

Until a few years ago, the mosque's monthly electricity bill ran upward of 1,000 Jordanian dinars (about US $1,400). Today, thanks to solar panels on the roof, the bill is zero, al-Shayeb says.

The upgrade forms part of a Jordanian government initiative to retrofit mosques across the country with solar photovoltaic (PV) panels. These convert sunlight—abundant hereabouts—into electricity. The initiative is administered through the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF), established in 2012 as an office of the Ministry of Energy and Mineral Resources.

The project at Masjid Abu Ghuweileh is among a number of "green mosque" schemes in Jordan and elsewhere around the world intended to help meet conservation and climate challenges at a grassroots level.

"Electricity and energy consumption is a very big issue in Jordan," says Lina al-Mobaideen, an engineer who heads project development at JREEEF. "The heaviest worries are about how we can reduce demand, and so reduce the overall energy bill. This led the government to [formulate policy] encouraging individuals to reduce their consumption."

Al-Mobaideen highlights a partnership established in 2016 between JREEEF and Jordan's Ministry of Awqaf (religious endowments) to focus on places of worship as nodes of influence within every community.

"Energy consumption at mosques is very high," she says. Islam's five daily prayer times—at dawn, midday, afternoon, sunset and evening—mean that worshipers tend to flow in and out of mosques all day long. Lighting, as well as equipment for cooling in summer and heating in winter, often stays on throughout.

On the south side of Amman, the roof of the Hamdan al-Qara mosque hosts 140 photovoltaic panels. A partnership established in 2016 between the country's energy efficiency fund and ministry of religious endowments focuses on places of worship as nodes of influence in communities.

"The mosque is the most appropriate place to encourage people to change their behaviour and introduce them to renewable energy," al-Mobaideen adds.

In 2017 JREEEF began launching tenders, area by area, to install solar PV systems in many mosques throughout the nation. By 2019 about 500 mosques were running on solar power, with the intention of extending the project to most of Jordan's 6,500 mosques (the smallest have energy usage so low that conversion is often uneconomic) as well as Jordan's smaller number of churches. Parallel schemes have been launched in educational institutions.

"It's an awareness tool," says Samer Zawaydeh, an independent consultant on renewable energy in Jordan and long-time educator for the Association of Energy Engineers, a US-based nonprofit organization that coordinates training for the sector worldwide. "Mosques and schools are places where people visit a lot. If people see solar PV, ask what it is, and learn more, then maybe they will choose it for their home or office."

"The mosque is the most appropriate place to encourage people to change their behavior and introduce them to renewable energy."
—Lina al-Mobaideen

The project works through direct grants from the Jordanian government. Each mosque submits a proposal for a solar PV system, with size and capacity based on the building's electricity consumption over the previous 12 months. Contractors, who are all Jordanian, then source components on the open market. One-quarter of the cost is covered by JREEEF and one-quarter by the Ministry of Awqaf, which disburses the grant. The remainder must be paid by the mosque community, usually by donations from members.

"People are continuously donating," says al-Shayeb. "The community already paid 300,000 dinars to renovate and extend this building. Then we gave priority to solar panels, because we were paying such high bills every month. People started donating right away."

The Abu Ghuweileh mosque was one of the first in Jordan to install solar panels, as early as 2013. By 2018 the two-stage installation was complete. Total outlay came to around 35,000 dinars, of which the government paid about 7,000—a lower-than-usual amount because the mosque began its conversion independently.

Al-Shayeb calculates that with shifts in the energy market and other economic considerations the community will recoup its investment in about a year and a half, while Zawaydeh estimates a payback period of between two and three years for solar PV systems of this type. But that's still a remarkably attractive proposition and it shows that prices have fallen substantially, even in the last few years. A 2014 study in Kuwait to convert all of that country's 1,400 mosques to solar power suggested a payback period as long as 13 years.

"Solar makes a big difference," Zawaydeh says. "It's a fantastic opportunity [and the benefits] can be realized fairly quickly. It makes financial sense."

The switch to solar power for mosques in Jordan is running alongside programs to reduce water use—the Islamic requirement

Marrakesh's 12th-century Jami'a al-Kutubiyah was among the first in the country to be fitted with solar panels by the Moroccan government. A display on the street outside shows how much energy the panels generate and the associated reduction in carbon emissions.

for ablution before each of the five daily prayers can create heavy demand—and replace incandescent lighting with LED bulbs, which use much less energy and last much longer.

Such concerns are rooted in budgetary prudence but can be corroborated in religion—a vital connection the government is making to encourage mosque communities.

"One of the things Islam teaches is not to overspend or exceed our consumption," says al-Mobaideen. She points to verses in the Qur'an, including Sura VII:31, which is interpreted in English as, "But waste not by excess, for God loveth not the wasters," and Sura XXV:67, which names the righteous as "Those who, when they spend, are not extravagant … but hold a just (balance) between those (extremes)."

"Conservation in spending and consumption—that's what we use to bring awareness to people," she adds. "It is both a financial and a religious imperative."

