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6 Reviving the Art of Tunisian Glass

Written by **Mariam Shahin**
Photographed by **George Azar**

In the mid-1980s, Sadika Keskes fired up the first artisanal glass furnaces in Tunisia in 600 years. Since then she has revived a once-thriving heritage craft and through her teaching lit up imaginations among a new generation of artisans.

12 Quartering Jerusalem

Written by **Matthew Teller**
Photographed by **Mostafa Alkharouf**

Nearly all modern maps of Jerusalem's Old City show it divided into four quarters labeled Christian, Muslim, Armenian and Jewish. The idea that gave rise to these labels dates to the mid-19th century and surveys of the city by colonial mapmakers—and specifically to the pen of a young British chaplain.

20 Sustainability's Dubai Beta Lab

Written by **Alan Mammoser**
Photographed by **Natalie Naccache**

Expo 2020 Dubai closed in March after showcasing buildings and displays designed to maximize sustainability, one of the Expo's top themes. Creative systems for power generation, water conservation and city planning all addressed global challenges.

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We distribute *AramcoWorld* in print and in digital editions 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 At the center of Expo 2020 Dubai's Sustainability District, "energy trees" turned sunlight into electricity, while a nearby wall of sun-nourished plants provided insulation for the pavilion of Slovenia. Photo by Natalie Naccache.

BACK COVER Shades of blue so popular in Tunisia appear along a sunlit wall outside the studios of glassmaking revivalist and artist Sadika Keskes near the city of Gammarth. Photo by George Azar.



28 Berlin's Transcultural Jam

Written by **Ken Chitwood**

Photographed by **Fabian Bennecke**

A musical wave has been swelling for a decade in the German capital, which one local analyst now calls "the city of choice for a new generation of cultural talent from the Middle East and North Africa"—part of the greater demographic shift that has made people of Arab backgrounds Berlin's fourth-largest ethnic-identity group. In street jams, clubs, studios, concert halls and online, new mixes of musicians are blending notes and ideas into genre-bending, transcultural fusions. "What we as artists in Berlin can do is tear down the borders in our head and invite others to do the same," says musician Jamila Al-Yousef.

34 Art of Islamic Patterns: Mughal Jaali

Written by **Richard Henry**

Art courtesy of **Art of Islamic Pattern**

Decorative and functional, lattice screens have been produced in countless geometric forms across Islamic lands over centuries. In New Delhi one such screen, there called a *jaali*, offers mesmerizing interplays of 6- and 12-sided figures. Originally crafted in the 16th century, it can be drawn today by following our step-by-step guide.

 **40 EVENTS**  **Online LEARNING CENTER**

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FIRSTLOOK

A Mother's Kiss

Photograph by Beawiharta

For more than eight hours, we navigated the Sekonyer River in a wooden boat, cruising through Tanjung Puting National Park in the Central Kalimantan region of Borneo, Indonesia. After docking, we walked about an hour in the lush rainforest. Then, our tour guide and ranger, Adut, placed corn and yams on top of a wooden table.

It was not long until orange-haired Bornean orangutans began to approach the table. More than five were carrying babies. Seeing so many newborns was, Adut informed us, highly unusual. He conjectured that the park's closure and resulting prolonged quiet due to the pandemic may have contributed to an optimal primate mating environment.

Observing the orangutans, I saw how intimately bonded the mothers were to their babies and how deeply they seemed to express love in every movement with them. As I watched a nearby mother and infant embrace, I photographed this magnificent moment as the mother was tenderly kissing her child's neck.

Orangutans are listed as critically endangered on the International Union for Conservation of Nature's Red List of Threatened Species, mainly because of habitat loss—in Indonesia they have lost 80 percent of their forest area. Sanctuaries like the Tanjung Puting National Park are helping to preserve their lives and future. And while I was happy to see so many new families among them, it impressed on me the urgency of finding ways to thwart deforestation.

—Beawiharta



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FLAVORS

Spinach and Lamb Curry (Sabzi)

Recipe by Farida Ayubi

Description by Durkhanai Ayubi

This type of spinach and lamb curry, called *sabzi*, is traditionally served with rice on Nowruz, the spring new year.

We make this dish in a pressure cooker to help tenderize the lamb. Pressure cookers are often used to help seal in flavor, create a uniform tenderness and substantially reduce the cooking time. If you don't have a pressure cooker, use a heavy-based saucepan or Dutch oven to cook the lamb instead; however, you'll need to add 2 cups (500 milliliters) more of water than the recipe states, and the cooking time will increase to about an hour or until there is approximately half of the liquid left.

(Serves 4–6)

1 cup (250 milliliters) sunflower oil

1 large yellow onion, finely diced

2 garlic cloves, finely chopped

1 fresh, long red chili, thinly sliced

1 kilogram (2¼ pounds) boneless lamb leg, cut into chunks

3 bunches (1 kilogram / 2¼ pounds) spinach, washed thoroughly, roots and stalks removed

½ cup (125 milliliters) boiling water

1 small bunch (80 grams / 2¾ ounces) cilantro, leaves and stalks finely chopped

1 small bunch (60 grams / 2¼ ounces) garlic chives, finely chopped

Salt

Pour half the oil into a pressure cooker pan over high heat, and fry the onion, garlic and chili, stirring regularly for 5 minutes or until golden brown. Add the lamb and sear until it has browned all over. Add 3 cups (750 milliliters) water and 2 tablespoons salt. Then close the lid of the pressure cooker. Bring up to high pressure, then reduce the heat to low and cook for 20 minutes. Remove the cooker from the heat, and set aside, allowing the pressure to release naturally.

Meanwhile, finely chop the spinach leaves. Place in a large saucepan with the boiling water, cover and let cook, stirring occasionally over medium-high heat for about 20 minutes or until all the liquid has been absorbed.

Next, heat the remaining oil in a frying pan over medium heat, and fry the cilantro and garlic chives, stirring occasionally for 5 minutes to bring out the flavors.

Add the lamb to the spinach along with 1 cup (250 milliliters) of its cooking liquid and the fried herbs. Stir to combine well, then simmer for 15 minutes over low heat so that the flavors mingle.

Enjoy with rice and a dollop of yogurt alongside.

Freelance food writer and restaurateur **Durkhanai Ayubi** is involved in day-to-day responsibilities of two family-run eateries in Adelaide, Australia: Parwana and Kutchi Deli Parwana. She has written for several international newspapers and websites. Daughter of Afghani refugees Zelmai and Farida Ayubi, she tells her family's story from her own perspective while passing along memories and recipes from her parents. *Parwana* is her first book and won the 2021 Art of Eating Prize.

Reprinted with permission from

Parwana: Recipes and Stories From an Afghan Kitchen

Durkhanai Ayubi.
Interlink Books, 2021.
Interlinkbooks.com



REVIVING THE ART OF TUNISIAN GLASS

Written by MARIAM SHAHIN

Photographed by GEORGE AZAR

As a rumbling furnace fires up, glowing orange at 1,500 degrees Celsius, Sadika Keskes blows through a long, thin metal pipe to gradually inflate a hot, heavy bubble of molten glass. Slight, spry and focused, she moves from the furnace flames to a nearby water-cooling basin and back to the furnace to continue shaping her glass creation. She continues working it, blowing, turning and reshaping the translucent, pliable recycled glass with jacks that resemble oversized tweezers, her delicate touches and breaths guiding each movement.

In Gammarth, Tunisia, where Keskes operates her shop, SADIKA, many know her simply as the glassblowing master and—for some of her larger projects—an architect of light. But perhaps most importantly for her country and the wider North African region, she's the pioneer of her country's glassblowing revival,





ABOVE Along Tunisia's Mediterranean coast, a short distance west of Carthage, where glassmaking thrived for centuries, Sadika Keskes in 1984 opened her glassmaking center. In addition to her own production, she has led workshops and trained more than 200 students since the 1990s. **OPPOSITE** Keskes and an assistant shape blown, molten glass into what will become a lamp.

and she has secured its techniques for future generations.

"I am a woman who likes the fire—its beauty, its atmosphere," says Keskes, 61, keeping her gaze fixed on the turning, glowing globe of glass. "It reflects my personality a bit."

Glassmaking started in Tunisia shortly after the arrival in the ninth century BCE of the Phoenicians, who inhabited much of the eastern Mediterranean coast and dominated maritime trade for centuries until eclipsed by Rome. Until their invention of pipe-blown glass in the first century BCE, the glass they produced was solid, much like the glass also produced for centuries in Sumeria and Egypt. Both forms of glassmaking were advanced in the Phoenician city of Carthage, whose

ruins today are just a few kilometers from Keskes' workshop.

In Europe glassblowing became popular and highly refined in Venice, particularly on the nearby island of Murano. There it was so lucrative that, in the 13th century CE, Venice passed laws restricting foreigners from learning the trade—which the Venetians had learned from Syrians—and glassblowers from traveling abroad. By the 14th century, in Tunisia glassblowing had almost completely died out. It took six centuries, and Keskes, to literally breathe new life into the craft.

"I wanted to rediscover the past in order to inform our present," she says, mentioning her introduction to glass began more than 40 years ago. "So I went in search of our history with this

luminous material, this magical carrier of light."

Keskes was barely a teenager when she won a top prize at school for clay sculpture. Her father, Bechir Keskes, a master carpenter, and her mother, Aichoucha Bouricha, a pianist, encouraged each of their



FROM LEFT Using a pipe long enough to keep the heat of molten glass at a distance, Keskes blows glass into a form of metal wire.



Disks of glass and metal that Keskes calls *suns* hang at the entrance of the Movenpick Resort and Spa in Sousse, along Tunisia's east coast. The disks range from 70 to 120 centimeters in diameter and weigh up to 600 kilograms. Suspended by single wires, they shift with air currents and shimmer in the changing sunlight.

children—Keskes has 11 siblings—to explore many art forms. So, she says, she always felt free to pursue artistic interests.

Soon after the school competition, she says, “I saw a documentary about glassmaking. It captured my imagination—the colors, the movement of the molten glass. The glow of the fire simply fascinated me,” she says. The experience stuck with her, and “from that day I was determined to be a glassmaker.”

Awarded a scholarship to Italy as a teenager, she set out in 1980 to Venice to learn from masters there. Later, in Tunis, she trained with glassblowers from Czechoslovakia (now the Czech

Republic and Slovakia), where Bohemia crystal remains some of the best in the world.

In Italy, she says, “I found the historical link between Murano glass and Phoenicia on many levels. What made Venetian-Murano glass so special is that it used local quartz pebbles, which are ground very finely and combined with soda as known as Levantine soda ash.” The quartz in Murano produced nearly pure silica sand, which lends glass its clarity. The Venetians, she adds, kept a monopoly on soda ash from the Levant until 1592.

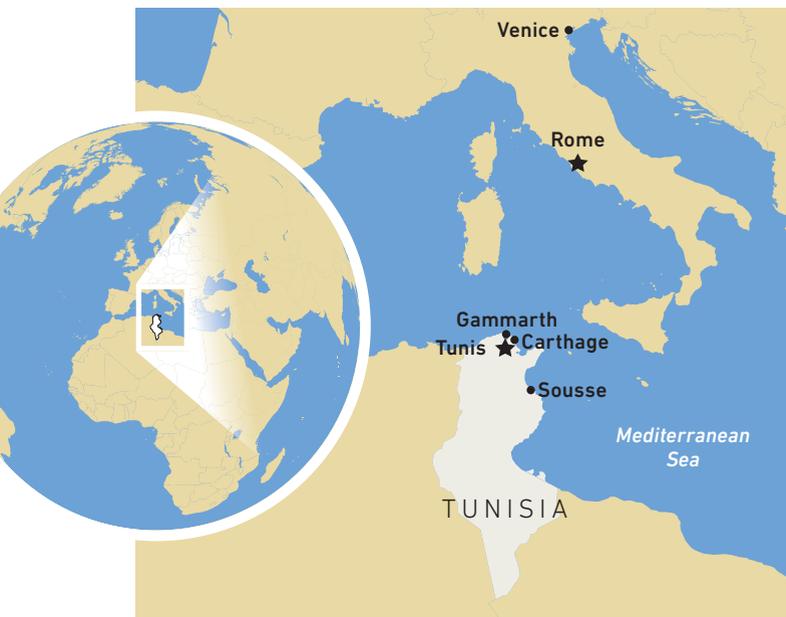
“This meant that the Murano-Syria connection was twofold. Both the initial know-how brought by Aleppo merchants to the Roman Empire at the end of the first century, as well as the raw materials [that] originated in the Middle East.”

Keskes immersed herself in both Italian and Slavic blown-glass traditions while also pursuing understanding of Tunisia’s own history with glass. In 1984, amid what became a seven-year teaching stint at the Tunis Institute of Fine Arts at Nabeul, she established an artisanal glassmaking workshop: It was, she says, “the first one in 600 years” in Tunisia.

Nearly a decade later, Keskes opened SADIKA in Gammarth, along the coast not far from the historic ruins of Carthage. Since its opening she has trained more than 200 young artisans and created initiatives to support them. Today some former students teach her techniques to their own students.

While Keskes was reestablishing glassmaking in Tunis in the 1980s and 1990s, a kindred movement had been taking root in the US. The Studio Glass Movement, inspired from a series of 1962 workshops at the Toledo Museum of Art in Ohio, was also reviving artisanal glass in North America.

“It’s a type of cottage industry of hand-blown and -made glass





that is produced in a limited series or as a unique piece,” explains glass scholar Bill Gudenrath, a resident advisor at the Corning Museum of Glass in New York.

“Artists actually do the work themselves as opposed to designing and having factory workers or technicians do the work.”

Gudenrath is also a glassblower, instructor and author, recognized internationally as an authority on early

TOP Assad Dghim, at left, whom Keskes taught in 1987, chats with Keskes at the Tunis Institute of Fine Arts at Nabeul, where Dghim is the trainer in glassmaking and where Keskes herself once taught. “Glassmaking with Sadika was about passion and beauty,” Dghim says. **FAR LEFT** Keskes’ craft is also about history, and her research has helped revive Phoenician and Carthaginian techniques like those that produced this two-handled jar. **LEFT** She has also reintroduced Carthaginian methods of using a “heart,” which is rolled in crushed silica, heated, and rolled again until it is covered in glass: After the glass cools, the heart is removed, and the result is a vessel. This technique was used both before and after the Phoenician development of glassblowing in the first century BCE. **LOWER AND LOWER LEFT** Other pieces by Keskes include these on display at her Gammarth showroom and, **BOTTOM RIGHT**, in a hall at the Movenpick Resort and Spa in Sousse.