This reflects the difficulty governments around the world have often faced in delivering either clear messaging or effective policy on the obvious long-term benefits of conserving energy and expanding use of renewable resources. Jordan's approach demonstrates a holistic way forward, with environmental concern and religious direction anchored in, but secondary to, the main point: economic benefit.

Al-Mobaideen emphasizes that energy conservation is spurring debate at the supranational level within the League of Arab States, where committees exchange best-practice knowledge among countries. She identifies Morocco as the Arab world's leader in renewable energy.

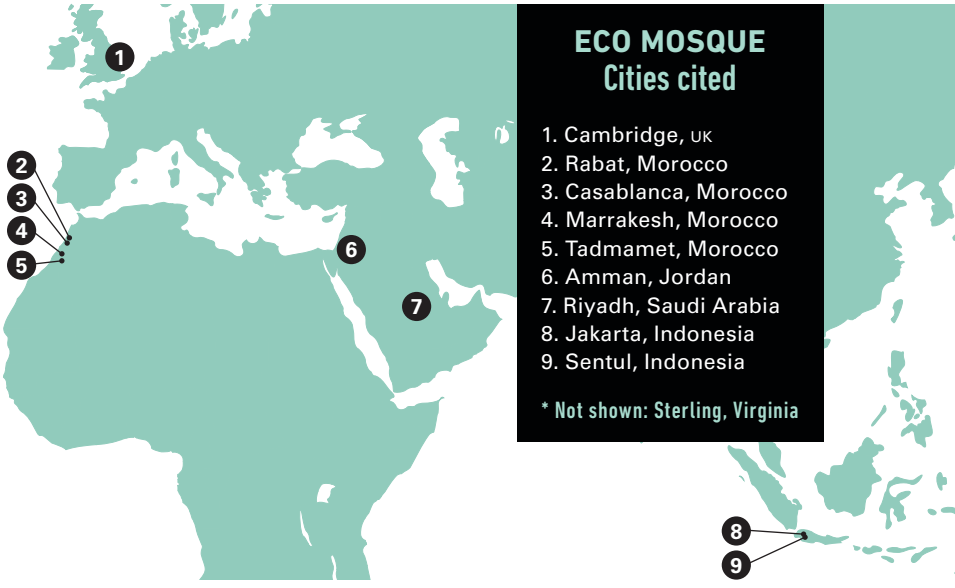
"Morocco already has the legislative framework, the institutional framework and action plans. [It has] implemented many large projects," al-Mobaideen says.

In 2016 Ministry of Awqaf and Islamic Affairs launched a project to install solar PV, LED lighting and solar water heaters in the country's 15,000 government-funded mosques, with technical support from the German international Gesellschaft fur Züsammenarbeit (GIZ). Government grants cover up to 70 percent of initial costs, and as part of the scheme, imams and other clerics are being trained in issues around renewable energy and sustainable technology in order to pass the message to their congregations and communities.

"What we want to do is inform people," Said Mouline, director of Morocco's National Agency for the Development of Renewable Energy and Energy Efficiency, told CNN in 2016. "Energy efficiency is not only a matter of technology, it's also a matter of behavior."

In 2016 Marrakesh's 12th-century Jami'a al-Kutubiyah became one of the first in Morocco to be fitted with PV, owing to its status as a symbol of the city. Its solar panels are hidden out of sight on the roof, while a digital display set up on the street outside reminds passers-by how much energy has been generated and the associated reduction in carbon emissions.

In the capital, Rabat, the large Masjid Assounna has cut its energy bill by more than 80 percent, saving around 70,000 Moroccan dirhams (about US $7,000) a year. The scheme has now reached Masjid Hassan II in Casablanca, the largest mosque on the African continent, with capacity of more than 100,000 worshipers. Renovations there, under way throughout 2020, will introduce PV among a



ALLAN WRIGHT / ALAMY STOCK PHOTO; OPPOSITE: KHALIL MAZRAAWI / AFP VIA GETTY IMAGES

"Besides coming here to learn about religion, we would like people to come to learn about the environment," says Khotib Kholil, who heads management of Az-Zikra Mosque in Sentul, Indonesia, the flagship eco mosque in the country. Tanks, **lower**, can hold up to 50,000 liters of rainwater collected from the roof for use in the mosque's gardens, and a biogas tank buried under the courtyard generates cooking fuel. Solar panels, he says, are next.

range of other measures, reducing the building's energy consumption by more than half as part of a national transformation. That program aims to improve energy efficiencies across the Moroccan economy and create 150,000 jobs over the next decade.

Similar projects are sprouting across the Islamic world. Analysis in 2019 of a PV test system installed at a large mosque in Riyadh, Saudi Arabia, calculated an annual energy bill reduction of more than half. The authors of the study, led by Amro M. Elshurafa of the King Abdullah Petroleum Studies and Research Center, wrote: "If some prior planning were incorporated in the early stages of the mosque's construction, PV can bring down the electricity bill to zero." Other studies are commencing on PV for mosques in Libya and Malaysia. Tunisia and Egypt are both investing heavily in solar power.