To illuminate this private health spa, Keskes designed ceiling panels of glass tiles.

later closer to home in Carthage, today a suburb of the nation's capital Tunis and a designated UNESCO World Heritage Site.

A turning point in her research came while investigating crematory furnaces discovered in Phoenician cemeteries in the Carthage area. In some she found remains of glass “dough”—indications that the furnaces were also used for glassmaking.

“I began replicating the Phoenician-Carthaginian furnaces, and I made glass in the Carthaginian way,” she says.

One early Phoenician method of glassmaking involved pouring glass into metal mold, she explains. Carthaginians employed a different method that used a pole with a solid object on its end, “which we call the ‘heart,’ and the glass is wrapped around it until it is completely covered by glass before being put into the furnace,” she says.

Kerkouane was one of the early Carthaginian cities, and its necropolis is a designated UNESCO World Heritage Site because the cemetery holds the only surviving Phoenicio-Punic remains. Keskes also learned that glass objects and beads had been discovered in Kerkouane graves of early, high-ranking officials. Resting sites of priests, she says, would often contain gold, too, as well as other objects of value.

“Glass was among the possessions we found. At the time it was considered as precious as diamonds are today,” says Keskes, explaining how she discovered remnants of gold in the glass furnaces. “The furnaces were used to melt gold and make glass—this gave the glass a very unique color.”

Her research helped her attain in 2019 the seat of vice president for the UNESCO International Fund for the Promotion of Culture, a post she says has increased her understanding of the significance of the history of glass in the region, and the use of color in particular, which can help identify a piece's origins.

For example, some glass colors were made with gold, while others, such as blue, were made from silver, and still others from a variety of other minerals—often highly localized.

Christine Tarkowski, a professor in the Fiber and Material Studies Department at the Art Institute of Chicago, points out that, for example, blues in glass are only found in Afghanistan, while other colors could be attributed only to Phoenicians.

“It has this ability to locate color because of the minerals in a specific place,” Tarkowski says.

Before glassblowing was discovered in the first century BCE, glass was semiopaque, cloudy, and contained bubbles, striations and sometimes poorly molten bits of minerals. It often resembled ceramics rather than what most think of as today's clear and

glassmaking techniques up to the 18th century. His research focuses on how glass is made, and he enjoys his self-identification as a “glass detective.”

He understands the impact of Keskes' contributions to Tunisian glass arts.

“It is clear to me that Sadika, perhaps unknowingly, is part of this international community of glassmakers,” he says.

For Keskes, her love of glass was also related to a personal journey of self-discovery, of learning about her own heritage as well as the contributions to the arts of glass from artisans over centuries from the greater Middle East. For nearly two decades, Keskes set out to research how glass was made throughout Mesopotamia, Pharaonic Egypt, Phoenician Byblos, and

“I am a woman who likes the fire—its beauty, its atmosphere. ... It reflects my personality a bit.”

—Sadika Keskes



LEFT Keskes sketches ideas for a glass ceiling that is part of a body of work she calls “Architecture of Light.” She cites influences from abstract expressionist painting, notably Paul Klee and his 1914 canvas from his travels in Tunisia, “In the Style of Kairouan.” In addition to research and archeology in Tunisia, Keskes has studied both Venetian and Slavic glassblowing traditions. **CENTER** Glass often breaks while being shaped, and the fragments are recycled. **LOWER** Keskes’ new dream is to open a school dedicated to architectural glass.



says glassblowers are tethered to their appreciation and respect for light.

“Nowhere does this intangible become more tangible than with glass. Glass absorbs light and reflects the light at the same time,” she says, underscoring how light changes with every second. “When I completed entire surfaces with glass, I realized that there was such a thing as an architecture of light.”

Some of her work has also included glass floors, mosaics, and ceilings in public buildings, and even a glass chalet hotel project. Her most recent dream is to design a school in Tunisia dedicated solely to teaching glass architecture where grand glass constructions can feature the many prismatic colors of light.

With all her contributions to reviving artisan glass in her country, she says there is still much more to do, much more to create.

“I like a challenge—new things—things with movement and the transient,” she says. “Glassmaking is a big challenge, and I like the challenge.” 🌐

vibrantly colored glass. It was glassblowing that also, in time, helped glass become more widely available and affordable.

Gudenrath notes that “glass as a material for windows coincided with the development of glassblowing” and that it has been in use in the Roman world since the end of the first century CE.

One of Keskes’ proudest moments came in the mid-1980s when she opened the Tunisian School of Glassmaking.

“One of the things that makes our school unique is the way we combine metal and glass,” she says.

Many of Keskes’ vases, lamps and candle holders are reminders of this combination. Her table and kitchenware creations are even at times throwbacks to the pre-glassblowing era, showcasing a sparkled and cracked design created by dipping the glass into water before putting it back in the furnace.

Since then more than 30 glassmaking workshops have launched in Tunisia as a result of her teaching. On average each workshop employs 15 to 20 people, and several students have ventured into teaching too.

Assad Dghim, whom Keskes taught in 1987, is the sole glassmaking trainer at the Tunis Institute of Fine Arts at Nabeul, where Keskes once taught, and he has been passing along his former instructor’s expertise since 2000.

“Glassmaking with Sadika was about passion and beauty,” Dghim says. “We endured the enormous heat and honed our own agility.”

Beyond the furnace and precision of shaping glass, Keskes



Filmmaker and writer **Mariam Shahin** has produced and directed more than 70 documentary films, and she is author of *Palestine: A Guide* and coauthor of *Unheard Voices: Iraqi Women on War and Sanctions*. **George Azar** is author of *Palestine: A Photographic Journey*, coauthor of *Palestine: A Guide* and director of the films *Beirut Photographer* and *Gaza Fixer*. He lives in Beirut.



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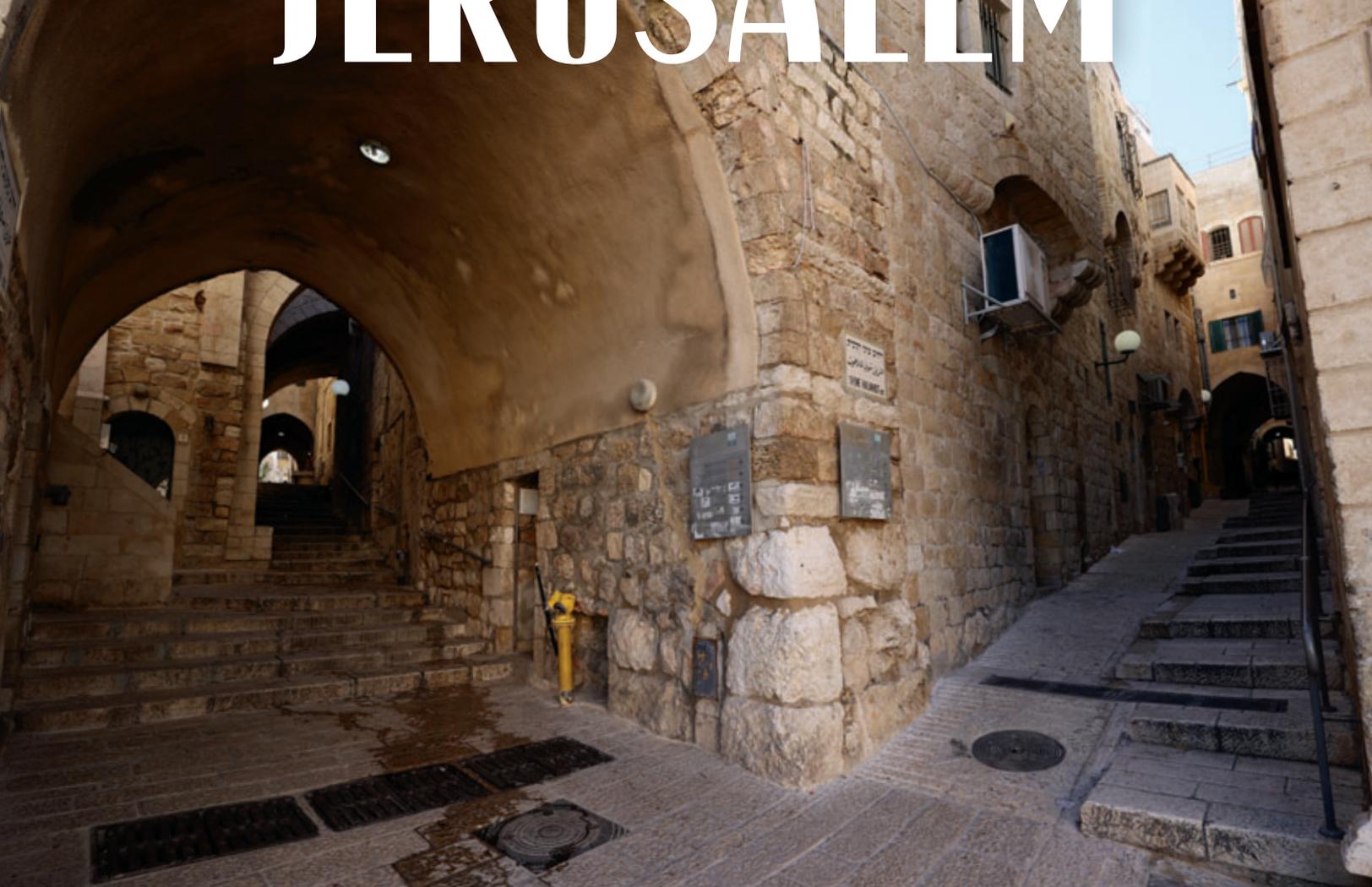


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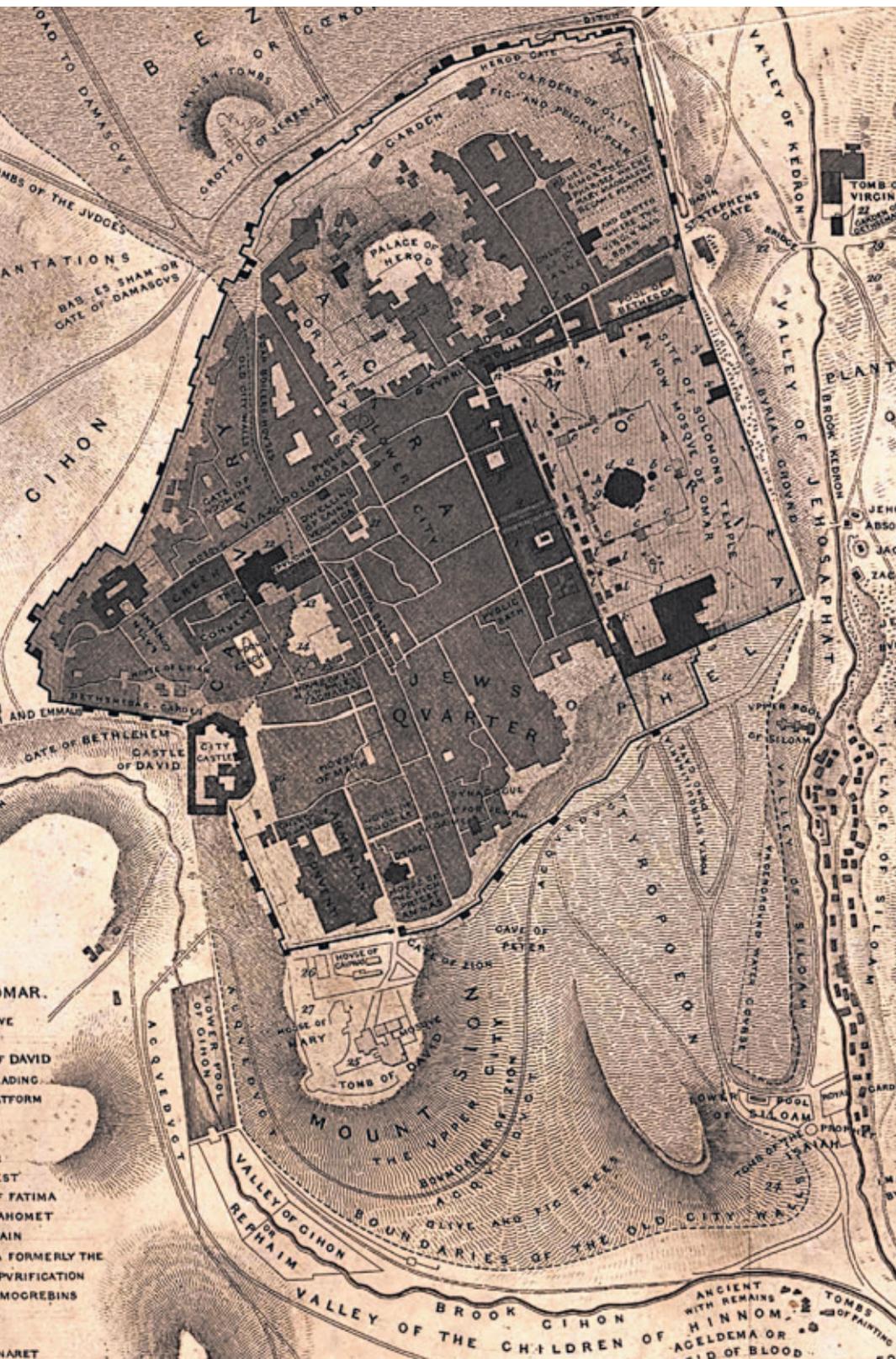


JERUSALEM



“Among ourselves, we don’t say it. ‘Where are you going?’
‘I’m going to al-Wad Street,’ ‘I’m going to al-Aqsa,’ ‘I’m going to the market,’
‘I’m going to the Redeemer church,’ not ‘I’m going to this quarter or that quarter.’
The notion of ‘Muslim Quarter’ is absent from our daily language.”