Indonesia, the country with the world's largest Muslim population, is also on board. In 2011 the Majelis Ulama Indonesia (MUI), or the Indonesian Council of Scholars, the country's top Muslim clerical body, launched the ecoMasjid initiative. This places Indonesia's 800,000 mosques at the center of a national public-education effort spotlighting the environment.

"It's about translating the language of environmental activism into more practical aspects of people's lives."
—Hayu Prabowo

"It started with the understanding that environmental degradation is not technical or technological, but a moral issue," says Hayu Prabowo, who heads MUI's environment unit in the Indonesian capital, Jakarta. "The government approached us to complement their approach to the public. We are closer to the people because of how people congregate daily at mosques—and Islam is very rich in teaching on environmental issues."

Hayu, who devised and oversees the eco-Masjid program, lists the criteria by which MUI assesses each mosque, from the appropriateness of the site and energy efficiency, to recycling, education and effective management. He sees mosques as nothing less than a vector for empowerment.

"Empowerment is not only about economics," he says. "It's about safeguarding people's health and livelihood. It's a very complex issue. We cannot manage it alone, but neither can government. It's about translating the language of environmental activism into more practical aspects of people's lives."

Of Indonesia's 50 or so participating mosques, the flagship is Masjid Az-Zikra. Built in 2010 in Sentul, around 45 kilometers outside Jakarta, Az-Zikra became ecoMasjid's national pilot project in 2014.

Driving south from Jakarta into the province of West Java, the highway climbs toward Bogor in the shadow of the Mount Salak volcano, nicknamed "Rain City" for its damp climate and high humidity. Amid foliage of cassava, bamboo and banana, the white domes and minarets of Az-Zikra rise above an organized grid of suburban streets under tropical thunderclouds.

The mosque stands as the centerpiece of a planned neighborhood that is home to around 150 Muslim families, founded by the late cleric Muhammad Arifin Ilham. He was formerly the mosque's figurehead and noted across Indonesia for his TV sermons until his passing last year at age 49.

"We want to lead by example, not by talk," says Khotib Kholil, who heads Az-Zikra's management. "Besides coming here to learn about religion, we would like people to come

Right: Inside Az-Zikra Mosque.
Lower left: Jakarta's Istiqlal Mosque is the largest mosque in all of Southeast Asia, and a new PV systems is expected to cut its monthly electricity bill in half.

to learn about the environment."

Khotib emphasises Az-Zikra's close working relationships with universities, technical institutes and agricultural colleges in and around Jakarta, which provide expertise on energy conservation and sustainability. One national priority is improving sanitation and water management.

Khotib identifies 10 large tanks at Az-Zikra, which hold around 50,000 liters of rainwater channeled from the mosque's roofs. All the building's water, sourced from wells and the rainwater tanks, is recycled three times—diverted on the fourth cycle to the surrounding gardens—and he explains how a simple adjustment to faucets has reduced the mosque's water usage for ablutions before prayer from 14 liters per person to four.

A biogas tank buried under the courtyard generates cooking fuel from human waste, but the mosque is still spending more than 30 million Indonesian rupiah ($2,000) a month on electricity and gas. The next step, says Khotib, is PV.

On Fridays Az-Zikra hosts around a thousand worshipers at midday prayers, though for special events that number may increase 10 times or more.

"This is seen as the most complete eco mosque," says Az-Zikra's secretary, Arief Wahya Hartono. "It's something we are very proud of, even if most people still don't understand what it means."

Back in Jakarta, Greenpeace campaigner Atha Rasyadi faces challenges from plastics in the oceans to chronically congested roads. But getting across the message of environmental conservation is, he says, perhaps the biggest of all.

"We want mosques to be talking about environmental issues. They have strong influence over their people and we want to make use of that," he says, describing how Greenpeace Indonesia is building strategic alliances with Muslim civil-society organizations.

Hening Parlan, environment coordinator for Aisyiyah, Indonesia's largest women's NGO, speaks even more plainly.

"There are more than 250 million people in Indonesia, and over 80 percent of them are Muslim," she says. "If we are not educating Muslims about the environment, we are achieving nothing. ecoMasjid is the key to making [knowledge of] climate change mainstream."

The efforts to move toward an eco-friendly congregational environment are starting to bear fruit. Arifin helped give Az-Zikra a nationwide profile. Addressing issues around wildlife conservation, forest preservation and energy efficiency, MUI is partnering with Indonesia's Ministry of Environment and Forestry on training courses for mosque leaders across the country, beginning in Aceh and Riau on Sumatra island, West Kalimantan on Borneo island and Lombok. And at Jakarta's Istiqlal Mosque, the largest mosque in Southeast Asia, which can hold as many as 200,000 worshipers, new PV is expected to halve the current 200 million rupiah (about US $13,000) monthly electricity bill. In another green initiative, a water-treatment plant channels wastewater to a new, highly visible fountain and public park around the mosque flanking the Ciliwung River.

"This is seen as the most complete eco mosque," says Az-Zikra's secretary, Arief Wahya Hartono. "It's something we are very proud of, even if most people still don't understand what it means."

Left: A forest of gracefully arced and interlaced columns creates the vaulting in the main prayer hall at the Central Mosque in Cambridge, England. Skylights above each column let in natural light during the day, and for summer cooling, louvered vents create natural convection. At night, energy-efficient LED lighting takes over. **Above**: A geometrically patterned screen offers both ventilation and ornamentation in a wall featuring brickwork that incorporates square Kufic calligraphy.

The next step is to move beyond retrofitting wastewater recycling or solar PV in existing mosques to including such technologies at the start of building projects.

That's an idea that has come to life in Tadmamet, a small village in the High Atlas Mountains in southern Morocco where the only public building is the newly built mosque. Its construction has been carried out almost entirely by the villagers themselves, with support from a government initiative to include solar and other green upgrades in the architectural plans. In addition to cavity walls that optimize insulation and small windows that keep interiors cool, the mosque has a preinstalled PV system, LED lights and a solar water heater. It now doubles as a schoolroom for the village children, and it even feeds surplus energy back into the local electrical grid to power new streetlights.

Tadmamet is now a leading small-scale example, says Rachid Naanani of Cluster EMC, a Moroccan nonprofit promoting energy efficiency in construction materials. "Beyond energy efficiency, [Tadmamet] aims to show that we can offer a mosque model which is self-sufficient in terms of energy supply," Naanani says.

One of the larger such examples opened last year in Cambridge, England, where the Central Mosque marks the first purpose-built eco mosque in Europe. Constructed mostly from sustainably sourced Scandinavian spruce, it is one of the only buildings in the world to use cross-laminated timber on a scale more commonly achieved using steel. Its forest of 16 arcing, tree-like columns create an interlaced vault over the main prayer hall—designed for 1,000 worshipers—that is reminiscent of Gothic fan-vaulting designs used in English medieval church architecture. During the day, skylights above each column suffuse the space with natural light; after dark, energy-efficient LEDs take over.

Those columns support a roof that is sowed with sedum, a flowering perennial, which introduces biodiversity and improves insulation. Even under moody English skies, the mosque's rooftop PV array generates enough electricity to cover around a third of the building's energy needs. Storage tanks harvest rainwater and gray water from ablutions for reuse in bathrooms and gardens. Bird boxes encourage local swifts to nest.

"We wanted to add beehives too," muses Tim Winter, the mosque's chair of trustees. "The East London Mosque produces its own honey from hives on the roof, but we didn't have enough space up here."

In addition, a heat pump exploits temperature differentials between outside air and the interior to keep the building comfortable, eliminating the need for more costly air conditioning. Insulation ensures that warmth from underfloor heating is conserved in winter, and in summer, rising hot air is vented passively through ceiling louvers. The parking area, tucked underground beneath the building, offers charge points for electric vehicles and racks for up to 300 bicycles.

The focus is squarely on saving money and improving the life of the community in both practical and spiritual ways.

On a balcony above the prayer hall, Winter, who is also dean of the Cambridge Muslim College and known as Abdal Hakim Murad, speaks passionately about a building that is both beautiful and significant.

"We are showing that religion is part of the solution to the big problems of the world," he says. The mosque "is making an important

spiritual and humane statement that religion is here to counter waste, to encourage us to give thanks for the blessings of creation, to enable us to think collectively rather than selfishly about the problems that face us."

That is a statement that, more and more, is resonating globally. In Riverside, California, activist Nana Firman heads the Green Masjid program sponsored by the Islamic Society of North America (ISNA), which is taking the message of conservation and energy efficiency into mosques across the US and Canada. One participating mosque, the All Dulles Area Muslim Society near Washington, D.C., recently reduced its energy consumption by one-fifth as part of a community campaign that included recycling and tree-planting.

Firman has also worked on environmental initiatives at mosques in Indonesia, where she was born and grew up, in collaboration with Parlan of Aisyiyah. This year Firman and ISNA coordinated a Green Ramadan initiative during the holy month of fasting, which concluded in May, highlighting Islamic environmental teachings and encouraging congregations to conserve resources.

Other nations, too, are following. In 2014 and 2015, the British government funded its own Green Mosques project, supporting Muslim communities in London. In Toronto, Canada, a sustainability project dubbed "Khaleafa"—blending the Islamic principal of stewardship (*khalifa*) with the environmental symbol of a leaf"—spearheads an awareness called "Green Khutbah" (*khutbah* means sermon). Many more mosque-based ecoprojects continue to launch, from India to Tanzania, too many to list.

"The Qur'an is a book about nature," says Winter. "It challenges us to look around to see the order of nature; that's the basis of Muslim theology. Integration into the natural world is the essence of the Qur'anic summons to humanity."