—MUSTAFA ABU SWAY



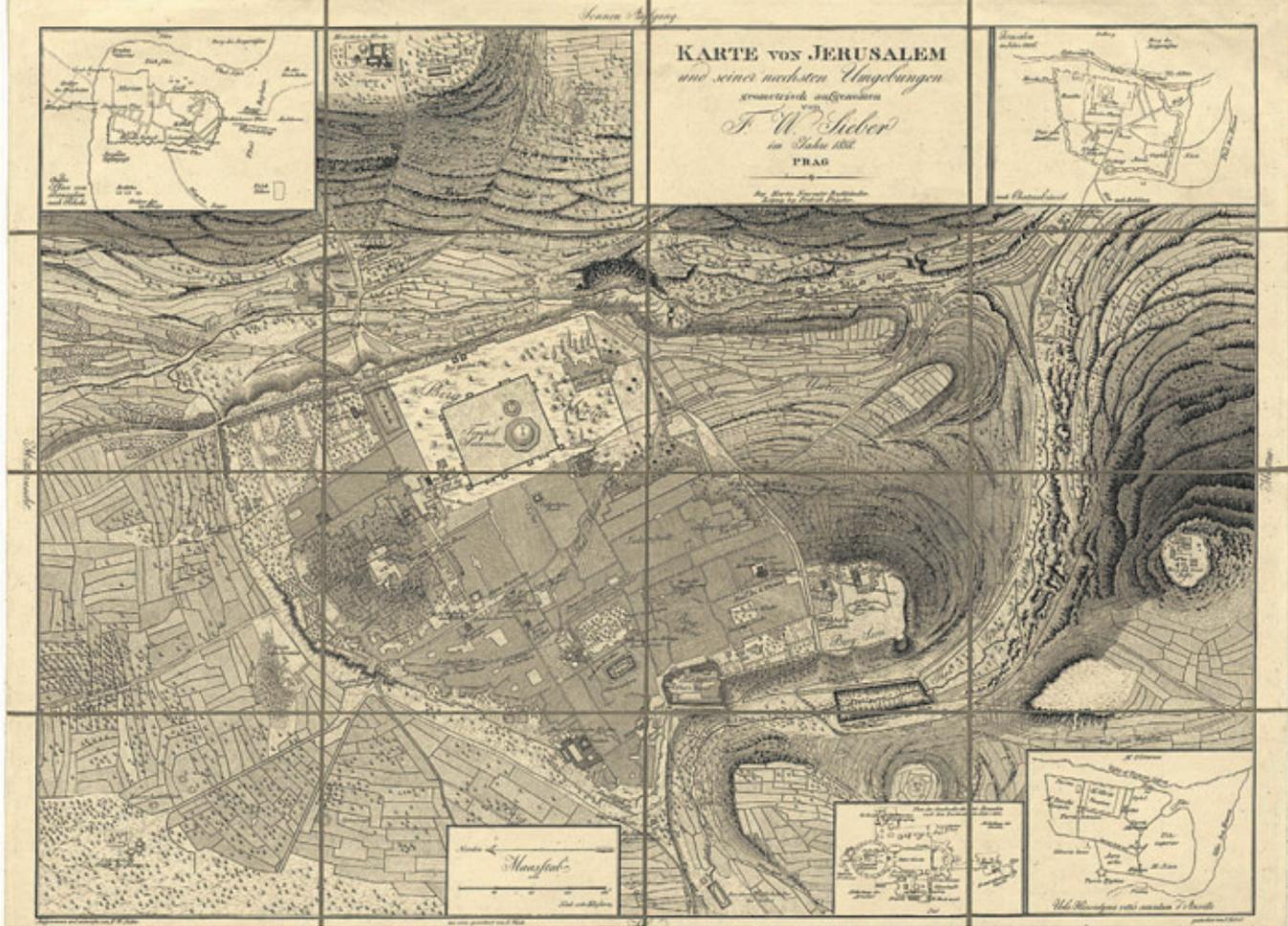
Maps of Jerusalem show the Old City divided into four: top left Christian Quarter, top right Muslim Quarter, bottom left Armenian Quarter and bottom center Jewish Quarter. Such neat divisions.

Nearly all modern maps do this. Many are even color coded, with blocks of shading for each quarter and precise borders marking frontiers from one quarter to the next. But it’s no surprise to learn that in reality no city functions like this.

The busiest of Jerusalem’s lanes is Suq Khan al-Zeit. *Suq* means market, a *khan* is a caravanserai, and *zeit* is oil, specifically olive oil. For hundreds of years, into the 20th century, this crowded street was lined with workshops where olives would be pressed and the oil stored for sale or processed into soap.

And nobody knows which “quarter” it’s supposed to be in. Most maps say it’s in the Muslim Quarter, but then again it has chapels, it includes part of the Via Dolorosa—the centuries-old Christian pilgrimage route—and it leads directly to the Church of the Holy Sepulchre. Some maps treat Khan al-Zeit as a dividing line, with the east side of the street counting as the Muslim Quarter and the west side as the Christian Quarter. Does that make the apricot I dropped one day in the middle of the street a Muslim apricot or a Christian one?

More problems arise. The “four quarters” configuration leaves out the Haram al-Sharif, or Noble Sanctuary, one of the names for the



al-Aqsa mosque compound, but the Haram is almost always shown as a neatly walled-off rectangle, visually separated from the rest of the Old City. Is the Haram inside the Muslim Quarter, or not? Visitors might imagine it is some kind of fifth quarter.

It's not, of course. The Haram al-Sharif is an Islamic space, intimately linked with the lives of the people who live within and around its perimeter—as well as countless more distant others—in ways that belie hard lines on a map. As the writer Ahdaf Soueif put it, “The north and west walls of al-Aqsa are not walls at all; they are a porous urban border that houses people, schools, libraries and archives.”

The idea of the four quarters is not old. It dates from the 19th century. But if you're approaching Jerusalem for the first time, you might assume that the four quarters (or are there five?), and their attribution to specific religious communities, are, somehow, holy. A holy city, divided into holy quarters. From that mistake, it's a short step to the next: thinking that, for example, only Christians live (or perhaps *could* live) in the Christian Quarter.

From that double mistake, it would be easy to absorb the unspoken message that you, an innocent visitor, might be more welcome in one quarter than another. Seeing all these zones of religiousness on the map, you might conclude that you should just stick tight with your own people, whoever they happen to be, for safety and so as not to unwittingly offend anyone else.

And that is a falsehood worth debunking.

This article is adapted with the author's permission from *Nine Quarters of Jerusalem: A New Biography of the Old City*, by Matthew Teller. (Profile Books [UK], Other Press [US], 2022).



TOP The first map of Jerusalem based on field measurements was published in 1818 by Franz Wilhelm Sieber. Only the Jewish neighborhood is defined—*Judenstadt*, which appears near the center of the map. **ABOVE** Reference to the idea of “quarters,” says Mustafa Abu Sway, dean of Islamic Studies at al-Quds University, is mostly confined to academic settings. **OPPOSITE** In 1835, British explorer and architect Frederick Catherwood drew this map, oriented to the north. Much like Sieber's, it notes only a “Jews Quarter.” **PREVIOUS SPREAD, CLOCKWISE FROM TOP LEFT** Churches St. meets al-Jabsha St. in what maps label the Christian Quarter; Suq Khan al-Zeit meets al-Khanqa St. in the Muslim Quarter; Armenian Orthodox Patriarch Rd. lies in the Armenian Quarter; and Shonei Halakhot St. meets Misgav Ladakh in the Jewish Quarter.

For more than 1,000 years, almost every map of Jerusalem was figurative or purely imaginary, a symbolic representation of an idealized location. In medieval Europe, as in the Islamic world, the idea of a map wasn't so much to function as a practical aid, since travelers would journey with knowledgeable



The first map to name the four quarters still used today was drawn from a British military survey made in 1841. It was labeled in 1849 by chaplain George Williams, who erroneously wrote that two main streets “divide Jerusalem into four quarters. ... The subdivisions of the streets and quarters are numerous, but unimportant.”

noticeable differences from a modern map is the lack of divisions within the city. The long western edge of the Haram al-Sharif is only lightly marked. Only one neighborhood is defined by religion—*Judenstadt*. There is no “Muslim Quarter” or any other quarter marked.

The next major advance was a map by the English explorer-architect Frederick Catherwood, published in 1835. It isn’t quite right—Catherwood gets a bit mixed up in the smaller alleys—but the detail is absorbing. As before, there is no mention of quarters apart from “Jews Quarter.”

It was two years later, in 1837, that the first map showing the presence of ethnoreligious quarters appeared. Viennese lithographer Hermann Engel translated Catherwood’s work into German but introduced variations in typography to differentiate geographical features from ethnoreligiously defined districts. Engel’s Jewish Quarter is marked in a lighter typeface

guides. Often, maps were drawn *after* travel, to serve as a rendering of how an individual or community conceived of a place. What Jerusalem looked like, or where it was, mattered far less than what it represented—a place of perfection, the point of connection between heaven and Earth. A map became a visual expression of religious belief.

Then in 1798 French General Napoleon Bonaparte invaded first Egypt, then Palestine. He brought with him scientists, artists and scholars. Their investigations sparked a surge of European interest in Arab and Ottoman culture. Painters painted. Explorers explored. The first map of Jerusalem based on measurements taken in the field appeared soon afterward in 1818, the work of Franz Wilhelm Sieber. One of its most

that he also uses for a Latin Quarter, Greek Quarter, Turkish Quarter and Armenian Quarter. This is the first time any of these names appear on a map.

On what did Engel base this innovation? Did he go to Jerusalem himself, or was he just printing a map from another source? Almost nothing has been written about his work.

English has informal terms to designate parts of a city—district, neighborhood, zone, area—and also formal or legal usages—borough, parish, ward. They are all pretty neutral. But “quarter” is problematic.

It need not imply exactly one-fourth, though that meaning has a solid foundation in Latin. Roman urban design often



LEFT Misgav Ladakh meets Bab al-Silsila at one intersection of quarters labeled Jewish and Muslim. While the English word “quarter” often carries military connotations, in Arabic the most common word for areas within a city is *hara*, which can be a street or a small district. In 1495, Jerusalem historian Mujir al-Din identified 18 *harat*; another count identified 39 *harat* during the 13th and 14th centuries. **RIGHT** Even today, says Jerusalem writer Khalil Assali, “Everybody still uses ‘hara.’”

involved the division of a military camp into four by the creation of a straight north–south road intersecting with a straight east–west road. Such military echoes survive in modern English, which has “married quarters,” “headquarters,” “quartermaster,” to “give no quarter.” This usage slid into civilian life—every grand house once had its servants’ quarters—though the undertone remained.

Quarter in the sense of a city district still seems to survive in a gray area. Particularly with Jerusalem, outsiders expect it to reflect a precise division into four. Yet other cities get by fine with fewer. New Orleans has only one—the French. Paris has a Latin Quarter and a few others. Many European cities have, or had, a Jewish Quarter. Birmingham in England has Chinese and Irish quarters, and a Jewellery Quarter, named for its artisans. There’s an Indian Quarter in Durban.

This hints at the word’s nuances of power, drawn from military origin, class hierarchies and cultural, nationalistic or ethnoreligious separation: When English uses “quarter,” it generally means a place where “other people” live.

Arabic has a completely different conceptual framework. In the Jerusalem context, the most important term is *hara*, which can also be transliterated in colloquial constructions as *haret* (plural *harat*). A *hara* can be both a street and a small neighborhood, often at the same time: The one lends its name to the other. It carries none of the baggage burdening the English word “quarter.”

Several *harat* could comprise a *hayy*, meaning district. Several of these, forming a large area in a big city, could be termed *rub’a*, literally a quarter. But such definitions are slippery. What’s clear from listening to people, and as one Jerusalemite, the writer

Khalil Assali, confirms, “Palestinians never use *rub’a*. Some people say ‘hayy,’ but that’s new. Everybody still uses ‘hara.’”

In 1495 Jerusalemite historian Mujir al-Din identified 18 *harat* in his city. Another count has identified 39 quarters in Jerusalem during the 13th and 14th centuries. By the 19th century, some had changed or disappeared, but many persisted, and others emerged. *Haret Bab Hutta* comprised, as it still does, the network of alleys running off the street that emerges from Bab Hutta (Gate of Forgiveness), the middle gate in the north wall of the Haram al-Sharif. *Haret as-Sa’diyya* was named after the Bani Sa’d tribe. There was *Haret Haddadin*, named for a tribal grouping of Christian Arabs; *Haret al-Mawarneh*, named for Maronite Christians; *Haret al-Qattanin*, the Cotton Merchants; *Haret Khan al-Zeit*, the Olive Oil Caravanserai; *Haret al-Magharba*, the North Africans; *Haret al-Wad*, beside Al-Wad Street, and several more.

Populations across the city remained mixed. Christians gravitated to the area around the Church of the Holy Sepulchre in the west of the city. Muslims often

settled in the north and east, close to al-Aqsa Mosque. Jews tended to settle close to the Western Wall in the south. But these patterns were neither fixed nor exclusive. There used to be a Jewish quarter in the northeast. Many churches thrive today in areas framed as Muslim, such as St. Anne’s, a Roman Catholic church beside the Haram al-Sharif. The Muslim area of *Haret al-Magharba* lay beside the Jewish holy place of the Western Wall. By around 1900, more than a third of Jerusalem’s Muslims lived *outside* the “Muslim Quarter,” and both Christians and Jews lived *inside* it. There were non-Armenian Christians in the “Armenian Quarter,” Jews in the “Christian Quarter” and

On his 1849 map, Williams largely ignored most local names of streets and places.



at bottom center Haret El-Yehud and Jews Quarter, and at top right—the big innovation, covering perhaps half the city—Haret El-Muslimin and Mohammedan Quarter.

No map had shown this before. Every map has shown it since.

The idea, in 1841, of a “Mohammedan” (that is, Muslim) quarter of Jerusalem is as bizarre as a “Catholic Quarter” of Rome. Or a “Hindu Quarter” of Delhi. Nobody living there would conceive of the city in such a way. At that time, and for centuries before and decades after, Jerusalem was, if the term means anything at all, a Muslim city. Many people identified in other ways, but large numbers of Jerusalem-

Following its introduction by Williams in 1849, the idea of “four quarters” took hold in outsiders’ imaginations, and it became a standard feature of maps of the city up to our own time, including this poster-size illustrated map for sale in the city to tourists.

Muslims in almost every part of the city.

Jerusalem had—and still has—a multitude of neighborhoods. All throughout its long, long history, it was never divided into four, neat, religious quarters.

Until the British arrived.

To tell this part of the story we need to return to the 1830s—for Jerusalem, a time of political upheaval. Following invasion, a popular uprising and a change of sultan in Constantinople, the Ottoman Empire was apparently about to collapse. The European powers scrambled to reimpose order, seize influence and, in Britain’s case, keep routes open to colonial possessions farther east in India. They also identified a power vacuum in Palestine. The first British Consulate opened in Jerusalem in 1839, and military intervention left a group of British officers stationed in Palestine to survey terrain. Two of them—Edward Aldrich and Julian Symonds—arrived in Jerusalem in March 1841.