One striking note shared by the messages generated around energy-efficiency schemes—whether in Jordan, Morocco, Indonesia, or the global South more generally—is positivity. The focus is squarely on saving money and improving community life in both practical and spiritual ways.

That can often contrast with how similar programs are promoted elsewhere. In many Western countries, conserving resources is still often seen as a technical issue linked to forecasts of global catastrophe.

Yet perhaps the path ahead can be as simple as these "green mosque" projects: Reduce consumption and invest in energy efficiency because it will save money and improve the quality of life for everyone.

For Jordanian energy consultant Samer Zawaydeh, it's obvious.

"I give training to 7-year-olds and 70-year-olds," he says. "The children know about climate change. Awareness in Jordan is growing. We understand the global issues, and we are doing our share, but here, the main reason for installing solar panels is economic.

"A very small amount is to do with social awareness and global climate change. People understand what other people are doing. If your neighbor [or] your mosque installs solar panels, you will ask yourself why—and the key reason is to get rid of the energy bill. During the past 10 or 15 years, energy costs in Jordan increased threefold. So solar is a move in the right direction."

MORLEY VON STERNBERG/MARKS BARFIELD ARCHITECTS (4)

The Central Mosque's garden leads to the front portico, **above**, and in its ablution rooms, **lower**, water is recovered and reused in bathrooms and gardens.

Matthew Teller is a UK-based writer, journalist, broadcaster and documentary-maker for the BBC and other international media. He contributes regularly to *AramcoWorld*. Follow him on Twitter @matthewteller and at www.matthewteller.com.

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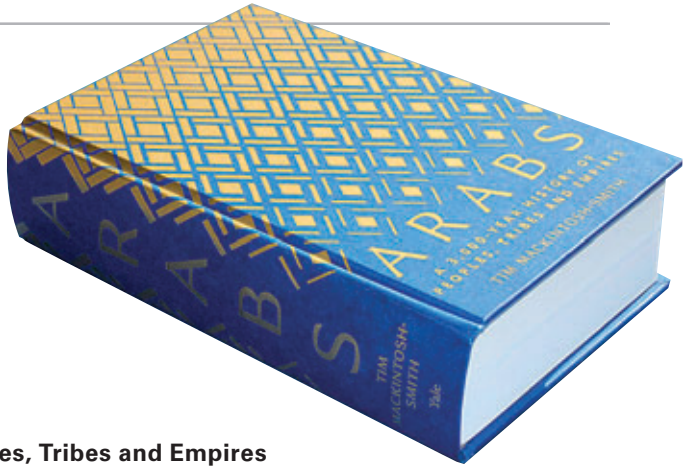
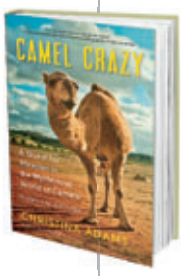
"To begin with the land is to put the etymological cart before the horse: there were probably Arabs before there was a place called Arabia."



Arabs: A 3,000-Year History of Peoples, Tribes and Empires

Tim Mackintosh-Smith. 2019, Yale UP, 978-0-30018-0-282, $35 hb.

Who is an "Arab"? What makes one identify as Arab? Mackintosh-Smith sets out to examine these questions in this erudite, carefully crafted book. He does not take a strictly chronological approach. Rather, he pursues themes sometimes leading him to skip over details in the story, only to return to backfill later. Notably, he deals with the historical, cultural and centrifugal forces that have prevented Arabs from achieving the unity so many have sought for generations, while the magnetic attraction of language pulls them together. Readers who know Arabic likely will appreciate his approach more than those who do not. While seasoning the text with relevant translations of poetry and observations regarding the origin and meaning of Arabic words, his style remains light and entertaining. Mackintosh-Smith is as adept at coining a phrase in English as he is at interpreting terms in Arabic. This is a book that will be read by lay readers and scholars for decades. —CHARLES O. CECIL



Camel Crazy: A Quest for Miracles in the Mysterious World of Camels

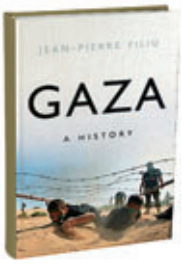
Christina Adams. 2019, New World Library, 978-1-60868-6-483, $17.95 pb.

American journalist Christina Adams did a deep dive into the world of camels, spanning continents and cultures, after learning about the potential health benefits of camel milk following a chance encounter with a herder in California. Her journey was personal: Her son, who was diagnosed with autism as a child and suffered from recurring health issues, saw dramatic improvements to his behavioral health after he began drinking camel milk. That kickstarted Adams' journey, lasting more than a decade, to learn all she could about camel milk and camels. Her odyssey included excursions with Mennonite herders in Michigan and interactions with camel farmers in Somalia, UAE and India. In the process, she discovered not only how camel milk might be used to treat a range of illnesses, but also gained exceptional insights into camels and their caretakers. The book's appendix includes extensive resources about how to use camel milk. —MARINA ALI

Gardens of Renaissance Europe and the Islamic Empires: Encounters and Confluences

Mohammad Gharipour, ed. 2017, Pennsylvania State UP, 978-0-27107-7-796, $94.95 hb.