The map they produced superseded Catherwood’s, forming the basis of cartography in the city for decades afterwards, not least for its labeling. Because here, newly arcing across the familiar quadrilateral of Jerusalem, are four double labels in bold capitals. At top left Haret En-Nassara and, beneath it, Christian Quarter; at bottom left Haret El-Arman and Armenian Quarter;

ites were Muslims, and they lived all over the city.

A Muslim quarter could only have been dreamt up by outsiders seeing what they wanted to see.

But it may not have been Aldrich and Symonds.

Below the frame of their map, printed in italic script, a single line notes that “The Writing” had been added by “the Revd. G. Williams” and “the Revd. Robert Willis.”

The first Protestant bishop of Jerusalem, Michael Alexander, had arrived in Jerusalem in January 1842. Chosen to accompany

him as chaplain was George Williams, aged only 27. Williams stayed just over a year before departing to Russia, Ireland and other postings, but he became Aldrich and Symonds’s champion, adopting their map—which had been published first in 1845 in plain form—and reproducing it in full in 1849 in his book *The Holy City*.

Did Aldrich and Symonds invent the idea of four quarters? It’s possible, but they were military surveyors, not scholars.

It seems more likely they focused on producing a usable street-plan for their superior officers. The 1845 publication, without street names, quarter labels and other details, suggests that.

It’s the 1849 publication we need to focus on.

The other named figure, Reverend Robert Willis, was a Cambridge University professor of mechanical engineering who dabbled in architectural history. He never went to Jerusalem.

So we come back to Williams. In *The Holy City*, he takes it

Populations across the city remain mixed in patterns that are neither fixed nor exclusive.

Among the busiest of Jerusalem's lanes is Suq Khan al-Zeit. Most maps say it's in the Muslim Quarter, but then again it has chapels, and it includes part of the Via Dolorosa, the centuries-old Christian pilgrimage route.

upon himself to "assign names" to Jerusalem's main streets, since "the inhabitants have, for the most part, dispensed with ... this convenient practice." This is false, as we've already seen: The inhabitants had names for every corner. Williams largely ignores contemporary Arabic and instead uses English names last used by the Crusaders. He has "Street of the Temple" for Bab al-Silsila (Street of the Chain); "Street of the Arch of Judas" for Haret al-Yahud (Street of the Jews); "Street of Saint Stephen" for Khan al-Zeit. These are names that were centuries out of date.

Compounding his anachronisms, and perhaps with a nod to Roman urban design, Williams wrote wrongly how two main streets "divide Jerusalem into four quarters." Then the crucial line: "The subdivisions of the streets and quarters are numerous, but unimportant."

Williams too saw what he wanted to see. With Britain's increased standing in Palestine, and the growth of interest in biblical archaeology, it was vital for the newly arrived missionaries to establish boundaries. They needed to know exactly who lived where, to target their evangelizing efforts. As British newcomers did in India and other colonies, they imported their home-grown conceptions of social division.

“We never use 'Muslim Quarter' in Arabic," Mustafa Abu Sway, professor of Islamic Studies at al-Quds University, says. "I am more than 60 years old, and I have never used that term except in an academic setting and media interviews. Among ourselves, we don't say it. 'Where are you going?' 'I'm going to al-Wad Street,' 'I'm going to al-Aqsa,' 'I'm going to the market,' 'I'm going to the Redeemer church,' not 'I'm going to this quarter or that quarter.' The notion of 'Muslim Quarter' is absent from our daily language."

Laura C. Robson, a historian of colonialism, concurs: "[The] evangelical Protestant worldview did a great deal to determine the nature of the encounter between the British and the local Arab populations ... in 19th-century Palestine. It determined the British focus on local Christian and Jewish populations, rather than the much larger Arab Muslim community. Furthermore ... it assisted the emergence of an understanding of Palestine as a place whose significance lay primarily in its Christian and Jewish heritage—an idea that would be used from the mid-19th century onwards to legitimize a British political claim to the so-called 'Holy Land.'"

Thus was a Muslim Quarter created.

The four quarters took hold in outsiders' imaginations. They appeared, reinforced in bold lettering, on maps throughout the 19th and then the 20th centuries.

If George Williams's framing, and the fostering of sectarian division it codified, hadn't suited the British and other European governments, such cartographic fantasy would never have persisted. The fact that it has, to the extent that it's now all over the internet and available for free at every tourist office, speaks volumes about the colonial ambitions of successive waves of Jerusalem's rulers, down to our own time.

"Religious, ethnic and racial difference underpinned European conceptions of state and society, and ethnographic maps



became a tool of empire and nation-building," wrote historian Michelle Campos. "The unease that European observers repeatedly expressed at the messy taxonomies of other heterogeneous Ottoman and Levantine cities such as Istanbul, Salonica, Izmir, Beirut and Jaffa ... contributed to a lasting desire to place Jerusalem's residents in neatly sealed quarters."

Jerusalemites lived—and live—in another Jerusalem. To take just one source, Jerusalemite musician Wasif Jawhariyyeh (1897–1972) wrote vividly about the shared experience of religious celebrations and the fluidity of inter-communal relations before British rule. "It is amazing to see how the huge festivals and wide national celebrations of each religion and every confession followed one another in peace and security," he wrote. Palestinian historian Salim Tamari, who edited Jawhariyyeh's diaries for publication, notes the absence of ethnoreligious demarcation lines at that time. Jawhariyyeh's lived experience and Tamari's analysis of it offer a compelling repudiation of the colonial world view presented by George Williams and his heirs.

And so today, wherever you see it, know that it is false. 🌐



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SUSTAINABILITY'S DUBAI BETA LAB

Written by ALAN MAMMOSER | *Photographed by* NATALIE NACCACHE





From the 1851 Crystal Palace in London to the 1889 Eiffel Tower in Paris and the 1893 introduction of the Ferris Wheel in Chicago, world's fairs have stimulated progressive building ideas. They have also introduced inventions that have gone on to change the world: the telephone, the television, the touchscreen. Beyond the monuments and technology, thoughtful observers see in this string of innovations the aspirations of each age. Amid what can seem like extravagant carnivals, world's fairs also offer a civilizational compass.

In 2013 the Paris-based Bureau International des Expositions, the body charged with certification of World Expo designations, looked for a host city along the great arc stretching across Africa and the Arabian Peninsula to South and Southeast Asia, where our century's greatest growth of human populations will occur. Near its geographical center lies the largest city in the United

Some 50 countries exhibited in Expo 2020 Dubai's Sustainability District, which centered on the slanted oval of Terra—the Sustainability Pavilion, **OPPOSITE**. Two other themed districts—Opportunity and Mobility—comprised three “petals” of the expo's nearly five square kilometers. Along walkways leading to the district's entry portals, designers inscribed the 17 Sustainable Development Goals adopted in 2015 by 193 countries of the United Nations. **ABOVE** Inside Terra, the roof's “eye” of sloping, ribbed steel descends to a courtyard and creates a natural vent to let heat rise out of the building.

Arab Emirates (UAE), Dubai, with a population currently a bit under 3.5 million and growing.

Delayed a year by the global coronavirus pandemic, Expo 2020 Dubai opened its six-month run last fall and closed March 31.

The Expo's three themes of Sustainability, Mobility and Opportunity each expressed a widely shared yearning for the future. It was fitting to put sustainability at the head of the list, for the other two depend upon it. As a result, the centerpiece of the expo's numerous sustainability-themed exhibits and buildings became Terra—the Sustainability Pavilion, an architecturally eloquent expression of desire to hold human growth and technology in a better balance with natural forces.

Whatever Expo 2020 Dubai was to say about our common future, it was likely going to be here, where technologies directly addressed critical elements of materials, energy, water and food with ideas designed to serve burgeoning cities.

A NEW COURSE FOR DUBAI

When Dubai received its award of the World Expo, it did so as the first city to host such an event in the Middle East, Africa or South Asia. Dubai's leaders then pledged to make it the most sustainable one ever, and to do so by using the occasion to create the nucleus of a new permanent district designed to set a new course for the sprawling desert metropolis. It would be planned meticulously with devotion to conservation and low-carbon impacts.

Ambitious goals for energy use, water and waste recycling were set. Protocols for monitoring, reporting and adjusting in light of emerging data were put in place. Design and construction took seven years.

As a result, some 80 percent of the expo's more than 120 permanent buildings earned Gold status from the US Green Building Council's Leadership in Energy and Environmental Design (LEED). Seven signature pavilions, including stunning structures by Saudi Arabia and the UAE, received the highest LEED certification of Platinum. Similarly, the international Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL) conferred an Excellent certification on the Expo site as a whole.

A record 192 countries participated. While most were housed in buildings erected by the Expo, many others built custom structures. This required each national planning team to submit plans for construction, operation and dismantling that adhered to demanding environmental standards for all aspects of materials, energy, water, recycling and more.

As one result, photovoltaic solar panels on the roofs of all of the Expo's permanent buildings—some 120 buildings were LEED-certified for the event and will remain in operation as part of District 2020, Dubai's newly-named smart city—created enough power to meet a laudable 30 percent of the event's energy requirements. For water, all buildings were required to exceed Dubai's standard building regulations for efficiency, which stimulated creative planning for water capture and reuse throughout the Expo.



Terra Director John Bull, **ABOVE**, explains the pavilion addresses two urgent resources for sustainability planning: energy and water. The pavilion roof is covered in photovoltaic solar panels supplemented with 18 “energy trees,” and it nears self-sufficiency in water collection, consumption and retention. “It works on two principles: Grab as much water as you can, then don’t let it leave,” he says. Expo’s head of sustainability operations Dina Storey, **LEFT**, emphasizes that 80 percent of Expo’s buildings are permanent. “Expo is not a finished project,” she says. “It is a pilot project.”



Much as expected, the results were not universally successful—and planners say that’s not really the point when experimenting ambitiously. Full self-sufficiency in energy and water remained elusive. Novel projects such as hydrogen-powered

for far longer. As such the legacy might lie less in buildings than in the ideas the entire expo process incubated.

SUNSHINE + WATER = INSPIRATION

Terra—the Sustainability Pavilion, named from the Latin word for earth and anchor of the Sustainability District, was designed around a simple idea: Use sustainably sourced materials and, with them, produce energy and water equal to consumption.

Designed by UK-based Grimshaw Architects, Terra’s dramatic, kinetically elongated oval canopy, completely covered with ultraefficient, monocrystalline photovoltaic cells embedded in 1,055 glass panels, appears to float above the building. Its 30-degree slant orients it to the sun and optimizes water collection. At the center of the roof’s elegant, 130-meter length, the solar panels fall away gracefully to a hurricane-eye that drops, open to a courtyard below, creating a natural thermal chimney that expels heat.

The canopy’s angle is also set to maximize prevailing breezes, and under it, the solar panels are semitransparent, which creates a comfortable, shaded courtyard that is naturally cooler than outside by 1 to 2 degrees Celsius.

More shade lay around Terra’s perimeter, in the carbon-fiber and solar-panel “forest” of 18 “energy trees.” Up to 20 meters tall and varying from 15 to 18 meters in diameter, their orientation rotates during the day to track the sun. Panels on their back sides pick up additional light reflected from the ground, which adds 20 percent to the efficiency of their electricity production.

Together the great canopy and the energy trees generate 4 gigawatt hours of electricity a year. There are no batteries in

ered busses to transport visitors were not implemented. Constraints of cost and time caused some ideas to fall away.

Yet Expo’s considerable successes showed a serious effort in the context of a city globally rated as one of the world’s least sustainable—and now advancing its own Clean Energy Strategy that aims to generate 75 percent of its energy from non-carbon sources by 2050.

“Expo is not a finished project,” says Dina Storey, head of sustainability operations for Expo Dubai 2020. “It is a pilot project.”

Born and raised in Iraq, Storey is a chemical engineer and a graduate of Columbia University in New York. It was she who led the planners who labored for five years to implement, monitor and report on Expo’s sustainability. On a site that a decade ago was open desert, she points out, they strove to create something not for only six months but also to last and be further developed



The pavilion of Slovenia has sustainably harvested spruce wood in its structure and roof, and it is wrapped in a green wall of 45,000 plants set in hundreds of meter-square panels of natural volcanic stone. **RIGHT** Matic Volk, commissioner general of the Republic of Slovenia for Expo 2020 Dubai (left), and Jurček Žmauc, director general of the Slovenia Pavilion (right). "I was worried about the wall, but then I saw it thriving last June, in 55-degree [Celsius] heat," says Žmauc.

Terra: Its flow of power rises with the daylight, when it lets excess power flow into Dubai's utility grid, and it ebbs at night, when the grid returns the power.

In this way the sun powers Terra's three restaurants and 6,000 square meters of exhibit spaces that lie mostly below ground to evade summer's harsh heat.

The sunlight also powers water production.

"It works on two principles: Grab as much water as you can, then don't let it leave," says John Bull, Terra's director. "Terra is its own water treatment plant."

In addition to its own recycling, most of the building's water needs are met using a sponge-like technology that sucks up water from the air conditioning units as well as the great solar canopy, which also collects rain and dew. As a demonstration project, there is also, amid the grove of energy trees, an experimental, solar-powered water tree, shaped as an upward cone, which harvests water from the air through a cactus-like reverse transpiration process.

The landscaping of the site used locally native and adaptive species, such as baobab trees and succulents, which need about 75 percent less water than most landscaping currently in the region. The plants receive the "gray water"—mainly from sinks—for irrigation after that water passes through transparent tubing up on the solar canopy, where the sun's ultraviolet rays kill any harmful bacteria. Wastewater goes through a more intensive process before going into a planted area that adds further natural filtering.

Instead of walls of carbon-intensive concrete, the exterior walls are built using gambion rocks, a system of cages containing stone quarried locally from the Hatta mountains. An aggregate

of recycled material forms the floors. Stairways are made of concrete poured over hard, hollow, shell "balloons," lending stairs all the strength of concrete with much less material.

Terra also learns and adjusts by using data from sensors that are integrated with the expo's full-site monitoring system developed by Siemens called MindSphere. This watches its energy and water consumption, its interior and exterior climate, its waste and more, all of which allows its managers to make real-time adjustments.

"It's a building that works hard to inspire people," says Bull. "It does not claim to have all the answers," he continues, "but it's a blueprint. It represents a really interesting way of energizing people on sustainability."

"It doesn't ignore the urgency, but it's not preachy. It's positive. It's fun."

Bull points to the last gallery in Terra, where the Laboratory of Future Values challenges visitors to question even their own questions, as in, "Am I asking the right questions?" that can move each of us personally, and the world, toward, for example,





In the pavilion of the Czech Republic, Jiří František Potužník, commissioner general for his country's participation, stands inside the solar-air-water-earth-resources (SAWER) room, where water is separated for drinking and irrigation after being drawn out of the air in a two-phase process with a desiccant unit Potužník developed in collaboration with Czech Technical University in Prague.

more sustainable food habits and practices.

"We try to provoke the right conversation, to nudge people into thinking about their own relationship with the planet," he says. He believes the legacy of Terra will be in its ability to help form a generation that sees that the future depends upon their choices.

The full assessment of Terra's goal of net-zero energy and water is planned for this fall, which allows the building to experience a full year of use. After the Expo it is planned to be made into a children's science museum and global center for the study of sustainable development.

ENERGY + WATER = FOOD

Terra's ideas found complements in neighboring pavilions that addressed technologies such as atmospheric water generation—grabbing humidity out of air, advanced modular construction, and everywhere the ideas of recycling and reusing prevailed.

Across the way from Terra was the oval-shaped pavilion built by Slovenia, where renewable spruce wood and a green wall made of some 45,000 plants wrapped the exterior walls. The plants, growing out of the full height of the wall, both conserved water and kept the building cool. Rooted in a natural material of volcanic stone that itself greatly slowed evaporation even in summer, this literal "green wall" also supported birds, butterflies and a few small snakes among 16 moisture sensors that guided constant adjustment of water flow.

Like the rest of the building that was composed largely of prefabricated components, the green wall came in pre-seeded, meter-square panels designed for quick assembly. Its producer, Slovenia's Urbanscape, which has also designed the green roof

Modular, scalable and portable, SAWER produces water from air even in the desert.

garden on the new Dubai Opera, intends the technique for wide use in the greater Middle East region.

Its hardiness through Dubai's summer heat amazed even the pavilion's director, Jurček Žmauc.

"I was worried about the wall, but then I saw it thriving last June, in 55-degree [Celsius] heat," he says. Only a few of the panels required replacement, he adds.

Also nearby, the Czech Republic's pavilion shared many similar concerns, but its solutions took on a more industrial edge. The fantastic swirl of stainless-steel tubes adorning its façade represented water-carrying capillaries serving an integrated system within called SAWER, short for solar-air-water-earth-resources.

Displayed behind a long glass wall on the building's main floor, it links machines producing water from the air for drinking and for irrigation. It works by forcing a high-speed stream of air through a "desiccant unit" in which a specially designed silica surface captures molecules of water.

This concentrated stream of air is then heated and forced through the desiccation process a second time, producing hot wet air from which condensation is captured.

"It makes 900 liters of water per day and cold air for the AC," says Jiří František Potužník, commissioner general for Czech participation at the Expo. He developed it in conjunction with researchers at Czech Technical University in Prague.

Powered by hybrid solar panels on the roof that produce both electricity and hot water for heat, SAWER's water then goes to two further processors: Some goes to be remineralized for drinking, but most goes through a photo-bioreactor that adds nutrients and symbiotic fungi. This results in a richly green-tinted stream that irrigates the pavilion's surrounding landscape.

RIGHT Colored lights enhance the presentation of full-circle water sustainability in the pavilion of The Netherlands, where a self-contained system also irrigated a green cone. **CENTER RIGHT**, that grew a variety of plants including tomatoes. Comprising 95-percent recycled materials, the pavilion's water system relies on a solar-powered dehumidification system called SunGlacier by its developer, Ap Verheggen. **BOTTOM RIGHT**.

The efficiency comes when fungi in the water attach to the roots of plants to help them hold nutrients and limit evaporation.

“The water production is directly related to the solar power,” says Potužnik. “One to two liters of water is produced per square meter of solar collector surface, per day, depending on the season.”

Again, the system is modular, scalable and portable. Potužnik asserts that it can be produced in standard-size units that will function autonomously in desert environments. But he doesn't foresee it replacing the large, carbon-intensive, energy-intensive desalination systems for big cities like Dubai. Rather, he sees it serving more rural and isolated areas that lack dependable water supplies.

The tendencies in the Slovenian and Czech pavilions appeared to reach even higher in the neighboring pavilion of the Netherlands, where solar energy, manufactured water, green walls, recycling and modular construction reached true circularity and combined to produce actual food.

Some 95 percent of the Dutch pavilion was built using recycled material. Steel sheets and pipes were rented locally. Designed by V8 Architects, the building housed a temporary biotope in a circular climate system, in the center of which a giant green cone was covered in edible plants irrigated with captured water.

Pavilion visitors were treated to a lovely light show within this huge, plant-covered metal cone—and the show finished with a column of water pouring down from the roof.

The technology to do this began on the roof with solar panels that powered a dehumidification unit there called SunGlacier. Designed by inventor Ap Verheggen, it takes a different approach to atmospheric water capture.

“We blow air in a cold shower,” says Verheggen. The humidity in the warm air condenses against the cold droplets of water, which grows the droplets and precipitates them in a waterfall that grows in volume as it descends. “It's a growing waterfall,” he says.

This solar-powered rain-shower produces up to 2,000 liters per day, enough to water the plants in the green cone inside and cool the building. The solar panels are translucent enough to allow sunlight to filter into the enclosed metal room, and the humidified air, rich in carbon dioxide, provides a rich climate for the plants, which include tomatoes. On the second floor, the water is served from taps: clear, cool and delicious.

The SunGlacier, and the whole building, was built to be temporary, portable, scalable and mass produced. Verheggen is working to apply it to large greenhouses. Like the Slovenian and Czech techniques, he sees it as part of a suite of technologies that will not so much replace other systems serving expanding



LOWER: COURTESY OF THE NETHERLANDS PAVILION

populations in dry regions but supplement them.

“In my view we will never be able to replace the huge amounts of water that are produced by desalination for huge cities,” he says. “But desalinated water for households can be mixed with fresh SunGlacier water to fulfill everybody’s needs. It could lead to an enormous reduction of the negative effects of desalination.”

“They were showing that to survive, we need to ... retrofit cities with ecological intelligence.”

—Jim Patchett

Jim Patchett, cofounder of Conservation Design Forum and a leading US-based expert on sustainable water management, sees great value in what was on display at Expo.

“They were showing that to survive we need to understand how natural systems function, to retrofit cities with ecological intelligence.”

It was exciting to see their emphasis on the sheer value of water.”

However, he tempers his praise with caution.

“The Expo exhibits are certainly things that can be applied large scale. I’m sure they’re feasible,” he says, “but they must be applied economically.”

“What they were showing, very concretely,” he says, “is that flushing water away will be impossible in the future.”

PLANNED CITIES = ZERO WASTE?

While each of these pavilions highlighted innovations in sustainability technologies—and they were not the only ones—the challenges of sustainability in our cities goes much further, from the single building to the city itself.

Storey and her team of nine staff approached their task from this perspective.

“Eighty percent of Expo’s structures will remain,” says Storey. “The expo site was planned from the beginning to become a real city, a new district of Dubai on what was desert.” That city-district, she asserts, will be highly sustainable.

Her team had three tasks: Ensure construction met LEED Gold or Platinum standards, follow circular principles by targeting 85 percent diversion of waste from landfills, and then document all work for regular monitoring and reporting to provide a record from which future city-builders could learn.

Along the way, they worked with “carbon consultants” to measure proposed ways of building against “business as usual,” and monitor their carbon savings using realistic, replicable methods.

For water conservation, they ensured every building on the site used less than half the legally required maximums. For drinking water they built water-bottle-friendly Sabeel fountains, named using the Arabic word for public, charitable water fountains that proliferated across the Islamic world for centuries. Water for sale came in aluminum cans, as aluminum is perpetually recyclable, and recycling bins for them were ubiquitous.

For solar panels on the roofs, Storey explains they first proposed a goal to meet 25 percent of their total energy requirement with onsite-only solar power, and to meet 50 percent of their total energy requirement with a combination of onsite and offsite renewable energy.

“We soon realized that to meet the 50 percent objective, we



ABOVE The Sustainability District invited the Expo’s more than 23 million visitors to write their own ideas about sustainability. Throughout the Expo, drinking water was available from water-bottle-friendly Sabeel fountains, **RIGHT**, which were named using the Arabic word for public, charitable water sources that proliferated across the Islamic world for centuries.



would need to cover the entire 30,000-car parking lot with solar panels,” says Storey.

But that parking lot, composed of a composite consisting of recycled car tires, was not destined to be permanent. After Expo, it will be built over with high-density housing. As a result, the sustainability calculation did not sufficiently benefit Expo because the solar panels might not be in place long enough to produce more energy than it took to manufacture and install them.

Some observers nonetheless saw a missed opportunity. Frank Wouters, a Dubai-based energy expert and director of the EU-GCC Clean Energy Network, worked with a consortium of consultants that presented a plan for 100 percent, onsite renewable



Rising 21 meters above the plaza, this lattice of carbon fiber by UK architect Asif Khan formed the entrance portal for the Sustainability District. The interwoven fibers created a screen reminiscent of traditional, turned-wood lattices used for shade for centuries across North Africa, the Levant and the Arabian Peninsula. Visible through the portal is a cluster of Terra's "energy trees." Other pavilions by participating nations, including Brazil, Singapore, Saudi Arabia, Morocco among dozens more also addressed sustainability from other technological and social perspectives.

energy production at the Expo.

"We proposed expanding solar power onto the surrounding site, making the parking lot completely shaded with solar panels," he says, "then providing alternative offsite parking and transport."

"We added hydrogen-to-power, biomass, and more onsite photovoltaic with batteries," he says. "The power from these diverse sources would flow into the utility grid but produce 100 percent net energy for Expo."

"I think it was feasible," Wouters maintains, "but of course it comes with a cost."

Storey argues with his approach.

"That was actually unsustainable," she says, "because it would put a lot of solar panels onto something temporary, requiring their removal later. We wanted solar panels only on permanent buildings, to form a basic part of the infrastructure of the future city district."

As it turned out, the rooftop solar panels produced up to 30 percent of the Expo-built buildings' energy requirements. Storey is pleased with this. Indeed, most analysts expect that future carbon-neutral cities will depend on both localized, rooftop and utility-scale, offsite-solar-park sources of energy.

Peter Ellis, a Skidmore, Owings & Merrill veteran who planned a new, water-conserving "garden city" in India, agrees that the 100-percent onsite energy objective was preferable for the Expo, insofar as Expo was a model city. And he doubts a truly sustainable city can ever be built in a desert. Still, he sees great value in what Expo has given to the world.

In reflecting on lessons learned at Expo 2020 Dubai, Storey emphasizes understanding every flow of energy, water and waste.

"If you look at what they did in those pavilions, they went to great lengths in the harsh climate," he says. "They did excellent work with water capture and reuse, with embedded carbon reduction and recycling.

"They created a great showcase of what we can do," adds Ellis. "Now it's a question of how to communicate it."

In reflecting on her experience and lessons learned at the Expo, Storey returns again and again to the critical role of planning. She emphasizes the importance of thinking through the whole city from beginning to end, of understanding every flow of energy, water and waste. And to monitor, report, update and adjust, over and over, learning all the time.

"I think it's our commitment to comprehensive planning that may be our most important legacy," she says. 🌍



Alan Mammoser is a researcher and writer on energy, environment, infrastructure and planning in the US and the Middle East. He is coauthor of *Beyond Burnham, An Illustrated History of Planning for the Chicago Region*. He divides his time between his native Chicago and Dubai.

Natalie Naccache (natnacphotography.com; @natnacphotos) is a documentary photographer based between Dubai and Beirut. Her photographs have been published and exhibited internationally.



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BERLIN'S TRANSCULTURAL JAM

Written by KEN CHITWOOD

Photographed by FABIAN BRENNECKE

It's a damp, cold October night in Berlin, but along Hauptstraße in the Friedenau district, inside the famed Zig Zag Jazz Club, the crowd waiting for Alaa Zouiten is lively, chattering and warm.

A fire-red glow reflects from the lights near the stage where the Morocco-born 'ud player begins plucking a few of his instrument's strings. Clinking glassware and the hum of conversation subsides into concentration.



Zouiten's first song comes as a rapid-fire arrangement that at once showcases his virtuosity, flitting between styles he refers to as *flamenco arabe* and urban jazz. After that, his band joins him: a Spanish percussionist, a French bassist, a Canadian violinist and a pianist from Lebanon. Midway through their opener, Zouiten pauses to let his audience know it's about to hear something new.

"We are trying a mix of different styles of music up here," he says. "I hope it's OK."

Cheers erupt. One woman near the front calls out, "It's more than OK. It's *geil!*"—a German slang compliment that falls between "cool" and "sick."

Reflecting on the audience's enthusiasm, Zouiten elaborates as he strums and talks, strums and talks.

"I am neither a purist Arab 'ud player, nor a jazz composer, nor a traditional flamenco artist," he says, continuing to pad his thoughts with notes that will lead into the next song. "Just the fact that I'm from a country like Morocco, with its Arabic,

Amazigh, Islamic, African, Jewish and Andalusian influences, makes the answer more difficult."

Like his band, his music and the city he now calls home, Zouiten is surrounded by a comingling of cultures and the resulting exchange of geographic collateral.

"While I was looking for a label for my music, some called my music Oriental Jazz. Others called it Arabic Andalusian fusion," he says. "I was constantly dissatisfied with all these names, until finally I came to the right term. My music is about a *plaisir transculturel*, or transcultural enjoyment."

Music has never been about just one thing, he says. Throughout the Middle East, North Africa and the Mediterranean, music has always been rich with both tradition and the eclecticism that comes with movements of peoples. In Morocco, for example, where French and Arabic are spoken both independently and fused into a dialect, there's a complex soldering and even reconciling of identities that often presents in music. Moroccans, like people elsewhere, understand nuanced cultural representations, which in their region light up a spectrum of Arab,

Italian, French, Amazigh and Andalusian influences that have all at different times borrowed from and given to other styles.

People in Berlin identifying as Arab are now the fourth-largest ethnic group in the city, approximating 135,000, or 3.5 percent of the total population. Musicians like Zouiten are helping create a musical landscape more open than ever to fusion.