While establishing diplomatic relations and trading goods during the Renaissance, the Islamic East and European West discovered a shared passion: gardens. European travel narratives to the major Islamic empires of the day—Ottoman Turkey, Safavid Persia and Mughal India—included descriptions, drawings and sketches of cities and their gardens. These added "to the reciprocal flow of ideas and concepts in terms of architectural and garden design," including "exchanges of gardeners" and "horticultural or irrigation techniques." Vivid descriptions of Ottoman gardens for example, led to the French court's replacement of Italian gardeners "by Ottoman specialists after 1495." The "gardens of Mughal emperors served as models" for the Lisbon gardens of Portuguese envoys to Goa and became "symbols of wealth and status." In the cultural rivalry between Rome and Constantinople (today's Istanbul), "villa gardens constituted a stage for outdoing each other." This collection of scholarly, yet readable, well-illustrated essays closely examines how Islamic and European garden traditions interacted and influenced one another. —TOM VERDE



Gaza: A History

Jean-Pierre Filiu. John King, tr. 2017, Oxford UP, 978-0-19062-3-081. $21.95 pb.

Histories of Palestine tend to be overarching, rarely focusing in tightly on one city and its hinterland. Alongside an obvious exception to that—Jerusalem—Jean-Pierre Filiu has added Gaza. Filiu's first sentence, "The word 'Gaza' arouses passions and emotions whenever it is uttered," sets the tone for the book, first published by Hurst in 2014, as he unearths new sources in what the publishers claim is the first comprehensive history of Gaza in any language. Fifty pages are devoted to "Gaza before the Strip," charting the

city's path from the earliest times into the 20th century. After that, more than 300 pages meticulously examine the aftermaths of 60 years of wars and refugee influxes as Gazans repeatedly led the Palestinian struggle against occupation. The story is often a bitter one, but as Filiu recognizes, Gaza "lies at the heart of the nation-building of contemporary Palestine."

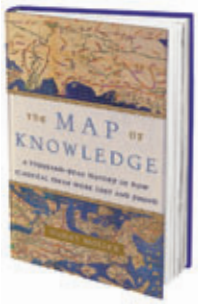
—MATTHEW TELLER

The Journey: Memoirs of an Egyptian Woman Student in America

Radwa Ashour. Michelle Hartman, tr. 2018, Olive Branch Press, 978-1-62371-9-975, $20, pb.

"From the moment I walked through the glass doors at Logan Airport in Boston [in 1973], I knew I'd stepped into a new world," writes Radwa Ashour, who would become one of Egypt's acclaimed novelists. The 27-year-old professor at Ain Shams University in Cairo had been accepted into the doctoral program at the new W. E. B. Du Bois Department of Afro-American Studies at the University of Massachusetts in Amherst. *The Journey*, first published in Arabic in 1983 (*Al-rihla: ayyam talibah misriyah fi amrika*), is an intimate, often charmingly unfiltered view of Ashour's reaction to this new world and the people she met. She shares her experiences not only as a scholar but as a political activist and young wife separated from her family and her Palestinian husband, poet Mourid Barghouti. In 1975 Ashour became the first student at the University of Massachusetts to receive a doctorate in African American literature, one of her many outstanding accomplishments before her untimely death in 2014.

—PINEY KESTING



The Map of Knowledge: A Thousand-Year History of How Classical Ideas Were Lost and Found

Violet Moller. Doubleday, 2019, 978-0-3855, $30 hb.

Moller traces three of antiquity's greatest works—Euclid's *Elements* (mathematics); Ptolemy's *Amalgest* (astronomy); and Galen's writings (medicine)—on their circuitous journeys via translation centers of the Middle East and southern Europe, to the printing presses of Renaissance Venice. Stops include the medieval cities of Baghdad, "unrivalled anywhere in the world for its … scholarship and wonder"; Córdoba, "a great centre of learning" that "drew scholars far and wide, especially in the fields of medicine [and] astronomy"; Toledo, where Alfonso x "established a school of Jewish, Christian and Muslim scholars to translate important texts into the local vernacular"; and Palermo, where "an open-minded atmosphere … prevailed at court," and Arabophilic kings employed scholars to translate original Greek texts "from Arabic to Latin." This exploration of "the web of transmissions of these manuscripts" is entertainingly informative.

—TOM VERDE

Queen of the Sea: A History of Lisbon

Barry Hatton. 2018, Hurst Publishers, 978-18-49049-979, £14.99 pb.