Large numbers of Arabs first began arriving in Germany in the 1970s as *Gastarbeiter* (guest workers), many from Morocco and Tunisia. Others later came from Lebanon, Palestine, Iraq, Sudan and—most recently—Syria, often fleeing conflicts. For this reason, over the past couple decades, Berlin has become a polestar of music influenced by, performed by and increasingly produced by new arrivals. Amid and alongside an ethnically German majority, the mix has come together in connections of people, tones, rhythms, instruments and ideas. Compositions are resonating not only within Berlin, but across Europe and beyond. Berlin has become one of the world's hottest crucibles of musical creativity.

"I love the transcultural approach in music, and that means there are no boundaries between music and cultures," says Alaa Zouiten. Morocco-born and, since 2009, Berlin-based, the 'ud virtuoso and music educator is among the more than 135,000 Arab-identifying residents of the city helping make Berlin one of the world's hottest centers of creative arts. Zouiten cites the fusions in his own music as Moroccan, Amazigh, African, Jewish, North African and Andalusian. "Together it all sounds really organic," he says. "In that moment, the listener says, 'We're all pretty close, and we have more similarities than differences.'" **OPPOSITE** Zouiten performs in 2019 at Berlin's Gnaoua Festival, which featured the sounds of West Africa.



OPPOSITE: IVETARYSAVAT



LEFT AND ABOVE Syria-born percussionist Elias Aboud completed his musical education at Berlin's Barenboim-Said Akademie in 2013. In December he performed with the Boulez Ensemble at the city's Pierre Boulez Hall. Independently, Aboud and three fellow Syrian musicians formed the Ramal Ensemble whose polyrhythmic sound features both Arab and Eurocentric styles. "My hope is that my music would move you not because you are Arab but because you are a listener," says Aboud.

When Professor Amro Ali arrived in 2011, he says that he sensed the first signs of the burgeoning cultural scene. As a sociologist specializing in how cultures influence behavior, he noticed the city's peppering of restaurants offering kebabs, shawarmas, baklava and the like, but he also noticed a lack of institutions showcasing Arab literature, art and music.

That changed in the 2010s following the Arab Spring that ultimately forced many from North Africa and the Levant—and notably from Syria—to seek refuge and asylum abroad. A historic turning point came in 2015 when, faced with such

great numbers of people fleeing repression of the Syrian Revolution, German then-Chancellor Angela Merkel opened Germany's doors wider than ever. Of the approximately 1.2 million asylum seekers Germany welcomed were artists, teachers, businesspeople and intellectuals and, among them, many chose to settle in Berlin.

Arabs and others from across the Middle East and North Africa were thus meeting each other in the city, says Ali, and sharing a common experience of emigration and adaptation. This created a fertile ground for intercultural interactions and collaborations in everything from practical matters to creative music.

"Berlin was already a cultural hub," says Ali, who is now a research fellow at the Freie Universität Berlin as well as a lecturer in sociology at the American University in Cairo. "But it was becoming a hub where Arabs could establish themselves quickly."

What the English magazine *Exberliner* called "an unprecedented outburst of cultural activity" was under way.

Newspapers, plays, films, art shows and Baynatna, the city's first-ever Arabic library, all opened amidst the influx.

"It has become the city of choice for a new generation of cultural talent from the Middle East and North Africa," Ali says.

There emerged new alliances and new opportunities among artists and local institutions, organizations and subcultures, all in what has become, especially since the end of World War II, one of the world's most introspective cities, one unusually committed to the experimentation required for regeneration. Berlin was yet again becoming a pivot point for another chapter of European cultural history.

Before the COVID-19 pandemic (and now cautiously restarting) jam



Berlin "has become the city of choice for a new generation of cultural talent from the Middle East and North Africa."

—Amro Ali

sessions, musical performances and dance parties proliferated. 'Ud players connected with percussionists and countless others in parks and plazas, especially amid the popular Sunday market at Mauerpark (Wall Park), along a former part of the Berlin Wall.

The weekly performances of The Arab Beats Project, an "Oriental electronica" collaboration by disc jockeys Rafi Gazani of Palestine and Uroš Petkovic of Serbia, brought together hundreds of partygoers at clubs along the graffiti-covered streets of Kreuzberg. On the classical side, the renowned West-Eastern Divan Orchestra, founded by Palestinian American scholar Edward Said and Israeli American conductor Daniel Barenboim and based in Seville, Spain, spawned in Berlin the Barenboim-Said Akademie, which offers students from the Middle East and North Africa bachelor's degrees and certificates in music. The Arab Song Jam emerged with weekly performances at Werkstatt der Kulturen, a venue in the southern, increasingly hip district of Neukölln.

"It's this diversity that makes the scene so exciting," says Sean Prieske, who is a doctoral fellow in transcultural musicology at Humboldt-Universität in Berlin. Prieske says he's met traditional and modern musicians, classical artists and those into hip-hop, metal, electronica and jazz, and he says it's common now to hear that musicians are moving to Berlin solely to try to launch their international music careers.

Elias Aboud is among them. A percussionist who learned music in Damascus, Aboud finished his musical studies in 2021 at Barenboim-Said. In addition to performing with prominent orchestras, Aboud formed the Ramal Ensemble with three fellow

Taha Sheikh Dieh, **RIGHT AND BELOW**, is a rapper and lyricist from Aleppo who performs with the stage name 6aha Aiwa. After the Syrian revolution and his move six years ago to Germany, he says his lyrics and performances began reflecting more of the ongoing transitions of his countrymen. Berlin, he says, "gave me more access and freedom to express my feelings and thoughts." He also discovered the city's production scene for electronic music, "genres where I was just listening to them back in the days in Syria."

"I was queuing in line for asylum ... [and some of the volunteers there] invited me to a jam session."

—Taha Sheikh Dieh

Syrian musicians in Berlin. They not only play traditional pieces, he says, but also compose "works that bring the sophisticated poly-rhythmic sound of Arab music to Western chamber ensembles, experimenting with classic tunes from both traditions."

While the idea for the ensemble began in Syria, Aboud recalls, "I was able to bring it to fruition

here in Berlin," where he not only discovered a new sound but what he calls "new color" to music while playing keyboards atop traditional Middle Eastern instruments such as the flute-like *ney*, or the *qanun*, played by plucking its strings.

"Classical music is something Germans are proud of," says Aboud. "It made sense to combine the sounds, mix the traditions, and create something new that would touch people from multiple backgrounds and cultures."

In his newest project, Aboud is crafting music inspired, he says, by Berlin's popular *U-Bahn* subway lines. His first piece, "U8," sought to evince the rapid-transit



LOWER LEFT: COURTESY TAHA SHEIKH DIEH; OPPOSITE, TOP: COURTESY ELIAS ABOUD; LOWER: COURTESY AMRO ALI



Jamila Al-Yousef—festival curator, antiracism and empowerment trainer, Berlin native and lead vocalist for the band Jamila & The Other Heroes—says her performances and lyrics take inspiration from her Palestinian father, who came to Germany as a refugee. “I believe in a transcultural-hybrid approach. That means that every individual has a whole different story in what shaped their identity. So we can have all sorts of backgrounds, and if you see musicians or artists like that, that is fine, but if you want to put them into a corner by ‘this is the Syrian artist, this is the Iraqi artist, and this is the German artist,’ this won’t work, especially in Berlin.” **ABOVE** Jamila & The Other Heroes perform in November at the Cairo Jazz Club in Egypt.

lines connecting heavily Arab neighborhoods in the Neukölln district to other parts of the city.

“My hope is that my music would move you not because you are Arab, but because you are a listener. It doesn’t matter whether you’re Arab, German, or Latin American. I just want people to appreciate the music.”

Because of Berlin’s warmly eclectic and often outspokenly nonrestrictive music scene, musicians like About have been able to obtain a level of local status they aren’t able to replicate in their home countries, says Prieske.

“While you can’t compare it to Cairo or Baghdad, with their robust musical traditions, Berlin is definitely the most important city for Arabic music outside of Arabic-speaking countries at the moment,” he says.

Taha Sheikh Dieh, a rapper and lyricist from Aleppo, agrees. He knows Berlin isn’t the only city where these musical fusions occur, but he says the city offers musicians like him access to different kinds of networks. Taha, who performs as 6aha Aiwa, performed relatively unnoticed for eight years in Syria before he moved in 2015 to Berlin where he immediately connected with the music scene.

“I was queuing in line for asylum, and some volunteers were providing hot tea. I started talking to one of them, and they invited me to a jam session,” he says, remembering.

When Taha arrived, he expected to enjoy other musicians performing. He was shocked when they called him up on stage.

“Suddenly I had to sing in Arabic. It was almost overwhelming,” he says.

Since then, Taha has been performing in festivals and solo concerts across Berlin. In 2016, he founded wladalamm, an Arabic rap, reggae and hip-hop group.

“Our music isn’t for fun,” he says. “There’s not one line that you can waste. It’s not just filling words.”

His lyrics, he says, offer a means to explore asylum seekers’ experiences—all of the good, the bad, and the in-between.



“If Berlin and its music scene is something, it’s actually seeing people with their very diverse intersectional identities, and it’s celebrating that.”

—Jamila Al-Yousef

“To have Syrians speaking about these topics, with no fear, is a way for Germans to learn about this—straight from the source. It gives us a stage so that we can ‘integrate’ them to our world,” he says. His rap, he emphasizes, is not “refugee music.”

“I do art. I do music. I want people to book me as a musician and not as a refugee,” he says, discussing how Arab artists in similar Berlin rap circles have taken notice that their music appears to be changing the things nonimmigrant Berliners are talking about as well.

“We cannot change the fact that Berlin is a German city. We are not going to change what German people like or how they



"Music Breaks All Borders," reads Zouiten's T-shirt as he holds a microphone to accompanying percussionists riffing off one another during a Berlin performance. Zouiten, 37, has also trained on piano, violin and classical guitar, and he is currently studying ethnomusicology at the Hochschule für Musik FRANZ LISZT Weimar in his pursuit to "continually propose new musical perspectives."

do things." But with a scene made up of people of so many different cultural streams, "we are shaping the city too," he says.

"Our fanbase is made up of Arabs and Westerners, anarchists and leftists, people from all over the spectrum. They resonate with our political perspectives, not just our cultural backgrounds," he says. "That's how it is in Berlin."

Perhaps as much as anyone in Berlin, vocalist Jamila Al-Yousef knows how it is, too, living a hyphenated identity as a minority in a curious but historically homogeneous city. Born on same day that the Berlin Wall fell—November 9, 1989—her mother is an *Urberliner*, meaning an "original Berliner," and her father came to Berlin as a refugee from Palestine: She calls herself Berlini-Palestini, and she is passionate about working alongside and collaborating with artists from across the world.

Al-Yousef founded the band Jamila & the Other Heroes in 2016, which over the past few years has toured in Germany, the Middle East and North Africa. In 2020, the group released its debut album, *SIT EL KON* (The Grandmother of the Universe) which features Arab percussion and Arabic lyrics but evades the confinement of labels such as "Arab music" by self-describing its sound as "psychedelic desert funk."

While tours continue to be difficult due to visa issues and a global pandemic not fully eased, Al-Yousef says that nonetheless, "as a band, we travel within our music. We travel within the

creations we make together."

Their goal, like that of so many others, is to bring new, creative energy to topics that are important to the city.

"What we as artists in Berlin can do is tear down the borders in our head and invite others to do the same," she says.

This echoes the sentiments of *plaisir transculturel* that Zouiten explains from the spotlight up on the Zig Zag stage, where the notes, the cheers and the smiles defy divisions, bind the crowd in experience, and warm the chill of another late-autumn night. 🌐



Ken Chitwood, Ph.D., is an award-winning writer on religion, travel and culture. He is currently a Fritz Thyssen Foundation Postdoctoral Research Fellow at the Berlin Graduate School Muslim Cultures and Societies of Freie Universität Berlin. He is also a research-fellow with the University of Southern California's Center for Religion and Civic Culture's Spiritual Exemplars Project. **Fabian Brennecke** (@fabian_brennecke) is a documentary photographer based in Berlin who specializes in social and cultural documentaries as well as portraiture.



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Electronica in Egypt: Sep / Oct 2019

New beats in Beirut: Jul / Aug 2016





MUGHAL JAALI

3

WRITTEN BY
RICHARD HENRY

ART COURTESY OF
ART OF ISLAMIC PATTERN

Decorative and functional lattice screens have been produced by artisans throughout the Islamic world in a wide variety of styles. In India these are known locally as *jaalis*, a term that comes from an early Hindi word for “net.” They are essential in the demarcation and articulation of architectural space. On a physical level, they moderate and modulate the passage of air and light, contributing

to temperature, atmosphere and ambience. Composed using dynamic symmetries that are both unique and related to other traditions in the Islamic world, jaalis cast stunning patterns of evanescent light upon floors and walls of buildings.

India’s extreme climate, with its intense sun and heat, prompted the development of various styles of jaalis across the subcontinent through the centuries. They have been constructed in a range of media, including stone and plaster, in which inventive symmetries and distinct geometric devices proliferate.

For this third installment in the Art of Islamic Patterns series, we turn to Delhi, where the Isa Khan enclosure sits within the gardens of the funerary complex of Mughal Emperor Nasiruddin Humayun. It is named after Isa Khan Niazi, a nobleman in the courts of Humayun’s successors Sher Shah Shuri and Islam Shah Suri. The building was constructed in 1547-1548 CE with an octagonal layout characteristic of the style known as *Lodhi*. Alongside a balcony within its enclosure, an extraordinary, balustrade-height jaali of red sandstone displays a delicate, 12-fold radial design. Looking closely it shows beautiful interplay of 6- and 12-pointed stars as well as a subtle vibration that was created by overlapping figures that, although they might first appear to be circles, turn out to be 12-sided figures, or dodecagons.