Lisbon's Mouraria—a name derived from Mouros, Portuguese for Moors—is the city's "most ethnic neighbourhood where Christians, Muslims, Hindus, Africans and Chinese live cheek-by-jowl along cobbled streets," as this engaging history of Portugal's capital relates. Lisbon's multiculturalism dates back centuries and is a hallmark of this vital seaport, where fortunes were made, regimes overthrown and the populace rebounded from devastating natural disasters, such as the earthquake of 1755, the largest ever to strike Europe. During the mid-12th century, the Reconquista also did its damage to the Muslim population of what was "the Moors' mightiest city in western Iberia." Yet their cultural influence survived in language—"Portuguese words beginning 'al'"—as well as signature legacies such as the nation's famed, hand-painted azulejos tiles. This is a richly rendered story of an important and often underappreciated European capital.

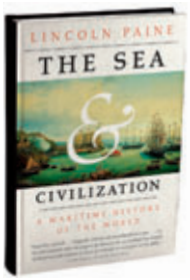
—TOM VERDE

Russian Hajj: Empire and the Pilgrimage to Mecca

Eileen Kane. 2015, Cornell UP, 978-0-80145-4-233, $37 hb.

In the late 19th century, the Russian Empire "took on a new role in the world: patron of the hajj," writes Eileen Kane. It practically had to. Absorbed into the empire via conquest of parts of the Caucasus, the Kazakh steppe, Bukhara and other regions of Central Asia, Muslims composed Russia's second-largest religious demographic by 1897. Advances in rail and steamship transportation enabled the empire to facilitate "mass hajj traffic." Despite rhetoric about religious tolerance, there were underlying political motivations for the initiative. Surveillance of Muslim subjects was one; diplomacy with neighboring Muslim powers (e.g., Persia) was another. These and other fascinating details of the organizational efforts behind Russia's hajj sponsorship (establishing medical facilities along the way and outfitting ships with rooms for ablutions as well as halal food, for example) are examined in this concise, informative volume on an often-overlooked chapter in Russian history.

—TOM VERDE



The Sea and Civilization: A Maritime History of the World

Lincoln Paine, 2015, Vintage, 978-1-10197-0-355, $24 pb.

As proud as we are of our terrestrial accomplishments, there is no ignoring the fact that 71 percent of the globe is ocean. Looking through the lens of maritime history on civilization as it emerged, developed and continues to be sustained, Lincoln Paine's objective in this hefty volume is to "change the way you see the world." He devotes a fair amount of his study to the watery highways and trading ports of the Muslim world, from medieval China to the modern Gulf. He addresses the lateen sail, Christian-Muslim maritime relations in the Mediterranean, Berber (as in "Barbary") corsairs and the role of the sea in the spread of Islam itself in this scholarly yet readable account of how crucial maritime travel, trade and exploration have been to human history.

—TOM VERDE

Women Travelers on the Nile: An Anthology of Travel Writing through the Centuries

Deborah Manley, ed. 2016, AUC Press, 978-9-77416-7-874, $18.95 hb.

Sarah Belzoni, wife of the explorer Giovanni Belzoni, is left on her own in a village near Luxor in the early 1800s after suffering an attack of ophthalmia. Women there boil garlic in water and treat her with the steam, curing her inflammation and restoring her sight. Belzoni's experience exemplifies how a Western woman's gender proved to be an advantage in travels up the Nile in past centuries. Indeed, the editor notes that one of the great differences between male and female travelers on the Nile was that "women could meet the women of Egypt," giving them a broader and deeper view of Egyptian culture—and providing one reason why so many classic travel accounts were written by women. This anthology is packed with vivid descriptions and unique perspectives by women traveling up the Nile to Nubia and beyond, and finally back, with stops in Luxor and Thebes, and even a few excursions into the desert. Writers include Crimean War heroine Florence Nightingale, Victorian travel writer Isabella Bird, economist Harriet Martineau and Egyptologist Amelia Edwards.

—ROBERT W. LEBLING

EVENTS

Highlights from aramcoworld.com

At the time of printing, public health protection measures may make some events unavailable. Please verify a venue's schedule before visiting. Find more events at aramcoworld.com.

CURRENT / AUGUST

Future Threads is a digital program featuring artists, curators and thinkers from the Arab world and beyond who engage with social transformations and future concepts. The program unpacks the disruptive potential of art and culture, providing innovative and original responses by artists during this time of pandemic, with studio visits, reading groups, films and music. The Mosaic Rooms, **online**, through August 8.

COMING / SEPTEMBER

Gulnur Mukazhanova: Solo Show. Berlin-based Gulnur Mukazhanova works silk and felt to create detailed installations and props for photos and video projects. This exhibit presents a new series of works, *Post-Nomadic Reality*, that is shown along with her 2013 series of photographs, *Global Society*. *Aspan Gallery*, **Almaty, Kazakhstan**, September 8 through November 7.

PERMANENT

Ithra Connect is a new online platform for children, families, creatives, art enthusiasts and professionals. The new programs feature a variety of themes focused on literature, technology, art, architecture, theater, design, learning and innovation that include kids' audio books and learning kits, weekly competitions and online monthly social meetups. Ithra, **online**.