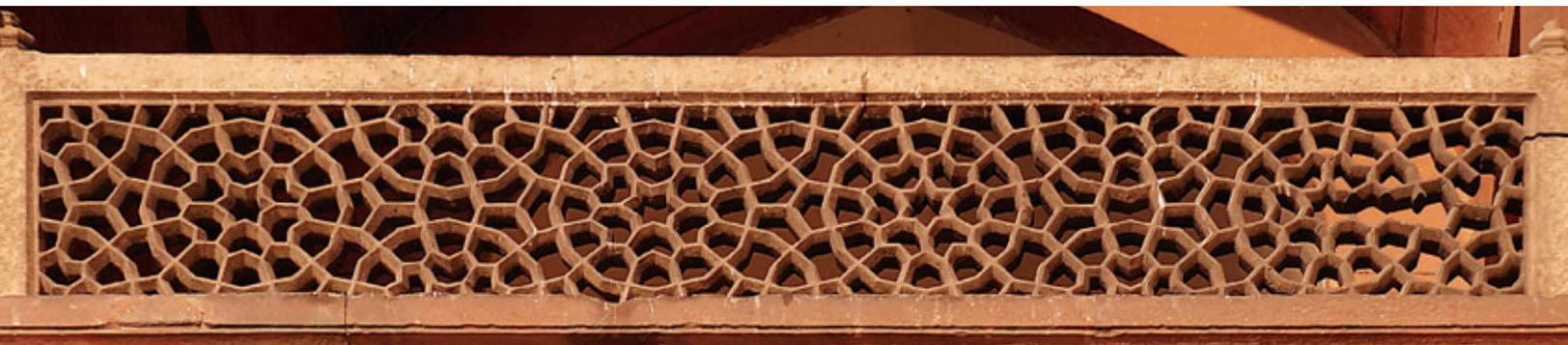
As indicated in the first two articles in this series, geometric patterns based upon 3- and 6-fold symmetries are one of the three main families of such patterns with Islamic art, and thus they are one of the natural starting points for journeys into these patterns. Twelve is six doubled, and thus there is an essential interrelationship also between 6-fold and 12-fold designs. Both are typically derived from the same proportioning module, sometimes referred to as a “harmonic rectangle,” which is expressed in mathematical terms using a ratio of 1 to the square root of 3 ($1:\sqrt{3}$).

This harmonic rectangle has been used elsewhere, too: for example in the ground plans of the Merenid Bou Inaniya Madrasa in Fez, Morocco, and as a framing device within the illuminated pages of masterpiece Mamluk Qur’ans as well as, more generally throughout the Islamic world, a way to produce modular repeating units on geometric surface designs.

The photo below shows the module repeated four times, and the instructions that follow will guide you in the construction of one.

BELOW Jaali screen from the Isa Khan enclosure of the funerary complex of Humayun, New Delhi. Red sandstone, 1547-1548.

RICHARD HENRY; OPPOSITE: ELIZABETH BRONWEN



WHAT YOU WILL NEED

Compass: Choose one of high quality that will precisely hold a radius and for which you can keep a sharp point on the pencil lead.

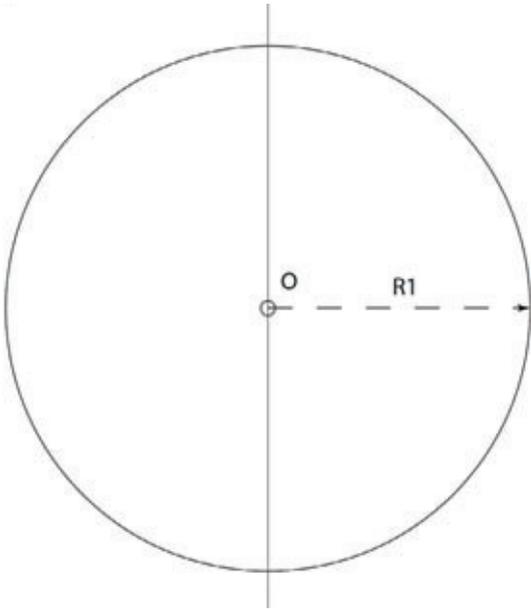
Straightedge: A metal one works best, 30 to 50 centimeters in length.

Paper: Use smoothly finished drawing paper, at least A3 or 11 by 14 inches. For this pattern, you may wish to cut it into a square.

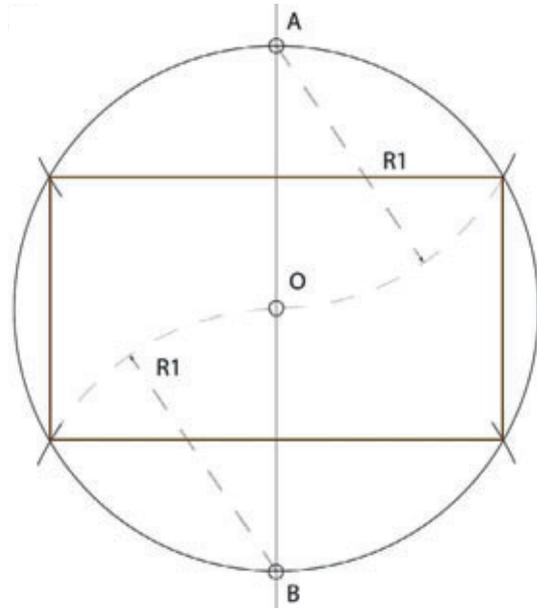
Eraser: Professional drafting erasers work best. Mistakes are part of learning to make patterns.

Pencils: Use hard leads, such as 2H, for lighter guidelines and soft leads, such as 2B and 3B, for heavier finishing lines. Add colors to fill as desired.

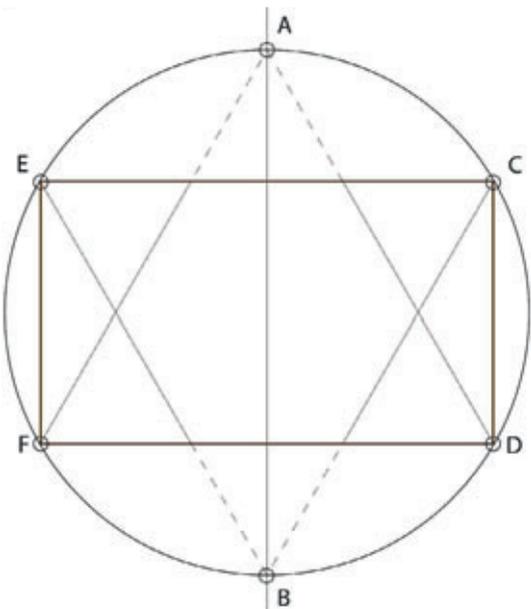
Tracing paper: A4 or 8½ by 11 inches size works well.



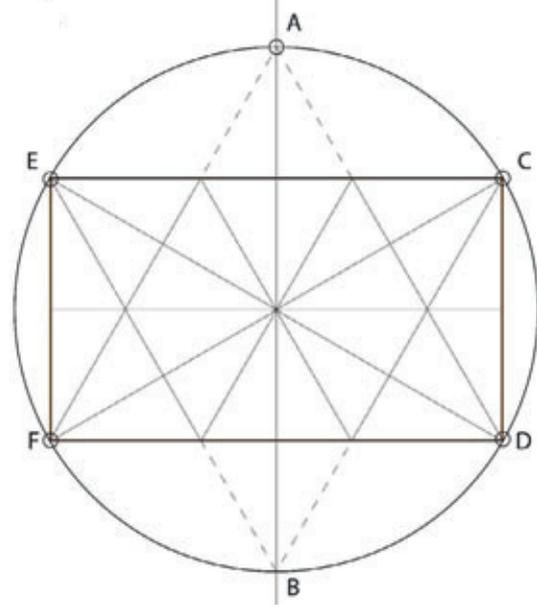
1. Start from a vertical line, set compass radius to R1, approximately 1/3 width of the page. Draw a circle in the middle of the line.



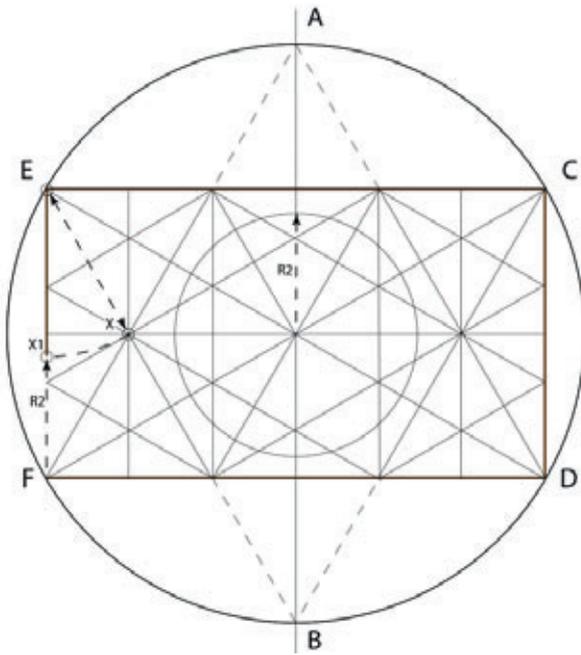
2. Without changing the compass radius, and with the compass needle anchored at point A then point B, make 4 additional divisions of the circle. This will create our "harmonic" proportioning rectangle with the special ratio of $1:\sqrt{3}$. This will form the fundamental repeat module for our design.



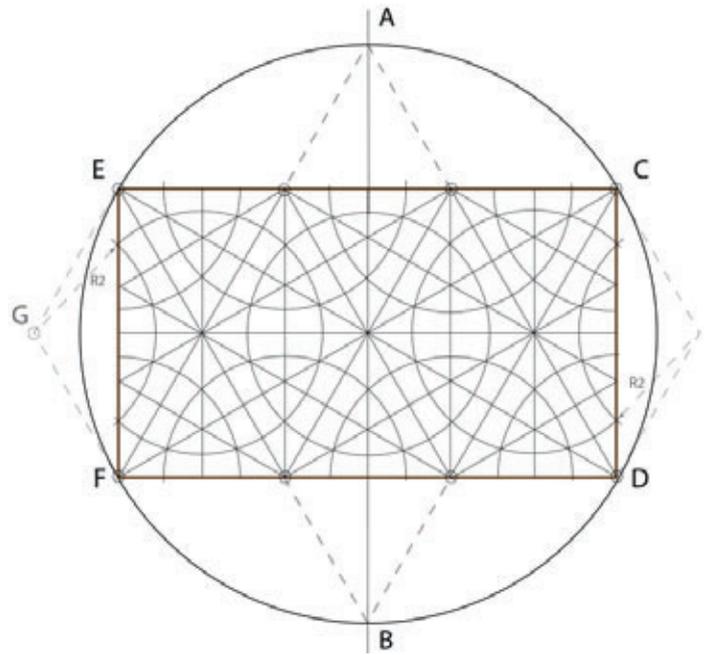
3. Link diagonal guidelines across our figure: A – F & D, B – E & C. Outside of the rectangle ECDF, these lines can be very light broken lines.



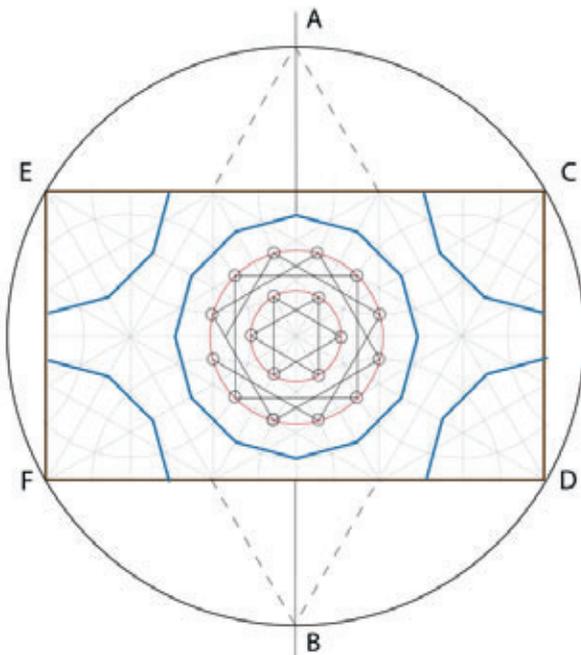
4. Add additional radial and diagonal lines, still as light guidelines.



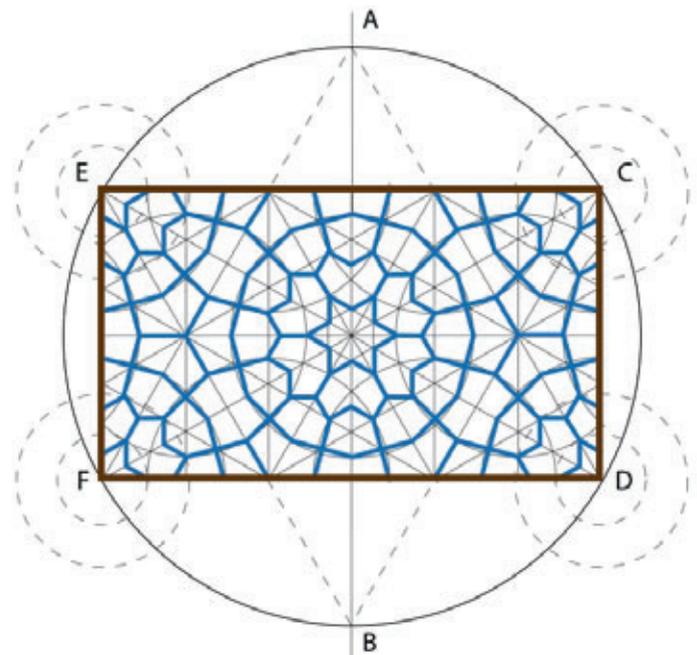
5. Measure the distance of segment E-X. Then swing that arc to meet the line E-F at X1. Now measure a new compass radius R2 on the vertical line from F to X1. This will provide the radius of the key proportioning circles, which will contain the overlapping dodecagons in our final design.



6. Arrange the proportioning circles with radius R2 evenly as above across our rectangular module. Note that two centers of the proportioning circle, G and H, are outside of the frame of our rectangular module.



7. First lightly outline the 6- and 12-pointed star motifs in the center, as above. Then, with a bolder line, or colored pencil, start to outline the overlapping dodecagons and quarter dodecagons.



8. Note how additional proportioning circles centred at E, C, D and F enable us to establish the quarter stars nestled in the 4 corners of the rectangular repeat module. To complete the design, mark bold division with the larger gaps. The design can now be completed with shading, tone and colour to emphasise the interrelationship of different shapes and bring the design to life. Guidelines can be left as part of the final design or erased according to individual preference.



Richard Henry is an artist and teacher who focuses on the contemplative aspects of pattern. He has a background in philosophy and cognitive psychology.



Watch our video tutorial on this pattern at aramcworld.com

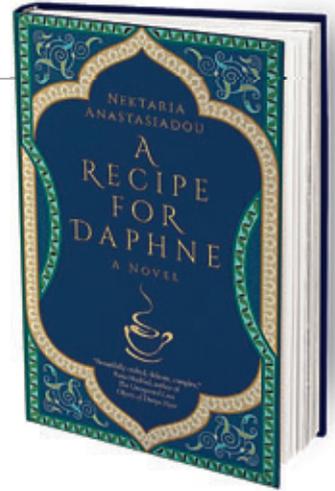


REVIEWS

Without endorsing the views of authors, the editors encourage reading as a path to greater understanding.

“The night before Daphne left for Istanbul, Sultana Badem warned her daughter that she must not under any circumstances fall in love with a man in the Poli, which is the only word Istanbul Rums use for their homeland: the City.”

—Excerpt from *A Recipe for Daphne: A Novel*, by Nektaria Anastasiadou



A Recipe for Daphne: A Novel

Nektaria Anastasiadou. Hoopoe, 2021.

A charming multiperspective, modern-day romance novel, this book centers on the Rum (Greek Orthodox Christian) community in Istanbul, Turkey. While Daphne, a 32-year-old teacher interested in applying for a Ph.D. in oral history, has lived her entire life in Miami, Florida, her visit back to her parent’s homeland teaches her new ways to live. With her mother being Rum and her father being of Ottoman decent, Daphne searches for her identity within the crossroads of Turkish cultures. Once she arrives in the city, however, she finds herself at another crossroads—between two men: Fanis, a lively 76-year-old, and Kosmos, a pastry chef at the renowned pâtisserie the Lily. To gain Daphne’s attention, Kosmos searches for the recipe to make balkanik, a Rum pastry originating from the 16th century. Centering on romance and family, this novel is a quick read for romance lovers interested in learning about Rum culture.

—HANNAH STERENBERG

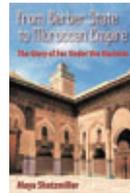


Bayana: The Sources of Mughal Architecture

Mehrdad Shokoohy and Natalie H. Shokoohy. Edinburgh UP, 2020.

A veritable textbook on Mughal architecture from the namesake region in Rajasthan, India, *Bayana* offers detailed maps and diagrams of Bayana’s important historical landmarks, some of which survive today. The authors delve into the multilayered history of Northern India, from the Vedic civilizations (1500–500 BCE) to the epic battles of medieval Islamic history that have defined Rajasthan. While modern-day Bayana is predominantly Hindu, this work reflects on the region’s strong connection with Islam. *Bayana* reminds us Southwest Asia is an amalgamation of religions, ethnicities, and political systems. The Shokoohys leave no stone unturned as they analyze the socioeconomic, political, spiritual and historical contexts for each aspect of Mughal architecture. While not light reading, it makes for a fascinating read for anyone interested in becoming more informed about Mughal architecture or culture.

—MARINA ALI

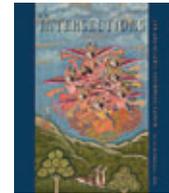


From Berber State to Moroccan Empire: The Glory of Fez Under the Marinids

Maya Shatzmiller. Markus Wiener Publishers, 2017.

A trio of powerful Berber dynasties arose in medieval Morocco, beginning with the Almoravids (1040 to 1147 CE) and then the Almohads (1145 to 1248). The formidable third of these, and the focus of this study, the Marinids (1250 to 1465), established Fez as their capital and initiated a flourishing for the city under the Marinid Sultanate. Shatzmiller, a professor of history at the University of Western Ontario, divides the work into three parts: the Berbers’ search for their role in Islamic history; the establishment of an Islamic state; and the implementation of Islamic institutions such as madrasahs. Updated from a 2000 edition, the book adds a new introduction as well as a concluding chapter on trade in the Mediterranean world. With much of the scholarly writing on the medieval Maghrib in Arabic or French, this volume will be of particular interest to English-speaking students of North African history.

—JEFF KOEHLER



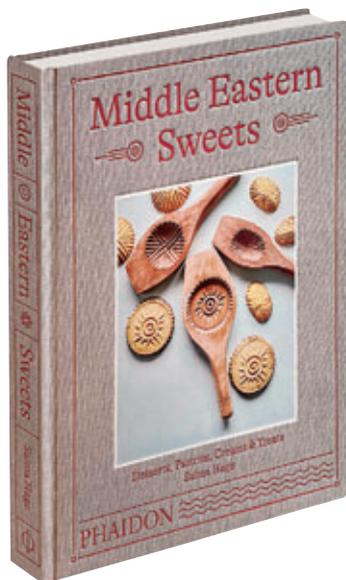
Intersections: Art and Islamic Cosmopolitanism

Melia Belli Bose, ed. University of Florida Press, 2021.

This richly illustrated book celebrates a reflection of Islam’s inherent cosmopolitanism, characterized by diversity and the exchange of ideas. Each of the 10 scholarly essays in this oversized volume—stemming from a May 2018 symposium sponsored in part by the University of Texas at Dallas and the Dallas Museum of Art—highlight examples of artistic “intersections” between the West and the Islamic world across centuries. The striking similarity of two 12th-century gilded-silver bowls, one Byzantine, the other Seljuq, demonstrates “both shared and differentiated identities” of their courtly origins. Lavishly decorated 17th-century Syrian ‘ajami rooms, awash in murals and wooden inlays, “incorporated and reinterpreted European elements and motifs” while inspiring later Orientalist architecture like as 19th-century American artist Frederick Church’s Hudson Valley mansion Olana. An engaging book for fans of history, especially art history.

—TOM VERDE

AUTHOR'S CORNER



Sweet Memories of a Middle Eastern Childhood: A Conversation with Salma Hage

by TOM VERDE

Acclaimed cookbook author Salma Hage grew up in the mountains of the Kadisha Valley in Northern Lebanon. Like many cooks, she learned her craft at her mother's knee, as well as those of other female relatives in her household, where she often took on the role of cook for her eleven siblings. Her most recent book, *Middle Eastern Sweets*, pays homage to the many sweet endings to traditional family meals plus the rich multicultural influences that have defined Lebanon and the region for centuries. These include a wide variety of cakes, cookies, pastries, ice creams and other delights, some classic and standard, others nuanced to suit the modern, health-conscious palate. Yet all reflect the distinctively Middle Eastern flavors that Hage came to know at an early age and which define the region's fondness for desserts.



Salma Hage

What role did sweets play in your home growing up in Lebanon?

For me, sweet things represent love and care. One of my earliest memories is of my mum and grandmother cooking together and teaching me how to roll doughs and pastries. To an extent, that experience is universal, with many of our first experiences in the kitchen involving flour, butter and sugar to be cut into stars, suns and moons. I wanted to show that Lebanese sweets and desserts can be as simple and easy to make as rolling star-shaped cookies.

What are some distinctively Lebanese sweets?

Almost too many to count! Baklava, layers of flaky filo pastry and sweet, spiced nuts drenched in a sugar syrup is probably among the most well-known. We also love our knafeh, which is made from a type of filo pastry, shredded into vermicelli noodle-like strands and filled with a sweet cheese center. Many of the recipes in my book are found throughout the region, so can't be claimed to be strictly Lebanese.

How about ma'moul, the fancifully shaped cookies stuffed with date paste? They seem to be common in the Middle East, but are they in fact Lebanese, or regional?

Ma'moul are Levantine in origin, and they've been served in the region for hundreds of years to celebrate the end of religious fasting periods. They're particularly popular at Eid and Easter to demonstrate that after periods of fasting there is a sweet reward at the end. The cookies themselves are unsweetened and slightly bland on the outside with a sweet, aromatic center to reflect this. In fact, a lot of the more ubiquitous sweets in the Middle East are common throughout the region, so it's fitting that it's just as common to find some version of the same recipe in Tehran as it is in Tel Aviv.

To what degree have the recipes or ingredients of Middle Eastern sweets been influenced by contact with other cultures, be they colonial or commercial, and vice versa?

I always think that food has no borders, and that's certainly true of sweet things too. In the introduction to *Middle Eastern*

Sweets, I write about the influence of French and European culinary traditions on the food of the Middle East, and in fact, cosmopolitan Beirut was known as "the Paris of the Middle East" for a time. Although not an anthropologist myself, I can spot more Western influences on certain dishes, such as the deep-fried donuts *awamat*, which are like French beignets, and the iced desserts such as the pomegranate and mint sorbet or the dark chocolate and tahini ice cream in my book.

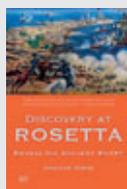
Processed sugar can be a dietetically controversial ingredient these days. Did you wrestle with that?

I'm conscious to exercise restraint when it comes to eating and serving sweet things, but I'm a firm believer in the adage, "a little of what you fancy does you good." Plenty of the recipes in my book are based around fruit, which is typically what Middle Eastern families will [also] serve as a sweet ending to dinners.

Middle Eastern Sweets: Desserts, Pastries, Creams & Treats

Salma Hage. Phaidon, 2021.


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Discovery at Rosetta: Revealing Ancient Egypt

Jonathan Downs. AUC Press, 2020.



The Book of Travels: Vols. 1 & 2

Hanna Diyab. Ed. Johannes Stephan. Trans. Elias Muhanna. NYU Press, 2021.



The First Great Powers: Babylon and Assyria

Arthur Cotterell. Hurst, 2019.



EVENTS

Highlights from aramcoworld.com

Please verify a venue's
schedule before visiting.

CURRENT / JUNE

Ali Kazim: *Suspended in Time* is informed by the time Ali Kazim, one of the most exciting artists working in Pakistan today, spent in the Ashmolean. During his residency in 2019, Kazim spent days browsing through the museum's South Asian collection, examining objects closely. His engagement with material and visual traditions—for example, how a small clay sculpture or a fingerprint can connect us—reflect on how the past informs and influences the present. Ashmolean, **Oxford, UK**, through June 26.

CURRENT / SEPTEMBER

Image? *The Power of the Visual* explores image making over the centuries through the lens of historic and contemporary artworks from diverse Muslim cultures. The 62-piece exhibition reflects on humanity's timeless preoccupation with images and explores their capacity to project power, reflect inner spiritual or poetic visions, give expressions to dearly held ideals or express key aspects of identity. Aga Khan Museum, **Toronto**, through September 5.

CURRENT / OCTOBER

Intersecting Past and Present: A Photographic Exploration focuses on the notion of the "history-altered landscape,"

a reference to the historical layers of a landscape and the influence of temporal succession on spatial dispersion. Starting at Sagalassos, one of Turkey's best-preserved archeological sites, and later broadening their focus northeast toward the archeological site of Pisidia, photographs by artists Bruno Vandermeulen and Danny Veys trace a long past, at the edge of presence and absence. Anamed Gallery, **Istanbul**, through October 17.

CURRENT / DECEMBER

reCRAFTED Histories: An Installation by Zahra Almajidi. Artist and metal-smith Zahra Almajidi uses both traditional and contemporary techniques in her work with craft objects. Pulling influence from her parents' background as Marsh Arabs (in southern Iraq) forced to migrate and resettle, Almajidi takes folk art to another level. The objects she recreates reflect both the original meaning and stories viewers may see as several steps removed. Arab American National Museum, **Dearborn, Michigan**, through December 31.

COMING / OCTOBER

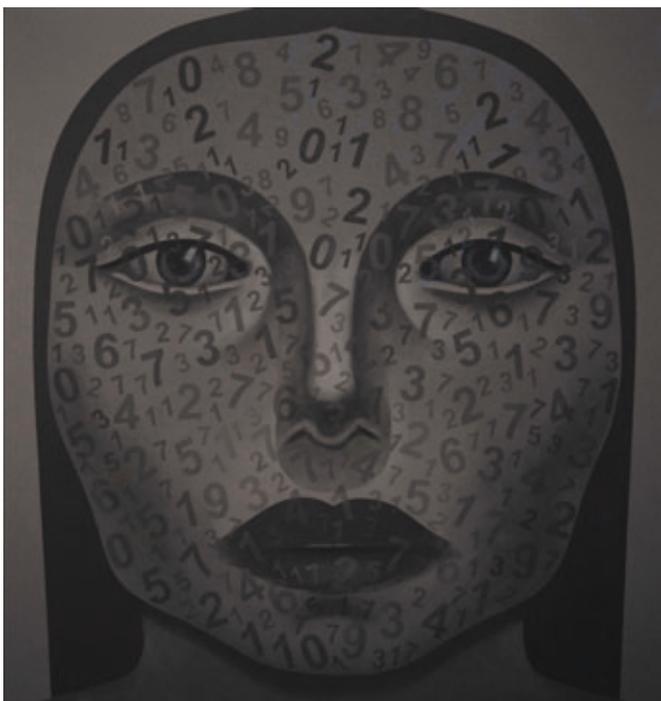
She Who Wrote: *Enheduanna and Women of Mesopotamia, ca. 3400–2000 BCE* brings together a comprehensive selection of artworks that capture

the shifting expressions of women's lives in Mesopotamia during the third millennium BCE, testifying to women's roles in religious contexts as goddesses, priestesses and worshippers in social, economic and political spheres while highlighting the religious and political power of high priestess and poetess Enheduanna (ca. 2300 BCE), the earliest-named author. The Morgan Library & Museum, **New York**, October 14 through February 19.

ONGOING

Afroz Amighi: *My House, My Tomb* is a sculptural diptych drawn with industrial materials, resembling a pair of delicate chandeliers dangling from the ceiling, but the primary medium is light. Like much of the work by Brooklyn-based artist Afroz Amighi, this installation is inspired by monumental religious architecture—in this case the Taj Mahal—which she understands as places of refuge and solace, evoking a history that never came to pass. Asian Art Museum, **San Francisco**.

Readers are welcome to submit event information for possible inclusion to proposals@aramcoamericas.com, subject line "Events."



Safwan Dahoul: *Awake* embraces the Syrian artist's dreams in all their beauty, chaos and nuances. Some are disconcerting nightmares of unsettled beings, while others are dreams of a perpetual longing for homeland. Dahoul talks about the gnawing pain of being in diaspora, so close yet so far, estranged. Partly autobiographical, this seminal body of work encloses on each canvas feelings and emotions that nonetheless emanate through space. The features of Dahoul's protagonist haunt viewers, gazing straight into the void and swallowing audiences through the darkness. Completely aware of life's struggles, conveying agony, loss and chagrin, Dahoul meanwhile emphasizes he is not a pessimist; rather, he asserts that he is documenting a current state of affairs. While the faces may reference subjective memories, Dahoul emphasizes the universality of his message. Ayyam Gallery, **Dubai**, through May 15.

Safwan Dahoul, "Dream 189," 2022, acrylic on canvas, 210 X 200 centimeters.



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