Manuscripts of the Muslim World includes digital editions of more than 500 manuscripts and 827 paintings from the Islamicate world broadly construed. These holdings represent in great breadth the flourishing intellectual and cultural heritage of Muslim lands from 1000 CE to 1900, covering mathematics, astrology, history, law, literature as well as the Qur'an and Hadith and consisting of manuscripts in Arabic and Persian. University of Pennsylvania Libraries, **online**.

Sultana's Reality is an Alice in Wonderland–styled interactive adventure, designed and animated by Indian artist Afrah Shafiq. Scroll through five chapters of the relationship between women and books in India: how women read them, avoided them, loved them, hated them—and eventually wrote them. The tale is told through interpretation of a selection of images from the visual archive at the Centre for Studies in Social Sciences, **online**.

Listings are available online at aramcoworld.com.

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Online Virtual Tours by the American Research Center in Egypt (ARCE):

Tomb of Menna in the Theban Necropolis: Some 3,000 years ago, on the west bank of the Nile in al-Qarna, Egypt, this relatively modest tomb was built and decorated for a man named Menna. Rediscovered in 1886, it can now be experienced in this well-produced 3D, immersive virtual tour sponsored by the ARCE, which also sponsored the tomb's preservation as well as scholarship about it. The virtual tour is smooth and intuitive, featuring crisp images of elaborately patterned ceilings of colors that appear remarkably bright. ***Aslam al-Silahdar Mosque***: The long reign of the 14th-century Mamluk Sultan al-Nasir Muhammad was a time of tremendous artistic achievements, when architecture in Cairo made the city the artistic capital of the Islamic world. The mosque, built between 1344 and 1345 by Amir Aslam al-Silahdar, is among the masterpieces of Mamluk architecture in Cairo, and it serves as a focal point of the neighborhood's community life. ***The Bab Zuwayla*** is a symbolic and historic site in Cairo that once functioned as the southern gate (*bab*) to the city's original settlement of al-Qahirah when it was founded in the late 10th century CE. Its location today, in a densely populated neighborhood, exposes it to risks from congestion and human activity. ***The Zawiya-Sabil Faraj ibn Barquq***, constructed between the years 1408 and 1409 CE, is regarded as an exemplary Mamluk complex that contains a number of distinctive architectural and decorative characteristics. Its location in Cairo, facing the Bab Zuwayla, also makes the monument quite distinctive.

From top: Tomb of Menna; Aslam al-Silahdar Mosque; The Bab Zuwayla; The Zawiya-Sabil Faraj ibn Barquq.

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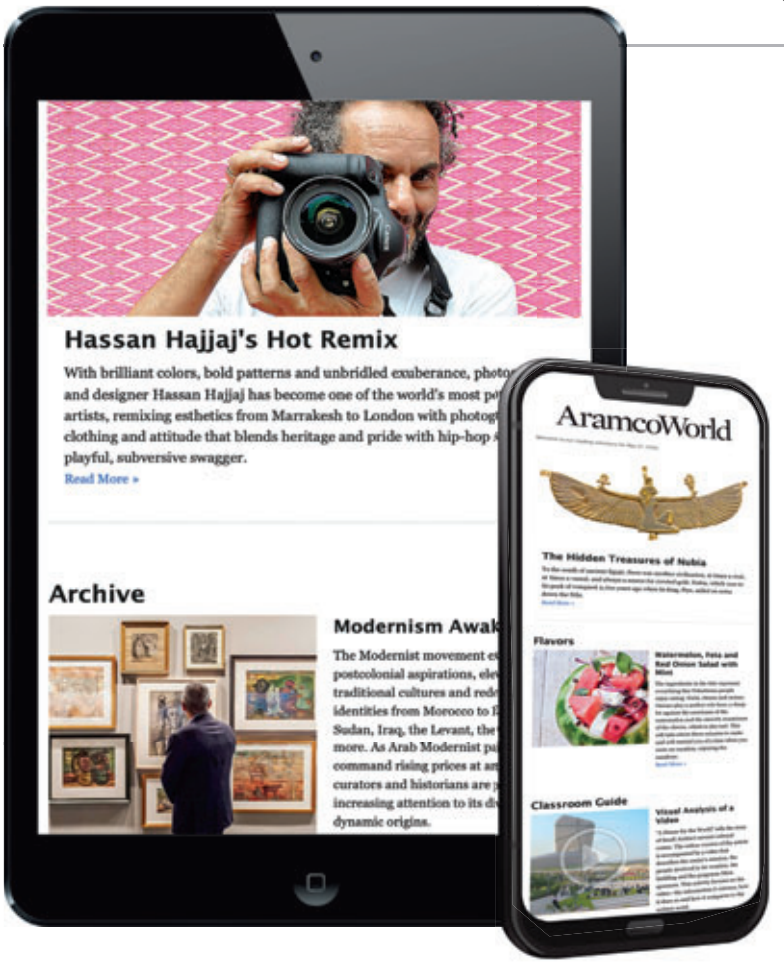

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